7.1 Using The Internet

There are millions of computers interconnected via the Internet. Computers fall into two groups as seen in this diagram:

- Those that provide the service (servers)
- Those that make use of the services (users or clients)

Each server represents one type of E-mail Web (http) Servers service that can be accessed once you are connected to the Internet. Each client essentially represents one user with access to the Internet who can then use services provided by the servers.

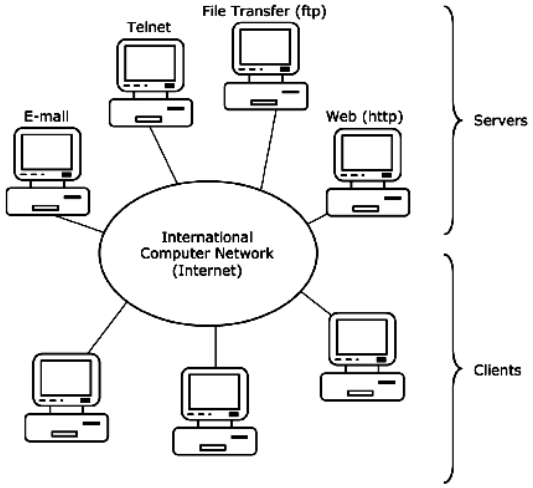


Figure (1) An Internet Network.

7.2 Understanding the World Wide Web

- A Web server hosts or stores a company's or a person's Web site.
- A Web site is a collection of pages containing information about a company, person, or product/service. For a Web server to communicate with other computers, it must use hypertext transfer protocol (HTTP).
- A Web server typically hosts many Web sites. The collection of all Web sites hosted by all Web servers connected to the Internet is known as the World Wide Web, often referred to as "The Web".
- "Hypertext" refers to the technique of accessing the Web pages using hyperlinks that link to other Web pages on the same or another Web site to find other text, pictures, media, etc.
- While Web pages display colour, graphics and photographs, these pages are stored on a Web server and have no formatting. It is the Web browser that formats the page using instructions written in a language called Hypertext Markup Language (HTML).

7.3 Recognizing Web Page Elements

A typical Web page will contain some standard elements, as shown in the following:

Figure (2) Internet Web Page Elements.

URL: The Uniform Resource Locator; identifies a Web page or other resource on the Web.

Picture: Graphics or photographs that may be set up as static (always show in this location), may animate, or hyperlink to other Web pages, Web sites, or another action such as run a video.

Field: An area on a Web page where you can enter information which is then sent to the Web server for processing. The most common one is a search field.

Button: An interactive graphic that performs an action when clicked.

Advertisement: Companies pay for the privilege of advertising on a popular Web page (i.e., gets many "hits") which then hyperlinks you to the advertising company's Web page.

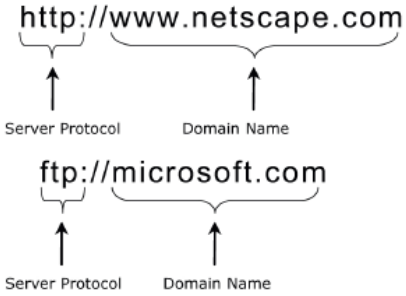
Status Bar: Shows what the Web browser is doing or which Web page or site displays if you click this hyperlink.

Hyperlink: Text or a graphic with a URL associated with it that displays when you point the mouse pointer over it. If you click the link, the Web browser software then tries to connect to the server corresponding to this URL and retrieve the information or Web page.

Pictures are not part of a Web page but stored separately on the Web server. The Web page only contains placeholders where the pictures should appear on the Web page. Pictures take longer to arrive from the server and are placed on the page after it has been formatted.

7.4 Using the Uniform Resource Locator (URL)

There are many computers connected to the Internet, and a computer can communicate with any other computer provided that 1) you know the address of the other computer, and 2) both computers speak the same protocol (language). The Uniform Resource Locator (URL) consists of these two parts. For example, if you want to view the Netscape Web site and Microsoft's file transfer server, the URL would be:



Use a Web browser program to communicate with any server connected to the Internet using the protocol portion of the URL. In the examples above, the first was Web server, and the second ftp server. Occasionally you may be able to navigate to a Web site without typing the "www" in the Web address (e.g., www.ccilearning.com); however, to go to a specific type of server, it is crucial that you enter the protocol at that time.

7.5 Identifying Other Elements

Other elements that may be involved when you are on different Web sites on the Internet include cookies, plug-ins, downloads, or security concerns.

Encryption: Encryption or protection software is built into Web sites to protect you and their database once you submit your purchase order against someone being able to obtain any personal information or financial transaction information submitted with the order.

Cookies:

- A *cookie* is a piece of text stored on your hard drive so a Web site can retrieve information about which sites you visited and what information interests you, consisting of:

  - An identifier or name you set up to get information from the site, or a generic id value assigned by the Web site
  - The Web site address
- When you set up a login id to register on a Web site, you also must enter a password that is then encrypted so other companies or people cannot see what the password is and try to log into that Web site as you.
- Cookies usually gather statistics on who is really visiting the Web site as a first time visitor, a return visitor, or someone who got there by mistake.
- It could also be used for e-commerce or shopping online to identify that you are a valid shopper.
- Some Web sites set up cookies to help customize the site to your preferences.

Cookies do not give out any information about your system other than what is in the folder containing the cookies. The biggest concern comes from the fact that spammers or companies who use programs to gather information for marketing purposes can gain access to these database lists leading to a large amount of junk or spam mail that you don't want.

FTP: If you go to a site to download information, the company generally requires you to register before you have access to any files. This includes any FTP (File Transfer Protocol) sites you may visit where a large amount of files can be uploaded (copied to the FTP server) or downloaded (copied from the FTP server).

Plug-in Programs: A plug-in is a program that can be downloaded to your system and then installed before you can view the item on the Web site such as the Adobe Acrobat Reader plug-in you need to view any PDF files.

Web Cache: This refers to another way to increase the speed of your bandwidth to the Internet. Some ISPs offer a Web caching service that will speed up the connection from your computer to other computers on the Internet as well as manage the traffic flow of requests for information at a reasonable cost.

Pop-ups: These ads can appear on your screen as a separate window from the Web browser, or appear similar to a window on the actual Web page. These are advertisements by companies who have paid to have them appear whenever anyone accesses the Web site, or in some cases, they may appear while using an application program that was previously downloaded from the Internet and then installed on your system.

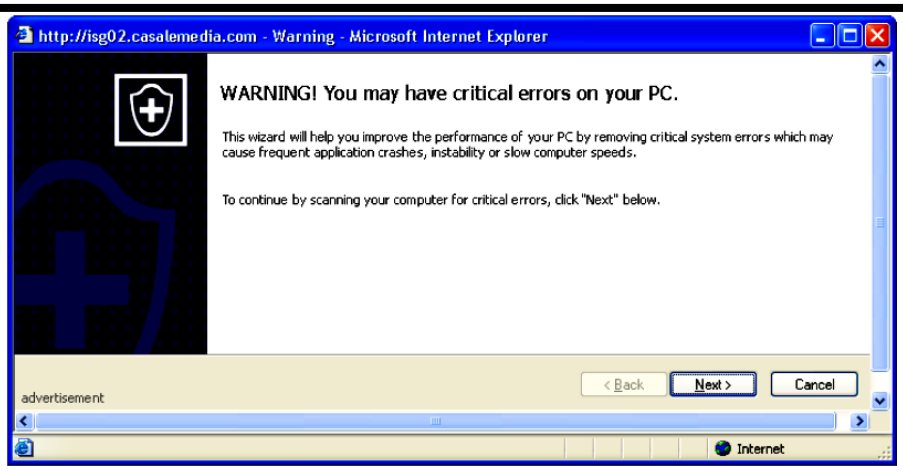


Figure (3) Pop-ups warning Message.

Pop-ups are not dangerous to your system as much as they are annoying. The more places you visit on the Internet, the more likely you are to begin seeing more pop-up ads on your screen. Companies sell programs to help eliminate pop-ups, or you can use the option in Internet Explorer to block or temporarily enable/disable pop-up windows.

7.6 Understanding Viruses

There is only one way a virus can infect your computer-you let it in! All viruses come into your computer on disks or files you put onto your computer, from e-mail attachments, or downloaded from a network or the Internet. While there are literally thousands of viruses that can affect PC systems, it does not matter how many or what kind of computer you have; a virus can cause just as much damage to any system that contains data. A virus is a computer program that is able to move from computer to computer by attaching itself to other program files. In most cases, these viruses are not harmful to the computer directly; however, others can be very destructive and destroy the data on your computer.

Some of the more common viruses are sent via e-mail where the virus is included with the attachment. When the user tries to open that attachment, the virus file starts up and resends this same message to everyone who may be in the contact list or address book of your e-mail program. In other instances, it may store itself somewhere on the system and activate on certain events or actions, e.g., Friday the 13th, Valentine's Day, open a program, etc. New virus programs are being created every day. As such, it becomes very crucial to understand what a virus is, how it works, and what you need to protect yourself against a virus and how to get rid of one.

There are many virus hoaxes that begin with a notification from someone who heard it from someone else about how malicious a virus can be to systems and that anti-virus vendors or Microsoft did not catch this virus. These types of messages create the same

traffic flow problems as the e-mail type of virus when people begin sending the warning message to all their contacts. The only way to know for sure whether a virus is a hoax is to check with your network administrator or a Web site that lists different types of virus hoaxes such as:

http://securityresponse.symantec.com/avcenter/hoax.html

www.trendmicro.com/vinfo/hoaxes/hoax.asp

http://us.mcafee.com/virusInfo/default.asp

www.truthorfiction.com (this site also contains information about scam programs)

Looking at the Types of Viruses: Essentially there are four basic types of viruses that could attack your system:

1. Boot Sector: Infects your system when read from an infected floppy disk set up as a boot disk. The virus then writes to the master boot sector, the area the computer reads first before doing anything else, and is loaded into the computer's memory, and can possibly infect every file from there.

2. Program or File: Part of a file used to start a program or action (e.g., batch file).

3. Macro: Looks like a macro file that runs in a specific program using macro languages but attaches to the default settings for that program, which then infects every new or opened file in that program.

4. Multipartite: Similar to a boot or program virus except these generally infect both areas.

There are some other malicious viruses that exist, although they are not actually a virus as they do not fit into the above-mentioned types. Many of these can cause as much or more damage to a computer. The two most common types are:

5. Worms: Virus programs that duplicate or replicate themselves through some means such as an infection of a program file, or as with e-mail, will resend itself to anyone in the recipient's contact or address list from their e-mail program.

6. Trojan Horses: Viruses written to be "hidden" and appear harmless and activate on some action, e.g., on Friday the 13th the program blanks the screen and moves all files to a hidden area of the computer.

7.7 Performing a Data Backup

Data can be lost as a result of power problems, computer breakdown, theft or hacking. The difficulty is that you never know when it is going to happen. Therefore, you need a strategy to protect your data best suited to your situation. A backup is when you save your data elsewhere as well as in the regular folder or hard drive. You can then recover the data even if the computer is stolen, data corrupted or deleted, or other damage occurs.

All users should be required to log into the computer using a valid id and password. This helps reduce any damage that could occur if someone tries to enter the computer or network without proper authorization. Network administrators will also recommend that you change your password on a frequent basis to prevent others from using your password with your login id. If the computer is stolen, then the data is lost whether you save regularly or not. That is where backup procedures can come in handy.

Every organization has a backup strategy. Some key factors to consider include:

- The data is backed up on removable media like magnetic tape or CD.
- The more critical the data, the more often the backups should occur. Most network servers are backed up at least once daily.
- The removable backup media should be stored in another physical location so that in case you have a fire in the building and computer systems are destroyed, your data backups are not destroyed at the same time.
- If users store some data files on their local drive, encourage them to make a copy on the server for a daily backup, or create backups of their own.

It is only the user-generated data that needs to be backed up as these often contain historical information you will not be able to replicate easily. Any down time you experience as a result of data loss can cost you and the company a lot of work, expense, and time delays. Many large companies build in backups as part of the disaster and recovery plans.

7.8 The Electronic Mail

Electronic mail (e-mail) follows the same process as for postal mail (commonly called snail mail). Advantages of using e-mail include:

Speed: Send or receive messages to one or multiple people, thereby reducing the time spent on the telephone trying to contact others.

Paper Trail: Print the message as a record of the communication. E-mail programs also enable you to create folders for storing messages.

Sharing Information: Every e-mail program enables file attachment to a message, as required. There may be some limitations to the size of the attachment that can be sent.

Easy Access: Send or receive messages from on-site or remote locations.

Collaborating with Others: Set up a message: either to go to one recipient with a copy to other people at the same time, or forward a message to someone else for further action.

Cost Savings: Relatively low compared to long distance calls, shipping costs, or physical visits.

While e-mail is the most popular means of communicating from one computer to another, there are other ways of communicating using a variety of devices such as pagers, text messaging services, or instant messaging.

Instant messaging (IM) is similar to having a conversation with one or more people. Popular IM programs such as MSN, Yahoo, or America Online can be used on computers, handheld devices and cellular phones that display graphics. As such, real time conversations can occur between users.

Text messaging usually refers to the process of sending a message but only text is shown at the receiver's end. This can be on a computer, pager or a cell phone with text messaging capabilities, and the message is limited to one person at a time, either entering the text or receiving the message.

7.9 Internal Mail

Internal mail refers to the process of sending or receiving mail by users connected to a local area network (LAN). The diagram shown illustrates the principles of e-mail on a LAN.

Each user on the network is allocated a "mailbox". When user A sends an e-mail to user C, the message is placed in user C's mailbox on the server. When user C wants to see the e-mail, he/she has to "fetch" the mail waiting in the mailbox. If user C is not there at the time user A sent the message, it is placed in the mailbox on the server for user C.

The e-mail address used is related to the user login id and travels within the LAN, using the e-mail program usually managed by the network software program.

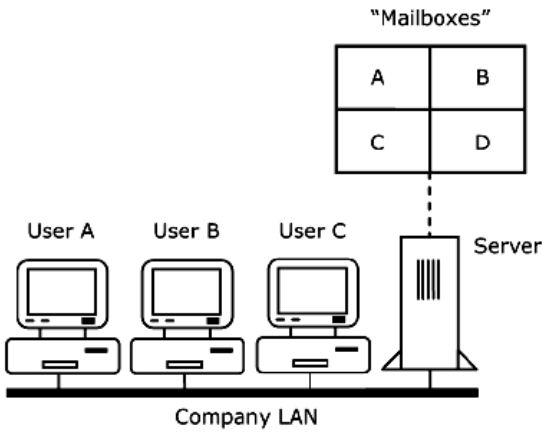


Figure (4) An Internet Mail.

7.10 Internet E-mail

Internet e-mail is often referred to as external mail as it comes from "outside" your computer. The process for e-mail from the Internet is similar to internal e-mail, except that e-mail comes from the Internet. The diagram here illustrates the concepts (for simplicity purposes, we use individual users):

Each e-mail user must have a unique e-mail address with an ISP who allocates a mailbox on the mail server for that user, usually identified by the user's name.

The e-mail server itself has a unique address on the Internet, referred to as the domain name. In this example, John has an e-mail account with an ISP called "ispy" and the domain name of the mail server is ispy.com. The full address of John's mailbox is then: john@ispy.com, pronounced as "john at ispy dot com".

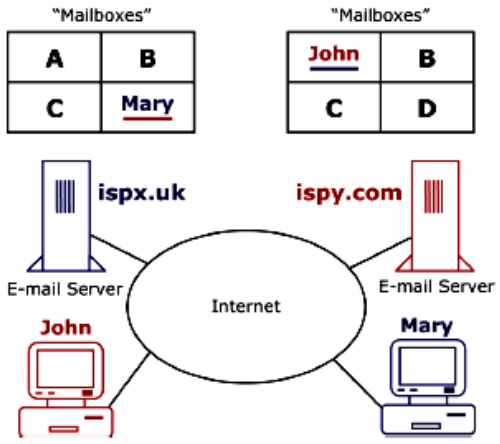


Figure (5) Internet E-mail.

Similarly, when John sends an e-mail message to Mary, he addresses the message to mary@ispx.uk. The message is routed through the Internet to the e-mail server with the domain name, ispx.uk. The server then puts the message in Mary's

mailbox on the server. The protocol used when one sends an e-mail to an e-mail server is simple message transfer protocol (SMTP).

If Mary wants to see if she has received an e-mail, she requests her e-mail server to send any mail in her mailbox down to the e-mail program on her computer. The server does not send the mail to just anyone and will request that Mary first identify herself by giving her username and password. If these are valid, the server sends all the mail in Mary's mailbox to her e-mail program where it is placed in the Inbox folder. The protocol used to request and download e-mail from the mailbox is called post office protocol (POP).

7.11 Domain Name Format

All computers connected to the Internet have a unique number called the IP address or number, just as every telephone has a unique number. Most servers connected to the Internet also have registered a domain name. IP addresses and domain names can be used interchangeably but it is much easier to remember a domain name like hartford.edu than 207.230.244.190.

To use an e-mail address, you must be set up as a user on a domain. This could be the ISP or your company. A typical e-mail address is structured accordingly:

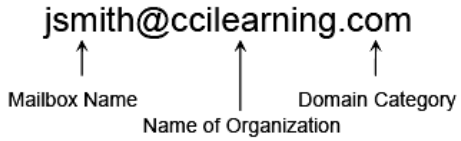


Figure (6) E-mail Domain Name Format.

Mailbox Name: Identifies a particular mailbox on the e-mail server. The name is based on company or ISP standards for e-mail addresses. Some domains let you create your own mailbox name with the only restriction that it must be unique.

Name of Organization: Identifies the organization that owns the server. It could be the full formal name of the organization, a shorter version of the company name or a unique combination of words if someone else has that name (e.g., contact@ccilearning.com versus contact@cci.com).

Domain Category: Identifies the server's information domain.

The Internet was originally established in the U.S. to facilitate research and development of military projects. A set of domain categories were defined to distinguish the different groups involved in these projects. These domains are usually called the "original top-level domains":

.mil	US military	.gov	US government
.com	commercial companies	.edu	universities
.org	organizations	.net	network sites

The jsmith@ccilearning.com address indicates that the address belongs to someone at a commercial company called CCI Learning whose last name is Smith and first name starts with a "J".

The original top-domain categories were adequate for the original purpose but became inadequate when the Internet became international. Top-level domains were expanded to include two letter country codes such as:

.au	Australia	.de	Germany
.ca	Canada	.uk	United Kingdom

Larger countries may expand their domain names to indicate the region within the country, e.g., pittmeadows.bc.ca is located in British Columbia, a province of Canada. Other countries use an expansion similar to the original domain names, e.g., amazon.co.uk is a commercial company in the U.K. and oxford.edu.uk is a university in the U.K.

Several new top-level domains have been proposed and may be available by the time this courseware goes to print. The following list gives a selection:

.aero	Air-transport industry
.biz	Businesses
.coop	Cooperatives
.ecom	electronic commerce
.info	Unrestricted use
.museum	Museums
.name	For registration by individuals
.new	news-related sites
.pro	Accountants, lawyers, and physicians

7.12 Internet Server Types

Organizations frequently own more than one type of server. A domain name convention for other server types is as follows:

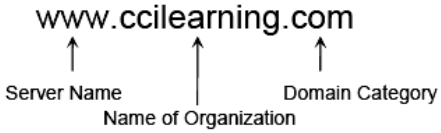


Figure (7) URL Internet Server Type.

The server name label identifies the server at the organization. Traditionally this label indicates the type of server (i.e., www for Web servers, ftp for ftp servers), but this is not mandatory. Many organizations have several servers such as www1.mit.edu, www2.mit.edu, and library.mit.edu for different Web servers at Massachusetts Institute of Technology.

If you get an e-mail from jsmith@betterbuilders.com that they also would have a Web server with the Web site address of www.betterbuilders.com where you can find out more information about jsmith's organization.

7.13 Looking at E-mail Components

Regardless of the e-mail program, the components of an e-mail message are the same as they are determined by the Internet e-mail protocols, which include:

- Addressing
- Subject Line
- Body
- Attachments

There are a number of e-mail programs currently available. For the purpose of this courseware, we will use Outlook Express. The concepts remain the same regardless of the e-mail program; what differs is where the commands and features are in each e-mail program.

1. Addressing: Identifies who will receive the e-mail.

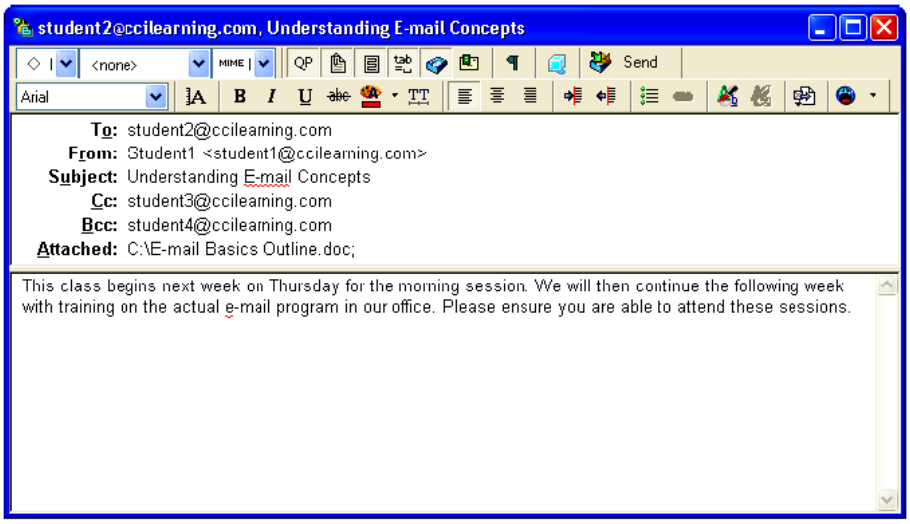


Figure (8) Example of E-mail Addressing.

To: The destination address, or who is getting the e-mail. You can send the e-mail to one or several recipients (separate names using a comma or semicolon).

Cc: The Carbon Copy address, or who gets a copy of this e-mail for information purposes only.

Bcc: Blind Carbon Copy to hide the fact that this recipient is receiving a copy (e.g., you send an e-mail confirming dinner reservations and Bcc the friend organizing the surprise party).

2. The Subject Line:

- Identifies the topic of the message, usually a short description of the content or purpose of the e-mail.
- Always try to put something in this line so people can scan through the list of received e-mails using the subject lines.
- E-mail without a subject line is usually considered to be spam or junk mail.

3. The Message Body:

- Where you type the message.
- Some e-mail programs provide formatting features that can be applied to the text for emphasis or enhancement.
- Include links to another e-mail address or a Web site as a quick reference, pictures that appear with the text, or attachments such as pictures, sounds, slide shows, spreadsheets, etc.

4. Attachments:

- Attach files to the message when you want others to have specific files.

- Much more convenient and faster than physically transporting the files to someone else.
- ISPs may restrict the size of attachments (between 5Mb and 25Mb) as these may slow the retrieval of mail, or cause traffic delays at the mail server for other messages.

7.14 Using E-mail Options

There are basically four options when sending an e-mail: create, reply, reply all, and forward. The option you use will depend on the purpose of the e-mail.

1. Creating New:

- Blank form displays for entering all the necessary message components and message body.
- Once address(es) and body of message entered, click the Send button.
- E-mail program uses SMTP protocol to send the message to the server managing the recipient's mailbox.

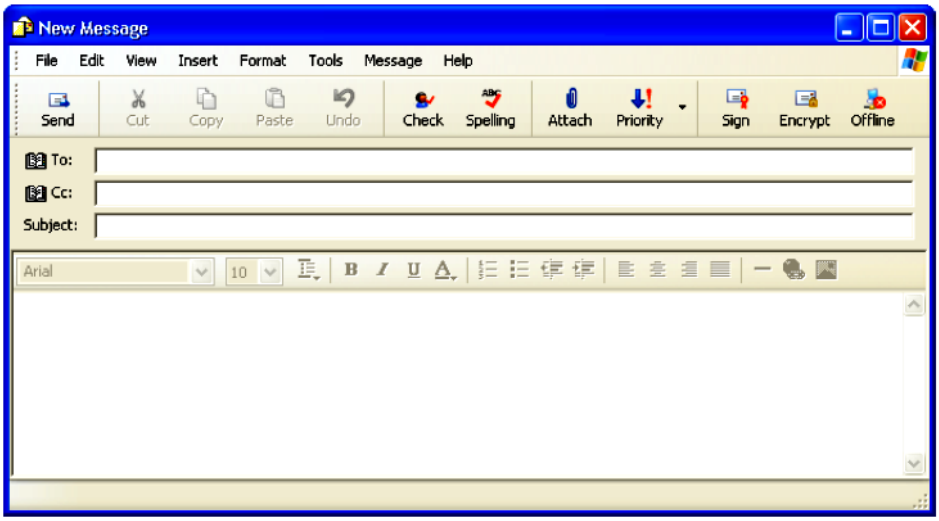


Figure (9) Using E-mail Options.

2. Reply Options:

- Reply
  - Replies just to the person who sent the message.
  - To field shows address of the person who sent you the message, and Subject line has Re: added to identify it is a reply to a previous message.
  - Original message is placed at the bottom of the message body for reference.

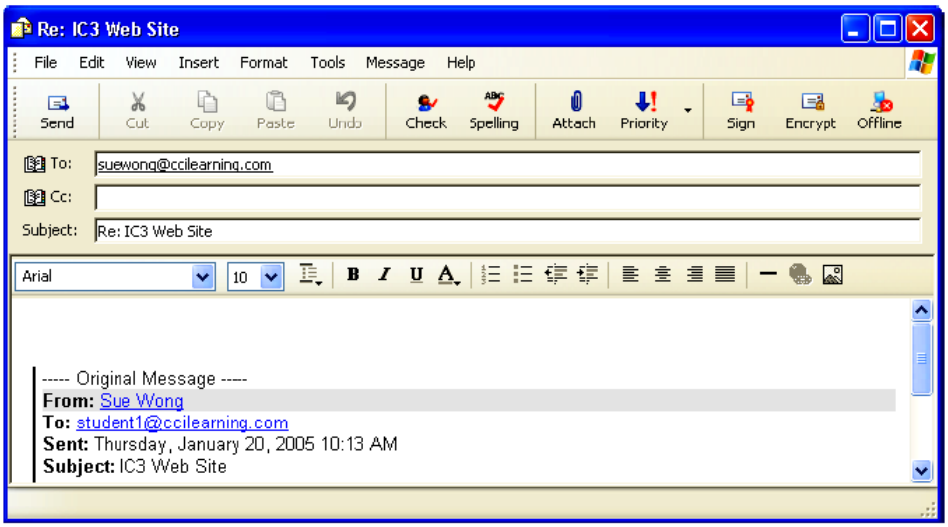


Figure (10) Example of Reply Option.

- Reply All
  - Sends reply to everyone listed on the original message.
- Forward
  - Sends message to a third person for further action.
  - Original message is appended at the bottom of the body and a Fw: is added in the Subject line.

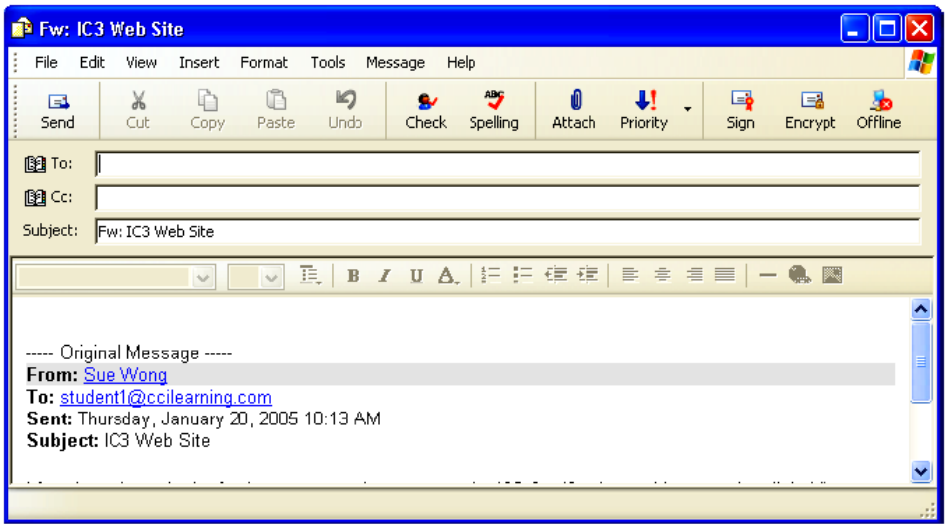


Figure (11) Example of Forward Option.

3. Receiving E-mail:

- When you request your e-mail from the mail server using the POP protocol, the e-mail program puts the mail in a folder, usually called the Inbox.

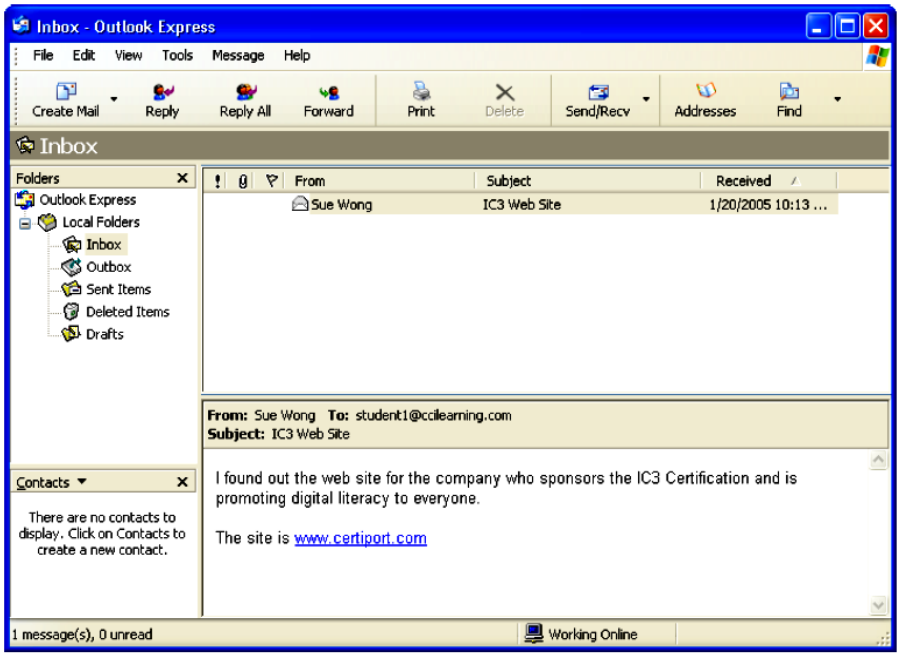


Figure (12) Receiving E-mail (Inbox).

- Some e-mail programs offer more than just managing messages and contacts. Microsoft Office Outlook enables you to send and receive e-mail, set up and organize a calendar, manage contacts, set up to-do (tasks) lists, or keep notes.

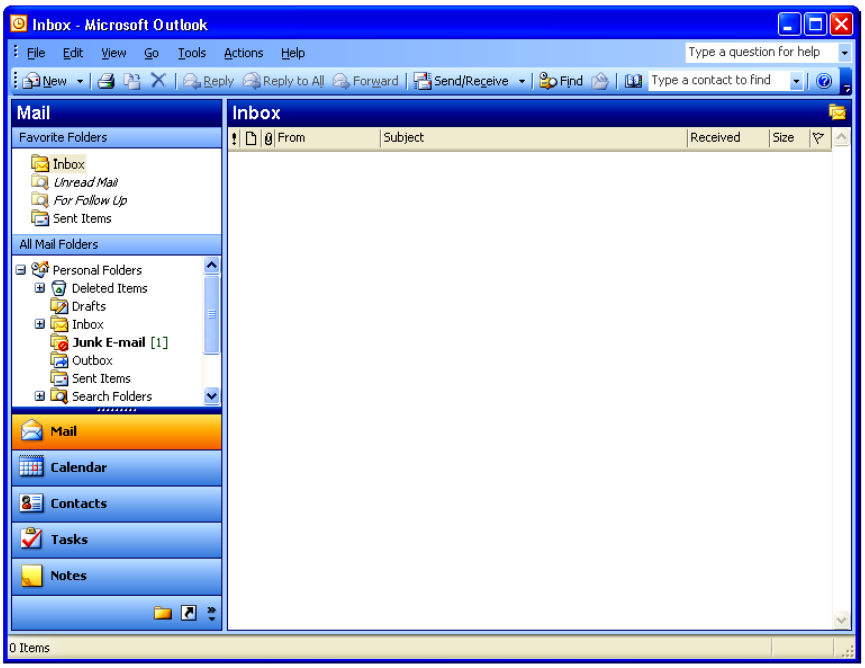


Figure (13) E-mail Managing.

- A Web-based e-mail program such as Hotmail or Yahoo appears similar to the following, where folders are similar to other e-mail programs. Use a Web e-mail program if you do not have a computer, no access to your e-mail program on this

computer, or to access e-mail viewed from any computer connected to the Internet, as in a library or Internet cafe. It can also be used for messages from solicited and unsolicited sources, or to separate business and personal e-mail.

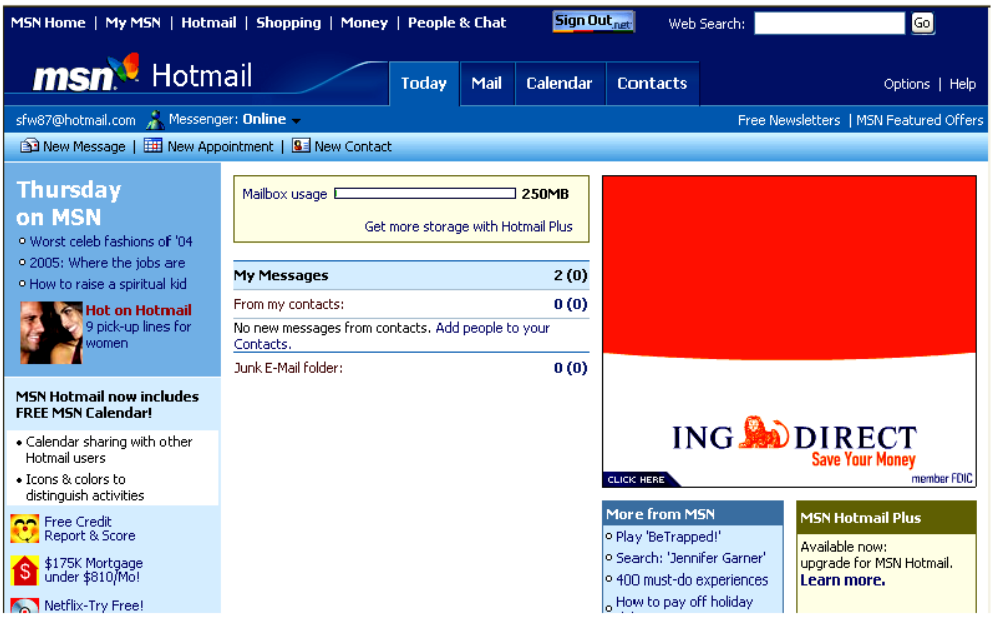


Figure (14) Web Based E-mail Program.

- PDAs or cellular phones require special software on the device prior to sending or receiving e-mail, or to view graphics along with text when the message is received.

4. Attaching Files:

- Attach electronic files to the message, shown usually as, on a separate line with the name of the attachment, or as an icon in the message text.
- Can save the attached document to use later or open it immediately.
- Can attach any kind of file: pictures, video clips, mp3 sound files, programs, games, etc., provided they do not exceed the size limit for attachments.