



# Computer and Internet Basics

An Introduction to Computers and the Internet

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CAL People and Computer Training  
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## Introduction

**Computer Basics** is a course developed to introduce CAL PACT participants to computer technology, the basics of how it works and how it can be used to help you in your work and in your life. This document serves as a companion to the class, as well as a reference for you as you continue to gain experience on your own. While the material covered here may seem a bit daunting on a first glance, do not be overwhelmed. By the end of the course, much of what you originally thought was mysterious will be more concrete.



We encourage you to expand your computer knowledge by attending other CAL PACT courses. Additional course documentation and information about our program is available online at the CAL PACT website: <http://calpact.berkeley.edu>.

## Skills and concepts you will learn in this class

- What is hardware?
- What is software?
- What is an operating system?
- Overview of the Internet
- E-mail
- Browsing and Searching the World Wide Web

## Conventions used in this document

Menus and menu commands are separated by a vertical bar ( | ). In the document they will appear as **Menu|Command**. An example of this is: “Select **File|New...**”

## Icons in the left margin

Occasionally, you will notice icons in the left margin. Their purpose is to highlight important information. Examples:



## Introduction

A computer is a tool that allows us to process information. A computer takes information (input) from the user and the rest of the outside world such as a microphone, mouse, or keyboard, and arranges and performs processes on that information to give back to the user as output through a monitor, printer, or speaker. Computers have many uses and have something to offer to everyone. Computers are used throughout the world for education, entertainment, research, business, and communications. Like any tool, it must be used correctly to obtain from it what you want. This class attempts to describe this relationship, and underscores the most important aspects of exactly how the computer relates with the user. In the second half of the class we will discuss the “Internet.” The Internet is simply a way for people to connect computers throughout the world and share information. Internet = Inter-Network. It allows people to communicate around the world sharing text, video, and audio instantly. However, before one can use the Internet, one must understand the way the computer works.

## What is a Computer?

The two essential Parts of any computer are the **Hardware** and the **Software**.

### Hardware

Hardware includes the physical parts of the computer that actually do all of the thinking and handle the input and output of data. The Hardware of a computer is all of the parts of the computer that you can touch.



### ***The Brain of the Computer***

#### ***The Central Processing Unit (CPU or Processor)***

The Central Processing unit, also called a CPU or Processor, is the central most important part of the computer. The CPU does all of the thinking for every part of the computer. The CPU controls the performance and speed at which your computer runs. The speed is measured in Megahertz (MHz) or in Gigahertz (GHz). 1000 Megahertz = 1 Gigahertz. In the late 1980's computers were only about 10 MHz, while today, the fastest personal computers run at over 2.2 GHz (2200 MHz). The speed of computers roughly double every year. However, the speed is not the only thing that determines the performance of your computer. Other parts of your computer affect the performance of your computer, especially the memory. Processors are very complex and use different types of technology making it hard to compare one directly to another. A 1GHz processor made today is almost 33% fast than a 1GHz processor made a year ago.

### ***Memory: Where the information is kept***

Memory is the part of the computer where information is kept, either temporarily or permanently. The two most important types of memory are RAM (Random Access Memory) and Storage memory. Memory is measured in “Bytes”. So, a “1” or a “B”

would be about 1 byte of information. A byte of information is equal to one letter or number such as “A”, “b”, or “25”.



RAM is used by the CPU to temporarily store information so that data can be saved and transferred very quickly. RAM is stored electronically; this can be both a good and a bad thing. Since the information that is kept in RAM is stored electronically, information on it can be read and transferred really quickly. However, when the computer is turned off, all of that information is erased. The more RAM a computer has, the more information it can transfer at a quick rate -- so computers with more RAM run faster.

Each computer only runs with specific types of RAM. They include SDRAM (Synchronous Dynamic RAM), DDR SDRAM (Double Data Rate SDRAM), and RDRAM (Radial Dynamic RAM). Every year new research creates a way to make faster and cheaper RAM, creating new computers that use the latest technologies to get the best performance out of our computers. Today’s newest computers use RDRAM or DDR RAM, depending on the CPU of the computer. While each computer has a limit as to how much RAM it can have, most computers today have roughly 128 megabytes of RAM. Oftentimes more RAM can be added to a computer, making it an easy way to increase the performance of the computer.

### **Storage Memory**

Storage Memory is where things are kept semi-permanently, meaning things are only erased from memory when the user erases it herself. Storage memory is located on mechanisms called disk drives, commonly called “drives.” There are various types of drives, all with different abilities and speeds. The main difference between them is portability and size. Generally, these two are inverses of each other, meaning that the more memory a disk has the more expensive it is. The more space a drive has, the more information it can store, allowing users to do more things.

Before we begin discussing different types of drives, it is important to understand how size is measured. The metric terms kilo, mega, and giga mean slightly different things when they are used with bytes. The “kilobyte” (KB) would seem to be about a thousand bytes, but is actually 1024 bytes. The reason is technical, but not important. The common prefix kilo is 1000, so we approximate. The prefix mega- (as in “megabyte” or “MB”) means approximately 1,000,000. In actuality, it is 1024<sup>2</sup>, or 1,048,576 bytes... which is pretty close to 1,000,000. A “gigabyte” (GB) is approximately one billion bytes.

The most important place of long-term storage on a computer is the **hard drive**. It is on this drive where most of the information you use on your computer will be kept. All other drives will be primarily used to share data or to keep backup copies of your data. The hard drive is a mechanical device that looks like a stack of CDs that stores data magnetically. Since it is a mechanical device, it is much slower than RAM, however, unlike RAM your hard drive will keep all of its information even when you turn your computer off. One of the drawbacks of hard drives is that they are not designed to be portable. Today hard drives can hold up to 180 Gigabytes

### **How big is big?**

Size is often only useful when you have some idea of relevance.

A few typed pages is apx. one kilobyte

A word processor program is apx. 500 KB (depending on its features)

A single picture-sized graphic is apx. 500 KB (.5 MB)

A three-minute song is apx. 3MB

An entire book is probably around 500 KB, but may vary depending on the length.

(GB) costing anywhere from 50¢ to \$2 per gigabyte. Average users will not need more than 10 GB of space, while only those doing lots of Video or Audio work will need more.

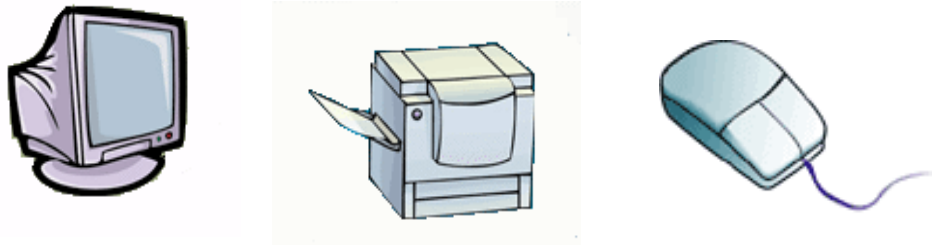
Some types of drives include floppy disk drives, CDROM drives, DVD-ROM drives, and Zip drives. All of these drives have portable disks that can be put into drives of different computers and have different strengths and weaknesses compared to one another.

Type of Drive	Amount of Space	Speed (MB/s)
CDROM Drive	700 MB	1 - 2
Floppy Disk Drive	1.4 MB	.016
DVD Disk Drive	1.2 – 5 GB	3
Zip Drive	250 MB	2.4

All of these Disk drives allow us to work on something at work, save it to a disk, and then come home, and use that same disk to access what you were working on.

### ***I/O: The Ins and Outs of Computers***

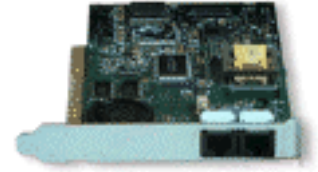
Computers can retrieve and output data in other ways besides transferring data to and from disks. All of the means to input and output data on a computer is called Input and Output, or I/O for short.



Some common ways to input data include the use of a mouse, a keyboard, or a scanner. A mouse is sometimes referred to as a “pointing device” because it allows you to move a pointer around the monitor and select (or “point to”) different objects you see on your monitor. A keyboard allows you to type letters, numbers, and other special characters to communicate with the CPU. A scanner is like a copy machine, except the copied image is copied onto the computer. Some common output devices include monitors, which display the current status of the computer; speakers which can make sounds; and printers, which put text or images from your computer on to paper.

There are many other devices that perform both input and output operations. One common device is called a **modem**, which is a device that allows computers to communicate with one another via a telephone line, cable line, or even satellite. More technically, a modem converts the binary/digital language (which is simply 0s and 1s) that computers speak into the analog signals that telephone lines carry. This process is called *modulation*. When the signals are converted back to binary on the other end, the process is called *demodulation*. Hence, “MODulation” and “DEModulation” = modem.

Computers with networking capabilities in campus departments most often use a technology called **Ethernet** to communicate with one another. Ethernet already speaks the digital language of computers. However, it requires special wiring apart from the phone lines that a modem uses. This wiring makes these connections many times faster than modems.

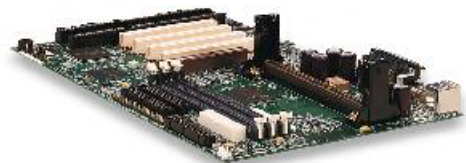


There are several **ports** on computers that allow for the input and output of data. Ports on computers allow people to connect a range of different devices, such as a CD Recorder or a Digital Video Camera, to another Computer. Some of the older ports include COM ports and Parallel ports, and some of the newer ports include USB (Universal Serial Bus) and Fire Wire ports. Usually Fire Wire or USB ports are used for most new devices. Fire Wire was the fastest, most affordable port design a year ago until the new version of USB was released. These two rivaling technologies compete with each other for computer makers to support their own type of standard, choosing between Fire Wire or USB.

### ***The Motherboard: The Part that Keeps everyone together***

The Motherboard is used to physically connect and digitally coordinate the operation of all of these hardware components. All of the parts we've discussed in this section connect to the motherboard. The motherboard has specifications that determine which hardware (mouse, hard drive, CPU, RAM, etc) are compatible with the motherboard. Not only are some new motherboards compatible with only newer hardware, but there are different types of motherboards that only work with hardware for which it was specifically designed. Today, we have only two common designs for desktop computers -- Apple (or Mac) computers and PCs (personal computers). The hardware for these two computers are almost completely incompatible with the other, except for a few small exceptions.

Motherboards have "slots" that allow the computer to expand. The "cards" that fit into these slots vary greatly from modems or video to sound or Ethernet. These cards can be replaced to improve the performance or add to the functionality of a computer and they can be swapped between different computers.



This is a large amount of information, but that also has risks. When a hard drive fails, all the information contained on it may be lost. That can add up to a lot of lost working hours, as that information may need to be re-entered into the computer. Or, it may be lost for good if the document was created on the computer and has no physical equivalent from which to re-enter the information.

Another very important type of drive is the CD-ROM drive. CD stands for compact disc, since this media, or the manner in which information is stored, is the same as

audio compact-disc technology. The ROM stands for Read Only Memory. A CD-ROM drive (and the associated CDs) are a device which allows easy portability of a good deal of long-term information, but with the large drawback that it is read-only; you can't save a file to a CD-ROM drive. However, you can read files off from it as many times as you want, which makes it perfect for distributing large programs or data (such as encyclopedias or other reference material) that doesn't change frequently.

### **Summary**

All this hardware works together to provide two very important functions to the user: the ability to input information, and the ability to output information back to the user. The capabilities of a computer, therefore, are largely dictated by what hardware it has.

### **Software**

Software is a tool that allows the hardware to process and manipulate data. Software is all of the commands that you use to make the all of the hardware do things. Software is essentially a list of commands; therefore it is not something you can touch. Software is stored on the different drives in your computer. Software, like data, can be stored and shared through disks. Unlike hardware, software is not permanent. It can be added, removed, and changed very easily. Individual software pieces are normally called programs. There are two types of programs, system software and application software.

### **System Software**

System software includes all of the utilities that allow your computer to work. Computers are naturally very complex, so system software is necessary to make all of the hardware and software to work together. Without system software, all the parts of the computer would be uncoordinated and users would not be able to take advantage of the power of a computer. The most important System Software is the Operating system.

### ***Operating System***

The operating system (OS) is a layer between the hardware of the computer and the software of the computer, with which the user interacts. In this regard, an OS manages requests for information from software, and asks the hardware to provide such information. As well, the OS manages the output of programs, asking the hardware to create output. The OS also provides a basic set of features for software, and a basic set of software for the user. Although different operating systems have different specifics and names behind some of these concepts, there are some fundamental concepts that all operating systems relate to the user, such as files, directories and commands.

### ***Files***

A file is a block of storage space which programs can use. As an example, a document you might type into a word processing program is stored as a single file.

Graphics or sound clips are also often stored as a single file, as are programs and their associated resources such as dictionaries or user preferences. Files have a “type” associated with them. This type helps to describe what information is contained in the file, and more importantly how programs should decode the information in the file.



Going any deeper than this reveals far too many technical details, but it is sufficient to say that any given software must know exactly what type of file it is dealing with in order to process it, since a text file is very different from a Word document or a graphics image! In fact, there are even various sub-types of text files (ASCII, Unicode), Word documents and graphics images (GIF, JPEG, Bitmap).

Files are described in the same sizes as storage capacity; for instance, a 1.44 MB floppy disk will be able to hold two .5 MB files and a 440 KB (.44 MB) graphic, since  $.5 \text{ MB} + .5 \text{ MB} + .44 \text{ MB} = 1.44 \text{ MB}$ . Files are also given a file name, and this is where the operating system comes heavily into play. The operating system controls the maximum length and format of the file name. For instance, in MS-DOS, file names are only allowed to have a length of eight characters followed by a period and then another three characters. This doesn't lend itself well to a very descriptive name, especially since those last three characters are often used to describe the type of file (such as “.DOC”, “.GIF” or “.XLS”). Newer operating systems have very high limits on the length of file names.

### ***Directories and Folders***

Computers have their own method of ‘filing’ to keep track of files. You can imagine disks to be just like filing cabinets. Different drawers contain different folders, and in these folders there are different files. Computers are the same way, except that instead of different drawers there are different disks. On these disks there are folders (also called “directories”), that contain files and more folders. For instance, a Microsoft Word file (a part of the Microsoft Office program suite) might be in a directory named “Word” inside another directory named “MSOFFICE.” Alternately, a Microsoft Excel file (another program in the MS Office suite) would be in a directory named “Excel” inside the directory named “MSOFFICE.” This directory mechanism allows for grouping files based on their related meaning.

It is the operating system that controls arrangement of the files and folders on the computer. For historical reasons PC drives are usually named by letter; “A” and “B” for floppy drives, “C” and “D” for hard drives, and the remaining (E-Z), for any of the other drives of your computer including CD-ROM Drives, DVD Drives, and Zip Drives.

These identifiers can be bundled together to provide a **path**, or a location of a specific file on a system. The operating system, again, determines the format of this path. In general the path determines the specific maneuvering a user or program must take to find the file, working from the general to the specific. A path will start with some sort of identifier of a storage device, then give a directory or

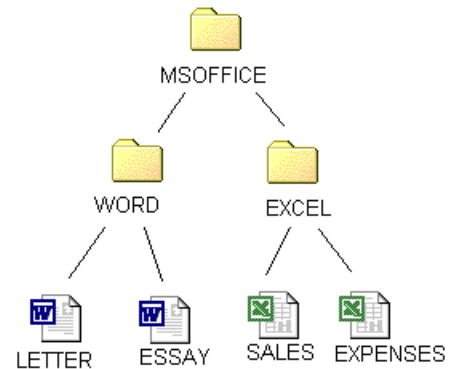
folder structure to traverse, and then the specific name of the file to find.

For instance, a file named "SALES.xls" in the "EXCEL" directory of the "MSOFFICE" directory on the hard drive "C" might be referred to as:

"c:\MSOFFICE\EXCEL\SALES.xls" on a PC.

Similarly, a file named "4th quarter budget.xls" in the "work" folder of the "my documents" folder on the hard drive named "Josh's Hard Drive" might be referred to as:

"Josh's Hard Drive:MSOFFICE:EXCEL:4th SALES.xls" on an Apple Computer



### Commands

An operating system also has a basic set of abilities allowing the user to interact with the computer. This includes things such as moving files between storage devices, checking the available capacity of storage devices, setting up hardware in the system, and installing, locating, or starting programs. Some Operating Systems require the user to type in commands and some require the user to move the mouse and press mouse buttons to execute commands. Older computers tend to have a command interface, while more modern computers use a graphical interface.

"dir" is a command to show the contents of a folder

```

C:\>dir
Volume in drive C has no label.
Volume Serial Number is 007B-ECAD

Directory of C:\

02/20/2002  02:27a    <DIR>        America Online 6.0
02/02/2002  04:46p    <DIR>        ATI
12/08/2001  11:13a    0 AUTOEXEC.BAT
12/03/2001  10:32p    <DIR>        Documents and Settings
02/08/2002  04:46p    <DIR>        jdk1.3
02/10/2002  06:52p    <DIR>        Kpcms
01/19/2002  07:21p    <DIR>        My Music
01/20/2002  02:30p    <DIR>        Palm
02/01/2002  09:30p    3,797 PCcheck.LOG
02/08/2002  04:46p    <DIR>        Program Files
02/06/2002  09:52p    600 PUTTY.RND
02/08/2002  04:39p    <DIR>        temp
02/01/2002  09:09p    <DIR>        TUWonder\WDMDrivers
02/01/2002  09:28p    932,496 w2k-766-04-020129x-2545e.exe
02/10/2002  06:53p    <DIR>        WINNT
           4 File(s)      936,893 bytes
          11 Dir(s)  1,051,459,584 bytes free

C:\>
  
```

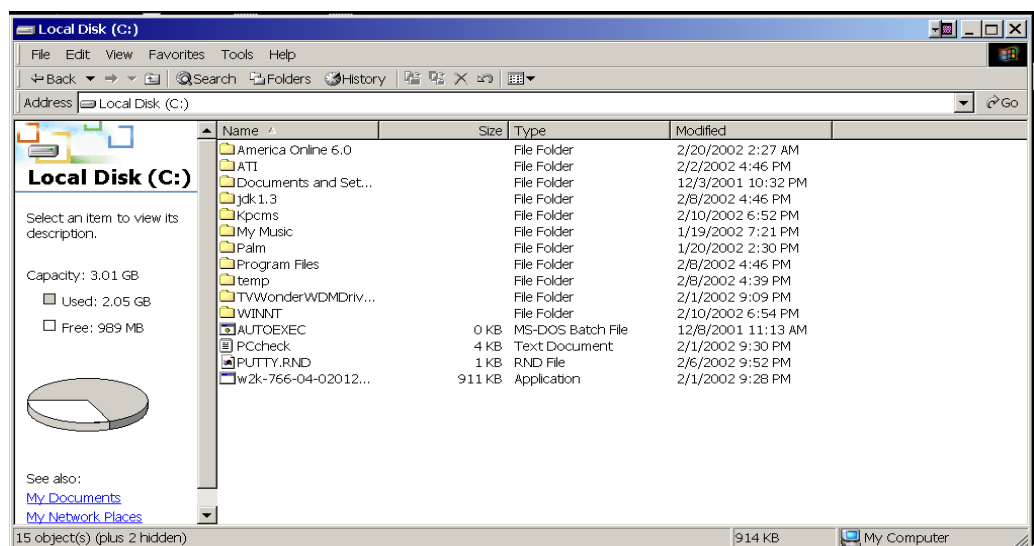
The Contents of C:

Here is where the next command will be entered

## Graphical User Interface

Perhaps the most important part of a graphical user interface (or **GUI**, pronounced “gooey”) is how it helps software interact with the user. How a user talks to a computer and how a computer talks back to the user is very important! In the past, people could only communicate with the computer by typing in commands. For instance, if you wanted to run a program, you would type in the name of the program using the keyboard. Or if someone wanted to open a directory, they would have to type in the command to open a directory, then add the directory’s name. The only way the computer could talk back to the user was by typing words back on the screen. By arranging words and making sentences, the computer could list all of the files of a directory, or tell you the status of a program. That interface would be considered a *command prompt interface*, where everything you do is driven by commands from the keyboard. Today, not only can we type in commands, but we can use the mouse to give commands as well. By double clicking with a mouse button on a folder, we can open that folder. By dragging and dropping files with a mouse, we can copy and move things. The computer can also “talk back” much more clearly. The computer can use pictures and text to display information, or show icons to represent files. By using graphics, it is much easier to understand what the computer is doing. This interface is called a **graphical user interface**. One common mechanism, which all modern GUIs offer, is a windowing system for programs.

A windowing system is a common method that allows programs to interact with the user. Each program gets a window from the operating system, allowing the program to display it’s information in that window and then create other windows as necessary to interact with the user. These windows can be stacked on top of one another, overlapping so the user can see different parts of different windows at the same time. As well, these windows need only be as large as the program requires, so you can see the status of the CD player on the screen at the same time as you are looking at a graphic image in your graphics viewer; neither program needs the full size of the screen, so they can both share the screen and you (the user!) can see both programs at the same time. Here is the same view of the computer but through a graphical interface:



A GUI can help other software by providing the above functionality very easily, allowing the software crafter to add extra functionality to the program without having to worry about the simple things like how to handle the windowing system.

### **Application Software**

Applications are the pieces of software that perform tasks for the user besides helping the computer operate (remember, that is the task of System Software). Applications range from games, calculators, and word processors (document creation programs), to programs that let you 'paint' on screen. Applications represent real world tasks. Application Software can be easily divided by looking at exactly what function they serve. Listed below are some common types of software which you might encounter while using a computer.

#### ***Editors***

Editors are programs which allow the user to edit and change information in a file. Word Processors (such as Microsoft Word and WordPerfect) are a sub-type of Editors which also allow for very sophisticated graphical descriptions of written information. A simple editor, therefore, will allow for the storage of generic text, whereas a word processor will also allow for changes in margins, fonts and color.

#### **Examples:**

Notepad, SimpleText, Write, Word, WordPerfect, Emacs

#### ***Spreadsheets***

Spreadsheets allow a user to perform manipulation of tabular data or data which is easily or commonly arranged in a table. Spreadsheets are also strongly associated with financial applications, because financial data and analysis is often managed in a tabular style, with columns of monetary figures being manipulated and then influencing other data computations.

#### **Examples:**

Excel, Lotus 1-2-3, Oleo

#### ***Databases***

Databases are programs which allow for very complex storage and retrieval of information. For instance, information about all the people affiliated with a university could be stored in a database, and then information could be retrieved from the database with specific criteria, such as a listing of only students in the university, only employees working for the university, or all people under a certain age associated with the university.

#### **Examples:**

Access, FoxPro, FileMaker Pro, Oracle

#### ***Communications***

As computers become increasingly connected to each other, communications software has become a very important part of the computer. Communications software might allow you to use communications devices such as a modem to dial

and connect to a remote computer, or send e-mail messages, or “chat” over the network. Of course one communications software which cannot go unmentioned in today’s world is the Internet “browser,” which lets you access information on the World-Wide Web from your computer, displayed as web pages on your monitor.

**Examples:**

Dial-up Networking, Netscape Navigator, Internet Explorer, Eudora

**Custom Software**

Custom software is usually designed to be used for a short amount of time for a very specific purpose, often to do something that would be too hard or too expensive to do by conventional, existing means. Usually, these types of programs are based on other programs, such as a custom program to access an old database that new software doesn’t support.

**Summary**

The combination of hardware and many different types of software allow a computer to become a very powerful tool. Since the way a computer is used is dictated by the software and limited by the hardware (and not the other way around), a computer can be used for almost any information-processing task. Software can make use of existing hardware and simply manipulate it in a different way to add a whole new level of functionality to a computer.

**Internet Basics**

Within the span of a single decade, the Internet has become a huge force in our lives. Even if you have never been “online” you have probably been exposed to some facet of this rapidly expanding medium. From “.com” this to “.edu” that, it is hard to ignore! Information about nearly every interest imaginable is either already online or is on its way to becoming a part of this immense domain of information.

Although you may already be familiar with its popular designation as the “information superhighway,” the Internet is actually a collection of computers, connected through a variety of means, to share information across vast distances. More technically, the Internet’s infrastructure is composed of a series of high-speed networks connected through specialized wiring, as well as millions of desktop computers connected through telephone, cable lines, and even wireless transmission.

**Some History**

While it may seem like the Internet is a relatively new invention, it has actually existed since at least 1969. Its beginning was as a military project called ARPANET,

which sought to provide reliable and secure communications in the event of nuclear war. In the 1970s and '80s, it expanded into an electronic forum for researchers and scientists to share their ideas and interests with far-away colleagues. Since the late 1980s, it has gathered momentum due in large part to the support of universities and private companies. The result has been our ability to instantaneously access information on a diversity of interests, ranging from electronic literary magazines to newsgroups devoted to mountain biking to e-mail that fills your inbox with the latest stock tips.

### **Trends and Prospects**

Because of the drastic reduction in cost of high-speed network hardware in the early 1990s, it is now more affordable for individuals and businesses to access this global network. Built from what was once a forum devoted solely to sharing military data and academic research, users can now choose from a variety of services and information online, such as electronic libraries, electronic law firms, government agencies, shops and stores, banks, travel guides, universities, local public schools, online business software applications, entertainment sites, digital music files, and on and on. As hardware improves and costs continue to drop, the number of users of the Internet will soon be numbered in the hundreds of millions.

Just as the number of users grows exponentially, so does the amount of information available. Not only does this present challenges for those attempting to find the information they want, but it also increases the problems of access for those who do not have access—the so-called “digital divide.” And there are problems with being able to find and use the content available on the Internet. We will discuss this later on in our section on searching.

### **E-mail**



#### ***In General***

Electronic mail has dramatically changed personal and business communications in the past few years. It seems that most everyone who has a computer has at least one e-mail account, if not three or four. Since the early days of e-mail popularity, all UC Berkeley students, faculty, and staff have been eligible for a free UCLink e-mail account. As the Internet has grown in popularity, many free commercial e-mail services have appeared. There are also many e-mail accounts that require a fee.

So what is e-mail anyway? It is simply a way to send messages from one person to another through a computer network. The messages may take the form of text only, or may include attachments of varying file types. Some e-mail software even allows you to create and utilize links to the World Wide Web or view images within the text of your message. One of e-mail's most convenient attributes is its ability to send the same message to a large number of people at the same time.

While e-mail is somewhat like traditional postal mail, there are several differences between the two. For instance, while a letter sent by traditional postal mail might take three days to travel across the United States, that same letter sent via e-mail would make the same journey in a matter of a seconds.

***A few benefits of e-mail***

- e-mail delivers in minutes whereas postal mail can take days
- e-mail provides filing systems and backup capabilities
- e-mail gives the option of attaching files such as word processing documents and images

***A few cautions***

- e-mail may seem impersonal compared to a handwritten note
- e-mail can be easily deleted and therefore should be archived if important
- e-mail in the workplace raises privacy concerns that written material in envelopes does not
- your e-mail messages can easily be forwarded by recipients to other unintended parties without your knowledge or consent

There are several types of e-mail accounts. Internet service providers, such as America Online or Juno, furnish e-mail accounts for their customers as part of their overall service. Most large companies establish e-mail accounts for their employees on the company's server for work-related communications. Nearly every university provides a general e-mail account and Internet access to students, faculty, and staff at no charge, as well as more full-featured accounts for a fee. Among the most popular accounts are the free Web-based variety that include Yahoo or Hotmail.

All e-mail account names are similar in appearance. The first part of an e-mail address is the user or login name. These are the characters before the "@" symbol. A login name can be virtually anything chosen by the user, and it does not necessarily have to relate to the user's real name. The second part of an e-mail address is what comes after the "@" symbol. This is usually the name of the server on which the account resides, along with the domain suffix which denotes the type of account.

Typically, an account from a private company will look something like this:

msjanedoe@yahoo.com

By contrast, a university e-mail account looks something like this:

jfkennedy@uclink.berkeley.edu

***Some examples of domain suffixes:***

- .edu – educational institutions
- .com – commercial entities & businesses
- .org – organizations
- .gov – government
- .mil – military
- .net – network-related groups

- .tv – open to the public
- .biz – used for businesses

**Country codes:**

- .ca – Canada
- .jp – Japan
- .uk – United Kingdom
- .de – Germany
- .us – United States (rarely used)

There is currently much discussion about revising the entire system of domain suffixes, including how domain names are requested and assigned, as well as expanding the types of domain names. The Internet Corporation for Assigned Names and Numbers (ICANN) has more information about this at the website, [www.icann.org](http://www.icann.org) if you are interested.

***E-mail at Cal***

Because the University of California is so large, the requirements for overseeing thousands of different accounts would be too demanding for one central server. For this reason, the University has created many different servers to support e-mail as well as academic and administrative needs. These range from departmental servers such as *nature* and *physics* to the more specific and powerful accounts located on the *socrates* server and the general purpose *uclink* accounts. Some of these accounts provide UNIX shell access, while others are POP (Post Office Protocol) accounts that require an e-mail client like Eudora or MS Outlook to read messages.

***Sending and Reading E-mail***

There are a number of applications (or e-mail clients) available that allow you to send, receive, and read your e-mail. One popular application is Eudora. CAL PACT offers a separate course on Eudora due to its widespread use on the Berkeley campus. Other examples of similar programs are Microsoft Outlook and Netscape Messenger. If you have UNIX shell access to your email account, you can use Telnet (or a similar application) to connect to your account and then use the Pine or Elm programs to send and receive e-mail. These are considered older methods given the proliferation of e-mail applications that utilize a graphic user interface (like Eudora or Outlook); however, they are still in wide use.

**Navigating the World Wide Web**

The World Wide Web (WWW or simply “the Web”) can be described best as an extremely large domain of ever-expanding information which grew out of the larger Internet. Today it comprises most of the Internet. It is based on *hypertext technology*, which allows specialized text to take the user to other locations on the Web. Web pages are written in a hypertext language known as HTML (HyperText Markup Language). Authors of web pages use HTML to create links to other parts of the Internet. These places on the Web can contain text, images, sound files, movies,

and many other kinds of data or media. The real power of the Web stems from its use of HTML to take a user to any piece of information almost instantaneously.

Because of its size and rapid growth, Web browsers exist to navigate through this domain of information, allowing access to virtually countless numbers of files on computers around the globe.

Browsers are software applications that present information resources on the Internet in a format capable of displaying text, images, movies, sound, and other files by reading HTML and other types of code. There are two main browsers in use today: Netscape Navigator and Microsoft Internet Explorer. (NCSA Mosaic was one of the first popular browsers used during the “early days” of the Web.)

At its most basic, a browser reads a file written in HTML from a server and converts it into the text, images, and other multimedia that appear on your screen. Then by the use of your mouse, you can navigate around by means of the links produced by the web page’s author, or the buttons and menus that are part of the browser itself.

### What is HTML?

HTML is the language used to create web pages. It offers a variety of features to make web content come alive on the computer screen. CAL PACT offers courses on HTML as part of our Web Design series. You can find more information on the CAL PACT website at <http://calpact.berkeley.edu> or by asking one of our instructors.

### Some common terms

#### *hypertext*

**Hypertext** is the standard protocol (or ‘language’) that allows information to be transferred between networked computers. It is the basis for linking documents to one another, allowing for easy navigation of the Web using a browser. This is where hyperlinks (or just ‘links’) come into play.

#### *hyperlink*

A **hyperlink** is a unique feature of hypertext. It is simply a word, phrase, or object that takes a user directly to another page or a certain point on a page. A text link is usually indicated by another color text (often blue), and is underlined. (Users can set their browser preferences to change this default setup.) When the mouse pointer is moved over a hyperlink, it turns to a pointing finger. Each hyperlink has a unique destination associated with it. Clicking once on the link takes the user directly to the destination the author of the page has chosen.

#### *URLs*

Web browsers do not limit you to using hyperlinks or the direction buttons to navigate. You can also enter addresses that tell the browser to take you directly to a specific location on the World Wide Web. A web page’s address is known in technical terms as a **URL**, or *Universal Resource Locator*. A browser will display this location information in a field near the top of the window. In Netscape this field is

✓ *It's....*

HTML stands for  
HyperText Markup  
Language

called “Location” or “Netsite” and in Internet Explorer it is called “Address.”

In today’s Web-conscious world, it’s important to understand the anatomy of a URL. Below is a breakdown of UC Berkeley’s main page URL.

http://	www.	berkeley.	edu
( <i>scheme</i> )	( <i>World Wide Web</i> )	( <i>domain name</i> )	( <i>domain suffix</i> )

Some other examples of URLs:

```
http://www.cnet.com
https://secure.bank.com
ftp://software.berkeley.edu
file:///desktop/internetclass.html
```

You must enter a URL correctly for a browser to locate the page! If a page is not loading properly, this is the first thing to check. In Postal mail if the address of a letter is slightly off, there is a good chance it would get to the person eventually. With the Internet, any mistake in the address will lead you to somewhere else completely. You can’t be off by even one letter!

In addition to entering the URL in the Location or Address field, you can also select **File|Open Page** from the menu bar at the top of the screen in Netscape, or **File|Open...** in Internet Explorer.

Web addresses are becoming more and more commonplace. Most companies, organizations, universities, and other institutions have websites. A growing number of private individuals are creating their own websites designed around their interests.

### ***http***

You may have noticed how most web addresses (or URLs) begin with “http://”. This is short for hypertext transfer protocol. This part of a URL is known as the scheme.

### ***Download***

**Downloading** copies a file from the Internet and places that copy on a user’s computer. Larger files like songs and videos take longer to download than smaller files like text.

### ***Upload***

When you send files from your computer to a specific destination on the Internet, it is called **uploading**. This includes transferring files to specific web addresses, or to specific individuals.

## **Navigating with a Web Browser**

A browser gives a user control and flexibility in deciding what information to view. Below are a few of the basic navigation functions in the Netscape Navigator and Internet Explorer browsers:

- **Forward** moves ahead to the sites already visited
- **Back** moves to previously visited pages
- **Stop** cancels any of the commands (such as loading a page)
- **Reload/Refresh** updates the page a user is currently visiting. This feature is especially useful when the connection to another page was not successful
- **Home** will automatically take a user to a predefined page, selected in the browser's preferences. This is helpful to allow for quick access to your favorite page.
- **Search** will take a user to the browser's default collection of search engines
- **Print** will print the current page being viewed. Both text and images will be printed
- **Security** will open a new browser window displaying the security information for the web page being viewed. (Netscape only)

### ***Bookmarks/Favorites***

Browsers allow you to bookmark pages for future reference. This is a useful shortcut function taken from the concept of a physical marker placed between the pages of a book. In either case, the marker provides easy reference to the desired page without having to search through many other pages to find it. Netscape calls these "Bookmarks" while Internet Explorer refers to them as "Favorites."

If you want to add your own bookmarks, it is very simple. In the Netscape browser, simply go to the desired web page and either double click on the bookmark icon to the left of the Location/Address field, or click on the "Bookmarks" button and select the "Add Bookmark" option from the pull-down menu. The location information for that page is then stored in the bookmarks file of the browser. You are then free to move on to other sites and add more bookmarks as desired. To go to a bookmarked location, just click on the "Bookmarks" button, pull down to the desired bookmark on the menu, and release the mouse button. This process is very similar in Internet Explorer.

### ***Plug-ins for your browser***

Browser plug-ins are small programs that enhance your browser's functionality. Examples are RealPlayer, QuickTime, Flash, and Shockwave. There are a wide variety of plug-ins that you can easily download and install. If you come across content on the web that requires a plug-in that you do not have, go to the appropriate website to download it. Well-designed sites that require plug-ins to

view certain content will give you a link to a download site. (If a site doesn't give this download information, use a search engine to look for the plug-in using its name as the search term).

### ***Security on the Web***

During your journeys on the Web, it is inevitable that a site will ask you for personal information. For instance, you may need to send your personal information over the Internet to purchase something. To simply send sensitive personal information such as a credit card number or Social Security number is **NOT** a good idea. This information is out in the open during its journey over the Internet. Doing this is the equivalent of shouting your credit card information to a waiter across a crowded restaurant. Chances are that no one will write it down or use it, but it is not a chance you want to take.

Fortunately, most sites that deal with sensitive information have support for the "https" scheme or Hypertext Transfer Protocol–Secure. This is a scheme that provides transmission security for the World Wide Web by means of encrypting data for transit. If an address starts with **https://**, then it is an indication that information transfers by means of that page are secure. When connected to a site that is secure, notice that a locked padlock appears in the left (Netscape) or right (Internet Explorer) bottom corner of the window. Normally the padlock either appears unlocked (Netscape) or does not show up at all (Internet Explorer). As an extra precaution, a warning screen will appear whenever user-typed information will be transmitted.

It is a good idea to keep your web browser and email client updated so that the security features are up-to-date with modern technology.

## **Searching the Internet**

### ***Search Engines***

Anyone who has spent time on the World Wide Web knows that you can't always find what you want on your own. This challenge is heightened by the ever-increasing amount of content on the Web. That is why search engines were developed. These search engines enable you to locate information on the Web according to subject, author, dates, titles, or a variety of keywords. Each search engine uses its own methods, and thus delivers differing results. If you don't find what you want using one, there are many others from which to choose. While all use a similar interface, each provides varying features.

### ***A sampling of search engines***

Ask Jeeves	<a href="http://www.ask.com">www.ask.com</a>
Excite	<a href="http://www.excite.com">www.excite.com</a>
Google	<a href="http://www.google.com">www.google.com</a>
Lycos	<a href="http://www.lycos.com">www.lycos.com</a>
Yahoo!	<a href="http://www.yahoo.com">www.yahoo.com</a>

Each search engine has their own design, however most are quite similar. Each search engine typically has a field where you can type in the keywords of what you are searching for, and then click the “search” or “go” button to see what the search engine finds. The more specific you are with your search criteria the better results you will receive. In general, the first ‘hits’ (or sites) that come up are generally more closely related to your search criteria than the last ‘hits’ in your search.

### ***Using a search engine***

As alluded to earlier, not all search engines are created equal. Some are very general, some more specialized. The trick is to find the search engine that fits your needs. Don’t be tied to one particular engine. Exploring the features of each will help you know which ones are best for which tasks.

## **Additional Search Engine Information**

### ***Not getting what you want?***

Sometimes your search results will not be what you were looking for. But fear not! There are many search engines to choose from, and nearly all of them have features that can help you refine your search. On the main page of each engine, there is usually a link titled “Help,” “Tips,” or “Options.” These links will explain the specifics of that engine.

## **General Search Tips**

1. Narrow your search terms as much as possible
2. Use Boolean separators, like AND, OR, +, and –
3. Try several search engines, since each gives different results
4. Use the “advanced” search options (if available) to have greater control over how your search is performed
5. Remember that search results from most search engines will not necessarily be a comprehensive listing of all content related to your search terms. Many companies pay to have their sites appear first in the results in some search engines.
6. Ask other people for sites they have found useful related to your subject, before you begin your search on the Web.
7. Be patient and creative as you perform your searches.

## **Enjoy the Internet!**

As a final word, don’t be intimidated or become frustrated with using the computer or Internet. As with any technology, every person learns and adapts in different ways. Just be sure to pass on to others what you discover and the favor will be returned to you. In short-relax, have fun and take advantage of what this incredible global information network has to offer!