

COMPUTER INFO-GALLERY

VOLUME - 4

(2015-16)



Students' Assignments as

IT Encyclopedia

PREFACE

This book is intended to make the new-comers (students) to 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 IT terminologies and concepts. Already 3 Volumes has been launched during 2012-15.

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 it without copying others' content. Then, I thought why not we club it together in the form of a book, which will help other students also. That is how this book got emerged. This is 4th Volume for the academic year 2015-16 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 respected Correspondent Sir, the honorable 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 of your present and future innovations for
the betterment of our students and the Institution.....

H.O.D

Principal

Correspondent

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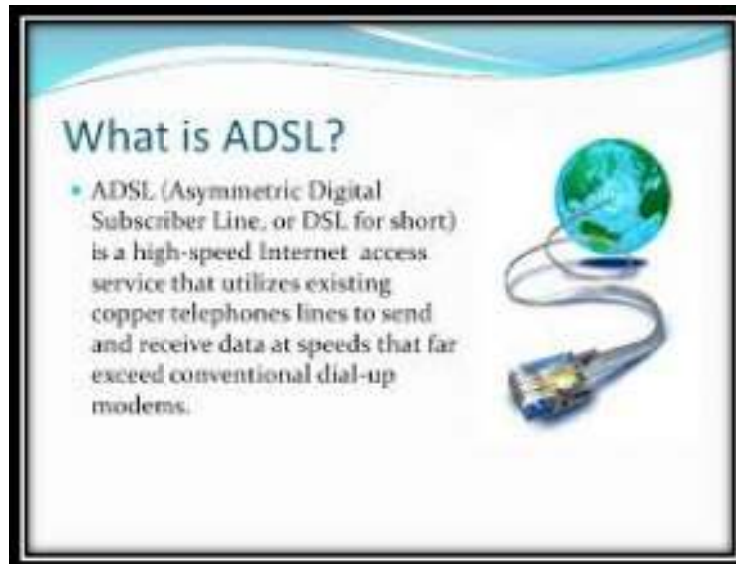
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UNDER THE GUIDANCE OF: MR. T.VELUMANI

01. ASYMMETRIC DIGITAL SUBSCRIBER LINE (ADSL)

Introduction

Asymmetric digital subscriber line (ADSL) is a type of digital subscriber line (DSL) technology, a data communications technology that enables faster data transmission over copper telephone lines than a conventional voice band modem. The 'A' in ADSL refers to the unequal distribution network bandwidth between downloads and uploads. ADSL supports data rates of from 1.5 to 9 Mbps when receiving data (downstream rate) and from 16 to 640 Kbps when sending data (upstream rate). ADSL as a service for consumers to receive Internet access in a relatively passive mode: able to use the higher speed direction for the download from the internet.



Overview

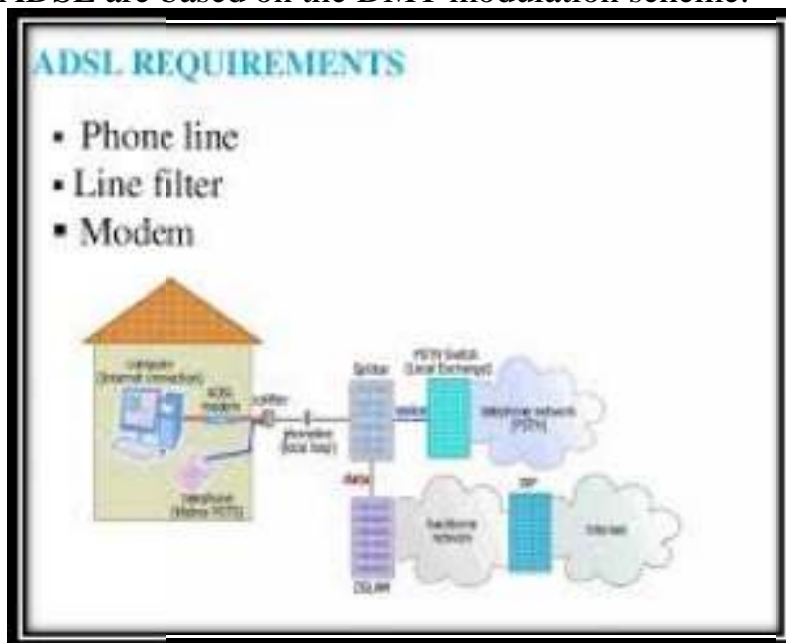
ADSL works by utilizing frequencies that are not used by a voice telephone call. A special filter, called a micro filter or DSL filter, is installed on a subscriber's telephone line to allow both ADSL and regular voice (telephone) services to be used at the same time. The marketing reasons for an asymmetric connection are that, firstly, most uses of internet traffic will require less data to be uploaded than downloaded. Secondly, internet service providers, seeking to avoid overloading of their backbone connections, have traditionally tried to limit uses such as file sharing which generate a lot of uploads. Currently, most ADSL communication is full-duplex. Full-duplex ADSL communication is usually

achieved on a wire pair by either frequency-division duplex (FDD), echo-cancelling duplex (ECD), or time-division duplex (TDD).

Operation

The total maximum capacity derived from summing the bits-per-bin is reported by DSL modems and is sometimes termed sync rate.

ADSL initially existed in two versions (similar to VDSL), namely CAP and DMT. CAP was the de facto standard for ADSL deployments up until 1996, deployed in 90 percent of ADSL installations at the time. However, DMT was chosen for the first ITU-T ADSL standards, G.992.1 and G.992.2 (also called G.dmt and G.lite respectively). Therefore, all modern installations of ADSL are based on the DMT modulation scheme.



Purpose

ADSL is designed to support the typical home user who frequently downloads large amounts of data from Web sites and online networks but uploads relatively less often.

In other respects, ADSL possesses all of the characteristics one associates with DSL, including high-speed service, an "always on" combination of voice and data support, and availability and performance that is limited by physical distance. Since the typical home user in fact does prefer a higher download speed, the telephone companies chose to make a virtue out of necessity, hence ADSL.

02. ADWARE

Adware is free software that is supported by advertisements. Common adware programs are toolbars that sit on your desktop or work in conjunction with your Web browser. They include features like advanced searching of the Web or your hard drive and better organization of your bookmarks and shortcuts.

Adware is software that is installed together with software or viaactivex controls on the internet. Adware is the name given to programs that are designed to display advertisements on your computer, redirect your search requests to advertising websites, and collect marketing-type data about you.



Adware, or advertising-supported software, is any software package that automatically renders advertisements in order to generate revenue for its author. The term is sometimes used to refer to software that displays unwanted advertisements known as malware.

Adware has been criticized because it usually includes code that tracks a user's personal information and passes it on to third parties, without the user's authorization or knowledge. This practice has been dubbed spyware and has prompted an outcry from computer security and privacy advocates, including the Electronic Privacy Information Center.

Two mainways of ways in which Adware can get onto your computer

- ❖ **Via freeware or shareware:** Adware can be included within some freeware or shareware programs-as a legitimate way of generating advertising revenues that help to fund the development and of the freeware or shareware program.
- ❖ **Infected websites:** A visit to an infected website can result in unauthorized installation of Adware on your machine. Hacker technologies are often used. For instance, your computer can be penetrated via browser vulnerability, and Trojans that are designed for stealthy installation can be used. Adware programs that work in this way are often called Browser Hijackers.

Anti-Adware

Anti-adware refers to any software utility that scans your system and removes adware, spyware, key loggers, Trojans, and other malicious code from your computer. Some of these programs are undetectable to anti-virus software and many users now use an anti-adware utility in addition to anti-virus software to protect their system.

Difference Between Spywares, Malwares, Adwares & Trojan

- ❖ **Spywares** are the programs which are used to monitor/Log the activity performed on a computer. These are used to spy on someone either for legal or illegal purpose.

Example: Key logger applications.

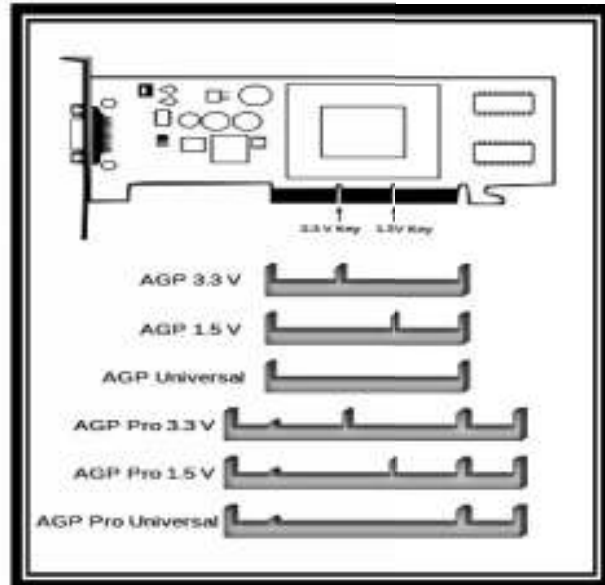
- ❖ **Malwares** are the program with malicious intention. It can be damaging your computer, spying on you or any other malicious task
- ❖ **Adwares** are the programs which delivers ads to your computer (generally in POP-UP's form). They consume your network.
- ❖ **Trojan** is a program which is used to gain access to a computer by installing a program on infected PC to open some backdoor.

03. ACCELERATED GRAPHICS PORT (AGP)

What is AGP?

The **Accelerated Graphics Port** (often shortened to **AGP**) is a high-speed point-to-point channel for attaching a video card to a computer system, primarily to assist in the acceleration of 3D computer graphics.

It was originally designed as a successor to PCI-type connections for video cards.



History

The AGP slot first appeared on x86-compatible system boards based on Socket 7 Intel P5Pentium and Slot 1P6Pentium II processors. Intel introduced AGP support with the i440lx Slot 1 chipset on August 26, 1997.

The first Socket 7 chipsets to support AGP were the viaapollo VP3, sis 5591/5592, and the ALI Aladdin V.

FIC demonstrated the first Socket 7 AGP system board in November 1997 as the FIC PA-2012 based on the VIA Apollo VP3 chipset, followed very quickly by the epox P55-VP3 also based on the VIA VP3 chipset which was first to market.

Early video chipsets featuring AGP support included the Rendition Verite V2200, 3dfxvoodoo Banshee, nvidiariva 128, 3Dlabs PERMEDIA 2, Intel i740, ATI Rage series, Matrox Millennium II, and S3 virge GX/2.

Versions

AGP and PCI: 32-bit buses operating at 66 and 33 MHz respectively					
Specification	Voltage	Clock	Speed	Transfers/clock	Rate (MB/s)
PCI	3.3/5 V	33 MHz	—	1	133
PCI 2.1	3.3/5 V	33/66 MHz	—	1	266
AGP 1.0	3.3 V	66 MHz	1×	1	266
AGP 1.0	3.3 V	66 MHz	2×	2	533
AGP 2.0	1.5 V	66 MHz	4×	4	1066
AGP 3.0	0.8 V	66 MHz	8×	8	2133
AGP 3.5*	0.8 V	66 MHz	8×	8	2133

Power consumption

AGP power provisioning								
Slot Type	3.3 V	5 V	12 V	3.3 V Aux	1.5 V	3.3 V	12 V	Total power
AGP	6 A	2 A	1 A	0.375 mA	2 A	-	-	48.25 W
AGP Pro110						7.6 A	9.2 A	50 to 110 W
AGP Pro50						7.6 A	4.17 A	25 to 50 W

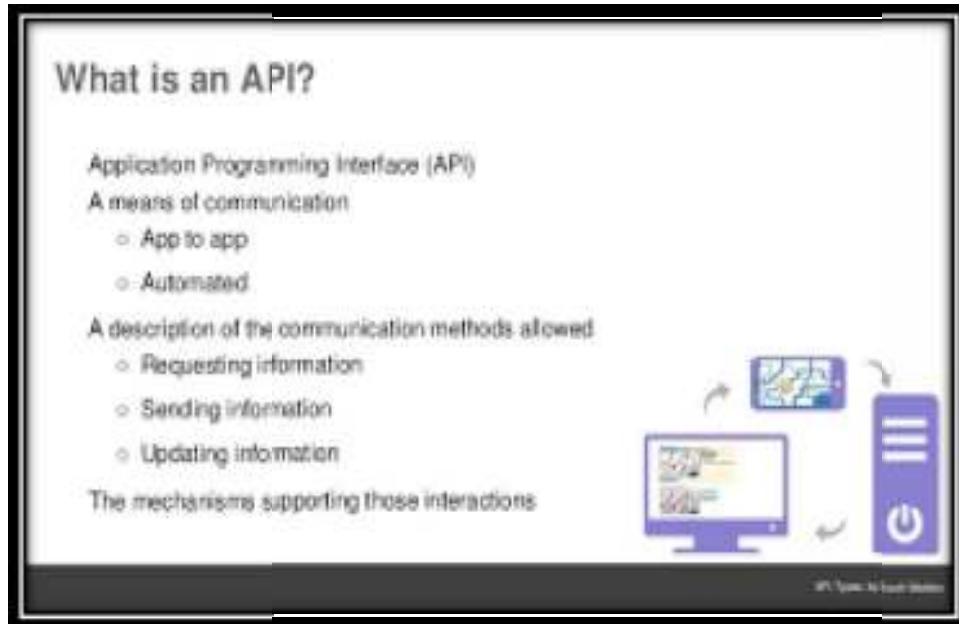
Legacy use

By 2010 few new motherboards had AGP slots. No new motherboard chipsets were equipped with AGP support, but motherboards continued to be produced with older chipsets with support for AGP.

Graphics processors of this period use PCI-Express, a general-purpose (not restricted to graphics) standard that supports higher data transfer rates and full-duplex.

04 .APPLICATION PROGRAMMING INTERFACE (API)

API Stands for "Application Program Interface," though it is sometimes referred to as an "Application Programming Interface." An API is a set of commands, functions, and protocols which programmers can use when building software for a specific operating system.



API in Object Oriented Language

- ❖ Object API is a description of how object works in a given object-oriented language- usually it is expressed as a set of classes with an associated list of class methods.

For example:

- ❖ In Java if the class Scanner is to be used (a class that reads inputs from the user in text-based programs)
- ❖ The API can be conceived of as a totality of all the methods publicly exposed by the classes called an interface.

API Libraries and Framework

- ❖ An API is usually related to a software library. The API describes and prescribes the expected behavior while the library is an actual implementation of this set of rules.

- ❖ API can also be related to a software framework. The overall program flow of control can be out of the control of the caller, and in the hands off the framework inversion of the control or a similar mechanism.

API In Design

- ❖ API's proposed the concept of information hiding in 1972. Principle of information hiding is that one may divide software into modules, each of which has a specified interface.
- ❖ Software architecture is dedicated to creating and maintaining high level software structures which typically include modules.
- ❖ API are designed in the real world, one must also understand the structures of software engineering organization.

API in Documentation

Professional-level documentation for an API should strive to include the following parts:

- ❖ **Reference documentation:**
 - A description of the function and objects in the API
- ❖ **Overview and concepts:**
 - A narrative description of the different parts of the API and how they interact. Major frame works in the API, such as its GUI, network and file system frameworks should have their own separate section.
- ❖ **SDK tools documentation:**
 - Documents that describe how to install and use build, compile, and deploy tools
- ❖ **License information:**
 - Documents that describe the API license

05. BASE STATION

Introduction

The term "base station" was first used to refer to the towers you see on the side of the road that relay cell phone calls. These stations handle all cellular calls made within their area, receiving information from one end of the call and transmitting it to the other.

A base station is the interface between wireless phones and traditional wired phones. It's what allows you to use your cell phone to call your home phone.

The base station, a wireless system, uses microwave radio communication.



A 1980s consumer-grade Citizens' band radio (CB) base station

The term base station is used in the context of mobile telephony, wireless computer networking and other wireless communications and in land surveying: in surveying it is a GPS receiver at a known position, while in wireless communications it is a transceiver connecting a number of other devices to one another and/or to a wider area.

In a computer network it is a transceiver acting as a router for computers in the network, possibly connecting them to a local area network and/or the internet.

Land surveying

In the context of external land surveying, a base station is a GPS receiver at an accurately-known fixed location which is used to derive correction information for nearby portable GPS receivers.

Computer networking

In the area of wireless computer networking, a base station is a radio receiver/transmitter that serves as the hub of the local wireless network, and may also be the gateway between a wired network and the wireless network.



Wireless communications

In radio communications, a base station is a wireless communications station installed at a fixed location and used to communicate as part of one of the following:

Media

Close-up of a base station antenna in Mexico City, Mexico. There are three antennas: each serves a 120-degree segment of the horizon. The microwave dish links the site with the telephone network.



06. BATCH FILE

Meaning

A batch file is a kind of script file in DOS, OS/2 and Windows. It consists of a series of commands to be executed by the command line interpreter stored in a plain text file. A batch file may contain any command the interpreter accepts interactively and use constructs that enable conditional branching and looping within the batch file, such as "if", "for", "go to" and label similar to Job Control Language (JCL) and other systems on mainframe and minicomputer systems, batch files were added to ease the work required for certain regular tasks by allowing the user to set up a script to automate them. When a batch file is run, the shell program (usually COMMAND.COM or cmd.exe) reads the file and executes its commands, normally line-by-line.

Unix-like operating systems (such as Linux) have a similar but more flexible type of file called a shell script. The filename extension .bat is used in DOS and Windows. Windows NT and OS/2 also added .cmd. Batch files for other environments may have different extensions, e.g. .btm in 4DOS, 4OS2 and 4NT related shells. The detailed handling of batch files has changed. Some of the detail in this article applies to all batch files while other details apply only to certain versions.

DOS

In MS-DOS, a batch file can be started from the command line by typing its name followed by any required parameters and pressing the "enter" key. When MS-DOS loads, the file AUTOEXEC.BAT is automatically executed. So any commands that need to be run to set up the MS-DOS environment for use could be placed in this file. Computer users would have the autoexec file set up the system date and time, initialize the MS-DOS environment, load any resident programs or device drivers, or initialize network connections and assignments.

In MS-DOS the extension ".bat" identified a file containing commands which could be executed by the command interpreter COMMAND.COM line by line as if it was a list of commands to be entered, with some extra batch-file-specific commands for basic programming functionality, including a GOTO command for changing flow of line execution.

Early windows

Microsoft Windows was introduced in 1985 as a GUI-based alternative to text-based operating systems and was designed to run on MS-DOS. In order to start it, the win command was used, which could be added to the end of the AUTOEXEC.BAT file to allow automatic loading of Windows. In the earlier versions, one could run a .bat type file from Windows in the MS-DOS Prompt. Windows 3.1x and earlier, as well as Windows 9x invoked COMMAND.COM to run batch files.

OS/2

The IBM OS/2 operating system supported DOS-style batch files. It also included a version of REXX, which was a more advanced batch-file scripting language. IBM and Microsoft started developing this system, but during the construction of it broke up after a dispute; as a result of this, IBM referred to their MS-DOS-like console shell without mention of Microsoft, naming it just DOS, although this seemingly made no difference with regard to the way batch files worked from COMMAND.COM. OS/2's batch file interpreter also supports an EXTPROC command. This passes the batch file to the program named on the EXTPROC file as a data file. The named program can be a script file.

Windows NT

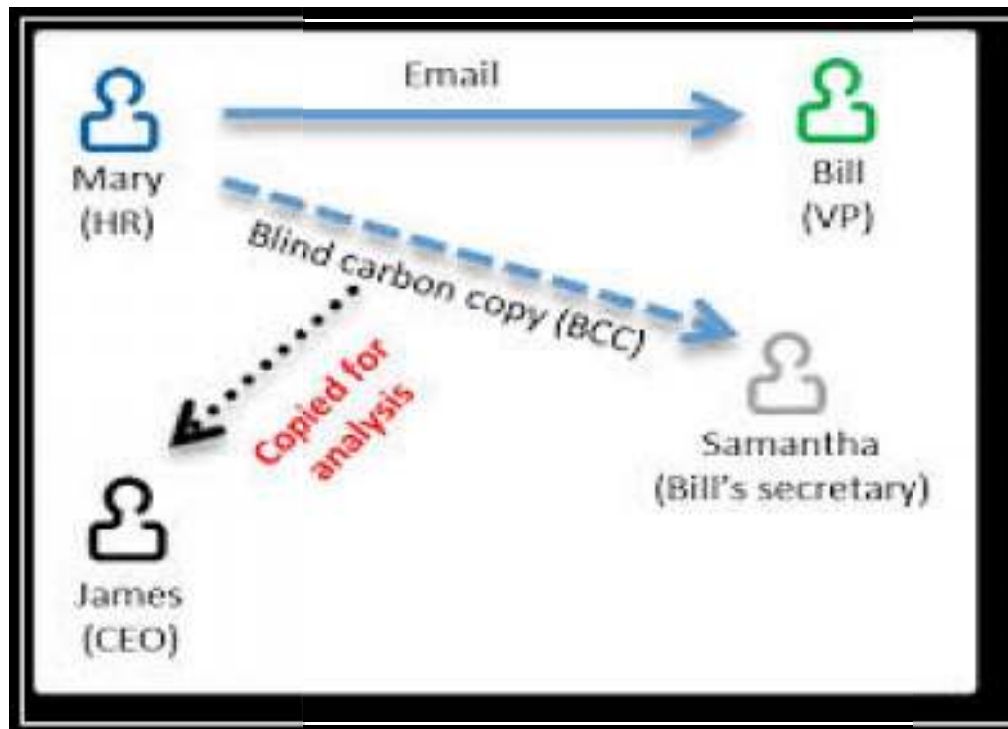
Unlike Windows 9x and earlier, the Windows NT family of operating systems does not depend on MS-DOS. Windows NT introduced an enhanced 32-bit command interpreter (cmd.exe) which could execute scripts with either the .CMD or .BAT extension. Cmd.exe added additional commands, and implemented existing ones in a slightly different way, so that the same batch file (with different extension) might work differently with cmd.exe and COMMAND.COM. In most cases, operation is identical if the few unsupported commands are not used. Cmd.exe's extensions to COMMAND.COM can be disabled for compatibility. Microsoft released a version of cmd.exe for Windows 9x and ME called WIN95CMD to allow users of older versions of Windows to use certain cmd.exe-style batch files.

As of Windows 8, cmd.exe is the normal command interpreter for batch files; the older COMMAND.COM can be run from within a cmd.exe window in 32-bit versions of Windows able to run 16-bit programs.

07. BLIND CARBON COPY (BCC)

Definition of blind carbon copy

BCC Stands for "Blind Carbon Copy." When you send an e-mail to only one person, you type the recipient's address in the "To:" field. When you send a message to more than one person, you have the option to enter addresses in the "Cc:" and "Bcc:" fields. "Cc" stands for "Carbon Copy," while "Bcc" stands for "Blind Carbon Copy." A carbon copy, or "Cc's" message is an e-mail that is copied to one or more recipients. Both the main recipient (whose address is in the "To:" field) and the Cc'd recipients can see all the addresses the message was sent to. When a message is blind carbon copied, neither the main recipient nor the Bcc's recipients can see the addresses in the "Bcc:" field.



Blind carbon copying is a useful way to let others see an e-mail you sent without the main recipient knowing. It is faster than sending the original message and then forwarding the sent message to the other recipients. It is also good netiquette to use Bcc when copying a message to many people. This prevents the e-mail addresses from being captured by someone in the list who might use them for spamming purposes. However, if it is important that each recipient knows who sent a message, use carbon copy (Cc) instead.

Advantages of blind carbon copy

1. To send an email to the second person without the first person knowing
2. Sending through a Mailing List or Newsletter
3. Protecting the second person by not sharing their email address to the first Person

Benefits

There are a number of reasons for using this feature:

- Bcc is often used to prevent an accidental "Reply All" from sending a reply intended for only the originator of the message to the entire recipient list.
- To send a copy of one's correspondence to a third party (for example, a colleague) when one does not want to let the recipient know that this is being done (or when one does not want the recipient to know the third party's e-mail address, assuming the other recipient is in the To: or Cc: fields).
- To send a message to multiple parties with none of them knowing the other recipients. This can be accomplished by addressing a message to oneself and filling in the actual intended recipients in the Bcc: field. However, this does not ensure that the Bcc: addresses will be hidden from other Bcc: addresses in all implementations.
- To prevent the spread of computer viruses, spam, and malware by avoiding the accumulation of block-list e-mail addresses available to all Bcc: recipients, which often occurs in the form of chain letters.

Disadvantages of blind carbon copy

In some cases, use of Blind Carbon Copy may be viewed as mildly unethical. The original addressee of the mail (To: address) is left under the impression that communication is proceeding between the known parties, and is knowingly kept unaware of others participating in the primary communication. A related risk is that by (unintentional) use of 'reply to all' functionality by someone on Bcc, the original addressee is (inadvertently) made aware of this participation. For this reason, it is in some cases better to separately forward the original e-mail.

08. BETA SOFTWARE

Definition of beta software

A pre-release of software that is given out to a large group of users to try under real conditions. Beta versions have gone through alpha testing in house and are generally fairly close in look, feel and function to the final product. However, design changes often occur as a result.



Advantages and disadvantages of beta software

The Beta version of any software is made available globally so that its errors, bugs and crashes can be reported by real time users. This is advantageous as it helps to enhance the software performance and make it failure free when the product/software is launched on a larger scale with a high performance rate. Another advantage of the same is that it provides a fast and less costly software feedback. Imagine a company employing so many testers as there are beta version users, and then paying them. This would sum up to a huge amount for the company.

Also, even if the company does appoint so many testers, the time duration would always be a consideration and a point of concern. Many people using the software globally would take very less time, and the varied dimensions of testing

would be highly fruitful. All the costs that the company has to bear would be that of renting a disk space on the internet and good popularity of the product.

About beta software

Find beta releases all over the place: operating systems, video games, web apps, music players, etc. The term “beta” refers to a product’s stage of development and to compare it to the life cycle of insects, which typically goes through multiple phases: eggs, larva, pupa, and adult.

As products develop, they go through a similar cycle: pre-alpha, alpha, beta, and release candidate. Usage of the “alpha/beta” labeling can be traced back to IBM as early as the 1950s. It may have heard about the software development cycle before, but let’s delve a little deeper into what these terms mean.



The pre-alpha phase

The pre-alpha phase is the portion of development that occurs before the first round of testing. Of course, a properly managed project will constantly be testing products in an iterative manner, so I suppose it’s more accurate to say that the pre-alpha phase refers to everything that happens before official testing begins.

This phase encapsulates many different activities: market research, data collection, requirements analysis and documentation, software design, and software engineering. That’s probably a load of mumbo-jumbo, but hopefully it gives an idea of how much work is involved even before a product begins development.

09. BING SEARCH ENGINE

Bing (known previously as Live Search, Windows Live Search, and MSN Search) is a web search engine from Microsoft.



Features

Interface features

- ❖ Daily changing of background image. The images are mostly of noteworthy places in the world, though it sometimes displays animals, people, and sports. The background image also contains information about the element(s) shown in the image.
- ❖ Video homepage for HTML5 enabled browsers on occasional events, similar to the daily background images.
- ❖ Sublinks – On certain search results, the search result page also shows section links within the article (this is also done on other search engines, including Google).
- ❖ Enhanced view where third party site information can be viewed inside Bing.
- ❖ On certain sites, search from within the website on the results page.
- ❖ On certain sites, Bing will display the Customer Service number on the results page.

Media features

- ❖ Video thumbnail Preview – where, by hovering over a video thumbnail, the video automatically starts playing.
- ❖ Advanced filters or advanced (query) operators – allow users to refine search results based on properties such as image size, aspect ratio, color or black and white, photo or illustration, and facial features recognition
- ❖ Video search with adjustable setting for length, screen size, resolution, and source

Integration with Hotmail

- ❖ With Hotmail's "Quick Add" feature, users can insert derivatives of Bing search results such as restaurant reviews, movie times, images, videos, and maps directly into their e-mail messages.

Integration with Facebook

- ❖ Bing's search results can display one's Facebook friends when a Facebook account is linked with Bing via Facebook Connect.
- ❖ Users have the option to send messages to their friends in the search results.
- ❖ As part of the changes announced May 10, 2012 the "sidebar" column of the new three-column search results display will include recommendations from Facebook and the ability to interact with others from the same page.
- ❖ For the previous year, search results had included Facebook recommendations using the "like" button, but most users did not want this; the new display makes this feature separate from search results in general.

Integration with Apple

- ❖ Apple's search results have now been integrated with Bing's web search engine.
- ❖ On June 10, 2013, Apple announced that it will be dropping Google as its web search engine and include Microsoft's Bing.
- ❖ This feature is only integrated with ios 7 and higher and for users with an iphone 4S or higher as the feature is only integrated with Siri, Apple's personal assistant.

10. BITTORRENT

Definition of bittorrent

BitTorrent is a peer-to-peer (P2P) file sharing protocol designed to reduce the bandwidth required to transfer files. It does this by distributing file transfers across multiple systems, thereby lessening the average bandwidth used by each computer. For example, if a user begins downloading a movie file, the BitTorrent system will locate multiple computers with the same file and begin downloading the file from several computers at once. Since most ISPs offer much faster download speeds than upload speeds, downloading from multiple computers can significantly increase the file transfer rate.



In order to use the BitTorrent protocol, you need a BitTorrent client, which is a software program that accesses the BitTorrent network. The client program allows you to search for files and begin downloading torrents, which are in-progress downloads. Most BitTorrent clients allow you to resume torrents that have been paused or stopped. This can be especially helpful when downloading large files.

About bittorrent

BitTorrent Inc. is an Internet technology company based in San Francisco. The design distributed technologies that scale efficiently, keep intelligence at the edge, and keep creators and consumers in control of their content and data. More than 170 million people use our products every month. Our protocols move as much as 40% of the world's Internet traffic on a daily basis.

It is used to build a better Internet. To work with people, industries and nations to create better ways to move information. Better ways for creators to make

money. New ways for fans to engage, on their terms. Ways to sustain the stuff we share. The Internet promised us this much. And we promise to make good on it. We believe in an Internet of options, not rules.

Bittorrent DNA

BitTorrent DNA is a disruptively effective content delivery technology. It significantly reduces bandwidth costs for popular files while dramatically improving the performance and scalability of websites. BitTorrent DNA enables websites to seamlessly add the speed and efficiency of patented BitTorrent technology to their current content delivery infrastructure, requiring no changes to their current Content Delivery Network (CDN) or hardware in the origin infrastructure.

Businesses can benefit from the efficiencies of peer-assisted content delivery while improving the end-user experience.

The BitTorrent Certified program includes a Software Development Kit (SDK) for consumer electronics manufacturers; ensuring compatibility between consumer electronics products, and the BitTorrent ecosystem of services and software. Compatible devices are eligible for the BitTorrent Certified logo endorsement, which allows manufacturers to leverage the BitTorrent brand for packaging and promotional materials.

Advantages of bittorrent:

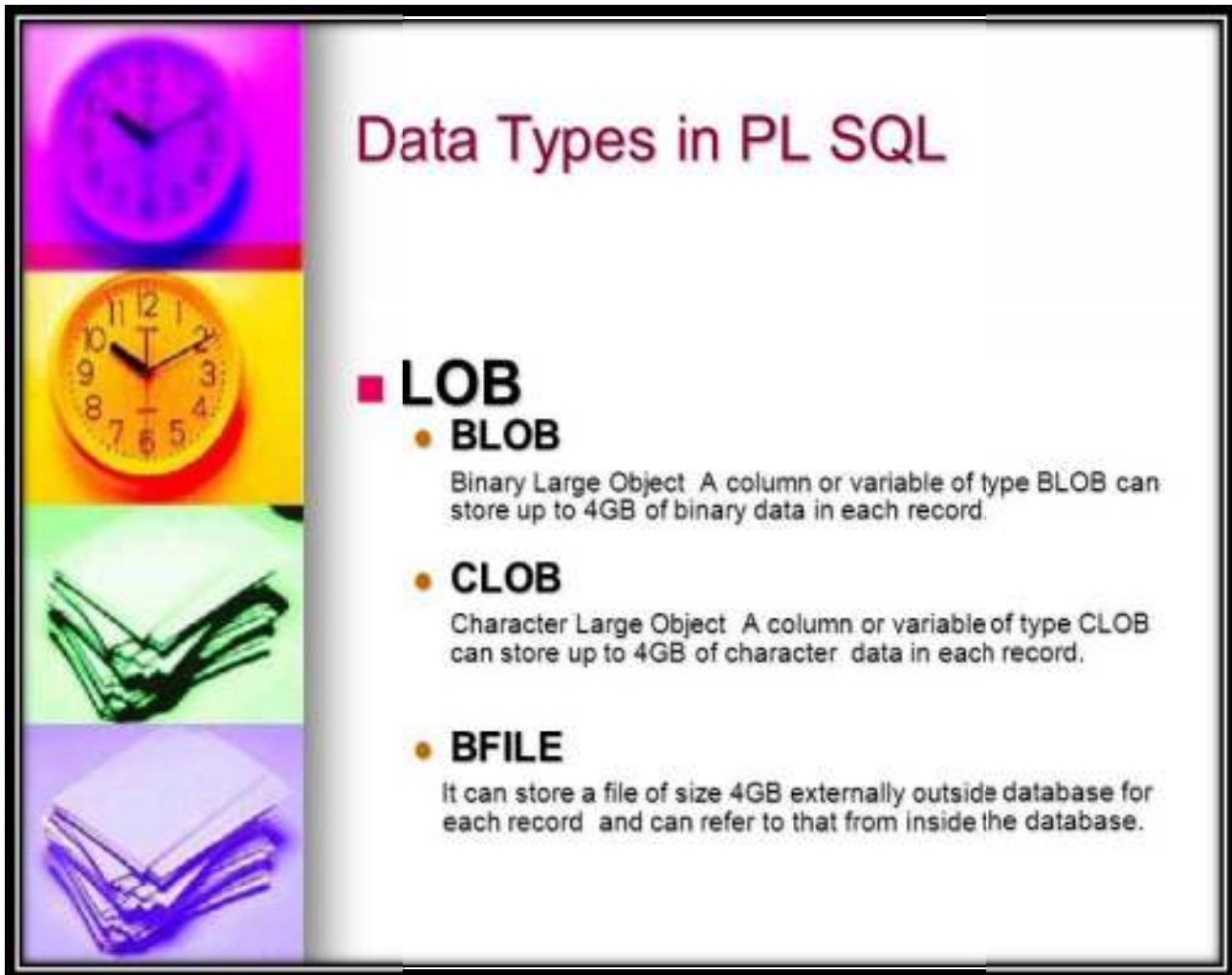
- ❖ Highly Efficient
- ❖ Makes sharing easier
- ❖ Prevents tampered or broken files from being shared
- ❖ Ability to download and upload large files in a shorter amount of time
- ❖ Free uploading and downloading

Disadvantages of bittorrent:

- ❖ If the seeder leaves the swarm too early, no one is able to use the file
- ❖ Seeder can only seed one or two files at a time
- ❖ The computer's performance drops drastically while using the program
- ❖ Old or unpopular files are hard to find
- ❖ Torrent files are too flaky due to excessive popularity

11. BINARY LARGE OBJECT (BLOB)

A Binary Large Object (BLOB) is a collection of binary data stored as a single entity in a database management system. Blobs are typically images, audio or other multimedia objects, though sometimes binary executable code is stored as a blob. Database support for blobs is not universal.

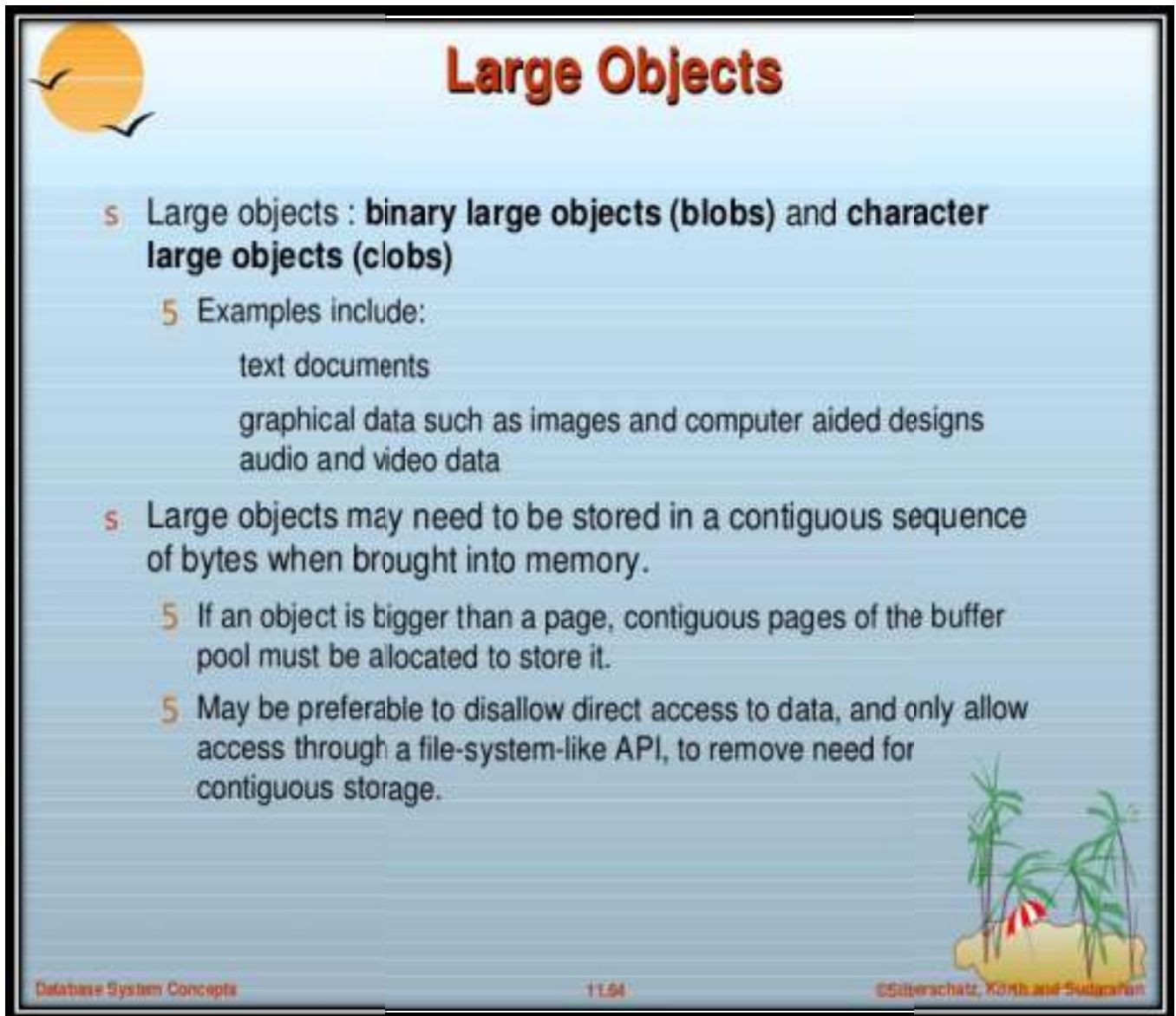


Data Types in PL SQL

- **LOB**
 - **BLOB**
Binary Large Object. A column or variable of type BLOB can store up to 4GB of binary data in each record.
 - **CLOB**
Character Large Object. A column or variable of type CLOB can store up to 4GB of character data in each record.
 - **BFILE**
It can store a file of size 4GB externally outside database for each record and can refer to that from inside the database.

"Blobbing" originally meant moving large amounts of data from one database to another without filters or error correction. This is fast because it puts the responsibility for error checking and filtering on the new host for the data. The term arose from the image of somebody grabbing fistfuls of material from one container and putting it in another without regard to what was in the "blob" they were grasping.

The data type and definition was introduced to describe data not originally defined in traditional computer database systems, particularly because it was too large to store practically at the time the field of database systems was first being defined in the 1970s and 1980s. The data type became practical when disk space became cheap. This definition gained popularity with IBM's DB2.



Large Objects

- s Large objects : **binary large objects (blobs)** and **character large objects (clobs)**
 - 5 Examples include:
 - text documents
 - graphical data such as images and computer aided designs
 - audio and video data
- s Large objects may need to be stored in a contiguous sequence of bytes when brought into memory.
 - 5 If an object is bigger than a page, contiguous pages of the buffer pool must be allocated to store it.
 - 5 May be preferable to disallow direct access to data, and only allow access through a file-system-like API, to remove need for contiguous storage.

Database System Concepts 11.54 ©Silberschatz, Korth and Sudarshan

Blobs were originally just big amorphous chunks of data invented by Jim Starkey at DEC, who describes them as "the thing that ate Cincinnati, Cleveland, or whatever" from "the 1958 Steve McQueen movie", referring to The Blob. Later, Terry McKiever, a marketing person for Apollo, felt that it needed to be an acronym and invented the backronym Basic Large Object. Then Informix invented an alternative backronym, Binary Large Object.

12. BLOG

A blog (a truncation of the expression weblog) is a discussion or informational site published on the consisting of discrete entries ("posts") typically displayed in reverse chronological order (the most recent post appears first). Until 2009, blogs were usually the work of a single individual occasionally of a small group, and often covered a single subject. More recently "multi-author blogs" (MABs) have developed, with posts written by large numbers of authors and professionally edited. MABs and other media outlets, and similar institutions account for an increasing quantity of blog traffic.

The rise of and other systems helps integrate MABs and single-author blogs into societal new streams. Blog can also be used as a verb, meaning to maintain or add content to a blog.

The emergence and growth of blogs in the late 1990s coincided with the advent of web publishing tools that facilitated the posting of content by non-technical users. Majority are interactive, allowing visitors to leave comments and even message each other via on the blogs, and it is this interactivity that distinguishes them from other static websites. In that sense, blogging can be seen as a form of indeed, bloggers do not only produce content to post on their blogs, but also build social relations with their readers and other bloggers. However, there are high-readership blogs which do not allow comments.

Many blogs provide commentary on a particular subject; others function as more personal; others function more as a part of a particular individual or company. A typical blog combines text, images, and links to other blogs, and other media related to its topic. The ability of readers to leave comments in an interactive format is an important contribution to the popularity of many blogs. Most blogs are primarily textual, although some focus on art, photographs videos or music and audio is another type of blogging, featuring very short posts. In education, blogs can be used as instructional resources.

On 16 February 2011, there were over 156 million public blogs in existence. On 20 February 2014, there were around 172 and 75.8 million blogs in existence worldwide. However, Blogger does not offer public statistics.

The Difference Between a Blog and CMS?

Software that provides a method of managing your website is commonly called a CMS or "Content Management System". Many blogging software programs are considered as a specific type of CMS. They provide the features required to create and maintain a blog, and can make publishing on the internet as simple as writing an article, giving it a title, and organizing it under (one or more) categories.



While some CMS programs offer vast and sophisticated features, a basic blogging tool provides an interface where you can work in an easy and, to some degree, intuitive manner while it handles the logistics involved in making your composition presentable and publicly available. In other words, you get to focus on what you want to write, and the blogging tool takes care of the rest of the site management.

Word Press is one such advanced blogging tool and it provides a rich set of features. Through its Administration Panels, you can set options for the behavior and presentation of your weblog. Via these Administration Panels, you can easily compose a blog post, push a button, and be published on the internet, instantly! Word Press goes to great pains to see that your blog posts look good, the text looks beautiful, and the html code it generates conforms to web standards. If you're just starting out, read Getting Started with Word Press, which contains information on how to get Word Press set up quickly and effectively, as well as information on performing basic tasks within Word Press, like creating new posts or editing existing ones.

13. BOOT DISK

A boot disk is removable digital data storage medium from which one can load and run a utility program. The computer must have a built-in program which will load and execute a program from a boot disk meeting certain standards.

Uses of Boot disks

- Operating system installation
- Hardware or software troubleshooting
- Customizing an operating environment
- Software demonstration
- Administrative access in case of lost password is possible with an appropriate boot disk with some operating systems
- Games
- While almost all modern computers can boot from a hard drive containing the operating system and other software, they would not normally be called boot disks are the most common forms of media used, but other media, such as magnetic or paper tape drives, , and more recently can be used. The computer's must support booting from the device in question.

The process of booting

The term boot comes from the idea of lifting oneself by one's own the computer contains a tiny program (bootstrap loader) which will load and run a program found on a boot device. This program may itself be a small program designed to load a larger and more capable program, i.e., the full operating system. To enable booting without the requirement either for a device or to write to the boot medium, it is usual for the boot program to use some system as a temporary storage. As an example, any computer compatible with this is able with built-in software to load the contents of the first 512 bytes of a floppy and to execute it if it is a viable program; boot floppies have a very simple loader program in these bytes. The process is vulnerable to abuse; data floppies could have a virus written to their first sector which silently infects the host computer if switched on with the disk in the drive.

Boot floppies

Bootable floppies for PCs usually contain or miniature versions of. The most commonly available floppy disk can hold only 1.4 of data in its standard format, making it impractical for loading large. The use of boot floppies is in decline, due to the availability of other higher-capacity options.



Booting from a disk

A modern PC is configured to attempt to boot from various devices in a certain order. If a computer is not booting from the device desired, such as the floppy drive, the user may have to enter the BIOS setup function by pressing a special key when the computer is first turned on (such as Delete, F1, F2, F10 or F12), and then changing the boot order. More recent BIOS permit the interruption of the final stage of the boot process by pressing a function key (usually F11). This results in a list of bootable devices being presented, from which a selection may be made.

Modern Apple computers will boot from an appropriate disk if the user presses the C key while the machine is starting.

14. BUFFER

A buffer is a temporary holding area for data while it's waiting to be transferred to another location. It is usually located in the RAM. The concept of the buffer was developed in order to prevent data congestion from an incoming to an outgoing port of transfer.

There are common uses for the buffer that help improve a device's overall performance. Nearly all hard disks make use of a buffer to facilitate easy retrieval of data. Any type of memory handling and data storage service will make use of some sort of buffer as well.

Even the CPU's most basic tasks need to use buffers to operate in the form of registers, where data like operands and operators are stored before they are processed. When a user downloads a video or audio file, a certain percentage of the downloaded file is placed in the buffer and then played. As the clip is played, the device continuously downloads the file and places it in the buffer. Because of this, there is less chance that the video or audio file will stall when network congestion occurs, unless of course the download rate is so slow that the play speed catches up with it. As another example, when printing a document, when the print command is invoked by the system or the application, the print data is sent to the buffer and is then transferred to the printer. From there, the printer accesses the information. This frees the computer up to do other tasks while the print command is being performed.

One disadvantage to this system is that any data in the buffer during device failure is lost. A buffer is a data area shared by hardware devices or program processes that operate at different speeds or with different sets of priorities. The buffer allows each device or process to operate without being held up by the other.

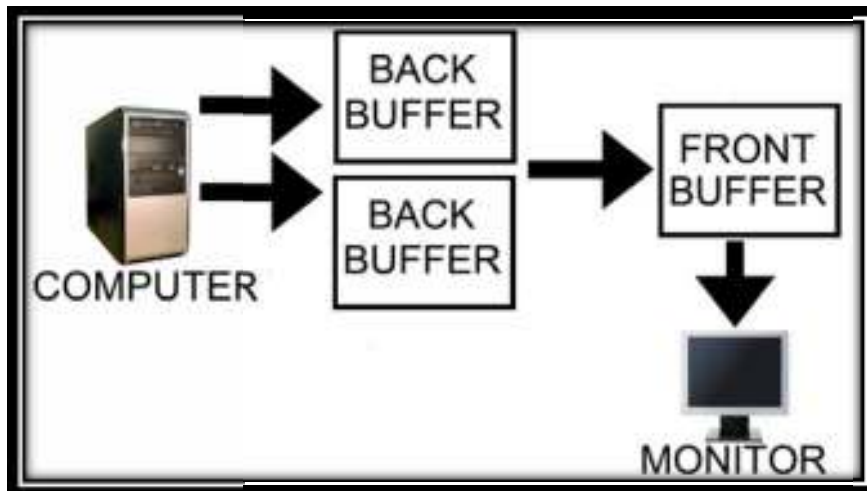
In order for a buffer to be effective, the size of the buffer and the algorithms for moving data into and out of the buffer need to be considered by the buffer designer. Like, a buffer is a "midpoint holding place" but exists not so much to accelerate the speed of an activity as to support the coordination of separate activities.

This term is used both in programming and in hardware. In programming, buffering sometimes implies the need to screen data from its final intended place so that it can be edited or otherwise processed before being moved to a regular file or database.



Intention of a buffer

The purpose of most buffers is to act as a holding area, enabling to manipulate before transferring it to the main memory. Because the process and data too are relatively slow, many keep track of data changes in a buffer and then the buffer to a disk. Then when you save the file, the word processor updates the disk file with the contents of the buffer.



This is much more efficient than accessing the file on the disk where each time you make a change to the file. Note that because your changes are initially in a buffer, not on the disk, all of them will be lost if it fails during an editing session.

15. BURNING A DISC

Even with a world full of iPods, MP3 players, digital home media servers and car audio systems that play music from USB flash memory; people still burn CDs. In addition to playing, downloading and converting a wide variety of digital audio and video formats, RealPlayer can also record, or burn CD-R and CD-RW media. This is a necessary feature for those who still want or need their music on CDs. Maybe your home entertainment system doesn't have the latest and greatest inputs for digital media, but there is a CD, DVD or Blue ray player. Maybe your car doesn't have a USB slot to plug in flash memory or an iPod, only a CD player. Or maybe you want to burn music to a blank CD, so you can let your children listen to the CD without ruining the original.



Before you can burn a CD:

- ❖ First, make sure your computer is connected to a drive that can record CD-R (Compact Disc-Record) or CD-RW (Compact Disc-Re Writable) discs. All modern disc drives will read and write both CDs and DVDs.
- ❖ Second, have a supply of blank CD-R or CD-RW discs. I suggest using CD-R. They are more reliable for playing. Just starting out, you don't need the complexity of Re-Writable. Use quality, brand name discs.
- ❖ Third, insert a disc in the CD/DVD drive.

How Long Will Auto Manufacturers Include CD Players in Cars? Here's a Guess.

The death of the factory in-dash cassette player was a long one. Delco and Motorola units first started appearing in new models in about 1970. The last new model car to come with a factory cassette player was the 2010 Lexus SC430. For most of that time, the in-dash cassette player co-existed with the factory CD player, which was first included in the 1984 S-Class Mercedes. But ever since the cassette player disappeared from new models, so has the CD player as more and more people prefer to plug their smart phones than lug around stacks of compact discs. It wasn't that long ago that many of us spent hours burning mix CDs just for the car. My limit was six—maybe 75 songs—because I had a six-pack changer and once loaded, I rarely bothered to swap out an old disc for a new one.

According to a survey of automotive experts, the factory CD player should be gone by 2019. That's just three years away. If you're shopping for a new, you may have encountered CD players as options. Some models—especially those aimed at Millennial—don't even offer a CD player because market research shows that the majority of buyers for those vehicles will never use it.

Term	Description
CD-R	CD-Recordable. Write Once, Read Many. (WORM)
CD-RW	CD-Rewritable. Write Many, Read Many.
ISO-9660	DOS compatible file system (8.3 character file names) for CD's. Requires extensions like "Rock Ridge" to fully support UNIX/Linux
Rock Ridge	ISO-9660 extension to allow long file names, UNIX symlinks and file protection (rwx). Windows readable.
Joliet	Microsoft extension to ISO-9660. Creates MS/Windows 95 like 8.3 file names with translation to 64 character names.
Multisession	Allows adding/writing files at a later time. Session must be closed before it is readable.
DAO	Burn entire audio CD at once in a single burn. It's the only way to avoid delays between tracks

16. CAPTCHA

What is CAPTCHA?

Well, since you asked, CAPTCHA stands for "Completely Automated Public Turing test to tell Computers and Humans Apart". Since the dawn of the Internet, people have tried to abuse websites for both sport and profit. As the abuse became profitable, the scale of abuse grew using automated software (sometimes referred to as bots). To prevent bots from overrunning sites with spam, fraudulent registrations, fake sweepstakes entries, and other nefarious things, publishers responded by testing users to see if they were human or not.



Applications of CAPTCHA

CAPTCHAs have several applications for practical security, including but not limited to:

- ❖ **Preventing Comment Spam in Blogs** - Most bloggers are familiar with programs that submit bogus comments, usually for the purpose of raising search engine ranks of some website (e.g., "buy penny stocks here"). This is called comment spam. By using a CAPTCHA, only humans can enter comments on a blog. There is no need to make users sign up before they enter a comment, and no legitimate comments are ever lost!
- ❖ **Protecting Website Registration**- Several companies offer free email services. Up until a few years ago, most of these services suffered from a specific type of attack: "bots" that would sign up for thousands of email accounts every minute. The solution to this problem was to use CAPTCHAs to ensure that only humans obtain free accounts. In general, free services should be protected with a CAPTCHA in order to prevent abuse by automated scripts.
- ❖ **Protecting Email Addresses From scrapers**- The Web in search of email addresses posted in clear text. CAPTCHAs provide an effective mechanism

to hide your email address from Web scrapers. The idea is to require users to solve a CAPTCHA before showing your email address. A free and secure implementation that uses CAPTCHAs to obfuscate an email address can be found at

- ❖ **Online Polls-** In November 1999, <http://www.slashdot.org> released an online poll asking which was the best graduate school in computer science. As is the case with most online polls, IP addresses of voters were recorded in order to prevent single users from voting more than once. However, students at Carnegie Mellon found a way to stuff the ballots using programs that voted for CMU thousands of times. CMU's score started growing rapidly.

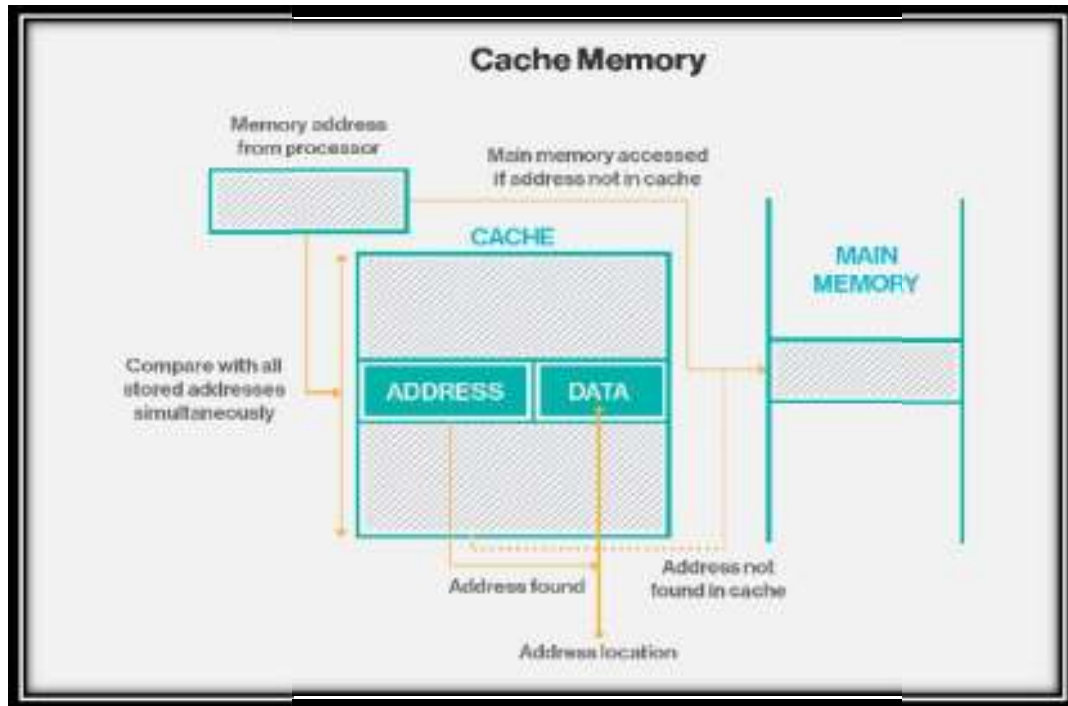
The next day, students at MIT wrote their own program and the poll became a contest between voting "bots." MIT finished with 21,156 votes, Carnegie Mellon with 21,032 and every other school with less than 1,000. Can the result of any online poll be trusted? Not unless the poll ensures that only humans can vote.

- ❖ **Preventing Dictionary Attacks-** CAPTCHAs can also be used to prevent dictionary attacks in password systems. The idea is simple: prevent a computer from being able to iterate through the entire space of passwords by requiring it to solve a CAPTCHA after a certain number of unsuccessful logins. This is better than the classic approach of locking an account after a sequence of unsuccessful logins, since doing so allows an attacker to lock accounts at will.
- ❖ **Search Engine Bots-** It is sometimes desirable to keep web pages unindexed to prevent others from finding them easily. There is an html tag to prevent search engine bots from reading web pages. The tag, however, doesn't guarantee that bots won't read a web page; it only serves to say "no bots, please." Search engine bots, since they usually belong to large companies, respect web pages that don't want to allow them in. However, in order to truly guarantee that bots won't enter a web site, CAPTCHAs are needed.
- ❖ **Worms and Spam-** CAPTCHAs also offer a plausible solution against email worms and spam: "I will only accept an email if I know there is a human behind the other computer." A few companies are already marketing this idea.

17. CACHE MEMORY

Definition

Cache memory also called CPU memory is random access memory that a computer can access more quickly than it can access regular RAM. This is typically integrated directly with chip or placed on a separate that has a inter connect with the CPU.



Cache memory levels explained

Cache memory is fast and expensive. Traditionally, it is categorized as "levels" that describe its closeness and accessibility to the microprocessor:

- ❖ **Level (L1) cache** is extremely fast but relatively small, and is usually embedded in the processor chip (CPU).
- ❖ **Level 2 (L2) cache** is often more capacious than L1; it may be located on the CPU or on a separate chip or with a high-speed alternative system bus interconnecting the cache to the CPU, so as not to be slowed by traffic on the main system bus.

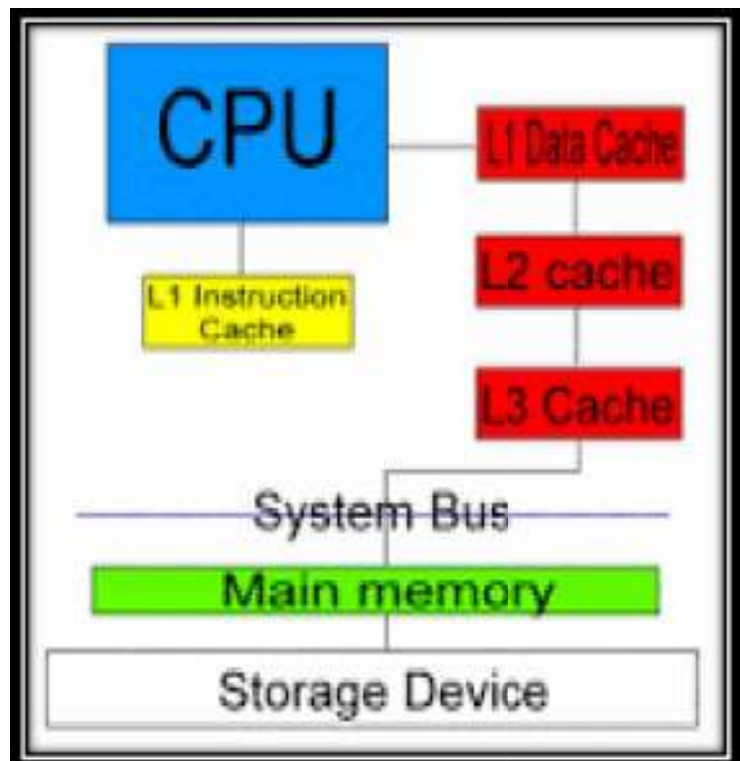
- ❖ **Level 3 (L3) cache** is typically specialized memory that works to improve the performance of L1 and L2. It can be significantly slower than L1 or L2, but is usually double the speed of RAM.

Specialized caches

In addition to instruction and data caches, there are other caches designed to provide specialized functions in a system. By some definitions, the L3 cache is a specialized cache because of its shared design. Other definitions separate instruction caching from data caching, referring to each as a specialized cache.

Other specialized memory caches include the translation look side buffer) whose function is to record to translations.

Still other caches are not, technically speaking, memory caches at all. For example, may leverage RAM or to provide much the same kind of data caching as memory caches do with CPU instructions. If data is frequently accessed from disk, it is cached into or flash-based storage technology for faster access and response.



Increasing cache size

L1, L2 and L3 caches have been implemented in the past using a combination of processor and recently, the trend has been toward consolidating all three levels of memory caching on the CPU itself. For this reason, the primary means for increasing cache size has begun to shift from the acquisition of a specific motherboard with different and bus architectures to buying the right CPU with the right amount of integrated L1, L2 and L3 cache.

18. COMPUTER AIDED DESIGN (CAD)

Definition

CAD (computer-aided design) software is used by architects, engineers, drafters, artists, and others to create precision drawings or technical illustrations. CAD software can be used to create two-dimensional (2-D) drawings or three-dimensional (3-D) models.

Computer-aided design/computer-aided manufacturing is software used to design products such as electronic circuit boards in computers and other devices.

Computer-Aided Design is a leading international journal that provides academia and industry with key papers on research and developments in the application of computers to design.

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Computer-Aided Design invites papers reporting new research, as well as novel or particularly significant applications, within a wide range of topics, spanning all stages of design process from concept creation to manufacture and beyond. Examples of relevant topics include but are not limited to:

Why CAD Software?

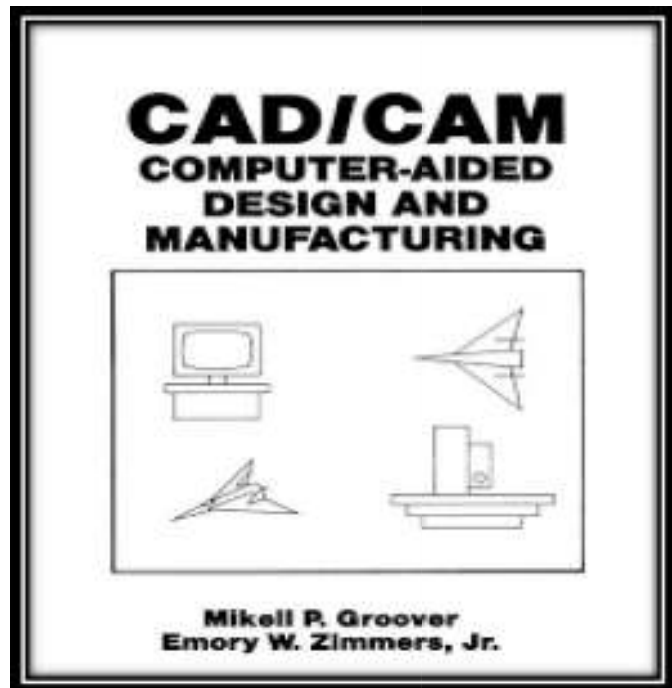
This technology makes product design more efficient by automating processes that were once manual, such as traditional drafting. With 3D CAD, designers can also do solid modeling, creating three-dimensional representations of their products.

But CAD isn't just about convenience or bells and whistles.

Broadly speaking, CAD software helps you explore concept design ideas, create product designs, carry out simulations and analyses, and perform engineering calculations. In other words, CAD tools assist you with the

experimentation, exploration, and iteration needed to make the most of your design's potential. The overarching goal? better products produced more efficiently and at less cost so that you get your products to market faster.

We're proud of the fact that PTC invented and first launched parametric CAD modeling software nearly 30 years ago. Today, product development professionals worldwide use our flagship CAD software suite.



CAD is used as follows:

1. To produce detailed engineering designs through 3-D and 2-D drawings of the physical components of manufactured products.
2. To create conceptual design, product layout, strength and dynamic analysis of assembly and the manufacturing processes themselves.
3. To prepare environmental impact reports, in which computer-aided designs are used in photographs to produce a rendering of the appearance when the new structures are built.

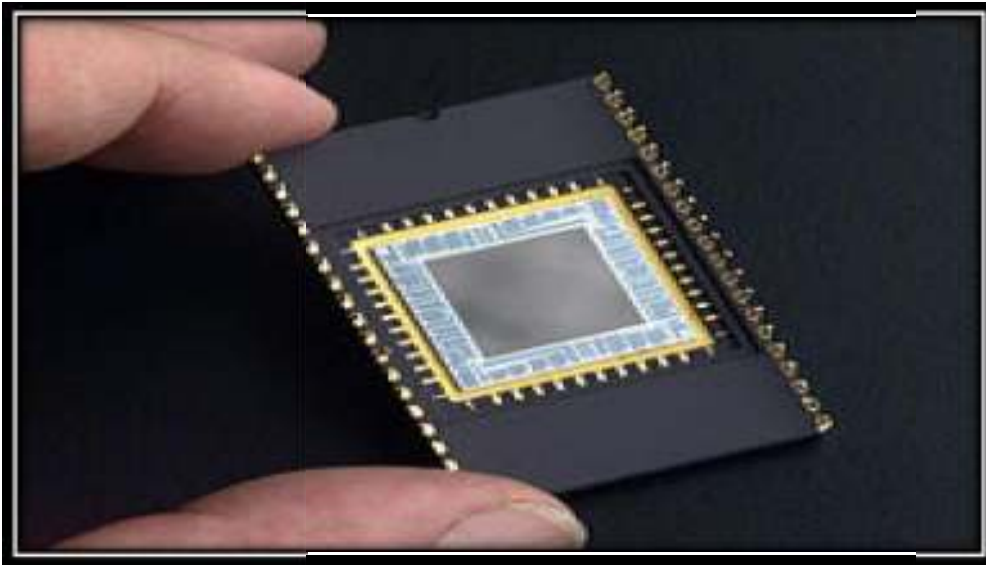
CAD systems exist today for all of the major computer platforms, including Windows, Linux and Mac OS X. The user interface generally centers on a computer mouse, but a pen and digitizing graphic tablet can also be used.

Most U.S. universities no longer require classes for producing hand drawings using protractors and compasses. Instead, there are many classes on different types of CAD software. Because hardware and software costs are decreasing, universities and manufacturers now train students how to use these high-level tools. These tools have also modified design work flows to make them more efficient, lowering these training costs even further.

19. CHARGE COUPLED DEVICE (CCD)

Definition

A charge-coupled device (CCD) is a light-sensitive integrated circuit that stores and displays the data for an image in such a way that each (picture element) in the image is converted into an electrical charge the intensity of which is related to a color in the color spectrum. For a system supporting 65,535 colors, there will be a separate value for each color that can be stored and recovered. CCDs are now commonly included in digital still and video cameras. They are also used in astronomical telescopes, scanners, and readers. The devices have also found use in for robots, in optical character recognition (OCR), in the processing of photographs, and in the enhancement of images, especially in meteorology.

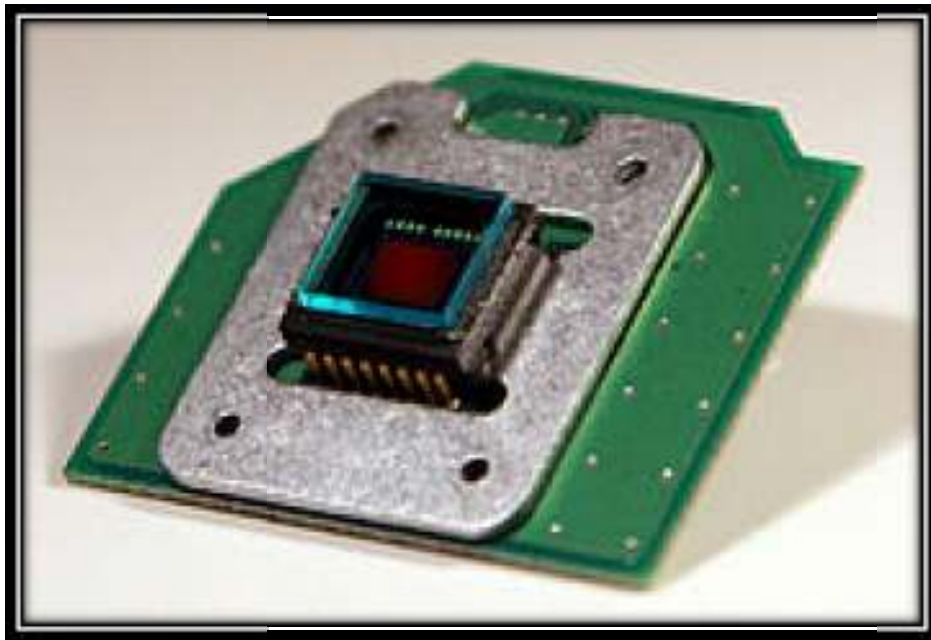


Architecture

The CCD image sensors can be implemented in several different architectures. The most common is their approach to the problem of shuttering. are full-frame, frame-transfer, and interline. The distinguishing characteristic of each of these architectures

In a full-frame device, all of the image area is active, and there is no electronic shutter. A mechanical shutter must be added to this type of sensor or the image smears as the device is clocked or read out.

With a frame-transfer CCD, half of the silicon area is covered by an opaque mask (typically aluminum). The image can be quickly transferred from the image area to the opaque area or storage region with acceptable smear of a few percent. That image can then be read out slowly from the storage region while a new image is integrating or exposing in the active area. Frame-transfer devices typically do not require a mechanical shutter and were a common architecture for early solid-state broadcast cameras. The downside to the frame-transfer architecture is that it requires twice the silicon real estate of an equivalent full-frame device; hence, it costs roughly twice as much.



CCDs containing grids of are used in and video cameras as light-sensing devices. Most common types of CCDs are sensitive to near-infrared light, which allows devices, and zero video-recording/photography For normal silicon-based detectors, the sensitivity is limited to 1.1 μm .

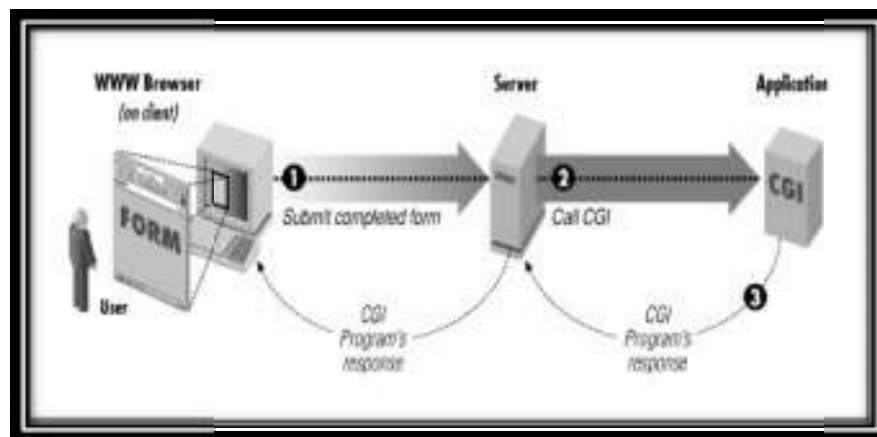
One other consequence of their sensitivity to infrared is that infrared from often appears on CCD-based digital cameras or camcorders if they do not have infrared blockers.

Cooling reduces the array's, improving the sensitivity of the CCD to low light intensities, even for ultraviolet and visible wavelengths. Professional observatories often cool their detectors with to reduce the dark current, and therefore to negligible levels.

20. COMMON GATEWAY INTERFACE (CGI)

Definition

The common gateway interface (CGI) is a standard way for a Web to pass a Web user's request to an application program and to receive data back to forward to the user. When the user requests a Web page (for example, by clicking on a highlighted word or entering a Web site address), the server sends back the requested page. However, when a user fills out a form on a Web page and sends it in, it usually needs to be processed by an application program. The Web server typically passes the form information to a small application program that processes the data and may send back a confirmation message. This method or convention for passing data back and forth between the server and the application is called the common gateway interface (CGI).



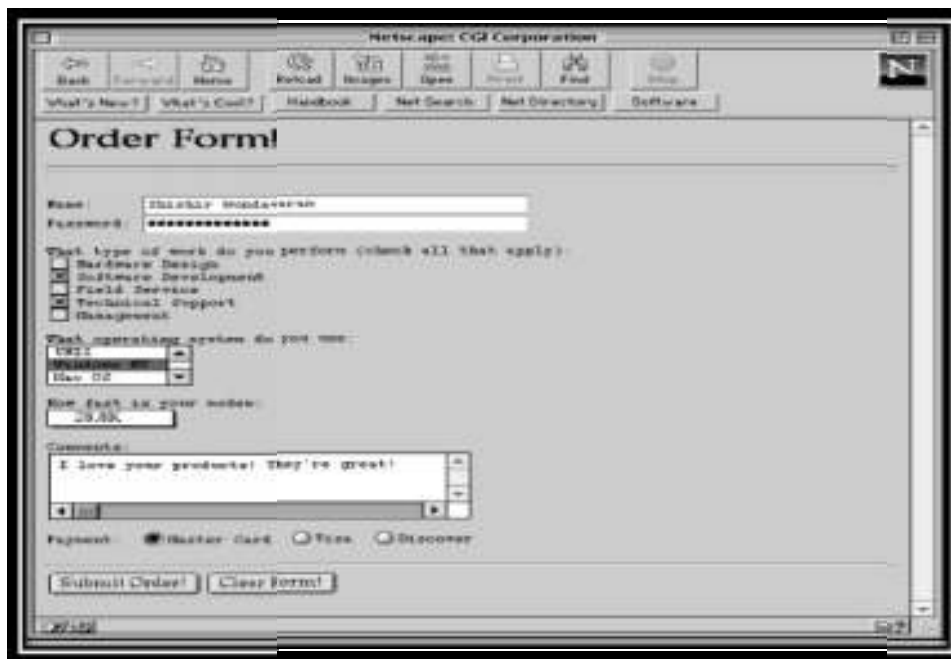
What Is CGI?

As you traverse the vast frontier of the World Wide Web, you will come across documents that make you wonder, "How did they do this?" These documents could consist of, among other things, forms that ask for feedback or registration information, image maps that allow you to click on various parts of the image, counters that display the number of users that accessed the document, and utilities that allow you to search databases for particular information. In most cases, you'll find that these effects were achieved using the Common Gateway Interface, commonly known as CGI.

One of the Internet's worst-kept secrets is that CGI is astoundingly simple. That is, it's trivial in design, and anyone with an iota of programming experience can write rudimentary scripts that work. It's only when your needs are more demanding that you have to master the more complex workings of the Web. In a way, CGI is easy the same way cooking is easy: anyone can toast a muffin or poach an egg.

CGI Applications

CGI turns the Web from a simple collection of static hypermedia documents into a whole new interactive medium, in which users can ask questions and run applications. Let's take a look at some of the possible applications that can be designed using CGI.



The screenshot shows a web browser window titled "Neticap CGI Corporation". The browser's address bar and navigation buttons (Back, Forward, Home, Forward, Images, All Web Sites, Print, Find, Stop) are visible at the top. Below the navigation bar, there are several menu items: "What's New?", "What's Cool?", "Handbook", "Net Search", "Net Directory", and "Software". The main content area is titled "Order Form!". It contains the following elements:

- A "Name:" label followed by a text input field containing "THOMAS MCDONALD".
- A "Password:" label followed by a password input field with masked characters "*****".
- A section titled "What type of work do you perform (check all that apply):" with five checkboxes:
 - Software Design
 - Software Development
 - Field Service
 - Technical Support
 - Diagnostic
- A section titled "What operating system do you use:" with a dropdown menu showing "Windows 95" and "Mac OS".
- A "How fast is your modem:" label followed by a text input field containing "33k".
- A "Comments:" label followed by a text area containing "I love your products! They're great!".
- A "Payment:" section with three radio buttons: "Master Card" (selected), "Visa", and "Discover".
- At the bottom, there are two buttons: "Submit Order!" and "Clear Form!".

Generally, forms are used for two main purposes. At their simplest, forms can be used to collect information from the user. But they can also be used in a more complex manner to provide back-and-forth interaction. For example, the user can be presented with a form listing the various documents available on the server, as well as an option to search for particular information within these documents. A CGI program can process this information and return document(s) that match the user's selection criteria.

21. CHIP SET

Introduction

A chipset is a group of integrated circuits (microchips) that can be used together to serve a single function and are therefore manufactured and sold as a unit. For example, one chipset might combine all the microchips needed to serve as the communications controller between a processor and memory and other devices in a compute.

In a computer system, a chipset is a set of electronic components in an integrated circuit that manages the data flow between the processor, memory and peripherals. It is usually found on the motherboard. Chipsets are usually designed to work with a specific family of microprocessors. Because it controls communications between the processor and external devices, the chipset plays a crucial role in determining system performance.



Intel ICH7 Southbridge on Intel D945GCPE Desktop Board

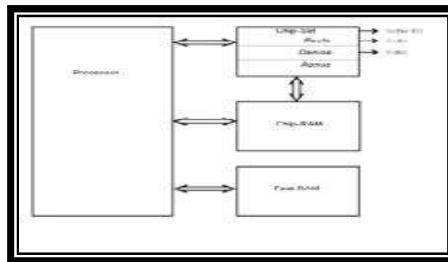
Computer

In computing, the term Chipset commonly refers to a set of specialized chips on a computer's motherboard or an expansion card. In personal computers, the first chipset for the IBM PC AT of 1984 was the NEAT chipset developed by Chip sandChipSandTechnologies for the INEL80286 CPU Technologies for the Intel80286 CPU.

Move towards Processor Integration In Pcs

Traditionally in x86 computers, the processor's primary connection to the rest of the machine is through the motherboard chipset's north bridge. The north bridge is directly responsible for communications with high-speed devices (system memory and primary expansion buses, such as PCI e, AGP and PCI cards, being

common examples) and conversely any system communication back to the processor. This connection between the processor and North Bridge is traditionally known as the front side bus (FSB).



Requests to resources not directly controlled by the north bridge are offloaded to the south bridge, with the north bridge being an intermediary between the processor and the south bridge. The south bridge traditionally handles "everything else", generally lower-speed peripherals and board functions (the largest being hard disk and storage connectivity) such as USB, parallel and serial communications. The connection between the north bridge and south bridge does not have a common name, but is usually a high-speed interconnect proprietary to the chipset

The Best Chip Set Manufactures

A list of top chipset manufactures. these are best companies in their field . If we are looking purchase the chipset then these the companies and brands we are looking it to purchase a chipset then these are the companies and brands we should be looking at. As easy as buying a prebuilt computer can be, there is a definite satisfaction that comes with building our own PC. Beyond the obvious monitor, keyboard, mouse, and speakers that sit on our desk. The computer itself requires a CPU, motherboard, RAM, graphics card, sound card, network card, power supply, hard disk drive, power supply, and a case to put it all in.



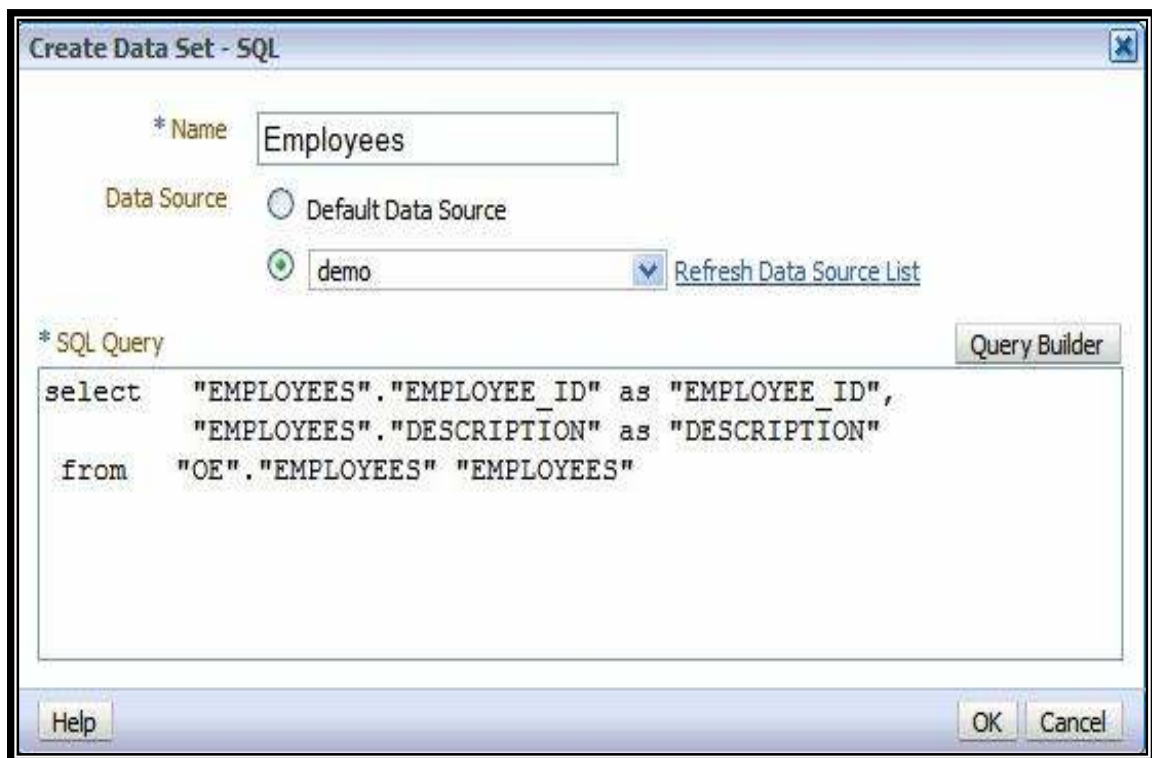
Some Mother board may also have those separate expansion cards already integrated. If we are careful, we may even be able to build our own custom machine for less money that it would cost for a pre-built model. When we upgrade our hardware, we can also sell the individual components to help offset our costs.

22. CHARACTER LARGE OBJECT (CLOB)

A **Character Large Object** (or **CLOB**) is a collection of character data stored in a database usually stored in a separate location that is referenced in the table itself. Database provide a construct explicitly named CLOB, and the majority of other database systems support some form of the concept, often labeled as text, memo or long character fields. Lobs usually have very high size-limits, of the order of 2GB or more.

How to Dataset with Sql Server?

The Dataset contains the copy of the data we requested through the SQL statement. We can use Dataset in combination with SqlDataAdapter class . The SqlDataAdapter object allows us to populate in a Dataset. We can use Fill method in the SqlDataAdapter for populating data in a Dataset.



Search Tables in a Dataset Sql Server

The DataSet contains DataTableCollection and their DataRelationCollection. The DataTableCollection contains zero or more objects. The Dataset may comprise data for one or more members, corresponding to the number of rows. The SqlDataAdapter object allows us to populate DataTables in a DataSet.

CLOB Data Type - Conversion Details

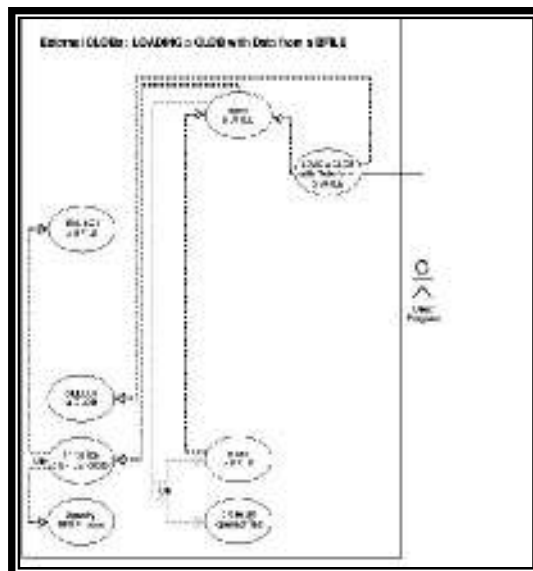
In Oracle, you can specify a string literal in SQL INSERT statement to insert data into a CLOB column. You can also insert an empty value using EMPTY_CLOB() function, and you can insert NULL.

BLOBs and CLOBs

Cache SQL supports the ability to store BLOBs (Binary Large Objects) and CLOBs (Character Large Objects) within the database. BLOBs are used to store binary information, such as images, while CLOBs are used to store character information.

BLOBs and CLOBs can store up to 4 Gigabytes of data (the limit imposed by the JDBC and ODBC specifications).

The operation of the Blobs and CLOBs is identical in every respect except how they handle character encoding conversion (such as Unicode to multiyear) when accessed.



Overview of CLOB

CLOB (Character Large Object) is a large collection of character data stored in a database table. Different database servers handles CLOB differently. But there are some common characteristics like:

- ❖ CLOB stores character data, which requires a specific encoding schema. For regular ASCII characters, the database default encoding schema is fine. So you don't need to worry.
- ❖ CLOB data is usually large. Many database servers offer very high maximum sizes like 4 GB.
- ❖ Operations on CLOB data is usually restricted. For example, LIKE may not be used on CLOB data.
- ❖ CLOB data is usually not directly stored inside the table. It is stored in different storage areas and its reference address is stored inside the table.

23. CLOCK CYCLE

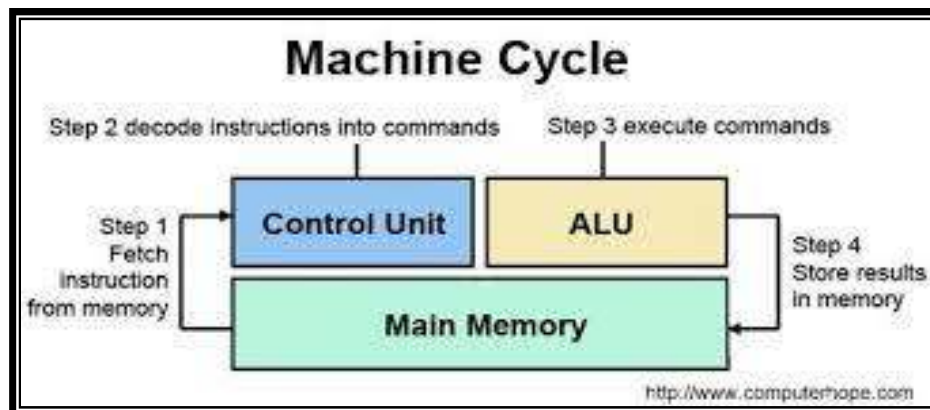
Definition

The speed of a computer processor, or CPU, is determined by the clock cycle, which is the amount of time between two pulses of an oscillator. Generally speaking, the higher number of pulses per second, the faster the computer processor will be able to process information. The clock speed is measured in Hz, typically either megahertz (MHz) or gigahertz (GHz).

For example, a 4GHz processor performs 4,000,000,000 clock cycles per second. Computer processors can execute one or more instructions per clock cycle, depending on the type of processor. Early computer processors and slower processors can only execute one instruction per clock cycle, but faster, more advanced processors can execute multiple instructions per clock cycle, processing data more efficiently.

Machine Cycle

The steps performed by the computer processor for each machine language instruction received. The machine cycle is a 4 process cycle that includes reading and interpreting the machine language, executing the code and then storing that code.



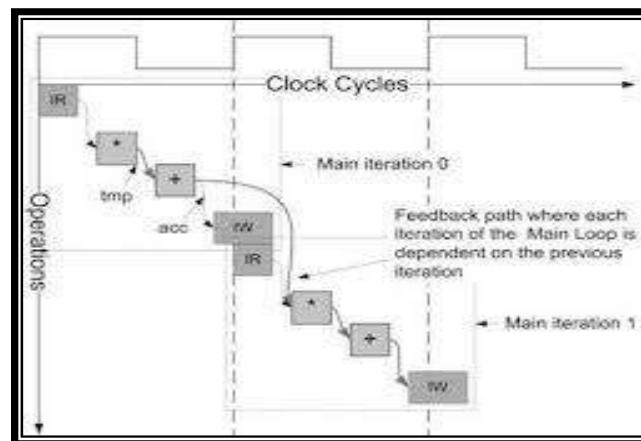
Instruction Cycle

An instruction cycle (sometimes called fetch-decode-execute cycle) is the basic operation cycle of a computer. It is the process by which a computer retrieves a from its determines what actions the instruction requires, and carries out those actions. This cycle is repeated continuously by the CPU, from to when the computer is shut down.

In simpler CPUs, the instruction cycle is executed sequentially: each instruction is completely processed before the next one is started. In most modern CPUs, the instruction cycle is instead executed in, as: the next instruction starts being processed before the previous instruction is finished, which is possible because the cycle is broken up into separate steps.

Clock Speed

It is also called clock rate, the speed at which. Every machine contains an internal clock that regulates the rate at which instructions are executed and synchronizes all the various computer components. It requires a fixed number of (or clock cycles) to execute each instruction. The faster the clock, the more instructions the CPU can execute per second. Clock speeds are expressed in megahertz or gigahertz.



The internal of a CPU has as much to do with a CPU's performance as the clock speed, so two CPUs with the same clock speed will not necessarily perform equally.

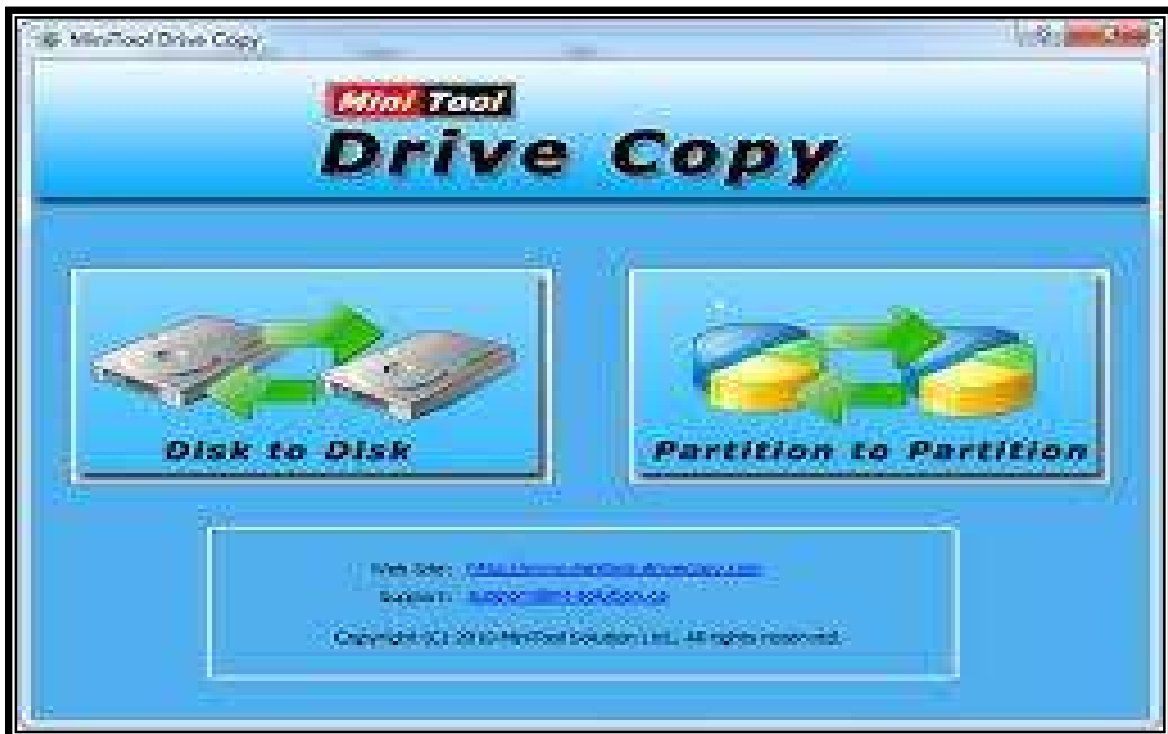
Whereas an Intel 80286 microprocessor requires 20 cycles to multiply two numbers, an Intel 80486 or later can perform the same calculation in a single clock tick. (Note that clock tick here refers to the system's clock, which runs at 66 MHz for all PCs.) These newer processors, therefore, would be 20 times faster than the older processors even if their clock speeds were the same. In addition, some microprocessors are which means that they can execute more than one instruction per clock cycle.

24. CLONE SOFTWARE

Definition of Cloning Software

Clone Software that copies the entire hard disk to another hard disk or to another computer via direct cable or the network. Cloning is used to back up the computer for a future system restore and to provide to interim storage for replacing the hard disk.

Drive Copy



Advantages:

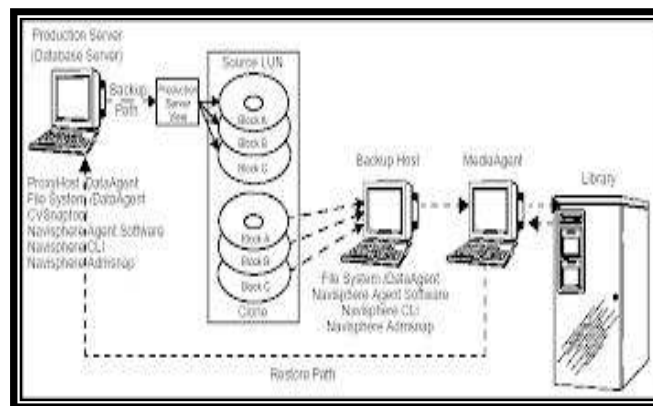
- ❖ It's also used to make a master copy of computer configuration for quick installations on new machines.
- ❖ The cloned disk is copied verbatim (cloned again) to the new computer much quicker than installing the OS and applications individually.
- ❖ See image file, reimaging, hosting server and clone. Clone is an easy to use file backup utility. "Clone software – fast, easy, full hard disk backup software".

- ❖ Clone can be configured to carry out auto mated backups of our critical data. Once we have configured clone we need to take no further action to ensure all our important data is backed up.

How it works?

Main features backup files and directories to a defined location-as many as we like use the data and time, file size or archive attribute to determine if a file should be copied synchronize directories Run as a standard windows utility or as a screen saver mode we can run our favorite screen saver as will backup to any media (including CD-RAW) that can be mapped to windows drive or UNC path use file filters to specify the type of the files we want to copy.

Working plan



Clone does not use any proprietary format for storing our files, we won't even need a copy of clone to restore our files, and windows explorer will do the job.

It's all carried out automatically. Clone copies files from one location to another. Our file are copied "as is" making it very simple to recover after an unforeseen loss of data.

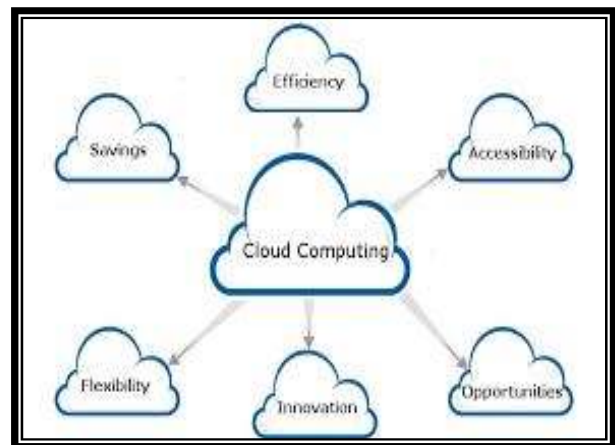
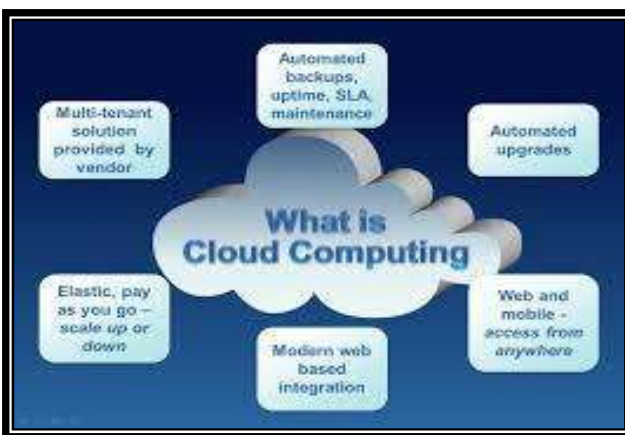
Common uses

- ❖ Reboot and restore
- ❖ Provisioning new computer
- ❖ Hard drive upgrade
- ❖ Full system backup
- ❖ System recovery
- ❖ Transfer to another user

25. CLOUD COMPUTING

Origin of the term

The origin of the term cloud computing is unclear. The word "cloud" is commonly used in science to describe a large agglomeration of objects that visually appear from a distance as a cloud and describes any set of things whose details are not inspected further in a given context. Another explanation is that the old programs that drew network schematics surrounded the icons for servers with a circle, and a cluster of servers in a network diagram had several overlapping circles, which resembled a cloud.



Similar Concepts

Cloud computing is the result of the evolution and adoption of existing technologies and paradigms. The goal of cloud computing is to allow users to take benefit from all of these technologies, without the need for deep knowledge about or expertise with each one of them. The cloud aims to cut costs, and helps the users focus on their core business instead of being impeded by IT obstacles.

Characteristics

Cloud computing shares characteristics with:

- ❖ **Client-server model** — Client-server computing refers broadly to any distributed application that distinguishes between service providers (servers) and service requestors (clients).

- ❖ **Grid computing** — "A form of distributed and parallel computing, whereby a 'super and virtual computer' is composed of a cluster of networked, loosely coupled computers acting in concert to perform very large tasks."
- ❖ **Mainframe computer** — Powerful computers used mainly by large organizations for critical applications, typically bulk data processing such as: census; industry and consumer statistics; police and secret intelligence services; enterprise resource planning; and financial transaction processing.
- ❖ **Utility computing** — The "packaging of computing resources, such as computation and storage, as a metered service similar to a traditional public utility, such as electricity."
- ❖ **Peer-to-Peer** — A distributed architecture without the need for central coordination. Participants are both suppliers and consumers of resources (in contrast to the traditional client–server model).

Infrastructure As A Service (IAAS)

In the most basic cloud-service model - and according to the IETF (Internet Engineering Task Force) - providers of IAAS offer computers – physical or (more often) virtual machines – and other resources. IaaS refers to online services that abstract user from the detail of infrastructure like physical computing resources, location, data partitioning, scaling, security, backup etc.



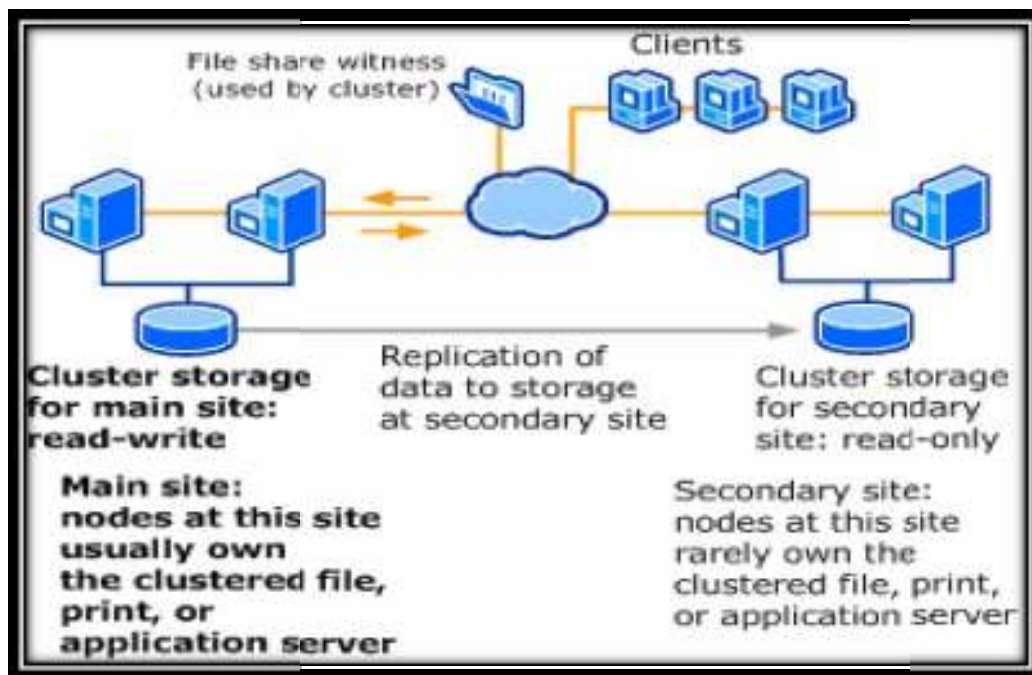
Cloud Clients

User's access cloud computing using networked client devices, such as desktop computers, laptops, tablets and smart phones and any Ethernet enabled device such as Home Automation Gadgets. Some of these devices – cloud clients – rely on cloud computing for all or a majority of their applications so as to be essentially useless without it.

26. CLUSTER

A cluster is a group of servers and other resources that act like a single system and enable high availability and, in some cases, load balancing and parallel processing.

In personal computer storage technology, a cluster is the logical unit of file storage on a hard disk; it's managed by the computer's operating system. Any file stored on a hard disk takes up one or more clusters of storage. A file's clusters can be scattered among different locations on the hard disk. The clusters associated with a file are kept track of in the hard disk's file allocation table (FAT).



Size of Cluster

The maximum number of clusters on a hard disk depends on the size of a FAT table entry. Beginning with DOS 4.0, the FAT entries were 16 bits in length, allowing for a maximum of 65,536 clusters.

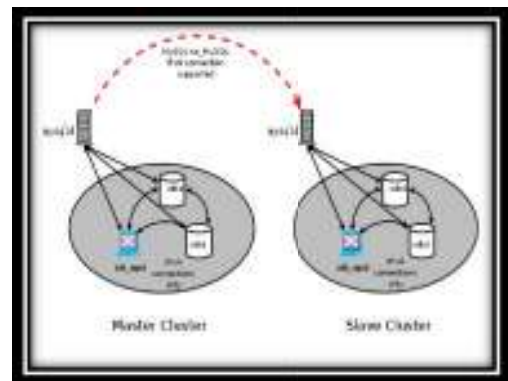
The tradeoff in cluster size is that even the smallest file (and even a directory itself) takes up the entire cluster. Thus, a 10-byte file will take up 2,048 bytes if that's the cluster size. In fact, many operating systems set the cluster size default at 4,096 or 8,192 bytes. Larger hard disks could be divided into up to four partitions, each with a FAT capable of supporting 512 megabytes of clusters.

Server Cluster

A server cluster is a group of independent servers and working together as a single system to provide high availability of services for clients. When a failure occurs on one computer in a cluster, resources are redirected and the workload is redistributed to another computer in the cluster. You can use server clusters to ensure that users have constant access to important server-based resources. Server clusters are designed for applications that have long-running in-memory state or frequently updated data. Typical uses for server clusters include file servers, print servers, database servers, and messaging servers.

Master Cluster

Master-cluster is a utility to facilitate implementing node.js core cluster module in any project. Also provides hot reloading of files on the worker in development mode so that workers are restarted when code is changed.



Cluster Slaves

The command provides a list of slave nodes replicating from the specified master node.

Note that if a slave is added, moved, or removed from a given master node, and we ask to a node that has not yet received the configuration update, it may show stale information. However eventually (in a matter of seconds if there are no network partitions) all the nodes will agree about the set of nodes associated with a given master.

Cluster Replicate

The command reconfigures a node as a slave of the specified master. If the node receiving the command is an empty master, the node role is changed from master to slave.

Once a node is turned into the slave of another master node, there is no need to inform the other cluster nodes about the change: heartbeat packets exchanged between nodes will propagate the new configuration automatically.

27. COMPUTER DAEMON

In computer a daemon or is that runs as a, rather than being under the direct control of an interactive user. Traditionally daemon names end with the letter d. For example, is the daemon that implements the system logging facility, and is a daemon that services incoming connections.

In a environment, the of a daemon is often, but not always, the process. A daemon is usually either created by a process a child process and then immediately exiting, thus causing init to adopt the child process, or by the init process directly launching the daemon. In addition, a daemon launched by forking and exiting typically must perform other operations, such as dissociating the process from any controlling. Such procedures are often implemented in various convenience routines such as daemon in UNIX.

Systems often start daemons at time and serve the function of responding to network requests, hardware activity, or other programs by performing some task. Daemons can also configure hardware like on some system, run scheduled tasks like, and perform a variety of other tasks.

Terminology

The term was coined by the programmers of. They took the name from, an imaginary being from a thought experiment that constantly works in the background, sorting molecules. Systems inherited this terminology. Maxwell's Demon is consistent with Greek mythology's interpretation of a as a supernatural being working in the background, with no particular bias towards good or evil. However, and some of its derivatives have adopted a as their rather than a Greek daemon. The word daemon is an alternative spelling of demon, and is pronounced. In the context of computer software, the original pronunciation has drifted to for some speakers.

Creation

In a strictly technical sense, a Unix-like system process is a daemon when its parent process terminates and the daemon is assigned the process (process number 1) as its parent process and has no controlling terminal. However, more commonly,

a daemon may be any background process, whether a child of the init process or not.



On a Unix-like system, the common method for a process to become a daemon, when the process is started from the or from a startup script such as an script or a script, involves:

- Dissociating from the controlling
- Becoming a session leader
- Becoming a leader
- Executing as a by and (once or twice). This is required sometimes for the process to become a session leader. It also allows the parent process to continue its normal execution.
- Setting the (/) as the current so that the process does not keep any directory in use that may be on a mounted file system (allowing it to be unmounted).
- Changing the to 0 to allow open(), create(), and other operating system calls to provide their own permission masks and not to depend on the umask of the caller
- Closing all inherited files at the time of execution that are left open by the parent process, including 0, 1 and 2 for the (,and). Required files will be opened later.
- Using a, the, or as

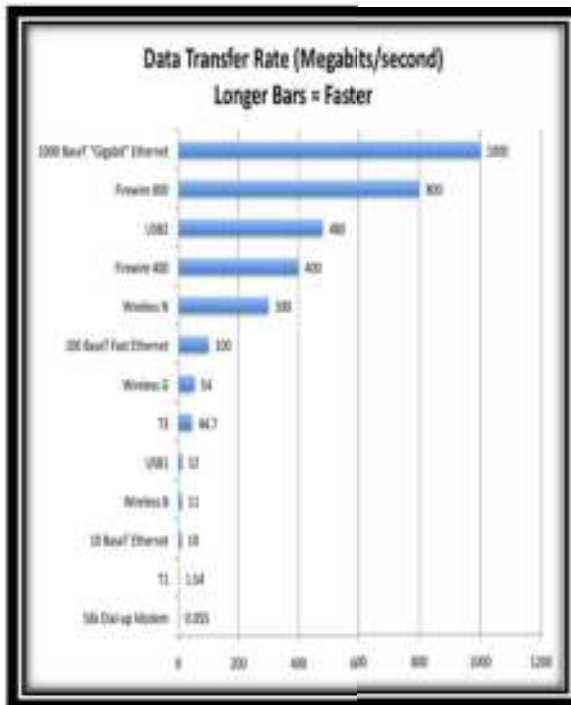
If the process is started by a daemon, such or, the super-server daemon will perform those functions for the process (except for old-style daemons not converted to run under system and specified as Type=forking and "multi-threaded" datagram servers under indented.

28. DATA TRANSFER RATE

The data transfer rate of a drive (also called throughput) covers both the internal rate (moving data between the disk surface and the controller on the drive) and the external rate (moving data between the controller on the drive and the host system).

The measurable data transfer rate will be the lower (slower) of the two rates. The sustained data transfer rate or sustained throughput of a drive will be the lower of the sustained internal and sustained external rates.

The sustained rate is less than or equal to the maximum or burst rate because it does not have the benefit of any cache or buffer memory in the drive. The internal rate is further determined by the media rate, sector overhead time, head switch time, and cylinder switch time. These are not applicable to SSDs.



❖ Media rate

- Rate at which the drive can read bits from the surface of the media.

❖ Sector overhead time

- Additional time (bytes between sectors) needed for control structures and other information necessary to manage the drive, locate and validate data and perform other support functions.

❖ **Head switch time**

- Additional time required to electrically switch from one head to another and begin reading; only applies to multi-head drive and is about 1 to 2 ms.

❖ **Cylinder switch time**

- Additional time required to move to the first track of the next cylinder and begin reading; the name cylinder is used because typically all the tracks of a drive with more than one head or data surface are read before moving the actuator. This time is typically about twice the track-to-track seek time. As of 2001, it was about 2 to 3 ms.
- ❖ As of 2010, a typical 7200 RPM desktop HDD has a "disk-to-buffer" data transfer rate up to 1030 Mbit/s. This rate depends on the track location, so it will be higher on the outer zones (where there are more data sectors per track) and lower on the inner zones (where there are fewer data sectors per track); and is generally somewhat higher for 10,000 RPM drives.
- ❖ Floppy disk drives have sustained "disk-to-buffer" data transfer rates that are one or two orders of magnitude lower than that of HDDs.
- ❖ The sustained "disk-to-buffer" data transfer rates varies amongst families of Optical disk drives with the slowest 1x CDs at 1.23 Mbit/s floppy-like while a high performance 12x Blue-ray disc drive at 432 Mbit/s approaches the performance of HDDs.

Effect of file system

Transfer rate can be influenced by file system fragmentation and the layout of the files. Defragmentation is a procedure used to minimize delay in retrieving data by moving related items to physically proximate areas on the disk.

Effect of areal density

HDD data transfer rate depends upon the rotational speed of the disks and the data recording density. Because heat and vibration limit rotational speed, increasing density has become the main method to improve sequential transfer rates. Area l density (the number of bits that can be stored in a certain area of the disk) has been increased over time by increasing both the number of tracks across the disk, and the number of sectors per track.

29. DATA TYPE

Definition

In computer science and computer programming, a **data type** or simply **type** is a classification identifying one of various types of data, such as real, integer or Boolean, that determines the possible values for that type; the operations that can be done on values of that type; the meaning of the data; and the way values of that type can be stored.



Classes of data types

I. Primitive data types

❖ Machine data types

All data in computers based on digital electronics is represented as bits (alternatives 0 and 1) on the lowest level. The smallest addressable unit of data is usually a group of bits called a byte. The unit processed by machine code instructions is called a word (as of 2011, typically 32 or 64 bits).

❖ Boolean type

The Boolean type represents the values true and false. Although only two values are possible, they are rarely implemented as a single binary digit for efficiency reasons. Many programming languages do not have an explicit boolean type, instead interpreting (for instance) 0 as false and other values as true.

❖ Numeric types

Such as The integer data types, or "whole numbers". May be sub-typed according to their ability to contain negative values (e.g. unsigned in C and C++).

May also have a small number of predefined subtypes (such as short and long in C/C++); or allow users to freely define subranges such as 1..12

(e.g. Pascal/Ada).

- Floating point data types, sometimes misleadingly called reals, contain fractional values. They usually have predefined limits on both their maximum values and their precision. These are often represented as decimal numbers.
- Fixed point data types are convenient for representing monetary values. They are often implemented internally as integers, leading to predefined limits.

II. Composite types

Composite types are derived from more than one primitive type. This can be done in a number of ways. The ways they are combined are called data structures. Composing a primitive type into a compound type generally results in a new type, e.g. array-of-integer is a different type to integer.

III. Enumerations

The enumerated type. This has values which are different from each other, and which can be compared and assigned, but which do not necessarily have any particular concrete representation in the computer's memory; compilers and interpreters can represent them arbitrarily. For example, the four suits in a deck of playing cards may be four enumerators named CLUB, DIAMOND, HEART, SPADE.

IV. Abstract data types

Any type that does not specify an implementation is an abstract data type. For instance, a stack can be implemented as an array memory containing , or as a linked list. Abstract types can be handled by code that does not know or "care" what underlying types are contained in them. Programming that is agnostic about concrete data types is called generic programming.

30. DATA DEFINITION LANGUAGE (DDL)

A data definition language or data description language (DDL) is syntax similar to a computer programming language for defining data structures, especially database schemas.

A DDL is a language used to define data structures and modify data. For example, DDL commands can be used to add, remove, or modify tables within in a database. DDLs used in database applications are considered a subset of SQL, the Structured Query Language. However, a DDL may also define other types of data, such as XML.



Four basic DDL commands

- ❖ CREATE
- ❖ USE
- ❖ ALTER
- ❖ DROP

CREATE

Installing a database management system(DBMS) on a computer allows us to create and manage many independent databases. To build a new table using SQL syntax, the CREATE command is used, followed by parameters for the table name and column definitions. The DDL can also define the name of each column and the associated data type.

USE

The USE command allows us to specify the database we wish to work with within our DBMS. For example, if we're currently working in the sales database and want to issue some commands that will affect the employees database, we would preface them with the following SQL command:

```
USE employees
```

ALTER

Once we've created a table within a database, we may wish to modify the definition of it. The ALTER command allows us to make changes to the structure of a table without deleting and recreating it.

```
ALTER TABLE personal_info  
ADD salary money null
```

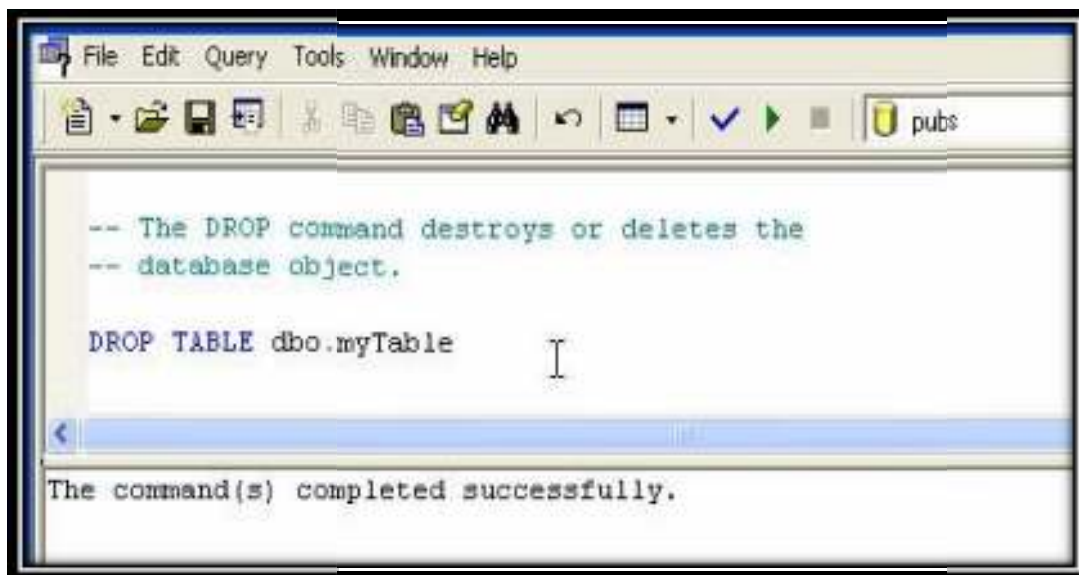
DROP

The final command of the Data Definition Language, DROP, allows us to remove entire database objects from our DBMS. For example, if we want to permanently remove the personal_info table that we created, we'd use the following command:

```
DROP TABLE personal_info
```

Similarly, the command below would be used to remove the entire employees database:

```
DROP DATABASE employees
```



Remember that the DROP command removes entire data structures from your database. If we want to remove individual records, use the DELETE command of the Data Manipulation Language. That's the Data Definition Language in a nutshell.

31. DIAL-UP CONNECTION

Definition

A dial-up connection uses a standard phone line and analog modem to access the Internet at data transfer rates (DTR) of up to 56 Kbps. A dial-up connection is a connection from an end user to an Internet service provider (ISP) that can be created over a conventional telephone line without any special arrangement with the telecommunications carrier.

Dial-up Internet access is a form of Internet access that uses the facilities of the public switched telephone network (PSTN) to establish a connection to an Internet service provider (ISP) by dialing a telephone number on a conventional telephone line.

Many remote areas depend on Internet dial-up connections because broadband and cable are rare in remote areas with low population numbers. ISPs often provide free dial-up connections, a viable alternative for budget-conscious subscribers.

Leased Line

A leased line is a private bidirectional or symmetric telecommunications line between two or more locations provided in exchange for a monthly rent. Sometimes known as a private circuit or data line in the UK. A leased line is a dedicated, fixed-bandwidth, symmetric data connection.

A leased line is a telephone line that has been leased for private use. In some contexts, it's called a dedicated line. A leased line is usually contrasted with a switched line or dial-up line.

- ❖ Used to provide point-to-point dedicated network connectivity.
- ❖ Analog leased line can provide maximum bandwidth of 9.6 Kbps.
- ❖ Digital leased lines can provide bandwidths :
64 Kbps, 2 Mbps (E1), 8 Mbps (E2), 34 Mbps (E3) ...

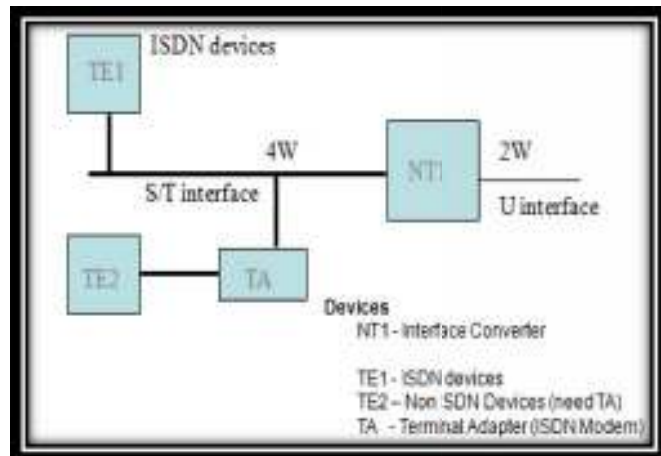
ISDN

Integrated Services for Digital Network (ISDN) is a set of communication standards for simultaneous digital transmission of voice, video, data, and other network services over the traditional circuits of the public switched telephone network. ISDN supports data transfer rates of 64 Kbps (64,000 bits per second).

Two types of user access are defined.

❖ **Basic Access** - Consists of two 64Kbps user channels (B channel) and one 16Kbps signally channel (D channel) providing service at 144 Kbps.

❖ **Primary access** - Consists of thirty 64Kbps user channels (B channels) and a 64 Kbps signally channel (D channel) providing service at 2.048Mbps (One 64 Kbps channel is used for Framing and Synchronization).



Advantages

- ❖ While the sound of a connecting modem is permanently etched into the brain of anybody who had to use a dial up connection, most children growing up today can't recognize it.
- ❖ High speed internet connections such as DSL, T1, and WiFi have made the out dated and slower dial up connections obsolete.
- ❖ We had a really quick dial up connection and I was really excited because I had a very slow one in the past.
- ❖ One of the benefits of dial-up service is that if you have a land line, all that you need is a dial-up account and the modem built into your computer to connect to the Internet.
- ❖ This can be useful if you are frequently in areas where you cannot access high speed Internet services.

32. DIALOG BOX

Definition

The graphical control element dialog box (also called dialogue box or just dialog) is a small window that communicates information to the user and prompts them for a response. Dialog boxes are classified as "modal" or "modeless", depending on whether they block interaction with the software that initiated the dialog. The type of dialog box displayed is dependent upon the desired user interaction. The simplest type of dialog box is the alert, which displays a message and may require an acknowledgment that the message has been read, usually by clicking "OK", or a decision as to whether or not an action should proceed by clicking "OK" or "Cancel". Alerts are also used to display a "termination notice" sometimes requesting confirmation that the notice has been read in the event of either an intentional closing or unintentional closing ("crash") of an application or the operating system. (E.g., "Gedit has encountered an error and must close.") Although this is a frequent interaction pattern for modal dialogs, it is also criticized by usability experts as being ineffective for its intended use, which is to protect against errors caused by destructive actions, and for which better alternatives exist.



Modeless

Non-modal or modeless dialog boxes are used when the requested information is not essential to continue, and so the window can be left open while work continues elsewhere. A type of modeless dialog box is a toolbar which is either separate from the main application, or may be detached from the main application, and items in the toolbar can be used to select certain features or functions of the application. In general, good software design calls for dialogs to be of this type where possible, since they do not force the user into a particular mode of operation. An example might be a dialog of settings for the current document, e.g. the background and text colors. The user can continue adding text to the main window whatever color it is, but can change it at any time using the dialog.

Application modal

Modal dialog boxes temporarily halt the program: the user cannot continue without closing the dialog; the program may require some additional information before it can continue, or may simply wish to confirm that the user wants to proceed with a potentially dangerous course of action (confirmation dialog box). Usability practitioners generally regard modal dialogs as bad design-solutions, since they are prone to produce mode errors. Dangerous actions should be undoable wherever possible; a modal alert dialog that appears unexpectedly or which is dismissed automatically (because the user has developed a habit) will not protect from the dangerous action. A modal dialog interrupts the main workflow. This effect has either been sought by the developer because it focuses on the completion of the task at hand or rejected because it prevents the user from changing to a different task when needed.

Document modal

The concept of a document modal dialog has recently been used, most notably in OS X and Opera Browser. In the first case, they are shown as sheets attached to a parent window. These dialogs block only that window until the user dismisses the dialog, permitting work in other windows to continue, even within the same application. In OS X, dialogs appear to emanate from a slot in their parent window, and are shown with a reinforcing animation. This helps to let the user understand that the dialog is attached to the parent window, not just shown in front of it.

Both mechanisms have shortcomings

- ❖ The Windows dialog box locks the parent window which can hide other windows the user may need to refer to while interacting with the dialog, though this may be mitigated since other windows are available through the task bar.
- ❖ The OS X dialog box blocks the parent window, preventing the user from referring to it while interacting with the dialog. This may require the user to close the dialog to access the necessary information, and then re-open the dialog box to continue.

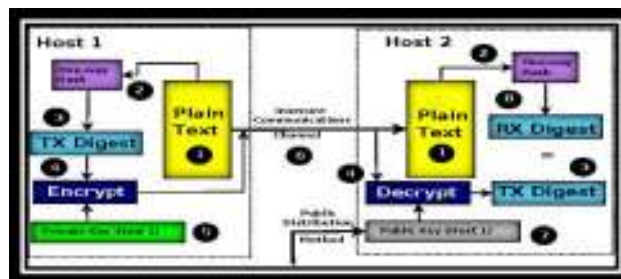
33. DIGITAL SIGNATURE

History

In 1988, Shafi Goldwasser, Silvio Micali, and Ronald Rivest became the first to rigorously define the security requirements of digital signature schemes. They described a hierarchy of attack models for signature schemes, and also presented the GMR signature scheme, the first that could be proved to prevent even an existential forgery against a chosen message attack.

Definition

A digital signature is a mathematical scheme for demonstrating the authenticity of a digital message or documents. A valid digital signature gives a recipient reason to believe that the message was created by a known sender, that the sender cannot deny having sent the message (authentication and non-repudiation), and that the message was not altered in transit (integrity). Digital signatures are commonly used for software distribution, financial transactions, and in other cases where it is important to detect forgery or tampering.



Working

To create RSA signature keys, generate an RSA key pair containing a modulus N that is the product of two large primes, along with integers e and d such that $e d \equiv 1 \pmod{\phi(N)}$, where ϕ is the Euler phi-function. The signer's public key consists of N and e , and the signer's secret key contains d .

To sign a message m , the signer computes $m^d \pmod{N}$. To verify, the receiver checks that $e \cdot m^d \equiv m \pmod{N}$. This basic scheme is not very secure. To prevent attacks, one can first apply a cryptographic hash function to the message m and then apply the RSA algorithm described above to the result. This approach can be proven secure in the so-called random oracle model. Most early signature schemes were of a similar type: they involve the use of a trapdoor permutation,

such as the RSA function, or in the case of the Rabin signature scheme, computing square modulo composite n . A trapdoor permutation family is a family of permutations, specified by a parameter.

That is easy to compute in the forward direction, but is difficult to compute in the reverse direction without already knowing the private key ("trapdoor"). Trapdoor permutations can be used for digital signature schemes, where computing the reverse direction with the secret key is required for signing, and computing the forward direction is used to verify signatures.

Applications of Digital Signatures

As organizations move away from paper documents with ink signatures or authenticity stamps, digital signatures can provide added assurances of the evidence to provenance, identity, and status of an electronic document as well as acknowledging informed consent and approval by a signatory. The United States Government Printing Office (GPO) publishes electronic versions of the budget, public and private laws, and congressional bills with digital signatures. Universities including Penn State, University of Chicago, and Stanford are publishing electronic student transcripts with digital signatures.

❖ Authentication

Although messages may often include information about the entity sending a message, that information may not be accurate. Digital signatures can be used to authenticate the source of messages. When ownership of a digital signature secret key is bound to a specific user, a valid signature shows that the message was sent by that user. The importance of high confidence in sender authenticity is especially obvious in a financial context.

❖ Integrity

In many scenarios, the sender and receiver of a message may have a need for confidence that the message has not been altered during transmission. Although encryption hides the contents of a message, it may be possible to change an encrypted message without understanding it.

34. DIRECT 3D

Definition

Direct3D is a graphics application programming interface (API) for Microsoft Windows. Direct3D is used to render three-dimensional graphics in application where performance is important such as games. Direct3D uses hardware acceleration if it is available on the graphics card allowing for hardware acceleration of the entire 3D rendering pipeline or even only partial acceleration. Direct3D exposes the advanced graphics capabilities of 3D graphics hardware, including Z-buffering, W-buffering, Stencil buffering.



Features in Direct 3d

- ❖ Video mapping, hardware 3D rendering in 2D OVERLAP PLANES
- ❖ Even sprites providing the use of 2D and 3D graphics in interactive media ties.
- ❖ Direct3D has superseded the DIRECT DRAW FRAMEWORK.

Direct3D offers full vertex software emulation but no pixel software emulation for features not available in hardware. For example, if software programmed using Direct3D requires pixel shaders and the video card on the user's computer does not support that feature.

Types of Devices:

There are four types of devices. They are:

- ❖ **HAL(Hardware Abstraction layer) device:** For devices supporting hardware acceleration.
- ❖ **Reference device:** Simulates new functions not yet available in hardware. It is necessary to install the DirectX SDK to use this device type.
- ❖ **Null reference device:** Does nothing. This device is used when the SDK is not installed and a reference device is requested.
- ❖ **Pluggable software device:** Performs software rendering. This device was introduced with DirectX 9.0

Moreover, devices contain a collection of resources; specific data used during rendering. Each resource has four attributes:

Type

Determines the type of resource: surface, volume, texture, cube texture, volume texture, surface texture, index buffer or vertex buffer.

POOL

Describes how the resource is managed by the runtime and where it is stored. In the Default pool the resource will exist only in device memory. Resources in the managed pool will be stored in system memory, and will be sent to the device when required. Resources in system memory pool will only exist in system memory.

Format

Describes the layout of the resource data in memory. For example, D3DFMT_R8G8B8 format value means a 24 bits colour_depth (8 bits for red, 8 bits for green and 8 bits for blue).

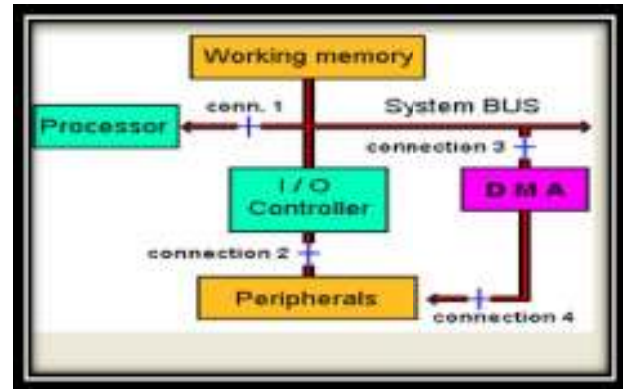
Usage

Describes, with a collection of flag bits, how the resource will be used by the application. These flags dictate which resources are used in dynamic or static access patterns. Static resource values don't change after being loaded, whereas dynamic resource values may be modified.

35. DIRECT MEMORY ACCESS (DMA)

Definition

Direct memory access (DMA) is a feature of computer systems that allows certain hardware subsystems to access main system memory (RAM) independently of the central processing unit (CPU).



Without DMA, when the CPU is using programmed input/output, it is typically fully occupied for the entire duration of the read or write operation, and is thus unavailable to perform other work. With DMA, the CPU first initiates the transfer, then it does other operations while the transfer is in progress, and it finally receives an interrupt from the DMA controller when the operation is done. This feature is useful at any time that the CPU cannot keep up with the rate of data transfer, or when the CPU needs to perform useful work while waiting for a relatively slow I/O data transfer.

Many hardware systems use DMA, including disk drive controllers, graphics cards, network cards and sound cards. DMA is also used for intra-chip data transfer in multi-core processors. Computers that have DMA channels can transfer data to and from devices with much less CPU overhead than computers without DMA channels. DMA can also be used for "memory to memory" copying or moving of data within memory. DMA can offload expensive memory operations, such as large copies or scatter-gather operations, from the CPU to a dedicated DMA engine. An implementation example is the I/O Acceleration Technology.

Modes of operation

- **Burst mode**

An entire block of data is transferred in one contiguous sequence. Once the DMA controller is granted access to the system bus by the CPU, it transfers all bytes of data in the data block before releasing control of the system buses back to

the CPU, but renders the CPU inactive for relatively long periods of time. The mode is also called "**Block Transfer Mode**".

- **Cycle stealing mode**

The cycle stealing mode is used in systems in which the CPU should not be disabled for the length of time needed for burst transfer modes. In the cycle stealing mode, the DMA controller obtains access to the system bus the same way as in burst mode, using **BR (Bus Request)** and **BG (Bus Grant) signals**, which are the two signals controlling the interface between the CPU and the DMA controller.

However, in cycle stealing mode, after one byte of data transfer, the control of the system bus is de-asserted to the CPU via BG. It is then continually requested again via BR, transferring one byte of data per request, until the entire block of data has been transferred. By continually obtaining and releasing the control of the system bus, the DMA controller essentially interleaves instruction and data transfers.

The CPU processes an instruction, then the DMA controller transfers one data value, and so on. On the one hand, the data block is not transferred as quickly in cycle stealing mode as in burst mode, but on the other hand the CPU is not idled for as long as in burst mode. Cycle stealing mode is useful for controllers that monitor data in real time.

- **Transparent mode**

The transparent mode takes the most time to transfer a block of data, yet it is also the most efficient mode in terms of overall system performance. The DMA controller only transfers data when the CPU is performing operations that do not use the system buses.

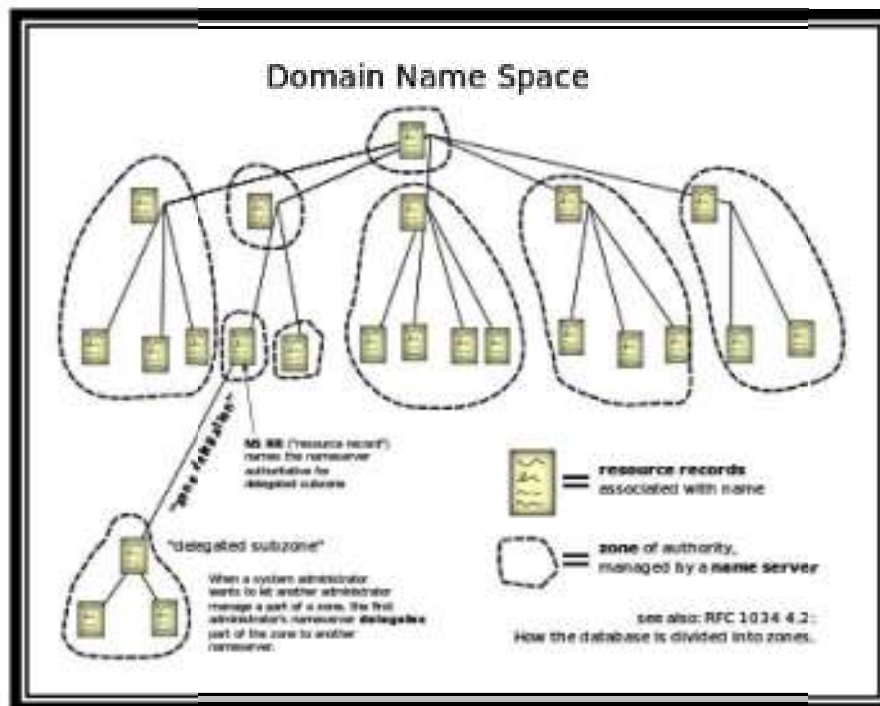
It is the primary advantage of the transparent mode that the CPU never stops executing its programs and the DMA transfer is free in terms of time.

The disadvantage of the transparent mode is that the hardware needs to determine when the CPU is not using the system buses, which can be complex.

36. DOMAIN NAME SYSTEM (DNS)

The Domain Name System (DNS) is a hierarchical distributed naming system for computers, services, or any resource connected to the Internet or a private network. It associates, various information with domain names assigned to each of the participating entities. Most prominently, it translates domain names, which can be easily memorized by humans, to the numerical IP addresses needed for the purpose of computer services and devices worldwide.

The Domain Name System is an essential component of the functionality of most Internet services because it is the Internet's primary directory service. The Domain Name System distributes the responsibility of assigning domain names and mapping those names to IP addresses by designating authoritative name servers for each domain.



Domain Name Syntax

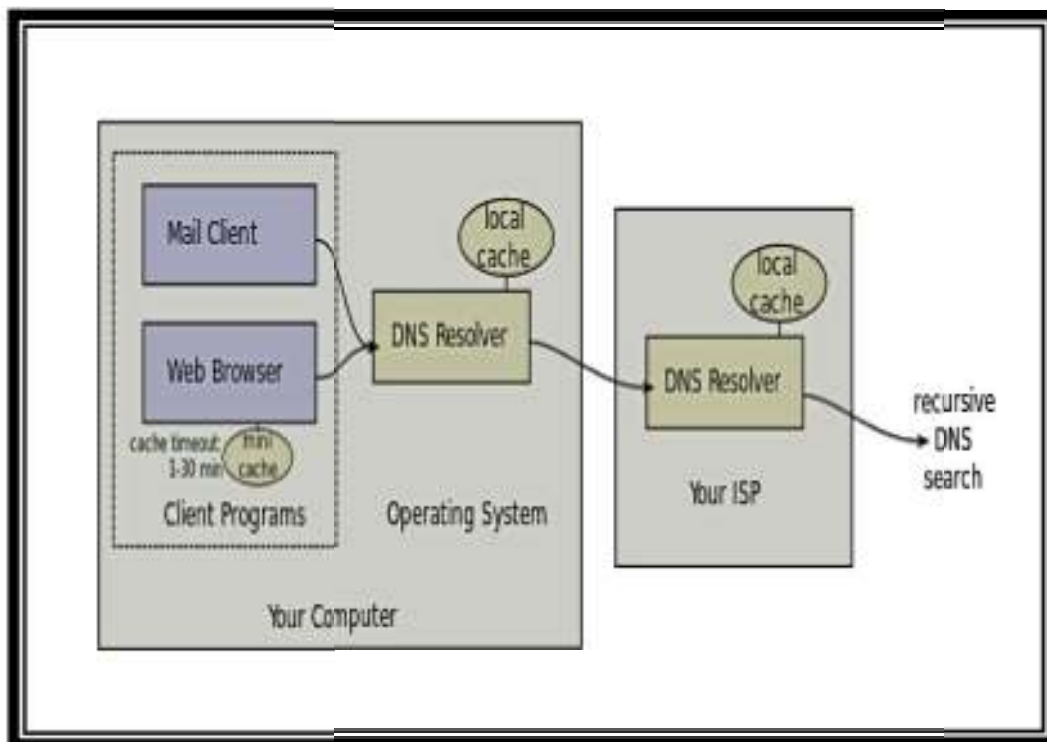
The definitive descriptions of the rules for forming domain names appear in RFC 1035, RFC 1123, and RFC 2181. A domain name consists of one or more parts, technically called labels.

Label

A label may contain zero to 63 characters. The null label, of length zero, is reserved for the root zone. The full domain name may not exceed the length of 253 characters in its textual representation.

Host name

Although domain names may theoretically consist of any character representable in an octet, host names use a preferred format and character set. The characters allowed in their labels are a subset of the ASCII character set, consisting of characters a through z, A through Z, digits 0 through 9, and hyphen. This rule is known as the LDH rule (letters, digits, hyphen).



Name servers

The Domain Name System is maintained by a distributed database system, which uses the client-server model. The nodes of this database are the name servers. Each domain has at least one authoritative DNS server that publishes information about that domain and the name servers of any domains subordinate to it. The top of the hierarchy is served by the root name servers, the servers to query when looking up (resolving) a TLD.

37. DONGLE (ADAPTER)

A dongle is a small piece of hardware used to connect to another device to provide it with additional functionality. The term "dongle" is also associated with similar devices meant to provide additional forms of wireless connectivity to devices.

The CD-based parts catalog used by Volkswagen Group used since 1989 requires a coded dongle be plugged into a host computer's port in order to run. Some professional digital audio workstation packages on the Atari TOS platform required the presence of the supplied dongle in the computer's cartridge port in order to run.

Steinberg's Cubase range and C-Lab's Creator and Notator packages frequently send data to the dongle, which sends a response determined by the electronics inside the cartridge.

To ensure compatibility with MIDI and other audio expansion units that also occupy the single cartridge port, some dongles had a pass-through connector to accommodate them. Some expanders were also designed with backplane sockets to host the different dongles unique to a specific set of packages. Eventually, software pirates were able to circumvent the dongle scheme by modifying the program's binary to accept simulated dongle responses, at the expense of stability and performance.



Copy protection circumvention

Some unlicensed game cartridges have a "daisy chain" that allows licensed games to pass along their authorization, for instance to circumvent the 10NES chip on the Nintendo Entertainment System.

Small peripheral applications

A Chrome cast plugged into the HDMI port of a TV. The wire attached to the other end is the USB power supply. Small devices that plug into other equipment to add functionality are often referred to as dongles. for example the infrared remote control adapters available for smart phones, or digital media players such as Chrome cast MHL.

A dongle enables adaptation to legacy standards such as HDMI via conversion circuitry contained in the dongle itself. MHL dongles often allow USB connections and/or device charging as well.

Dongle used in Different Fields

- Very short cables that connect relatively large jacks to smaller plugs allowing cables to be easily installed and removed from equipment with limited space available for connectors.
- Smartphone (portable CD players before 2000)
- PersCassette adapters enable cassette-radios to allow AUX in, like with iPod/MP3 player onal FM transmitters allow content from a portable media player, portable CD player, Smartphone, portable cassette player, or other portable audio system to be heard on an FM radio.
- IDE/PATA connectivity can be re-channeled with some dongles:
- Floppy disk drives have been emulated on solid-state "dongles" to ensure legacy recognition, allowing SD cards to serve software to old Commodore 64 and AppleII era computers.
- Allows SD cards to be recognized as "hard drives" on old DOS computers
- Can be used in many video games.
- USB host connectivity grants more flexibility to computer-based devices
- Older cars that "externalized" their CD players and changers from the head unit can now use "emulators" that allow USB and SD cards with MP3s and other audio files to be recognized as "tracks" to the CD control unit circuitry.
- The alternative term 'Pig-tail' is favored by some in the IT industry, due to the appearance of a full-sized connection element, with a short, thin wire extending, somewhat reminiscent of the rear of porcine animals.

38. EMOTICON

By plenty of measures, 2015 has been a banner year for emojis or emoticons. A Welsh professor declared them the fastest growing language in the UK. The New York Times used one in a headline, and a grid of them graced the cover of The New Yorker. To cap it all, last month the Oxford Dictionaries declared the tears-of-joy emoji the “word” of the year.

It now feels hard to imagine online communication without emojis, even if their explosion in popularity among English speakers only dates to October 2011, when Apple’s iOS 5 update bestowed the little icons upon millions of iPhones. (Gmail launched emoji support several years earlier, as did a number of third-party emoji apps, but neither of these developments paved the way for their mainstream adoption in the way that putting them on the iPhone’s virtual keyboard did.)

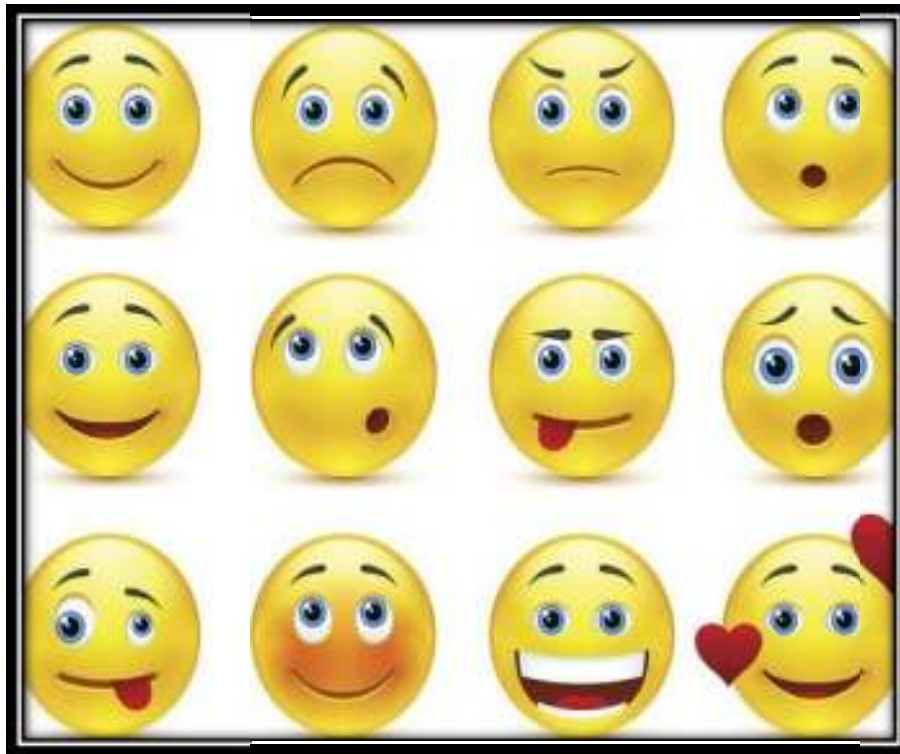
The very first emojis appeared on a handset sold by the company J-Phone (now Softbank) in 1997, but high prices kept it out of the hands of average citizens. The direct ancestors of the emoji we know and use today debuted in Japan in 1999.

“The emoji boom is over here in Japan,” says Shigetaka Kurita, the man widely credited with creating the adorable little runes. “They’re still around, they’re still pervasive, but they aren’t a fad anymore,” he says in his Tokyo office. He ventures that when Obama mentioned emojis on the White House lawn.

Understanding the rise and fall of emojis in their homeland requires a little history. When Japanese telecom leader DoCoMo introduced proto-emojis in 1999, they were a core feature of the company’s i-mode service, the nation’s first to bring the internet to mobile phones. In comparison to modern standards, the crude dot-matrix designs are something like digital versions of the primitive single-celled organisms that once emerged from the primordial ooze.

Emojis help to add nuance to quick fire messaging. Emojis were such a phenomenon, in fact, that they nearly sank the Japanese launch of the iPhone in 2008. A collection of the new emoji, made by Emojipedia. By the time Google and Apple began “localising” the emoji for use on Western computers and phones a decade later, display technology had leapfrogged the old screens upon which Kurita’s first emojis dwelled.

The resulting demand for crisper graphics and more detailed imagery forced Western designers to “fill in the blanks” with their interpretations, occasionally to the horror of Japanese emoji specialists.



Signs of the times: Emojis past and present

The Oxford Dictionary word of the year for 2015 was the “tears of joy” emoji, a decision that provoked howls of derision from the non-technologically inclined. In fact, this addition was very telling: the word of the year in 2010 was “app” and “tweet” the year before that.

In 2008 the word was “bailout” – in reference to bailing out a bank. These are all words that once upon a time we had no need for, but nowadays we can’t live without. So what’s next for emojis? Fans of Star Wars can currently use the hashtags #stormtrooper, #C3PO and #BB8 on Twitter and have a Star Wars emoticon automatically show up next to the word. Scandinavians and scandi-lovers can now download the new “Nordic Emoji”, which includes long-haired rock gods and lots of very cold-looking people.

In 2016, Apple users can hope for 38 new emojis to play with, including bacon strips, champagne, a pregnant woman, a groom to go along with the bride – and the introduction of Mrs Claus.

39. ENCAPSULATED POST SCRIPT (EPS)

Encapsulated PostScript (EPS) is a DSC-conforming PostScript document with additional restrictions which is intended to be usable as a graphics file format. In other words, EPS files are more-or-less self-contained, reasonably predictable PostScript documents that describe an image or drawing and can be placed within another PostScript document. Simply, an EPS file is a PostScript program, saved as a single file that includes a low-resolution preview "encapsulated" inside of it, allowing some programs to display a preview on the screen. At minimum, an EPS file contains a Bounding Box DSC comment, describing the rectangle containing the image described by the EPS file. Applications can use this information to lay out the page, even if they are unable to directly render the PostScript inside. EPS, together with DSC's Open Structuring Conventions, form the basis of early versions of the Adobe Illustrator Artwork file format.

Identification

There are different ways in which EPS previews are handled, there is no one way to identify an EPS file. A Windows-format EPS file containing a TIFF or WMF preview must start with the four bytes containing, in hexadecimal, C5 D0 D3 C6. These bytes comprise the first four bytes of a 30-byte header, whose remaining fields are six unsigned 32-bit integers and a 16-bit checksum. (Often two zero bytes follow the header.) EPS files having "DOS" WMF or TIFF previews are widespread on all platforms. In all other cases an EPS file must start with a line where a, b, c and d are all single digit numbers. A Mac-format EPS file is accompanied by a resource fork. The preview is a PICT resource with ID 256. An EPS file on the Mac is expected to have a file type code of "EPSF", whether or not it has a preview. An EPSI file will contain a line starting in the DSC prolog. In many cases they are not present at all.

Previews in Eps

EPS files also frequently include a preview picture of the content, for on-screen display. The idea is to allow a simple preview of the final output in any application that can draw a bitmap.

Without this preview the applications would have to directly render the PostScript (PS) data inside the EPS, which was beyond the capabilities of most machines until recently.



When EPS was first implemented, the only machines widely using PostScript were Apple Macintoshes. These machines could not directly render the PostScript, which presented Adobe with the problem of how to provide a preview image while also including the actual PS version for the printer. On the Mac this turned out to be easy to solve, as the Mac file system includes two parts (known as forks) that are logically referred to as one file. By placing the PostScript in the data fork and a standard Mac PICT resource in the resource fork, both images could be moved about together invisibly as if they were one file. While a PICT preview often contains a bitmap it could also contain a vector representation of the whole image, providing very high quality previews.

Neither of these technologies is commonly used on any other operating system, however. When faced with the same problems on Microsoft Windows-based versions of their programs, Adobe chose to instead include a TIFF file encoded into the header section of the PostScript. Sometimes, though more rarely, they used the WMF (Windows Metafile) format instead. WMF has the potential to provide vector previews, similar to PICT on the Mac. Both of these PC format EPS files have a particular disadvantage: because the PostScript data, header and preview are all in the same file, they will cause printing errors if a program does not understand the format well enough to extract only the PostScript data. A fourth format known as an EPSI includes an ASCII-encoded preview bitmap. This format allows for black-and-white previews only. It is mainly used on UNIX systems. Unfortunately, with several different ways of representing the preview, they have limited portability. An application which is unable to interpret a EPS file's preview will typically show an empty box on screen, but it will be able to print the file correctly.

40. EXPANSION CARD FOR PRINTERS

Expansion Card

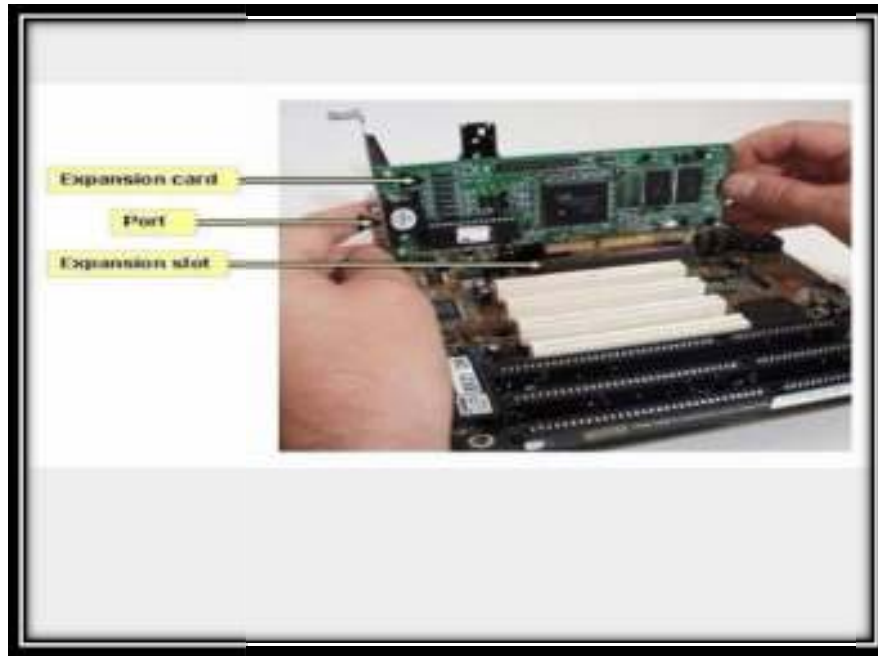
Expansion card referred to as an add-on card, expansion board, internal card, interface adapter, or card, an expansion card is a PCB that fits into an expansion slot on a desktop computer. An expansion card is used to give computer capabilities, such as graphics card. Expansion cards sometimes called daughter boards.



Types of Expansion Cards

- ❖ Interface card (ATA, Bluetooth, EIDE, Fire wire, IDE, Parallel, RAID, SCSI, Serial, and USB)
- ❖ Modem
- ❖ MPEG Decoder
- ❖ Network card
- ❖ Sound card
- ❖ Video card
- ❖ Video capture card

The purpose of adding an expansion card or board to a computer's motherboard is to add or expand some sort of functionality to the computer. Expansion cards are a way to upgrade a computer.



Expansion of Cards

- ❖ An expansion card is an electronic card board is used to add extra functionality to computers.
- ❖ Many different classes of expansion card are available, including sound cards, video graphics card, network cards and so on.

Related Tags

Categories : Hardware Motherboards Electronics

Synonyms : Printed Wiring Board (PWB),
Etched Wiring Board (EWB)

Computer Function And Accesories

An expansion card is a card which you can install to expand a computer's capabilities. Expansion cards are inserted into expansion slots on the motherboard.

Eg: Computer's Video Card.

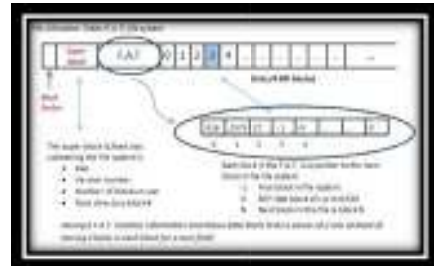
41. FILE ALLOCATION TABLE (FAT)

A File Allocation Table (FAT) is a table that maintains and provides a map of the basic units of logical storage on a hard disk that a file has been stored in. When you write a new file to a hard disk, the file is stored in one or more clusters that are not necessarily next to each other; they may be rather widely scattered over the disk.

When you read a file, the operating system reassembles the file from clusters and places it as an entire file where you want to read it. For example, if this is a long Web page, it may very well be stored on more than one cluster on your hard disk.

DOS 5.0 and later versions provide for support of hard disks up to two with the 16-bit FAT entry limit by supporting separate FATs for up to four partitions. With 32-bit FAT entry (FAT32) support in Windows 95 OSR2, the largest size hard disk that can be supported is two. However, personal computer users are more likely to take advantage of FAT32 with 5 or 10 gigabyte drives.

- ❖ Unused (0x0000)
- ❖ Cluster in use by a file
- ❖ Bad cluster (0xFF7)
- ❖ Last cluster in a file (0xFFF8-0xFFFF)

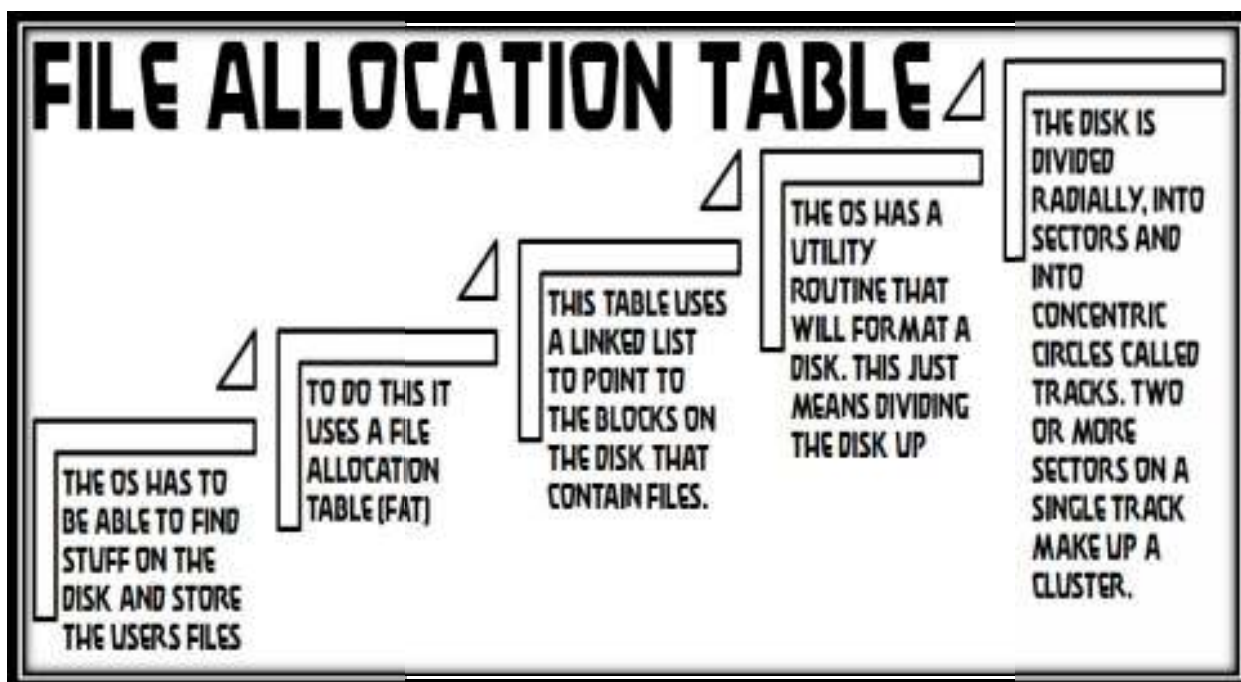


There is no organization to the FAT folder structure, and files are given the first available location on the volume. The starting cluster number is the address of the first cluster used by the file. Each cluster contains a pointer to the next cluster in the file, or an indication (0xFFFF) that this cluster is the end of the file. These links and end of file indicators are shown below.

Example of File Allocation Table

A version of the file allocation table (FAT) available in Windows 95 OSR 2 and Windows 98. FAT32 increases the number of bits used to address clusters and also reduces the size of each cluster. The result is that it can support larger disks (up to 2 terabytes) and better storage efficiency (less slack space). FAT12. FAT16, FAT32 and NTFS each use different cluster sizes depending on the size of the

volume, and each file system has a maximum number of clusters it can support. The smaller the cluster size, the more efficiently a disk stores information because unused space within a cluster cannot be used by other files.



With the advent of Windows XP in October 2001, support was extended to include the NTFS. NTFS is a completely different file system from FAT that was introduced with first version of Windows NT in 1993. Designed to address many of FAT's deficiencies, it provides for greatly increased privacy and security. The file system is inherently more resilient than FAT, being less likely to suffer damage in the event of a system crash and it being more likely that any damage is recoverable via the `chkdsk.exe` utility.

Some FAT source code and information:

OS.ZIP - This is my OS package! It contains three boot sector sources.

FAT32.HTML - This is an excerpt from the FAT32API.HLP file from Microsoft.

FAT12.ASM - Example of a FAT12 boot sector.

FAT16.ASM - Example of a FAT16 boot sector.

FAT32.ASM - Example of a FAT32 boot sector.

42. FLAT FILE

A **flat file database** is a database which is stored on its host computer system as an ordinary "flat file". To access the structure of the data and manipulate it, the file must be read in its entirety into the computer's memory. Upon completion of the database operations, the file is again written out in its entirety to the host's file system. In this stored mode the database is "flat", which means it has no structure for indexing and there are usually no structural relationships between the records. A flat file can be a plain text file or a binary file.

Data transfer operations

Flat files are used not only as data storage tools in DB and CMS systems, but also as data transfer tools to remote servers (in which case they become known as information streams).



Record No.	Exam No.	Miss	Activity
Record 1	1-45	11	Overly
Record 2	1-45	11	Packing
Record 3	18-30	11	Cockney

In recent years, this latter implementation has been replaced with XML files, which not only contain but also describe the data. Those still using flat files to transfer information are mainframes employing specific procedures which are too expensive to modify. One criticism often raised against the XML format as a way to perform mass data transfer operations is that file size is significantly larger than that of flat files, which is generally reduced to the bare minimum. The solution to this problem consists in XML file compression (a solution that applies equally well to flat files), which has nowadays gained EXI standards (i.e., Efficient XML Interchange, which is often used by mobile devices).

It is advisable that transfer data be performed via EXI rather than flat files because defining the compression method is not required, because libraries reading the file contents are readily available, and because there is no need for the two communicating systems to preliminarily establish a protocol describing data properties such as position, alignment, type, and format. However, in those circumstances where the sheer mass of data and/or the inadequacy of legacy systems becomes a problem, the only viable solution remains the use of flat files. In order to successfully handle those problems connected with data communication, format, validation, control and much else (be it a flat file or an XML file data source), it is advisable to adopt a Data Quality Firewall.

Terminology

"Flat file database" may be defined very narrowly, or more broadly. The narrower interpretation is correct in database; the broader covers the term as generally used.

Strictly, a flat file database should consist of nothing but data and, if records vary in length, delimiters. More broadly, the term refers to any database which exists in a single file in the form of rows and columns, with no relationships or links between records and fields except the table structure. Terms used to describe different aspects of a database and its tools differ from one implementation to the next, but the concepts remain the same.

FileMaker uses the term "Find", while MySQL uses the term "Query"; but the concept is the same. FileMaker "files", in version 7 and above, are equivalent to MySQL "databases", and so forth. To avoid confusing the reader, one consistent set of terms is used throughout this article.

However, the basic terms "record" and "field" are used in nearly every flat file database implementation.

- **Data types:** Each column in a database table such as the one above is ordinarily restricted to a specific data type. Such restrictions are usually established by convention, but not formally indicated unless the data is transferred to a relational database system.
- **Separated columns:** In the above example, individual columns are separated using whitespace characters. This is also called indentation or "fixed-width" data formatting. Another common convention is to separate columns using one or more delimiter characters. More complex solutions are markup and programming languages.
- **Relational algebra:** Each row or record in the above table meets the standard definition of a tuple under relational (the above example depicts a series of 3-tuples). Additionally, the first row specifies the field names that are associated with the values of each row.
- **Database management system:** Since the formal operations possible with a text file are usually more limited than desired, the text in the above example would ordinarily represent an intermediary state of the data prior to being transferred into a database management system.

43. GEOGRAPHIC INFORMATION SYSTEMS (GIS)

A Geographic Information System or Geographical Information System (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.

GIS Techniques and Technology

Modern GIS technologies use digital information, for which various digitized data creation methods are used. The most common method of data creation is digitization, where a hard copy map or survey plan is transferred into a digital medium through the use of a CAD program, and geo-referencing capabilities. With the wide availability of heads-up digitizing is becoming the main avenue through which geographic data is extracted.

Relating Information from Different Sources

GIS uses spatio-temporal allocation as the key index variable for all other information. Just as a relational database containing text or numbers can relate many different tables using common key index variables, the key is the location and/or extent in space-time. Any variable that can be located spatially, and increasingly also temporally, can be referenced using a GIS and x, y, and z representing, and respectively.

Data Capture

The current trend for geographical information system (GIS) is that accurate mapping and data analysis are completed while in the field. Depicted hardware technology is mainly used.



GIS Uncertainties

GIS accuracy depends upon source data, and how it is encoded to be data referenced. Land surveyors have been able to provide a high level of positional accuracy utilizing the derived positions. High-resolution digital terrain and aerial imagery powerful computers and Web technology are changing the quality, utility, and expectations of GIS to serve society on a grand scale.

Cartographic Modeling

The term "cartographic modeling" was probably coined by in his PhD dissertation and later in his book which has the term in the title. Cartographic modeling refers to a process where several thematic layers of the same area are produced, processed, and analyzed.



Address Geocoding:

Geocoding is interpolating spatial locations (X,Y coordinates) from street addresses or any other spatially referenced data such as individual addresses, such as a road centerline file with address ranges. The individual address locations have historically been interpolated, or estimated, by examining address ranges along a road segment. These are usually provided in the form of a table or database. The software will then place a dot approximately where that address belongs along the segment of centerline. In this case, the result of the geocoding will be an actually positioned space as opposed to an interpolated point. This approach is being increasingly used to provide more precise location information.

Future of GIS

As discussed above, many disciplines can benefit from GIS techniques. An active GIS market has resulted in lower costs and continual improvements in the hardware and software components of GIS. These developments will, in turn, result in a much wider application of the technology throughout government, business, and industry. It is quite likely that the future GIS systems of the future will include the additional dimension of time, giving researchers the ability to examine the variations in Earth processes over days, months and years. The advances in computer hardware, software and remote sensing technology will lead to more and more GIS adopting multimedia to represent data. These GIS systems coupled with the multimedia technologies will result in a powerful and richer presentation of information and ideas to stimulate interest and enhance information retention. The GIS of the future will also be more users friendly and accessible to the common man.

44. GNUTELLA NETWORK

Its substantial user base and open architecture make it a good large-scale, if uncontrolled, test bed. We captured the network's topology, generated traffic, and dynamic behavior to determine its connectivity structure and how well (if at all) Gnutella's overlay network topology maps to the physical Internet infrastructure. Our analysis of the network allowed us to evaluate costs and benefits of the peer-to-peer (P2P) approach and to investigate possible improvements that would allow better scaling and increased reliability in Gnutella and similar networks. A mismatch between Gnutella's overlay network topology and the Internet infrastructure has critical performance implications

Developed in a 14 days “quick hack” by Nullsoft (winamp)

- ❖ Originally intended for exchange of recipes

Evolution of Gnutella

- ❖ Published under GNU General Public License on the Nullsoft web server
- ❖ Taken off after a couple of hours by AOL (owner of Nullsoft)
- ❖ This was enough to “infect” the Internet
- ❖ Gnutella protocol was reverse engineered from downloaded versions of the original Gnutella software
- ❖ Third-party clients were published and Gnutella started to spread

BASED ON MESSAGE FLOODING

- ❖ Typical values $C=4$, $TTL=7$
- ❖ One request leads to messages
- ❖ Hooking up to the Gnutella systems requires that a new peer knows at least one Gnutella host
(gnutellahosts.com:6346; outside the Gnutella protocol specification)
- ❖ Neighbors are found using a basic discovery protocol (ping-pong messages)

Gnutella: Protocol Message Types

TYPE	DESCRIPTION	CONTAINED INFORMATION
Ping	Announce Availability And Probe For Other Servents	None
Pong	Response To A Ping	Ip Address And Port # Of Responding Servent; Number And Total Kb Of Files Shared
Query	Search Request	Minimum Network Bandwidth Of Responding Servents ;Search Criteria
Query Hit	Returned By Servents That Have The Requested File	Ip Address. Port# And Network Bandwidth Of Responding Servent ; Number Of Result And Result Set
Push	File Download Requests For Servents Behind A Firewall	Servents Identifier ;Index Of Requested File ;Ip Address And Port To Send File .

CONNECTIVITY IN GNUTELLA

Follows a power-law distribution: $P(k) \sim k^{-g}$

- ❖ k number of links a node is connected to, g constant (e.g. g=2)
- ❖ distribution independent of number of nodes N
- ❖ preferential attachment
- ❖ low connected nodes follow a constant distribution (?): more robust.

45. GOOGLE DRIVE

Google Drive is a file storage and synchronization service created by Google. It allows users to store files in the cloud, share files, and edit documents, spreadsheets, and presentations with collaborators. Google Drive encompasses Google, an office suite that permits collaborative editing of documents, spreadsheets, presentations, drawings, forms, and more. Google Drive was launched on April 24, 2012 and had 240 million monthly active users as of October 2014.



Client

For Google Drive to synchronize files between the user's computer and Google Drive storage, the Google Drive 'client' software must be running on the user's computer. The client communicates with Google Drive to cause updates on one side to be propagated to the other so they both normally contain the same data. Sundar Pichai of Google said that the Google Drive online storage service would be tightly integrated with Chrome OS version 20.

Storage

Google offers all users an initial 15 GB of online storage space that is shared across three of its most-used services: Google Drive, Gmail, and Google+ Photos (aka Picasa Web Albums). Users can upgrade their free 15 GB account through a paid monthly subscription plan to get additional storage. Documents using Google Docs native formats (including .gdoc, .gslides, and .gsheet) do not count towards this quota. In Google+ Photos, photos of resolution less than 2048 x 2048 pixels and videos shorter than 15 minutes also do not count towards this quota. Uploaded files in Microsoft Office and Open Document formats (with possible formatting changes) can be converted to Google's proprietary formats, and thus can be stored without counting against the storage quota. As of 13 March 2014, storage plans offered by Google:

Storage	Price
15 GB	Free
100 GB	\$1.99 per month
1 TB	\$9.99 per month
10 TB	\$99.99 per month
20 TB	\$199.99 per month
30 TB	\$299.99 per month

Ownership and Licensing

Google has one unified set of terms of service and privacy policy for all its products. According to CNET, unlike competing services Drop box and One Drive, Google has broad rights to reproduce, use, and create derivative works from content stored on the Google Drive, via a license from its users. This license is perpetual even after the user removes the material.

Google Drive for Education

Google Drive for Education was announced on September 30, 2014. It was made available for free to all Google Apps for Education users. It includes unlimited storage and support for individual files up to 5TB in size.

Popularity

On November 12, 2013, Google announced that Google Drive had 120 million active users, a figure that the company was releasing for the first time. On June 25, 2014 at the Google I/O conference, Sundar Pichai announced that Google Drive now had 190 million monthly active users, and that it was being used by 58% of the Fortune 500 companies as well as by 72 of the top universities.

Data safety and privacy

Some of the issues that have to be considered to see if Google Drive is "enterprise-ready" include:

- Encryption of data in transit and storage
- Service Level Agreements (regarding electronic discovery and incident management)
- Audit trails for users and administrators
- Data segregation and data isolation

Presentations

Presentations created in Google Slides can be up to 100 MB – which is about 400 slides. Uploaded presentation files that are converted into Google Slides format can be up to 50 MB.

Spreadsheets

All the limits on spreadsheets have been removed in the newer version of Google Sheets. In the older version, there could have been a maximum of 256 columns per sheet and 200 sheets per workbook, with 400,000 cells in all.

Uploaded spreadsheet files that are converted to Google Sheets format cannot be larger than 20 MB, and need to be under 400,000 cells and 256 columns per sheet.



*We express our sincere gratitude
for all those who have helped us, for
the successful launch of this book,
which is our new attempt*