CPA's guide to the Internet

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Technology

1998 CPA's Guide to the Internet

John Graves, CPA
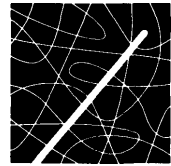Kim Hill Torrence

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Authors:

John Graves, CPA
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Chapter 1

Introduction to the Internet

Why Bother?

Time is short; expenses are high. Any busy professional knows the burden of buying and learning new technology–there never seems to be a good time to make the jump. So, your first question is likely to be: "Why should I bother to learn how to use the Internet?" It's a good question, and we'll try to answer it right here in the beginning.

Reason #1: Communications Costs

Most people venture into the online world because they want access to electronic mail (e-mail). Once they get online, they find a myriad of other valuable resources, but e-mail is the start of it all for most of us, and no wonder. Electronic mail is the fastest, least expensive, most versatile way to communicate with someone located in the next office tower or even halfway around the world. You may have seen e-mail addresses listed on business cards and letterheads recently. Almost all major firms, and many small and one-person businesses, now regularly use e-mail as a standard form of communication, just like the telephone, fax, and postal service mail.

E-mail sent on the Internet can reach its destination in seconds; it almost always arrives within an hour. This places e-mail at the top of the list of available communication methods, beating even a bicycle courier service in delivery time. Although faxing a document is very fast, this method has the problems of long distance phone charges, uncertain delivery, and less-than-optimal reproduction quality. You might be able to pick up the telephone and deliver a verbal message more quickly, but if your party is not available, or if the call is long distance, or if you must deliver a document instead of a verbal message, electronic mail is a better choice.

In addition to e-mail, the Internet offers a variety of methods for communicating information to potential clients, established clients, and colleagues. If the public can access your World Wide Web site at any hour of the day to obtain standardized information about your services, you and your office staff will be free to perform other tasks. Instead of using an expensive conferencing service to have a meeting among far-flung business associates, you can use Internet Relay Chat or Internet Phone to hook everyone together for a small hourly charge. You can provide research reports and professional recommendations to customers through an information repository such as an FTP or Gopher site on the Internet. The Internet makes most communication tasks easier, and less expensive, than the traditional methods you probably use now.

Reason #2: Information is Valuable

Take a moment to think of all the ways you get the information that's crucial to your professional expertise, and all the costs involved in getting it. Do you subscribe to a lengthy list of specialized publications? Do you pay an assistant for long hours spent performing research tasks? Do you attend certain

professional functions strictly to network with other accounting professionals? Do you travel to distant cities to receive training or professional updates? Do you pay high hourly online rates to search specialized commercial databases for company information, news, and legislative information?

Having access to the Internet certainly won't eliminate these costs, but it can definitely reduce them and provide you with the information you need more quickly and more efficiently. For example, the US government has made all SEC filings available for free on the Internet. Within minutes, you can connect to the EDGAR Project Internet site, search for a particular company record, and download that company's complete 10-K form—all from your desk. How does this compare with your traditional method for obtaining the same information?

Reason #3: Customer Service

We've all heard the buzz-words: continuous improvement, quality management, streamlined customer interface—the list goes on and on. However, beneath the jargon lies an important insight. Customers are demanding more, and faster, service for less cost. This is true for all industries, but the professional services are best able to translate information into customer service. We are, in the broadest sense, moving toward a service-based, information economy that will place knowledge at the top of the list of marketable goods. You need to be poised to deliver what your "customers" will be expecting, whether they are private practice clients, fellow managers, or corporate consulting associates; and the Internet will be a large piece of your customer service foundation.

Earlier in this chapter, we discussed how better communication and improved access to information are important benefits of

using the Internet. Imagine how this communication and
information will enhance your interactions with clients. How
would your clients react if they received a monthly electronic
update from you on important tax law developments? If they
could have 24-hour access to a list of frequently asked business
accounting questions and answers developed by your office? If
they could zip off a quick note to you and receive a response that
afternoon? If they could depend on your systems consulting
support even while you traveled for another project? If they could
communicate with you without regard to office hours and time
zones? If they could receive advice from you about their own use
of Internet resources?

Before long, all clients will expect this level of service, and most
organizations will be providing it. In this reference guide, we'll
describe how the Internet is uniquely situated, technologically
and otherwise, to be the channel for providing excellent customer
service. If you're not convinced yet, you will be.

What is the Internet?

The first thing to know about "The Internet" is that, in a way,
there really is no such thing. The Internet is actually comprised of
thousands of separate, freestanding computer systems and
networks at universities, companies, government offices, and
other institutions around the world. Each of these sites operates
with a high level of independence and autonomy. Each stores
different information in different ways for different purposes. This
explains the "Inter" part of the word Internet, because we are
really referring to the inter-connection of all these sites when we
speak of the Internet.

The "net" part of the word comes from how all these sites are linked together. Information travelling on the Internet traverses a web-like structure of many types of transmission lines, including fiber optic cables, regular phone lines, high-speed phone transmission channels, and others. The only thing the lines and separate points of this spider's web have in common is the language, or protocol, they all use to transmit and receive information. Communication on the Internet is based on the set of rules called the Transmission Control Protocol/Internet Protocol (TCP/IP). Each site on the Internet communicates via this TCP/IP protocol, so all sites on the Internet are connected.

As you may suspect, the story of the Internet is a sort of fairy tale in this era of proprietary technology and cut-throat competition. Long before the popular press raved about "The Information Superhighway," and long before the word "e-mail" was a part of our common vocabulary, a growing group of academic, government, and eventually private, institutions was quietly agreeing on how best to construct the world's largest communication structure. The TCP/IP communication language is the common factor; it provides the "net" in Internet.

How Did the Internet Happen?

Remember the Cold War? We actually can credit many aspects of our current version of "cyberspace" (the world of online networks) to this political stand-off. During the 1960s, the US government established a decentralized network among defense agencies and strategic command posts, so that our nuclear defense system would remain functional under a possible nuclear attack. The Advanced Research Projects Agency (ARPA)

eventually expanded to include researchers and academicians involved in defense work at various universities nationwide. Major defense contractors soon followed suit.

In the 1980s, the National Science Foundation (NSF) used the same technology to link together researchers in other, non-defense related disciplines and to give them access to a few very powerful supercomputer centers for statistical computing. At this point, the idea of efficiency and shared resources began taking shape. Eventually, the network started to grow of its own accord. People recognized the cost savings of using e-mail. Collaborators established discussion groups for subjects of shared interest. In 1989, the Internet Society opened access to the Internet to any users who agreed to abide by the "acceptable use" guideline, which defined acceptable use as non-commercial use.

Today, the Internet is open for both public and commercial use, and many of the Internet's resources are privately owned; but the strength of that original, non-centralized, heterogeneous network remains. Unfortunately, the strength of the Internet, its size and variety, is also a source of intimidation for new users. This guide will walk you through the various types of Internet sites and the software tools you can use to access them.

Who's In Charge of the Internet?

The answer seems like a paradox; no one is entirely in charge of the Internet. Each site maintains control over its own computer systems and networks, establishing rules that guide how files and data are stored and who has access to them. There are, however, several groups that have a good deal of control over Internet

operations. The most important is the Internet Society, based in Reston, Virginia. The Internet Society is composed of a group of technical committees of experts, drawn from both the public and private sectors, and from countries around the world. Any person or institution who wishes to establish an Internet site agrees to abide by the rules and procedures established by the Society, as do the communications companies that are building the transmission channels through which Internet information travels. Thus, the Internet is run by a certain level of consensus among all its participants. Debate is always lively and disputes are frequent; but, because each site remains autonomous, the Internet stays operational even if a particular site chooses not to participate. In addition, if one site or set of communications links becomes inoperative, the rest of the Internet network remains operational and continues to relay information.

Figure 1.1
The Internet Society works to establish rules and procedures to guide users of the Internet.
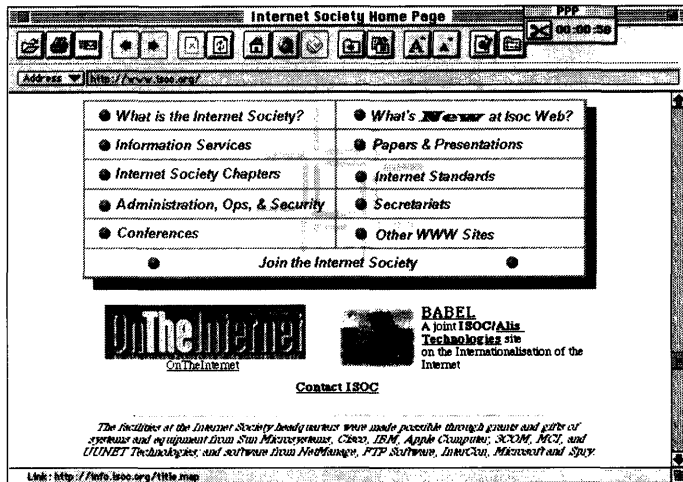
When we look at the real infrastructure of the Internet, the lines and channels of the network itself, we can see that a few big, private companies have considerable control. Corporate giants like AT&T, IBM, Sprint, and MCI have made major, long-term investments in building the communications network that

supports all Internet transmissions. Thus, they have a great deal of influence in the technological and public policy issues surrounding the Internet.

How Big is the Internet?

Once again, the first and most accurate answer to this question is a non-answer: no one really knows how many people use the Internet. Remembering that each Internet site is independently administered, you can see how estimating the number of users would be difficult. However, current best-guess estimates speculate that there are presently over 30 million Internet users in the US alone (compared with 8.4 million in 1995). This total includes university faculty and students, business users, persons in the non-profit sector, and individuals in the general public. The 1997 American Internet User Survey, conducted by FIND/SVP, Inc., showed that 60% of predominantly business users access the World Wide Web daily. The survey also found that a whopping 55 million Americans are poised to become Internet users, and for over 20 million adult users, the Internet is already "indispensible." According to Thomas E. Miller, FIND/SVP vice president, "These findings document the transition of the Internet from over-hyped curiosity to a communications and information utility on which millions of Americans now rely."

Where is the Internet Going?

Without a crystal ball, changes in the world of high technology are hard to predict. However, there are current developments that appear to define a general future direction for Internet activities. Perhaps most importantly, the Internet is becoming significantly easier and less expensive to use, and these changes bode well for any technology. As Internet Service Providers (ISPs), commercial firms that provide individual Internet accounts, compete for a growing number of customers, they will develop better user interfaces and stronger customer support organizations. For the non-technical user, this is a good development. Chapter 2 ("How to Get Connected") contains a discussion of what you'll want to consider when deciding what type of account to obtain.

On a parallel path, computer software developers are making more and better tools for using the Internet. These developers are working on intuitive, user-friendly software tools for searching on the Internet, browsing World Wide Web sites, creating and sending e-mail, and a wide variety of other functions. We are already at a point where navigating the Internet can be as easy as using a *Windows*-based software package or a *Macintosh*–just "point-and-click," and you're there. And, just as we saw with the *Macintosh* and *Windows* operating systems, the friendly and attractive computer user interface always wins. User interfaces that incorporate graphics, audio, icons, and intuitive menu commands are easier to learn and more inviting to computer users. Thus, software companies are bringing this type of software to the Internet arena, just as they did in other categories such as word processing and spreadsheet programs. These developments will bring more and more non-technical and casual users onto the Internet, and they will make the Internet a standard operating resource for businesses.

Ironically, the rapid growth of the Internet is frowned upon by some users. As more and more individuals navigate the Internet, whether for academic, business, or personal pursuits, the physical networks that connect to form the Internet become bogged down. Even as a new Internet user, you may notice some symptoms of network congestion; for example, users in the eastern time zone of the US may occasionally notice slowed load times around noon on weekdays (9:00 A.M. Pacific Standard Time), when the Silicon Valley comes online. To alleviate some of the burden on the networks, more than 110 research universities are collaborating on the Internet 2 project, which promises to develop a faster, advanced version of the Internet to serve academic institutions, doctors, and scientists, leaving the original Internet for the rest of us.

Figure 1.2
Internet 2, a collaboration of research institutions and the National Science Foundation, represents the "next generation" of the Information Superhighway.
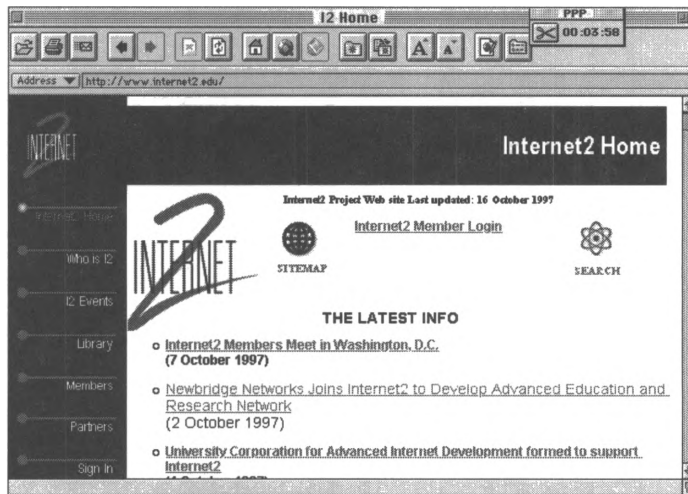
What Does the Internet Mean for Business Users?

On the subject of business use, the Internet is fast becoming an important ordering and distribution channel for products and services. For the past decade, organizations have been conducting a type of electronic commerce through electronic data interchange (EDI), a set of data transmission standards. But, until recently, most online transactions involved parties familiar with each other (such as a manufacturer and a supplier) who operated under a contract specifying both the terms of the interchange and ways to resolve disputes. Now we are moving into the next wave of electronic commerce development, featuring anonymous transactions between buyers and sellers that, to some extent, may replace traditional trips to the mall or grocery store (Amazon.com, the giant online bookseller, is a good example of a successful electronic vendor). Many companies currently provide online ordering for products as diverse as clothing, books, personal electronics, and food items. Customers can obtain a large number of products today, such as computer software and electronic publications, right on the Internet by accessing them directly from the seller's site.

The electronic commerce industry segment is one of the fastest growing areas of the Internet, and, recognizing its economic potential, governments around the world are looking at ways to stimulate consumer interest. On July 2, 1997, President Bill Clinton unveiled his administration's proposal, "A Framework for Global Electronic Commerce," which urged governments to "respect the unique nature of the medium and recognize that widespread competition and increased consumer choice should be the defining features of the new digital marketplace." In its June 24, 1997 issue, *PC Magazine* reported that in 1996, US residents spent approximately $350 million online, and some

analysts predict worldwide Internet trade could go as high as $6 billion by the year 2000. Consequently, creating Internet presence is fast becoming an important concern for businesses. A recent report by Gartner Group Inc., a prominent information technology research firm, predicted that companies using electronic commerce will be able to freeze out their less technologically advanced competitors and even lock in suppliers within the next five to seven years. Barbara Reilly, research director for applications development at Gartner, said electronic commerce "will shift from being an investment strategy to becoming somewhat of a competitive mandate."

Another business use of the Internet is marketing and customer service. As we discussed above, the Internet provides one of the most efficient and timely ways available to communicate with clients. It can serve as a channel for delivering information about products and services to potential customers. Many commercial ventures are setting up Internet sites for the specific purpose of providing detailed product and pricing information to individual and corporate buyers. For instance, it is much less expensive to provide a catalog online than to print and mail a paper catalog to thousands of customers, and an electronic catalog can be updated at any time. With the introduction of new graphics capabilities on the Internet, this type of marketing and distribution becomes not just feasible, but preferable for both businesses and customers.

What does all this mean for a CPA? Professional associations such as the American Institute of Certified Public Accountants are leading the charge to establish the CPA designation as the premier information professional. In fact, the AICPA listed information technology among the most important developments affecting the accounting profession in 1997. A study released by International Data Corporation predicts that the global

information technology consulting market will reach $75 billion by the year 2001; in the US alone, the total will exceed $40 billion. And, according to Marianne Hedin, an IDC program manager, "executives worldwide are turning to external consultants for assistance." CPAs interested in providing technology consulting services as part of a total package for business clients can take advantage of the training programs offered by organizations like the AICPA, which has partnered with such computer industry heavyweights as Microsoft and Great Plains Software.

Electronic commerce provides another opportunity for CPAs. A recent report by a special AICPA committee ranked electronic commerce as one of the top six assurance services accountants can provide. For electronic commerce to fulfill its promise, after all, ordinary consumers must be willing to provide personal information (such as credit card numbers) over the Internet to unknown parties. Understandably, this makes a lot of people nervous. A study commissioned by TRUSTe, a non-profit group working to establish consumer confidence in online trade, found that over 70% of 9,300 consumers were more concerned about privacy on the Internet than they were about information transmitted by more traditional media such as phone and mail. JCP Computer Services, a London-based secure electronic trading systems company, has advised any organization wanting to do business on the Web to involve "trusted third parties" who can certify the security of the Web site. Seeking to establish CPAs as that "trusted third party," the AICPA recently introduced the CPA WebTrust, a unique seal of assurance for Web sites. AICPA member firms have the option to undertake a training program in order to license the seal, which allows them to conduct audits of Web sites and assure the integrity and security of the site in an online report. When he announced the service in September 1997, AICPA President Barry Melancon said, "For more than 65

years, CPAs have been the guardians of fiscal responsibility, bringing added measures of trust and confidence to business. Today, we continue that tradition with CPA WebTrust."

It's easy to see that technology is creating opportunities that would have seemed fanciful just a few years ago. Within the next few years, the Internet will be one of the media we consider to be primary communication channels. We will place it alongside television, radio, and direct mail when building marketing campaigns. It will be a major part of the distribution strategies of corporations. Clients and customers will expect to have Internet access to service professionals, just as they expect to be able to call any business office on the telephone today. In taking the time now to learn how to use the Internet to your advantage, you are taking a big step toward positioning yourself as a leading-edge accounting professional.

How Does the Internet Work?

Any businessperson can easily use the Internet with today's available software without much knowledge of how or why the Internet works. If you can navigate fairly well around your computer and its operating software, you can easily install and operate Internet client software and be up and running with an Internet account in very little time. However, some people may be interested to know just how their e-mail message arrives at its location and how all these corporate and public networks are linked together, so this final section of Chapter 1 is a basic description of the electronic communications that make up the Internet.

Every Internet transmission is simply an exchange of data, and electronic data is exchanged using methods not very different from those used to deliver US postal mail. Your mail carrier walks a route that is a collection of houses or individual addresses. This small route originates at the local post office, one of many offices that make up another network of district offices. The address that you put on an envelope contains enough information to help the US Postal Service move the envelope to the right district office and then out to the correct route. At various points in its journey, different parts of the address are used to move the envelope to other points in the postal service network, until it finally arrives in your mailbox.

The Internet is a similar structure–it is a collection of small computer networks. These networks range in size and complexity from a few small computers to the actual Internet "core" network, consisting of large mainframe computers handling millions of bytes of data each minute. The actual physical connections between the various networks that make up the Internet take many forms, from T3 links that act as "backbones" between major locations, carrying 45 Mbps loads of traffic, to SLIP/PPP connections that carry Internet traffic over high-speed modems through dedicated ports supplied by service providers. (See Chapter 2 to learn more about these different types of connections.) Every site connected to the Internet through one of these lines has a unique Internet address, just like destinations on typical postal routes have individual addresses that make it possible for mail carriers to deliver letters to particular destinations.

To send a message to another computer on the Internet (such as an e-mail message, a request for a World Wide Web document, or a file transfer), your message must be addressed to the person or machine to which you wish to send it, just as letters sent

through postal mail must be addressed to the intended recipient. The transmission is accomplished through a system called packet switching, in which information sent across the Internet is broken into parts and each part is placed in an "electronic envelope" called a packet. Each packet contains a structure called a header that functions like the information on a regular postal envelope—it identifies the message's destination, source address, and provides other information that computers on the network need to correctly route, process, and reconstruct the packets into Internet messages.

As a message is transmitted across the Internet, it moves from one subnetwork to another through "gateways," computers that are connected to two or more of these small subnetworks. Just as mail moves from the collection of district offices to your mail carrier through your local post office, Internet traffic moves to your local subnetwork through a gateway. Computers on the Internet examine the header information attached to each packet and then move the message along to the next site, a process called "routing." Internet host computers maintain tables of information called "routing tables" that are lists of instructions such as "packets for subnet x are sent to gateway a." When packets are passed along the Internet, the hosts use the routing tables and the destination address contained in the packet header to move the information along on its journey. The header also supplies information that allows Internet computers to choose alternate paths for the packet to follow if some part of the Internet has failed. When the packets have arrived at their destination, the computer that receives them uses the information contained in the header to assemble the packets into the completed message.

Headers are attached to the message and are read by a set of shared protocols used in all Internet transmissions. Protocols are the set of conventions that determine how information will be

exchanged–often between computers from different manufacturers and running different operating systems. Internet protocols specify how a network moves data, handles errors, and allows messages to be sent, received, and understood by users of different kinds of hardware and software systems. As discussed earlier in this chapter, the Internet uses a specific set of protocols called TCP/IP (Transmission Control Protocol/Internet Protocol) to move packets of information through the Internet and to implement the server/client functions that characterize the Internet. These protocols are layered, and an electronic message must use different layers of protocols to successfully traverse the Internet, just as mail processors use different pieces of the postal address you write on an envelope to route mail messages.

For example, to send a simple Internet e-mail message, you use the protocols of the mail program being run on your computer to create the message and send it on to the next layer of protocols, called Transmission Control Protocols (TCP). TCP is responsible for breaking the message into packets that are small enough to move through the Internet, and for assigning identifying information in the header of each packet. Then TCP moves the message on to the Internet Protocol (IP) level. IP adds its own set of header information that is needed to route the message appropriately and is then responsible for delivering the message to its destination. Once the message has arrived at the correct e-mail address, IP turns the packets over to TCP again. Then TCP reassembles the packets and makes a connection with the appropriate application program–the mail program on the destination computer. The diagram below illustrates this layering:

Figure 1.3
The layered communications protocols of the Internet.

Application
(Such as e-mail program at sending system)

TCP
(Breaks message into packets, if necessary)

IP
(Routes the packets through the Internet)

TCP
(Reassembles the packets and delivers to application)

Application
(Such as e-mail program at receiving system)
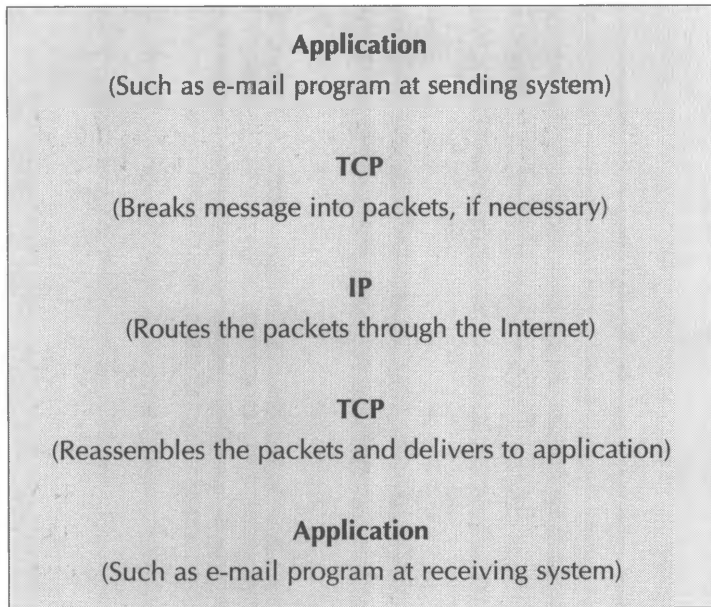
In most Internet transmissions, the header information for TCP/IP protocols is stripped when a transmission has been successful. As a result, this level of protocol and decision making is invisible to the typical Internet user, just as the processing and routing that takes place between your mail box and your letter's destination is invisible, though not really very mysterious.

Chapter 2
How to Get Connected

There are many ways to access the Internet–some cost less than others because they provide less functionality. Before deciding among access options available to you, you might want to take a few moments to consider exactly what you want from your Internet connection. In this chapter, we'll describe (very generally) the different types of Internet connections and the functionality they offer, concentrating on the type of connection most people use–a dial-up account using a personal computer and modem from home or office. A word of warning: all Internet access services are not created equally. As you look at your access options, make sure that you're comparing "apples to apples" and ask around to see what other people are doing about Internet access. One section of this chapter, "Choosing an Internet Service Provider," describes considerations for making this selection. And the last section of this chapter, "High-Speed Connections," describes the types of connections available for individuals, work groups, and firms who need more capacity and faster access to the Internet than traditional 14.4 or 28.8 Kbps PC modems provide.

To understand about access options, you'll need to know a little bit about "clients" and "servers," because the TCP/IP communication protocol on which the Internet is built is a "client/server" protocol. In the TCP/IP world, every Internet site is a server. That is, those thousands of independent computer networks and mainframes we described in Chapter 1 all speak

together via TCP/IP, and they are all Internet servers on the
network. Any other computer that connects to an Internet server
to view or retrieve information is called a client. When you
traverse the Internet sending e-mail, or searching for data,
information, and files, you are using client software. The
client/server paradigm delegates some communication tasks to
servers and some communication tasks to clients–that's how the
transmission works.

Therefore, to connect to the Internet, you need some way to
utilize Internet client software and to connect to Internet servers.
You can get access to client software in many ways; below we
describe the most frequently used ways, along with their
advantages and disadvantages. In a nutshell, here are the options:
(1) you can use Internet client software on your own personal
computer and connect to the Internet via an Internet Service
Provider (ISP) with a SLIP/PPP account (see the "Top-of-the-Line"
section); (2) you can use client software through an account on a
commercial online service, like *CompuServe* or *America Online*
or another access provider (see the "Middle-of-the-Road"
section); or, (3) you can use client software on a mainframe to
which you connect through a terminal or personal computer (see
the "Free, But Limited" section). As you probably have guessed,
these sections are arranged from the option with the most
functionality (and the highest cost) to the one with the least
functionality (and also the lowest cost).

Top-of-the-Line: Internet Service Providers

Internet Service Providers (ISPs) supply their customers with a type of account known as a SLIP/PPP account (also called dedicated port, dial-up direct, or dedicated dial-up line service). In this case, you need a computer, a modem, and dial-up communication software such as Serial Line Internet Protocol (SLIP) or Point-to-Point Protocol (PPP). You do not need to have a dedicated telephone line for this service unless you wish to have 24-hour, continuous access to the Internet, but service providers generally guarantee a connection–meaning that they are dedicating an incoming line or port for you. With this type of service, you must have the client software on your personal computer for the Internet functions you intend to use (such as e-mail, FTP, Gopher, and World Wide Web), as well as other special, though not costly or difficult to acquire, software. The Internet Service Provider will specify what is needed.

You are connected directly to the Internet during the time of your call to an ISP. The advantages are that mail and files are received directly by your personal computer and the ISP provides the necessary computing power to use graphics, audio, and video tools. The disadvantages are a slightly higher cost and the need for some attention to security (see Chapter 7, "Personal Security," for a full discussion of security considerations).

Most ISPs provide the software you need to connect to their systems, along with a variety of Internet application software, as part of their sign-up packages. For instance, the Instant InterRamp package from Performance Systems International contains PPP communication software, Netmanage's *Internet Chameleon* software (tools for using e-mail, FTP, Gopher, Telnet, and the World Wide Web), and an easy-to-understand installation and

user guide. The ISP marketplace is changing daily, so we can look forward to a broader range of providers and more creative service packages as the Internet boom continues.

The crucial factor in selecting an ISP is local telephone access. Paying long distance phone charges on top of your monthly fee is an unnecessary expense; if you do not have a local ISP, you can contact one of the ISPs providing nationwide service to gain access to a connection through a local phone number. Dedicated dial-up lines that remain available for your use 24 hours per day cost between $200 and $300 per month.

Middle-of-the-Road: Commercial Online Services and Shell Accounts

If you already subscribe to a commercial online service, you undoubtedly have seen the hype about which Internet functions are available through your service. *Prodigy, America Online,* and *CompuServe* are rushing to provide Internet functions to their customers as quickly as they become available. Many people are joining these services expressly to gain access to the Internet. If you are interested in the other services provided by the online giants, such as stock quotes, news releases, reference databases, and special interest groups, subscribing to one might be the way for you to get the best of both worlds.

Figure 2.1
Commercial online providers like CompuServe now offer full Internet functionality in addition to member services.
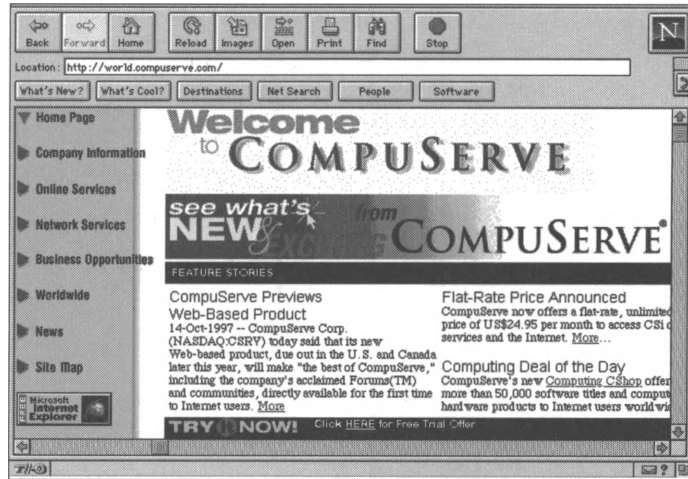
On both *CompuServe* and *America Online*, customers can use a fully functional Internet connection through the services' host computers. Customers can use Internet tools, such as FTP, Gopher, and World Wide Web, for the same hourly charge as accessing the commercial service. For some tasks, such as retrieving a file via FTP on *CompuServe,* the customer's PC acts as a terminal on the host computer, which in turn acts as a client via the Internet. For other tasks, such as using a World Wide Web browser to access a Web site, the customer's PC is acting as a stand-alone client through a gateway that the commercial service provides.

In a similar manner, some other providers supply what is known as a "shell account" (also called a dial-in terminal account, UNIX account, or command line account). In this scenario, customers subscribe to a commercial service which provides dial-up access to its mainframe and use of its Internet client software. All Internet commands, such as file transfers and e-mail, use the client software on the provider's computer; you can store information on the provider's computer in your personal workspace. While mail and other information in your personal

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workspace can be viewed while online with the provider, you must take a second step and use the file transfer function of your terminal emulation software if you wish to download files from your workspace to your personal computer. Unfortunately, this type of connection is too slow to use the graphics of the World Wide Web and other applications with graphics, sound, and video.

Free, But Limited Access

The largest free, public access route to the Internet is the National Public Telecomputing Network (NPTN). Based on the model of public television and radio (but without the government funding), the NPTN has the mission of providing low-cost computing services to the community-at-large, including access to a limited group of Internet tools. Through the largest NPTN site, the Cleveland Freenet, users can access e-mail and other basic Internet functionality, such as mailing lists and discussion groups. In addition, the Cleveland Freenet has gathered a wide range of Internet resources together on its information server, including daily headline news from _USA Today_ and access to the catalogs of various libraries. To use e-mail and some other options on the system, users must register with Cleveland Freenet by signing and returning the application form provided to visitors online.

If there is a Freenet within your area code, you may have found a good way to explore the Internet very cheaply. If not, the long distance charges involved in accessing a Freenet regularly will probably make this an undesirable access route for you. Either way, you may already have discovered the biggest problem with the NPTN–because the demand is much greater than the

equipment resources available, the phone line is often busy and users cannot connect exactly when they want to.

Some areas, mostly larger cities, have public-access Internet services through local community groups or public institutions. For instance, the Cleveland Public Library has a dial-up service called the "Cleveland Public Electronic Library," which allows access to anyone with a personal computer and modem. All users of the Electronic Library are given access to a wide range of library catalogs and a good deal of information from various Internet sites gathered on the library's Internet Gopher server. In addition, users who have a library card registered with the Cleveland Public Library can connect to a large number of online research databases through a library agreement with OCLC's FirstSearch service (for instance, the MLA Bibliography and the PsychLit database). This description is just an example; you should check with your local library to find out what Internet access services are available.

Both of the options described above, the National Public Telecomputing Network (NPTN) and access through a public organization such as a library, offer a very limited portion of full Internet functionality. When you dial into such a service, you are using the client software available on the service's mainframe. In both cases, users are limited to the information available on the local system and connecting to a limited number of remote sites designated by the system. NPTN sites provide e-mail privileges, but other public-access services do not. None of these sites (that we know of) provide the more advanced Internet functions (such as FTP, Gopher, and World Wide Web) that allow a user to choose and visit other, remote Internet sites. Because the client software you are using is running on a mainframe, transferring files can be cumbersome. If you are looking for a very inexpensive way to use Internet e-mail, perhaps the NPTN is for

you. If you want to dip your toes into some research and information retrieval, your local library may be an option. Either way, you'll probably outgrow this functionality fairly quickly and want to move onward and upward on the Internet.

Other Options: Do You Already Have Access?

You may already have access to the Internet and not know it. Before establishing your own connection, check to make sure that you know about all the options available to you through your company, your university, or other resources. While you may decide to change access options later to obtain additional functionality or use the Internet from your home, these already-available connections can offer ways to explore the Internet at low cost while gathering information for your later decisions.

If you work for a company that is large or technology-savvy, you may already have access to some Internet functionality through your office computer network or mainframe. Many corporate e-mail systems provide an Internet gateway that allows for sending and receiving Internet e-mail. Check with your e-mail system administrator to find out. You should also stop by your firm's library or information center to see what help and resources are available. Research is the oldest and biggest use of traditional online services, so the people responsible for research in your company are likely to know whether or not Internet access is already available.

Next, think about other groups you belong to, and how they might help. If you are a student, faculty member, or staff employee at a large private or public university, you may already

be eligible for a free or low-charge Internet shell account through the university mainframe. Most schools prohibit use of these academic accounts for commercial activity, but they offer a good way to learn about the Internet. You may be able to obtain dial-up access to the university mainframe so you can use your academic Internet account from home.

If you belong to a local computer club or computer users' group, check to see what assistance is available to you there. Some computer clubs offer Internet shell accounts through their local bulletin board systems (BBSs). If not, you are still likely to find sophisticated Internet users in the group who can refer you to Internet service providers with local dial-up phone access, and they might have some good tips for you as well.

Get Connected with Other Internet Users

In addition to getting connected to the Internet, you may also want to think about making some human connections. The "power users" of the Internet say they get their best information from other users. In *CompuServe Magazine*, Internet guru Paul Gilster advised users that, " . . . word of mouth is the way most site information is passed" (March 1995, p. 30). This is, in part, because the Internet is changing very quickly, and in part because the nature of the decentralized Internet makes collecting information about sites and the information available from them a daunting task.

So, you should consider what options you have for getting the latest Internet information. This guide will be one good source. Your professional association or special interest organization may

host an Internet discussion group or subscription mailing list, and your company may have training or technical support available for Internet users. Kent Information Services, Inc., offers two newsletters, the monthly *Internet Bulletin for CPAs* and its weekly online news service, the *Internet->Bullet*, to give subscribers the latest and most comprehensive information available on Internet resources for the accounting professional.

Choosing an Internet Service Provider

As discussed above, by far the most popular types of Internet connections are SLIP and PPP, both of which require Internet Service Providers (ISP) through which to connect to the Internet. The first step to take when choosing an ISP is to assess what types of services you will need. If you only require a connection from a single office site and the software necessary to allow you to retrieve information, then your choice may be simpler than a company that needs to be able to access the Internet from various locations or a company that hopes to provide information and services to its clients over the Internet. After you've identified your company's needs, you'll be in a better position to choose an ISP that can give you the best service.

When deciding on an ISP, the first decision you will make is whether to use a local or national provider. National providers offer the benefit of being able to connect to the Internet from POPs (points of presence) all over the country, and if part of your typical business activity is traveling, this can be a real value. For example, members of the Kent Information Services, Inc. staff present Internet seminars at locations all over the country. Using a national provider insures that we can connect to the Internet

from various locations with reasonable ease and reliability. If your
company does not require this type of flexibility, you might
consider a local provider that offers the benefit of fewer clients,
and, sometimes, more personal service. The most important
factor when choosing an ISP is the ability to connect to the
provider with a local phone call and avoid long-distance charges.

Another issue to consider when choosing your ISP is the
technical capabilities of the company. Although a small local
provider may offer enthusiasm and customized service, they must
also prove that they can offer the crucial technical capabilities
you will need to be assured reliable service. Some typical
considerations are:

1. The ability to make a successful connection when you
   dial in (the ratio of customers to modems).
2. Multiple connections to Internet backbone providers to
   insure service in the event that one of the ISP's lines
   goes down.
3. Training, consulting, and technical support services.
4. Experience with business customers.
5. Security precautions.
6. POPs near your location.

When you have identified ISPs that can offer the services you
require and have the technical capability to provide that service
reliably, then you must consider and compare the costs of various
ISPs. The costs of services offered by ISPs vary, so ask colleagues,
friends, and other business users about their ISPs. Typically, ISPs
offer a certain number of hours of service for a monthly fee, but
some ISPs tack on hidden costs (such as additional charges for
each e-mail message). Be certain that you are clearly informed
about the services that are included in the initial and monthly
fees.

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High-Speed Connections

Once you connect to an ISP through your 14.4 or 28.8 Kbps modem, you are likely to be satisfied with the speed of your Internet travels for at least a while. However, many sophisticated Internet users become restless while waiting for graphics-intensive World Wide Web pages to download; or, they wish to make extensive use of the rapidly growing multimedia capabilities of the Internet, such as audio transmissions or video conferencing. For those users (and their ranks are fast growing), there are several types of high-speed options available.

ISDN

The factor constricting how fast we communicate with other sites on the Internet is called "bandwidth." Stated very simply, bandwidth is the volume of data that can travel across the connection simultaneously. It is the size of the electronic "pipe" through which information travels. For those of us who use a regular telephone line to connect to our Internet Service Providers (ISPs), restricted bandwidth is a real issue.

Most regular phone lines can accept transmission speeds of up to 28.8 Kbps only (and many people experience trouble at this speed due to line noise and interference). This is because most regular phone lines transmit information in analog, not digital, format. (Digital signals are based on the numerical data generated by the computer. Analog signals are electronic signals that are comparable to sound.) More precisely, although most of the phone switching equipment used by the phone company has already been converted to digital equipment, the connections between our homes or businesses and the phone company switching equipment are still analog. Because analog format

introduces more line noise and garbling over long distances, a regular phone line has a fixed cap on the speed at which it can transmit information.

To transmit and receive information at speeds faster than 28.8 Kbps, you need a different kind of phone connection—one attached to the digital transmission equipment at the phone company. Then, you need a way to transmit and receive digital information, called an interface. Taken together, these capabilities are called ISDN, or Integrated Services Digital Networks. ISDN is a network technology that allows for high-speed simultaneous transmission of voice, data, images, and video information. ISDN will allow you to hook up your phone, fax machine, computer, and other communications equipment to a single interface and send all this information through your local phone company's equipment. Most experts predict that we will all need to upgrade our home and office building phone wiring to fiber optic materials before this all comes together, a very expensive proposition for consumers and local phone companies. But, many ISDN functions, including high-speed Internet connections, are available now over the regular copper wiring that has been in our walls for years.

Basic and Primary Access
National ISDN-1 (the first of three proposed stages of ISDN) was finalized and adopted by the large Bell companies in 1997, with essentially two areas of promotion: terminal portability and switch interoperability. Terminal portability ensures customers that ISDN equipment can be moved to a new ISDN location without problems. Switch interoperability ensures customers than various ISDN network service provides will all communicate seamlessly via a standard signaling language.

There are two methods of ISDN architecture: Basic access and
Primary access. An ISDN basic user connection, called BRI (Basic
Rate Interface), contains three separate channels, or "pipes." Two
channels (the B1 and B2 channels) carry any user conversation
from a telephone, computer, fax, or other device. The third
channel (D) carries call setup information for the the network, but
can also carry user data transmission, if needed. As you can see,
three separate "conversations"–for example, an incoming fax, a
telephone call, and an outgoing e-mail message–can be
conducted on the same telephone line that once could
accommodate only one transmission at a time. This is possible
because of the digital connection; users carry on two distinct
circuit-switched voice or data calls at the same time through a
single line, and a third packet-switched data channel is available
to send or receive data on the D channel. Additionally, as many
as eight individual devices (telephones, computers, and so on)
can be connected to the same ISDN line and each may be given
as many separate phone numbers as necessary. In short, an ISDN
BRI connection eliminates the need for myriad telephone lines to
meet a business' needs. Basic Rate ISDN equipment is available
in many computer and high technology retail outlets, and many
companies offering enhanced ISDN services (such as ISPs or
online service providers) will help you select and order the
proper equipment.

While Basic access ISDN connection deals with the relationship
among individual devices and the network, Primary access
determines the method by which numerous Basic access users
can be connected to the network via a common line facility. This
type of access eliminates the need to provide individual Basic
access lines when a group of terminal devices shares a common
PABX (Private Automatic Branch Exchange) that could be
connected directly to an ISDN via a single high-speed line.

Getting ISDN Access

Before you get too far along in your quest for speed, you need to make two important calls. First, check with your local phone company. ISDN service is available in most phone exchange areas in many large cities, but it's not available everywhere. The representative at your phone company's business office can tell you if your area can access ISDN service.

Next, you need to make sure that your Internet Service Provider (ISP) provides ISDN Internet connections. An e-mail message or call to customer service will get you the information you need. Most ISPs provide a good deal of technical support for customers during the installation and initial hook-up of ISDN connections. If your ISP does not provide ISDN service, another in your area most likely does. Commercial online services, such as *CompuServe*, provide ISDN access in some larger cities. If you already use a commercial service for retrieving specialized information such as news and investment data, this may be a good, high-speed Internet access option for you.

You will need two additional pieces of equipment to send and receive information over the ISDN line provided by your phone company (called the "U-connector"). The first is called an NT1 device. This device plugs into the ISDN phone jack on the wall, and it can cost anywhere from $100 to $300. Some NT1 devices also require a separate power supply unit; your telecommunications equipment supplier can help you determine if you need one. Next, you need to connect your PC to the NT1 device through a Terminal Adapter (TA). The TA will replace the modem you currently use and will enable your PC to use common terminal standards to communicate across the ISDN line. TAs are also called ISDN cards, and there are many TAs available across a wide range of prices. Once you get your ISDN connection installed, it works very much like a regular modem

Internet connection. After making your SLIP or PPP connection through the dialer software, all your Internet client software, such as e-mail, Gopher, and Chat programs, will work exactly the same as they always have.

If you use a stand-alone PC or work in a small office environment, an ISDN line is likely to be the only high-speed option you will consider for your Internet applications. If you connect to the Internet via a mainframe or local area network (LAN), however, you may have encountered terms such as T1, Frame Relay, and DDS. These terms describe other telecommunications channels that provide Internet access at a larger bandwidth than traditional telephone lines–channels that require more sophisticated equipment and ongoing systems maintenance. Luckily, these types of connections usually are established by a systems analyst or LAN administrator who is responsible for installing and maintaining the connection for a company. Below are basic descriptions of how these types of high-speed connections work and when they might be useful to your firm.

T1

T1 is a digital communication system that enables voice and data to be transmitted at 1.544 Mbps (not "bits per second," or "thousands of bits per second," but *millions of bits per second*). A T1 line is divided into sub-channels based on frequency that allow voice and data, or many streams of data, to be sent simultaneously over the same line. This option is generally useful for large corporations with multiple national or international offices or firms that send very large files, such as medical imaging results, over the line. A T1 line is expensive, with installation charges beginning at about $2,000 and monthly charges ranging from $2,000 to $3,000.

Frame Relay

The speed of Frame Relay telecommunication can approach the 1.544 Mbps of T1 technology, but speeds closer to 56 Kbps are more common to this channel. Frame Relay utilizes existing public voice or data telephone lines, which differentiates it from T1's use of specialized lines. Through a packet-mode switching technology, Frame Relay can sustain higher transmission speeds over these same public lines than is normally possible, similar to the mode of operation of older public data networks such as Tymenet and Sprintnet. Frame Relay service is available through AT&T, MCI, and many regional telephone companies at widely varying costs. It is a good alternative to the more expensive T1 technology for companies that do not require as many separate transmission sub channels as T1 can provide.

Digital Data Service

Your firm can connect to an ISP directly through a Digital Data Service, or DDS, line. Comprised of two modules, the Data Service Unit (DSU) and Channel Service Unit (CSU), this type of connection is a good choice for smaller companies that anticipate between five and ten concurrent Internet users at any given time. DDS facilitates transmission speeds similar to Frame Relay, at 56 Kbps or 64 Kbps. The costs are lower than the other high-speed options: about $500 to install and $500 monthly for the dedicated line. One trade-off on this option, however, is lack of flexibility because a DDS line connects your office to one ISP only, a problem if your organization utilizes more than one Internet Service Provider or a combination of commercial online services.

These high-speed Internet connection options are very expensive when compared to the newer ISDN technology now available in

most regions. This is one reason why ISDN is the choice to consider first when you are exploring ways to make a high-speed connection. However, channels such as DDS and T1 provide the additional feature of allowing from several to many concurrent users at a single site to access the Internet through the high-speed connection, something an ISDN line does not do. For this and other technical reasons, the systems professionals at your company may have chosen one of the other telecommunication channels described here.

Wireless Communications

Wireless communication technology is enjoying spectacular growth, fueled by media hype about the "mobile professional" and the real needs of businesses to give employees constant, reliable access to information and communication, regardless of where they are. Wireless communication operators are in fierce competition for subscribers; researchers estimate that there will be approximately 250 million cellular and PCS (Personal Communication Services) subscribers worldwide by the year 2000. Because wireless communications have such a bright future, and because so many companies are entering the market, prices for mobile communications are expected to fall, which is good news for busy professionals.

The advantages of wireless access are obvious. Phone lines can be expensive and, with the rapid rise in the popularity of the Internet, clogged. Some proponents of wireless technology promise connection speeds of 1.5 Mbps, more than 50 times the speed of a 28.8 Kbps modem. More importantly, secure and dependable wireless access gives traveling professionals the

freedom to send and receive information anywhere, anytime, without having to locate and plug into telephone lines.

Wireless communication devices depend on an unbounded medium (such as the atmosphere, the oceans, or outer space) through which the signal is radiated freely, spreading through the medium rather than following a bounded (or tangible) medium like coaxial cable. Three popular types of wireless communication technology are cellular networks, PCS, and satellite communications.

Cellular Transmissions

Today's cellular networks represent an important advancement over earlier mobile phone systems that could only be used within the range of a particular tower. The original cellular radio system was based on analog technology, which dedicated a cell channel to one caller while that caller was located within the cell (a specified area served by a low-power transmitter and an associated receiver). Now, when a user makes a call, his mobile unit seizes a free channel in the current cell and automatically switches control of the call to another cell as needed, allowing the caller to drive to a cross-town meeting, for example, with no disturbance to the connection. The caller moves in and out of cells without being aware of the transfer. Digital-based cellular radio systems also allow several callers to share the use of a cell channel through a technique called Time Division Multiplexing, which packs multiple "bits" of information into the extremely narrow time blocks allotted to each of several signal sources.

PCS

Personal Communications Services (PCS) represent the next generation of wireless telecommunications. PCS is a family of mobile or portable radio communications services that encompass mobile and ancillary fixed communications services to individuals and businesses and can be integrated with a variety of competing networks. The Cellular Telecommunications Industry Association defines PCS as a "wide range of wireless mobile technologies, chiefly cellular, paging, cordless voice, personal communications networks, mobile data, wireless PBX, specialized mobile radio, and satellite-based systems." PCS gives users access through a unique personal identifier rather than just a terminal; the technical framework necessary for "personal mobility" is called the intelligent network, or IN. With applications like universal personal telecommunication (UPT), personal number, virtual card calling, and universal access number, a user's "personality" is configured into the IN system. For example, personal profiles, credit configurations, personal numbers for incoming calls (and a voice prompt for outgoing messages) can be entered into the IN system. Broadband PCS will allow for two-way voice, data, and video communications.

Satellite Transmissions

Although cheaper than lines or cables, the broadcast towers on which many cellular networks depend are expensive to build and are not feasible in rural areas. Low earth orbit satellites can fill this communications void. In fact, some analysts predict that this technology will make the need for traditional phone cable obsolete.

Satellite communications systems are line-of-sight microwave systems with a single repeater. These satellites are said to be

geostationary because their speeds are matched to the rotation of the earth at the equator. Like other communications systems, standards govern the use of satellite frequencies; signals sent to the satellite (called uplink) and signals received from the satellite (called downlink) are each assigned specific frequencies. The coverage area is immense; the broad focus of the downlink signal allows a single transmitter to cover an area as large as the continental US. For transmissions originating at a single point and flowing to many points in one direction (such as TV and radio signals), this type of large coverage is desirable. However, two-way transmissions (such as telephone and Internet connections) can be slightly less desirable due to the time it takes a sent signal to return to earth (approximately 240 milliseconds).

Figure 2.2
At the NTIA site, you can access many documents that discuss PCS and other forms of wireless communications.
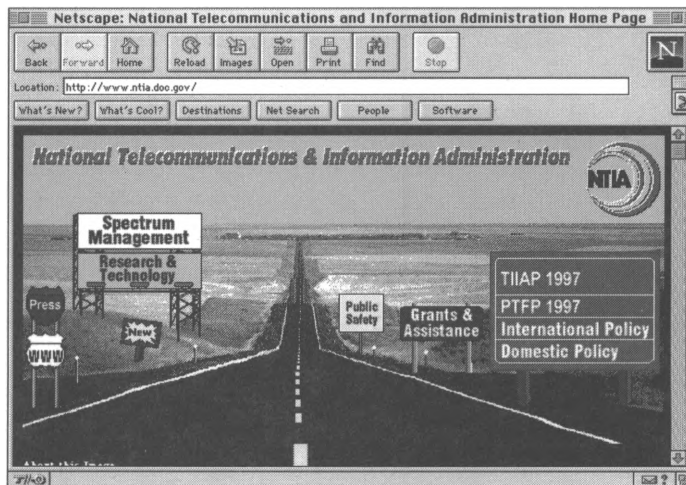
If you wish to learn more about the telecommunications aspects of the Internet, here are two good places to start: The Telecommunications Page of the Computer category of Yahoo (**http://www.yahoo.com**), available via the World Wide Web, and the Telecommunications Digest Usenet newsgroup (*comp.dcom.telecom*), available via the Internet's Usenet function. For more information on wireless technologies, visit the

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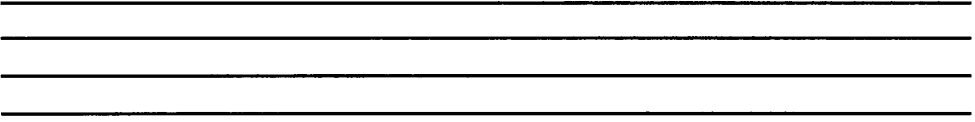
National Communications & Information Administration Web site
(**http://www.ntia.doc.gov**). The NTIA is the Federal agency that
covers domestic and international telecommunications.

Chapter 3
Using and Enhancing
Your Web Browser

The hype is everywhere. Media pundits are announcing the arrival of the "real" information superhighway. Businesses are scrambling to establish something called a home page. Teenagers are spending hours playing complex, graphics-oriented, online games. Perhaps your neighbors are bragging about how much of their shopping they can now do online, complete with catalogs and product photographs. The World Wide Web has arrived, and it is the most revolutionary development in years on this already-always-revolutionary Internet media.

The World Wide Web was initiated over eight years ago by American academic Tim Burners-Lee at the European Laboratory for Particle Physics in Geneva, Switzerland. He developed the concept of a universal library of knowledge connected across computers and networks with easy-to-use point-and-click links. This library was visualized to contain text, graphics, and sound–a true multimedia, hypertext network on a global scale. The World Wide Web is now that reality.

The World Wide Web (also called the Web, WWW, or W3) provides users with a consistent means to access a variety of media in a simplified fashion. More and more, users are accessing the Internet through a Web browser and performing all

Internet tasks from this standardized client software. However, there are times when you need to perform a specialized task, such as accessing a Telnet site, or view a particular type of file, such as a PDF file formatted with Adobe *Acrobat*. In this chapter, we'll show you how to configure your browser to work as efficiently as possible when accessing a variety of Internet resources, covering the following topics:

- Using and customizing your Web browser.
- Accessing Usenet newsgroups with your browser.
- Using Telnet software through your Web browser.
- Configuring your Web browser to use helper applications.

Web Browsers

A Web browser is a client program that is used to connect to a WWW host computer (the server) and communicate with it. The Web browser handles some of the computing load while the host computer handles the rest. Since both the user's computer (the client) and the host computer (the server) share computing resources, this is called a client/server application. If you have a full service, PPP Internet account, your ISP will have provided a Web browser in your set-up software. The two major players in the current "browser war" are Netscape's *Navigator* and Microsoft's *Internet Explorer*. Because the vast majority of Internet users utilize one of these two software programs, we'll be using them as examples in this chapter.

To visit a Web site with your Web browser software, you need its "address." This address is usually referred to as a URL (for Uniform Resource Locator) and is generally a long, single-line input box near the top of your browser's screen display. A typical Web site address looks like this: **http://www.kentis.com**. Note that a WWW site address begins with **http://**; a home page address sometimes also ends with a slash, although this one does not. The **http://** designator indicates that the information is to be retrieved by the client software from the server computer through use of the hypertext transfer protocol. The language in which the page is created is called HTML, or hypertext markup language.

Once connected, the Web browser will display its opening screen (called a home page) at the listed address. The links to other sites or files are usually listed in blue and underlined. Some links are displayed as icons or buttons, much like the *Windows* or *Macintosh* graphical user interfaces. Once you click on one of these links, you go to the site indicated by the link. If you wish to go back to the original site, you click on the backwards arrow or **Back** button on your browser's screen. The browser remembers the prior address and returns you to it. Browsers can also take you to FTP or Gopher sites when you enter the site address preceded by the appropriate designation of "ftp://" or "gopher://." FTP and Gopher sites are discussed in detail in Chapter 5.

The site address referenced above is the home page of Kent Information Services' *Accounting Professionals' Resource Center*. To access the site using Netscape *Navigator*, follow these steps:

⇒ Open your Internet connection through the dialing software.

⇒ Launch Netscape *Navigator*.

⇒ Place your cursor in the **Go to:** box and type **http://www.kentis.com** (Note: at various times, the **Go to:** box might be labeled **Location:**).

⇒ Press **<ENTER>**, and the following screen will appear.

Figure 3-1.
Home page of the Accounting Professionals' Resource Center at the Kent Information Services Web site.
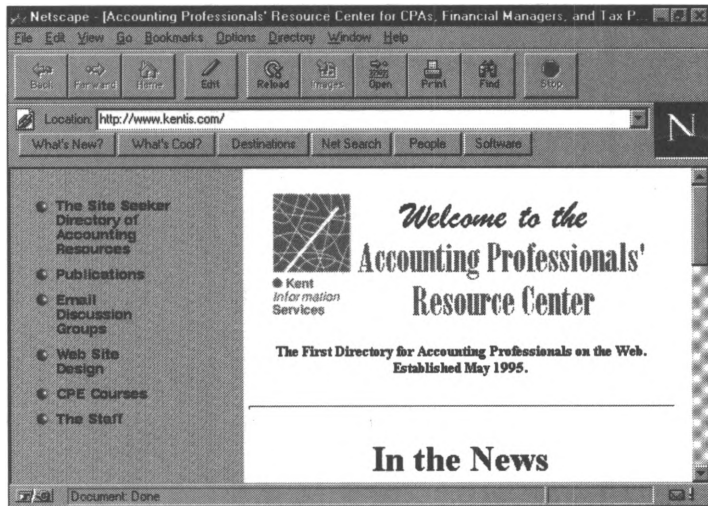
Many Web sites contain handy archive and reference information. Suppose you need quick access to a specific passage in the US Tax Code. A visit to the Taxing Times WWW home page, accessed here via Microsoft *Internet Explorer* client software, at **http://www. scubed.com/tax/tax.html**, reveals that the entire Tax Code is online, along with all federal tax forms and instructions in a variety of downloadable and printable formats.

Figure 3.2

Taxing Times Web site provided by Maxwell Technologies, Inc.
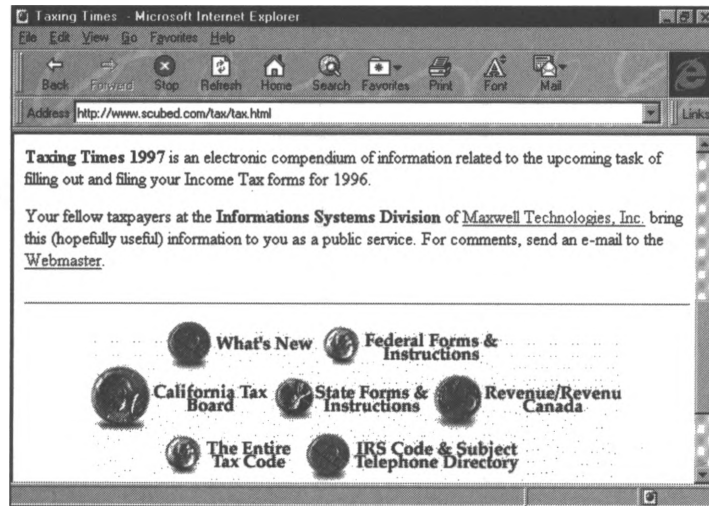
Certainly this Internet function is the most fun to use, because HTML documents (the screens displayed on the Web) incorporate graphics and sound in addition to words. You may find yourself lost for several hours the first few times you go "surfing" on the Web, because it is intriguing. Many companies and organizations are currently building Web sites to meet the rapidly growing demand for information delivered in this format. Below are the home pages of two prominent accounting firms, both accessed via *Internet Explorer*.

Figure 3.3
Home page of Ernst & Young, LLP.
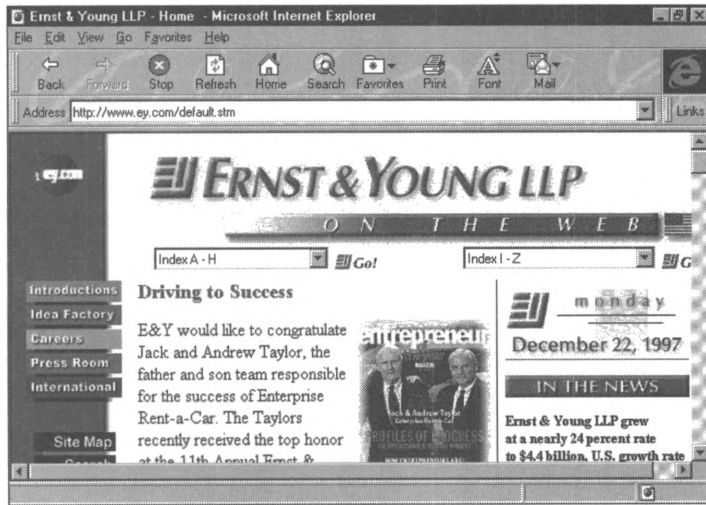
KPMG in Canada provides useful reference information, such as research reports and survey results, on their Web site.

Figure 3.4
Home page of Canada's KPMG.
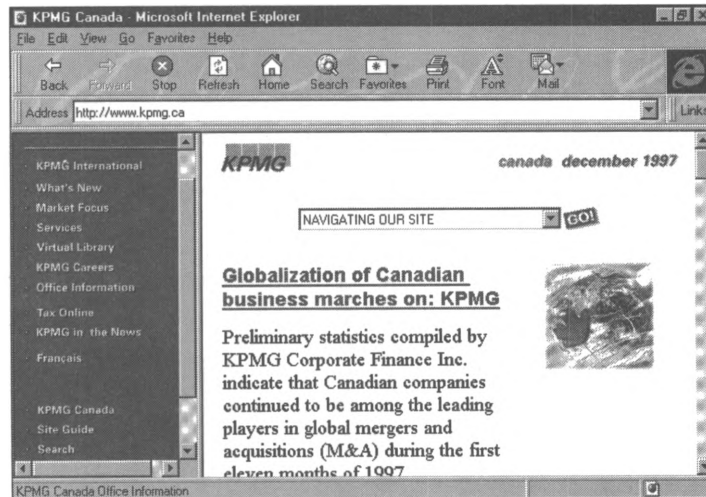
We have a word of caution, though, about the tendency for Internet users to move onto the Web and forget about the other useful Internet functions, like FTP and Gopher. Because Web sites are the newest type of Internet servers, they are also the least

developed and most sparse in terms of actual information
available. While the "wow" and glitter of Web sites will catch
your eye, and, undoubtedly, the content of these sites will very
soon catch up with the cosmetics, you'll still find a good deal of
in-depth information on those FTP and Gopher sites that have
been years in the building.

The most valuable Web sites are those that include many links to
other Internet sites, of whatever type. The home page of the
company that produced your Web browser is a good place to
start. The site of a professional organization, such as the
American Institute of Certified Public Accountants, is another.
This site contains hundreds of links to online resources for
financial professionals.

Figure 3.5
*Home page of the
AICPA Web site,
called AICPA
Online.*
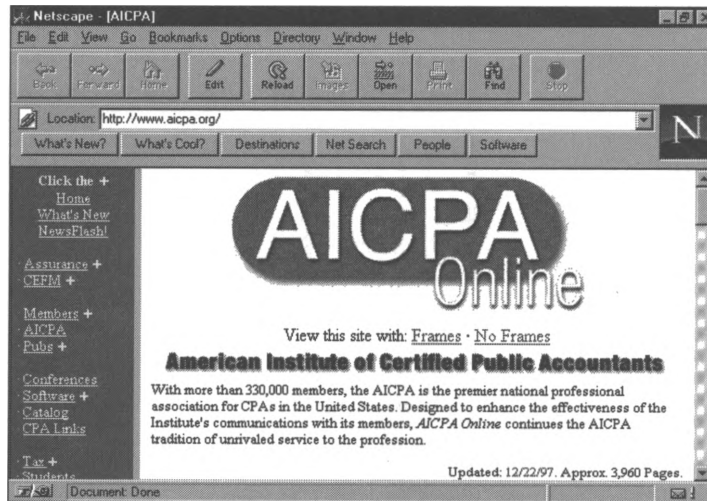
Customizing Your Web Browser

Just like all personal computer software these days, the most
popular Web browsers provide a series of options that a user can
manipulate to customize the software. In this section, we'll show

you some of the popular customizing options. You may wish to consult the user's manual of your Web browser to learn about the options available in detail and fine-tune your browser configuration.

Navigator Preferences

Most of the user-definable preferences in Netscape *Navigator* are located within the **Options** menu. For instance, the first area you will probably want to open when installing your Internet account and getting your browser up and running is the **Mail and News Preferences...** screen, as in the steps below:

⇒ Launch *Navigator*.

⇒ Open the **Options** pull-down menu.

⇒ Choose **Mail and News Preferences...**, and the following screen will appear.

Figure 3.6
Mail and News Preferences screen of Netscape Navigator.
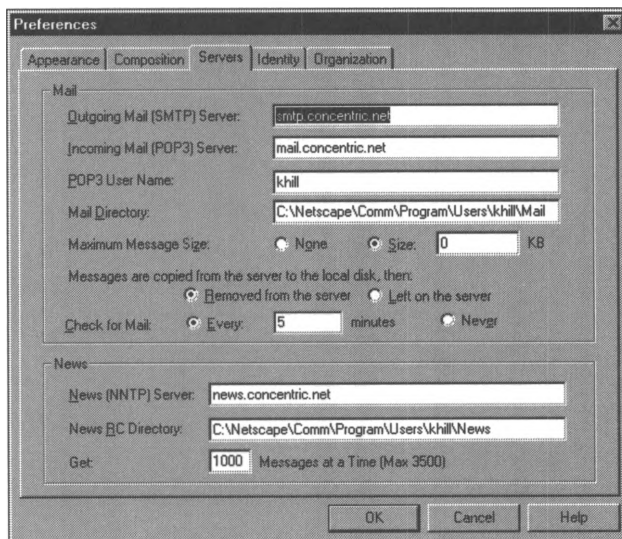
On this screen, you should fill in the names of the mail and news servers that your Internet service provider designates for your use.

If you need help configuring these preferences, simply call the customer service line of your ISP.

Another preferences screen that many users customize is the **Colors** area. To change the way that text and hypertext links will appear in your browser screen, follow these steps:

⇒ Launch *Navigator*.
⇒ Open the **Options** pull-down menu.
⇒ Choose **General Preferences...** .
⇒ Click on the **Colors** tab, and the following screen will appear.

Figure 3.7
Choices for customizing screen colors in Netscape Navigator.
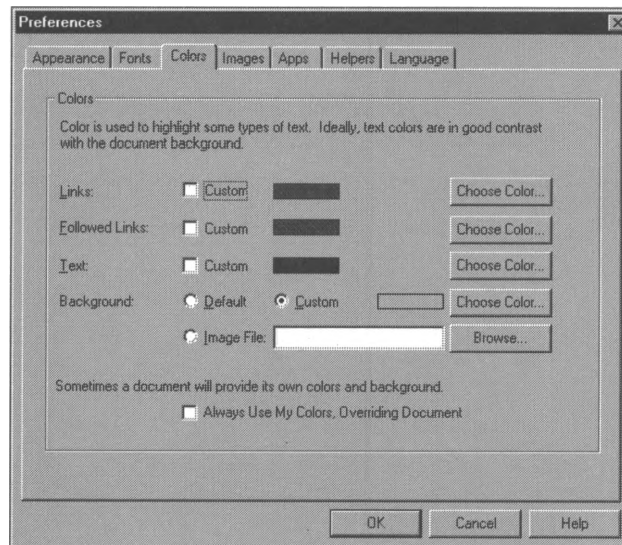
One area that you should be wary of customizing is the **Security Preferences...** choice under the **Options** pull-down menu. Before you change the default settings in this area, be sure you are either well versed in the ins and outs of browser security, or that you enlist the help of someone who knows your system, such as your network administrator. For most users accessing Internet sites from a stand-alone PC, the default security settings are

appropriate. See Chapter 7 for a more complete discussion of personal security on the Internet.

Internet Explorer Options

The customizing options in *Internet Explorer* are grouped under the **Options...** choice of the **View** menu. To modify the settings that control your dial-up connection to your Internet service provider, follow the steps below:

⇒ Launch *Internet Explorer*.

⇒ Open the **View** pull-down menu.

⇒ Choose **Options...** .

⇒ Click on the **Connection** tab, and the following screen will appear.

Figure 3.8
Setting Connection options in Internet Explorer.
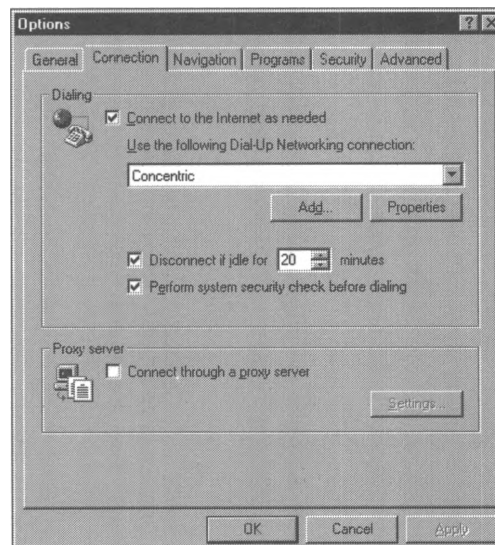
Here, you can designate which dial-up connection you wish to use when browsing the Web.

To change the appearance of your browser screen, set the options on the General tab.

⇒ Launch *Internet Explorer.*
⇒ Open the **View** pull-down menu.
⇒ Choose **Options... .**
⇒ Click on the **General** tab.

On this screen you can modify screen and link colors. Once again, be sure that you understand the ramifications of changing browser security options before changing items on the **Security** tab.

Usenet Newsgroups

The name Usenet describes a collection of over 1,000 bulletin board type discussion groups on the Internet. Each newsgroup limits its discussion to a specific topic. The benefit of participating in a newsgroup is that you generally get high-quality answers to almost any question. This is because you are asking a group of people from all over the world that share the same interest as you do. As long as you post a question that is pertinent to that newsgroup, you will probably receive dozens of replies, usually within a few hours.

As you become more familiar with Usenet, you will notice that the newsgroups are arranged in a hierarchy. Newsgroups began as an organized tree structure under several major topics: comp (computers); sci (sciences); soc (social issues); talk (chatting); news (Internet news); rec (hobbies and recreation); and misc (everything else). Soon, newsgroups were forming that could not

be accommodated within this structure, so a topic called "alternative" was formed; all groups within this structure start with "alt." Other special topics formed, including the business (biz) topic, which includes newsgroups related to business and commerce. As time progressed, the controls over the establishment and naming of newsgroups loosened. Now, a glance over the list of newsgroups available from your Internet Service Provider will demonstrate that the topics are somewhat scattered across categories.

Each particular newsgroup (say, for instance, ***biz.comp.accounting***) is named by beginning with the major topic (business), then the sub-topic (computers), then any other more precise topic (accounting). Therefore, the names of newsgroups look very much like the file path names on computers, except that the parts are separated by periods rather than slashes.

Although free-standing Usenet newsgroup client software is available, most people access Usenet through the "News" function of their Web browsers. To access the newsgroups available through your Internet service provider using *Internet Explorer*, follow these steps:

⇒ Launch *Internet Explorer*.
⇒ Press the **Mail** button (which is really the "Mail and News" button).
⇒ Choose **Read News**.

Note: At this point in the process, Internet Explorer may launch the Internet News Configuration Wizard to obtain some information from you. You will be asked to supply your full name, your Account Name and Password with your Internet service provider, your e-mail address, and the name of the Usenet news server computer at your Internet service provider. You may

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also be asked to indicate whether you use a local area network (LAN) or modem to access your e-mail, and which Dial-Up Networking connection you would like to use (choose the Concentric Dial-Up Networking connection).

⇒ As the launching of the newsreader program proceeds, you will see a message screen asking if you wish to download a list of available newsgroups (assuming that you have not previously used this function of *Internet Explorer*). Click the **Yes** button.

The list of available newsgroups may take from several minutes to 20 minutes to download. When the download process is complete you can scroll and click through the alphabetical listing of newsgroups to select topics of interest to you. You can also find newsgroup names that contain a particular series of letters or a word, such as "tax."

To find and subscribe to the ***misc.taxes.moderated*** newsgroup, follow these steps:

⇒ In the currently displayed Newsgroups window, type the word **tax** in the box labeled **Find newsgroups which contain**.

⇒ When the list of newsgroups appears in the lower part of the screen, click on the ***misc.taxes.moderated*** group and press the **Subscribe** button, as illustrated below. A newspaper icon will appear next to the newsgroup to which you have just subscribed.

⇒ Press **OK** to return to the Internet News screen.

Figure 3.10
Subscribing to a Usenet newsgroup using Internet Explorer.
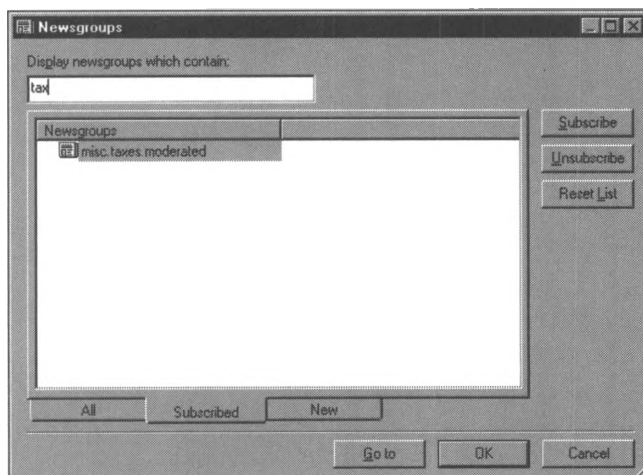
To view and read the postings in this newsgroup, follow these steps:

⇒ If the newsgroup ***misc.taxes.moderated*** does not appear in the box labeled **Newsgroups**, select it by clicking on the down-arrow at the right-hand side of the box and clicking on the ***misc.taxes.moderated*** newsgroup name.

⇒ If you are not already connected to the Internet via your Internet Service Provider, press the **Connect** button.

⇒ Wait for the newsgroup postings to download (the default setting in *Internet Explorer* is 300 postings downloaded at a time).

⇒ Scroll through the list of posting headers in the top portion of the screen until you find a posting that interests you, then click on it and the text of the posting will appear in the bottom portion of your screen.

Newsgroup Protocol

You'll want to make sure that you are up to speed on the subject of the newsgroup before jumping into any discussion by posting a

message to the newsgroup. You can educate yourself fairly quickly by scanning and reading the newsgroup postings over about a week. Then, when you are clear on the subjects that are being discussed, you can add your comments. You will also want to download and read carefully any "Frequently Asked Questions" lists that are posted in the newsgroup. These documents include the letters "FAQ" in their subjects, along with other topic information. They are posted by the founder or a long-standing member of the newsgroup, and they contain the answers to questions frequently asked by newcomers.

When posting comments to a newsgroup, remember to be polite and keep within the topic. These are two of the most important rules of "Netiquette," the set of informal rules for appropriate behavior on the Internet. Being polite includes remembering that a world-wide system such as the Internet includes users from many cultures and social backgrounds. Make sure that you compose your messages clearly, so that they are not misconstrued or understood in a context that you did not intend. Also, remember that the subject heading is the criterion people use to select a posting to read. Taken together, all postings with the same subject heading constitute a "thread." Thread drift, the tendency for messages with a particular subject heading to drift off the relevant subject and into tangent territory, is very annoying to busy newsgroup users who take the time to read postings that end up being irrelevant for them. Make sure to start a new thread by posting a message with a new subject heading if you wish to comment on something other than the thread's subject. The postings in the *news.announce.newusers* newsgroup contain many additional guidelines for using Usenet, such as tips on writing style for postings and advice for finding the right newsgroup in which to post a question or comment.

When you are ready to make a posting to a newsgroup (perhaps a question or a reply to a question posted by someone else), just click on the **New Message** button and create your posting, along with an appropriate subject line. Then, click on the **Post** button at the upper left of your screen (a thumbtack and paper icon) to transmit your posting. When you have a particular posting displayed and you wish to respond to it, you can press the **Reply to Group** button to post a reply to the newsgroup, or you can press the **Reply to Author** button to send a private reply via e-mail only to the posting's author.

Telnet

The Telnet function of the Internet is much like the terminal emulation function of your personal computer's communication software. Via Telnet, you can access another mainframe computer as if your computer is a terminal for that mainframe. When you access another mainframe via Telnet, you are leaving the environment of your Internet Service Provider and entering the environment particular to that system. You may need a sign-on name, a password, or other qualifying information. Telnet is especially useful for gaining access to sites with specific, interactive systems that are not suitable for adaptation to other types of Internet servers.

To use Telnet, you must first determine how your Internet account makes this function available to you. For users of UNIX dial-up accounts, Telnet is usually accessible by typing **telnet** at the command prompt. There are also stand-alone client software programs you can use to access Telnet sites. However, just as with Usenet newsgroups, most Internet users visit Telnet sites by

installing Telnet software and configuring it to work with their Web browser client software.

To download a popular Telnet shareware program called *EWAN* and configure it to work with *Navigator*, follow the steps below:

⇒ Launch *Navigator*.
⇒ Visit the *EWAN* Web site at **http://www.lysator.liu.se/ ~zander/ewan.html**.
⇒ Click on the **latest version** link (about mid-way down the page); the following screen will appear.

Figure 3.11
Downloading the EWAN Telnet software.
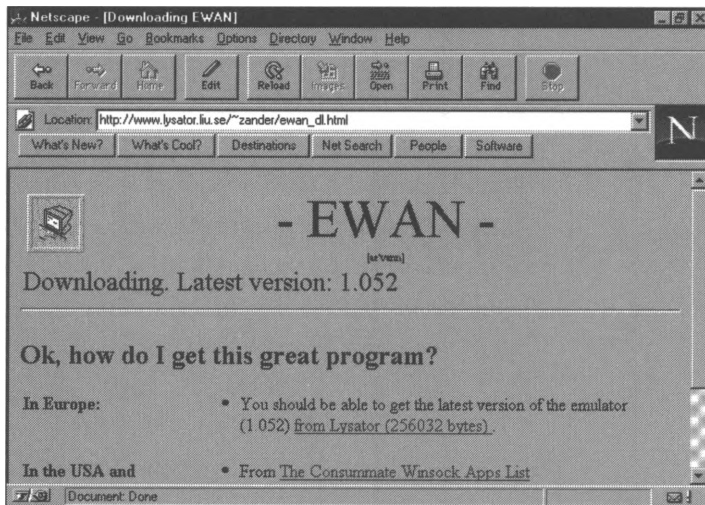
⇒ Choose a download location and click on the link to initiate the download process.
⇒ When prompted by *Navigator*, click on the **Save to Disk** button and choose a location on your hard drive in which to store the file. Many users store downloaded programs in the **Temp** folder.

You will notice that the filename ends in the extension *.zip*, indicating that this is a compressed file. If you do not know how

to decompress this type of file, see the *WinZip* section of Chapter 5. You will need to download and install *WinZip* software and successfully decompress the *EWAN* installation file before you can finish the installation process. When you have completed those steps, proceed with the installation, as outlined below.

⇒ From the *Windows 95* **Start** menu, choose **Run...** and browse and select the decompressed *EWAN* file to execute it.
⇒ Follow the on-screen installation instructions.

When you have completed the *EWAN* software installation, you are ready to configure *Navigator* to use *EWAN* when accessing Telnet sites through the Web browser software.

⇒ Launch *Navigator.*
⇒ Open the **Options** pull-down menu.
⇒ Choose **General Preferences...** .
⇒ Click on the **Apps** tab.
⇒ In the **Telnet** box, fill in the location of the *EWAN* program, which you chose during the installation of the software, as illustrated below.
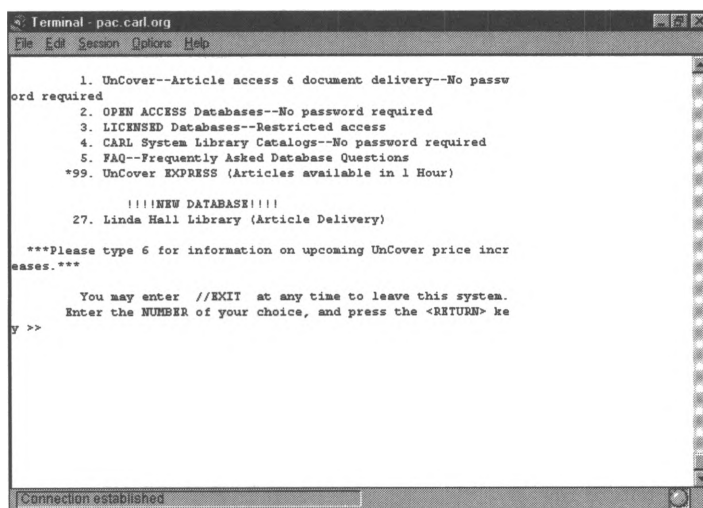
Figure 3.12
Configuring
EWAN as a
Navigator Telnet
application.
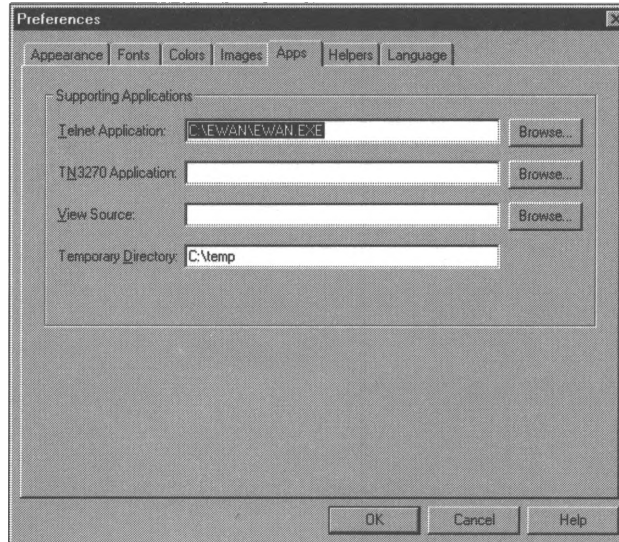
Now, you can use *Navigator* to visit Telnet sites. When you enter a URL that begins with the designator **telnet://** in the **Go to** box, *Navigator* will automatically launch *EWAN*. For example the illustration below shows the opening terminal screen that appears when using *Navigator* configured with *EWAN* to access the very useful Colorado Alliance of Research Libraries (or CARL) Telnet site at **telnet://pac.carl.org**.

Figure 3.13
*Opening screen at
the CARL Telnet
site.*

If you visit this site, you will notice that the server computer first
asks you which service you wish to access, and which type of
terminal you are using (almost always VT-100).

Because you are approaching a mainframe computer as one of its
own users when you use Telnet, be prepared for some
roughriding and quirks. The mainframe you are accessing may
not have the same command keys, screen mapping, and screen
navigation keys as those to which you are accustomed. The initial
sign-on screen usually gives tips on how to make your way
through the system. Some systems may offer Telnet access, but
only to registered users. Many systems allow public access, but
they publish sign-on instructions elsewhere on the Internet, such
as in mailing lists or at World Wide Web sites. The Colorado
Alliance of Research Libraries, illustrated above, allows public
sign-on via Telnet, and you can search the variety of catalogs and
indexes from this large library consortium by following the on-
screen instructions. However, to order a journal article from their
extensive collection, you must first establish an account with
them through another channel.

When accessing another system, try to use the appropriate sign-off procedure, usually defined at the sign-on screen. Many systems use "exit" or "/exit" or some version of "logoff." If you get stuck in a Telnet connection and cannot exit the system, try pressing the **<CONTROL>** key along with the right square bracket "]." This is a generic escape sequence for many systems.

Helper Applications

As you have probably learned by now from your own Web surfing, Web browsers are very powerful and versatile software tools–but they do have limits. Internet site developers create a vast number of files in various programs and save them with any number of file extensions that identify the programs needed to open them again. Web browsers recognize HTML and some other types of files (such as text and GIF graphics files), and you may even add plug-ins to your browser that will allow it to display non-HTML documents in the Web browser window. But to display some types of documents, Web browsers require help.

As you know, the driving idea in the development of the WWW is the integration of various kinds of data into a single, user-friendly interface. To meet this goal, Web developers rely on MIME (Multi-Purpose Internet Mail Extension). Originally, MIME was used to enhance the abilities of electronic mail. Using headers attached to the e-mail messages, MIME identifies the type of content in the messages and, when necessary, delivers the messages into the application program associated with the content type. MIME can be used in the same way to associate files retrieved through a Web browser with the application files that can read them.

You can configure your Web browser to recognize the extensions of the files used most at Internet or intranet sites you visit and to "hand off" these non-HTML files to the appropriate programs. For example, if you access many *Microsoft Word* files, you may wish to configure your Web browser to automatically launch *Word* for viewing a retrieved file. To configure *Word* as a helper in *Navigator*, follow the steps below:

⇒ Launch *Navigator*.
⇒ Open the **Options** pull-down menu.
⇒ Choose **General Preferences**.
⇒ Click on the **Helpers** tab.
⇒ Click on **Create New Type**.
⇒ Fill in the screen as shown below.

Figure 3.14
Configuring Navigator to recognize Microsoft Word as a helper application.
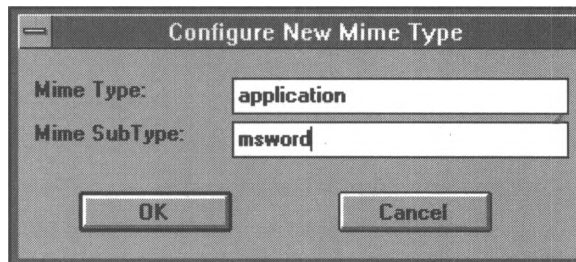
When you click on **OK**, you will be returned to the Helpers screen where you can identify the file extensions associated with the application program (*.doc* and *.wrd*) and the name and location of the application program (*c:/winword/winword.exe*). When you click on **OK**, your new application will be added to the list of helper applications, as in the screen below.

Figure 3.15
Adding Microsoft Word to the Navigator helper applications.
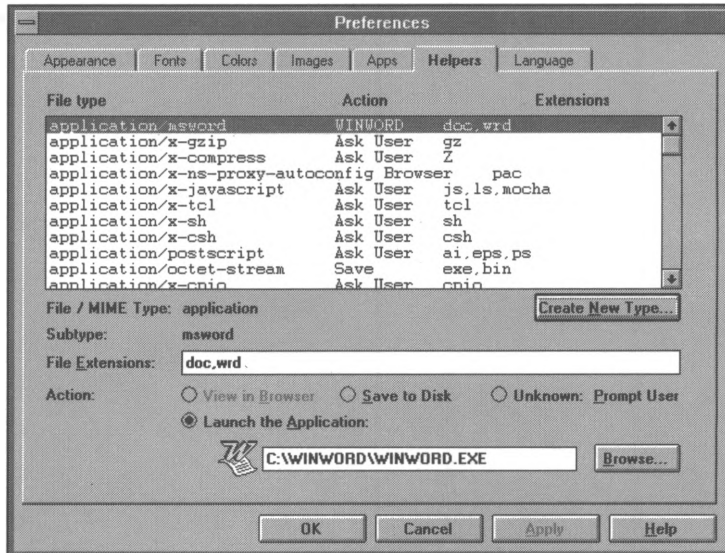
A very popular file viewer that you will surely wish to download and install as a helper application is the Adobe *Acrobat* viewer, available at **http://www.adobe.com**. Files created in Adobe Portable Document Format (PDF) are very common on the Internet; in fact, many tax forms, government publications, and software manuals are distributed in this format.

In the following two chapters, you will learn how to use other functions of the Internet, including e-mail and leading-edge tools such as video conferencing. In addition, you will see how commercial online services, such as *America Online*, provide specialized software for customers to access Internet functions.

Chapter 4
Electronic Mail and
Commercial Online Services

As you learned in Chapter 3, World Wide Web browser software, such as *Internet Explorer* and *Navigator*, provides a friendly, graphical way for Internet users to visit Internet sites and find information. By now, you've probably used your browser to visit Web sites, download files, and perhaps even conduct a search or two. This chapter describes how to use the electronic mail module of your Web browser to send and receive e-mail messages. Even if you've already used Internet e-mail, we suggest that you read the e-mail section first, because it contains some useful background information on how Internet sites are named, and the conventions of online correspondence. In addition, we'll show you how to find and subscribe to e-mail discussion lists, also called subscription mailing lists. And, because many people use e-mail and other Internet functions through specialized software provided by a commercial online service such as *America Online*, we'll also show you the features available through such a service. This chapter covers the following topics:

- Electronic mail.
- Subscription mailing lists.
- America Online.
- CompuServe
- Microsoft Network.

Electronic Mail

You can send electronic mail on the Internet to any other person or organization connected to the Internet with no long distance or postage charges. Your message will be sent in one or more packets, and each one will include a packet header containing your e-mail address, your recipient's e-mail address, and the total number of packets in your transmission. The TCP/IP communications protocol used throughout the Internet will ensure that the packets all arrive at your intended destination and that they get re-assembled in the correct order. As the packets travel to their destination, they will traverse the web-like structure of shared communication lines we described in Chapter 1. This "party line" approach to sharing lines is what makes the Internet so economical.

E-mail Addresses

E-mail must be addressed to the person to whom you wish to send it, just like any piece of mail. However, Internet e-mail must be addressed EXACTLY and correctly, unlike US Postal Service mail or UPS packages, which might contain a small address error and still arrive at their destinations. This is because Internet e-mail is routed and delivered entirely by computer programs, whereas other types of mail usually receive some human attention in their delivery. On the other hand, regular US mail is called "snail mail" by clever Internet users who are impressed with the comparative speed and efficiency of e-mail.

Just like any other mail, e-mail must be addressed to a person (called a user on the Internet), and a place (called a domain). An Internet e-mail address is comprised of the following components: (1) the user name, and (2) the domain. These two

items are separated by the @ symbol which is referred to as the
"at" symbol. There is only one @ symbol in any e-mail address,
and it always separates the user name from the domain. Thus,
when you send e-mail to a specific person, you are sending your
message to a single user at a single domain. These are the two
halves of an e-mail address.

User Name

The portion of an Internet address that precedes the @ symbol is
the user identification for the specific person to whom you are
sending mail. Each user has a unique name that is assigned by
the administrator of the system through which the user connects
to the Internet. In the e-mail address **johng@kentis.com,** "johng"
is the user name.

Users of commercial online services, such as *America Online* and
CompuServe, can be reached via Internet e-mail by sending
messages to their user ID on that service followed by the @ sign
and the domain name of the commercial service. *America Online*
users have formats like **johng@aol.com**. When addressing mail to
CompuServe users, you must replace the comma in their user IDs
with a period. Therefore, *CompuServe* user 72204,2525 has an
Internet e-mail address of **72204.2525@compuserve.com**.
CompuServe has recently introduced personalized e-mail names,
which means that users can select their own user names on the
"compuserve" domain.

Domain

The domain portion of an e-mail address specifies where the mail
is to be delivered. It corresponds roughly to the city and street
name on a letter sent through regular US postal mail. Once you
are accustomed to looking at domains, you'll see that you can
glean quite a lot of information from them. Each domain name is
unique on the Internet, and the domain portion of the address

may also contain a machine name, an abbreviation for domain type, and some indication of geographic location, all separated by the period symbol (also called "dot"). The generic format for an Internet e-mail address is:

user@machinename.domainname.domaintype

There are no spaces in an Internet e-mail address, so all portions of the address are separated by the @ symbol or a period (dot). If someone were to read the e-mail address **johng@kentis.com** to you over the phone, it might sound something like this: "john-g at kent-i-s dot com." When e-mail addresses appear in print, they are often enclosed in quotation marks or ended with a period, because the e-mail address falls at the end of a sentence or bullet item. However, no e-mail address really ends in a period or contains quotation marks, so you should eliminate any extraneous punctuation when using an e-mail address you find in printed material.

In large systems with multiple computers that share a domain name, such as a university domain with several mainframe computers, there may be more than one computer that has e-mail user accounts assigned to it. In those cases, a machine name will precede the domain name, as always, separated by a dot. The abbreviation following the domain name may designate what type of institution runs the domain:

.com indicates a company
.gov denotes a governmental agency
.org describes a not-for-profit organization
.edu indicates an educational institution

Sometimes, the type of domain is replaced by the domain's geographic location, as in **johng@kentis.kent.oh.us**. Recently, the

InterNIC, the body responsible for assigning domain names, has begun assigning some US domain names with the country code ".us," to be consistent with the domain naming conventions in the rest of the world.

Sending and Receiving E-mail

Which software you will use to create, send, and manage your e-mail transmissions will depend to a large extent on the type of Internet connection you have chosen. If you access the Internet through a commercial online service such as *CompuServe* or *America Online*, your commercial service software will include an e-mail module. If you have a mainframe account through a university or corporation, or a UNIX shell account, your suite of mainframe software will include a text editor and mail management program. In either case, you should contact the customer support group of your commercial online service or the system administrator (or online help area) of your UNIX account to get help with using the e-mail module.

If you have a full-service account through an Internet Service Provider (ISP), you have a wider range of choices. Your ISP may have supplied set-up software that includes a mail module; for instance, *Eudora* is a popular stand-alone e-mail program provided by many ISPs to their customers. Most Internet users, however, simply use the e-mail module integrated into their World Wide Web browsers. Both *Navigator* and *Internet Explorer* include fully featured mail tools that will serve most people's needs.

Once you gain access to an e-mail module, you will want to practice creating and sending e-mail. You can send a message to someone you know, or you can send a test message to yourself. For this example, suppose you wish to send a message to Kent

Information Services to obtain more information on technology self-study courses. Below are the steps to send an e-mail to John Graves using the Mail tool of *Internet Explorer*:

⇒ Double-click on the icon called **The Internet** on your *Windows 95* desktop.

⇒ Click on the **Mail** button on the toolbar (with an icon of a newspaper and an envelope).

⇒ Choose **New Message...** .

⇒ At the New Message screen, click in the **To** field and fill in the e-mail address of the person to whom you wish to send the message (in our example, **johng@kentis.com**).

⇒ Fill in the **Subject** field with the subject of your message.

⇒ Type a message in the text portion of the screen.

When the message is complete, it will look something like the one below.

Figure 4.1
Creating an e-mail message with Internet Explorer.
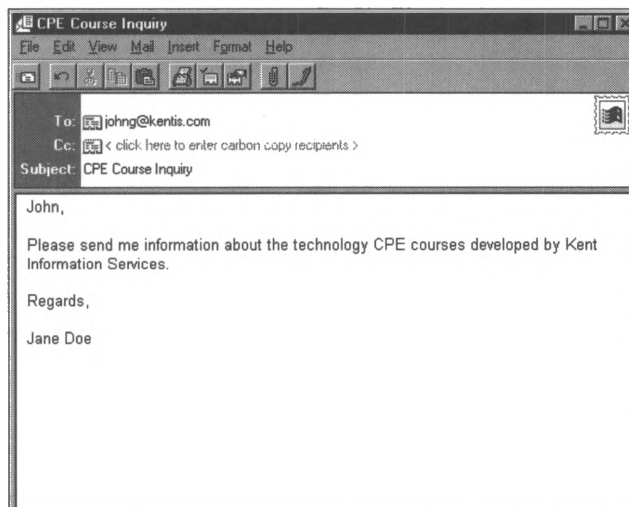
⇒ To send your message, click on the **Send** button on the left end of the toolbar (an icon of an envelope with lines to the left). *Internet Explorer* will display a screen
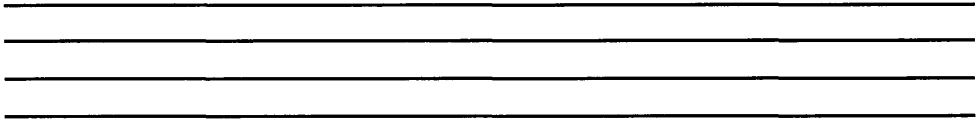
informing you that your message has been placed in your **Outbox**.

When you are ready to transmit your outgoing mail and receive your incoming mail, establish a connection with your Internet Service Provider via the dial-up connection. Click on the **Mail** button from the *Internet Explorer* main screen, choose **Read Mail**, and click on the **Send and Receive** button.

Here's how to create an e-mail message with Netscape's *Navigator* WWW browser:

⇒ Double-click on the **Navigator** icon on your desktop in *Windows 95*.
⇒ Open the **Window** pull-down menu.
⇒ Choose **Netscape Mail**.
⇒ Click on the **To: Mail** button on the toolbar (an icon of a letter in an envelope).
⇒ In the Message Composition screen, place your cursor in the **Mail To:** field and type the e-mail address of to the person to whom you wish to send the message.
⇒ Fill in the **Subject:** field with the subject of your message.
⇒ Type a message in the text portion of the screen.

Your message will look something like the one below.

Figure 4.2
Creating an e-mail
message with
Navigator.
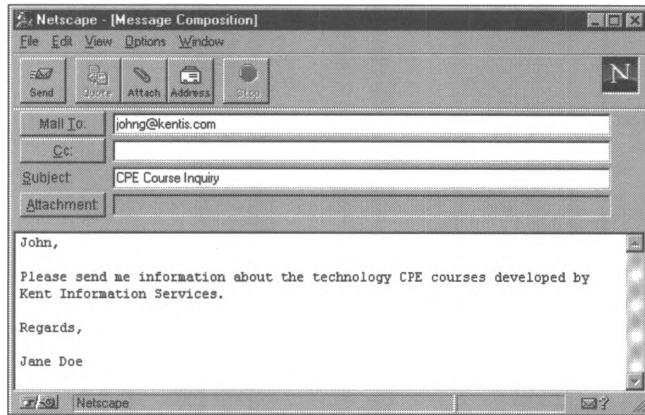
To send your message, click on the **Send** button at the left end of the toolbar. If you are not already connected to your Internet Service Provider, *Navigator* will launch your dial-up connection and send the e-mail message to your recipient.

Once you begin sending and receiving e-mail, you'll quickly see that electronic correspondence tends to differ from printed correspondence. For instance, writers of e-mail seem to favor brief messages with informal structure. They tend to put less emphasis on the form of the e-mail (say, a memo or a letter) and more on the content. First names are used much more often in e-mails than in regular letters, and long, convoluted sentences are frowned upon. It may take some time for you to get accustomed to the brevity and reduced formality of e-mail communication, but you will probably come to appreciate it.

Recipients of e-mail messages also appreciate your efforts to make the subject heading of your e-mail as clear and specific as possible. Many Internet users receive hundreds of e-mail messages per day, and whatever you can do to make reviewing them easier will earn you "Netiquette points." For instance, a subject heading that reads, "Question" is much less clear than

one which reads, "Query on Subscription Prices." ("Netiquette" is the jargon term used to describe the rules of behavior of the Internet. Netiquette is so important that we dedicated an entire section to these formal and informal rules, Chapter 4, "Netiquette and Copyrights.")

The Internet also has a whole set of informal, always changing, abbreviations and electronic gestures, called "emoticons." For instance, a "smiley face" is composed of a colon and a right parenthesis: :) . The alphabetic counterpart to a smiley face is a "grin," which is a lowercase letter g enclosed in carets: <g>. Both :) and <g> indicate that the writer is kidding, or is amused and mirthful. These can be good indicators in written language, because plain text can be misunderstood so easily. Taken together, these electronic colloquialisms form a sort of online language. Before long, you'll be fluent in "online-ese," and, if you're anything like us, you'll be tempted to use the efficient, friendly tone of e-mail in all your correspondence.

Sometimes, e-mail does not reach its intended destination, for any one of a number of reasons. Perhaps you inadvertently made an error when typing in the e-mail address. Or, perhaps the user to whom you are sending mail is no longer a registered user at the domain where you are sending the mail. When mail cannot reach its destination, it is returned to your mailbox along with a system message describing the delivery problem. You may want to contact your recipient via another channel (like the telephone or fax) to determine how to correct the e-mail address on the message.

Often, you will need to ascertain someone's e-mail address before sending your message. There are several ways to discover e-mail addresses. The first is to simply contact your intended message recipient via phone or check the person's business card,

letterhead, or other printed material for an e-mail address. The next level of discovery is to search the online index on your local system, if your message recipient is also a user of that system. For instance, a *CompuServe* user can search the Member Directory for other *CompuServe* users' e-mail addresses. This Directory is organized by name, state, and city of residence. Other types of Internet access providers, such as university systems, supply similar directory and "phonebook" tools.

Many academic and commercial Internet sites provide a server specifically for finding user names and e-mail addresses, called a Who-Is server. If you have access to Who-Is client software, you can enter the name of the domain where you think a particular person has an Internet account along with their name to discover their e-mail address. You can also use World Wide Web browser software to search any one of several Internet directories available online. Two of the more popular databases are *Look Up!* (**http://www.lookup.com**) and *Four 11* (**http://www.four11.com**). Several of the more popular Web search engines, such as *Yahoo!* and *Excite*, also provide directories for locating e-mail addresses.

Subscription Mailing Lists

As we discussed in Chapter 3, Usenet is a grouping of online bulletin boards that you can access via the News tool in your Web browser. Subscription mailing lists on the Internet are similar to Usenet newsgroups in several ways. Like newsgroups, mailing lists also provide a forum for persons with similar interests to share knowledge and expertise. They provide announcements and information related to a particular, sometimes very specific,

topic. However, mailing lists are available only by subscription and are not open to the general public as Usenet newsgroups are. There is no charge for a mailing list subscription, but you must purposefully subscribe to the list. You will receive the mailing list messages in your electronic mailbox each day or set period until you un-subscribe from the list. This is in contrast to Usenet, where you read and download messages only when accessing Usenet via your News software. While only a small percentage of Usenet newsgroups are moderated (meaning that messages are reviewed by a central authority before posting), all mailing lists are subject to some sort of coordinated control, the rules of which are determined by the person who started and maintains the list, called the list "owner." So, subscription mailing lists are a more focused, controlled type of discussion group.

Once you have found a mailing list in which you wish to participate, you should send a subscription message to the automated list administration address. With slight variations, the format is typically structured in the following manner: (1) address the message to "listproc," "listserv," or "majordomo" at the home domain of the list; (2) leave the subject line blank (or, if your mail program requires a subject, enter spaces or the word "subscribe"); (3) in the body of the e-mail message, at the left-hand margin, type the word "subscribe," then the name of the mailing list, then your own first and last names. It is very important that you address this e-mail to listproc or listserv and not to the mailing list itself. If you address the message to the list name, your subscription request will be distributed to the hundreds or thousands of persons in the mailing list distribution group—very embarrassing for you and annoying for them. A mailing list subscription request for the tax discussion group called ATax-L is illustrated below, using the *Navigator* e-mail tool.
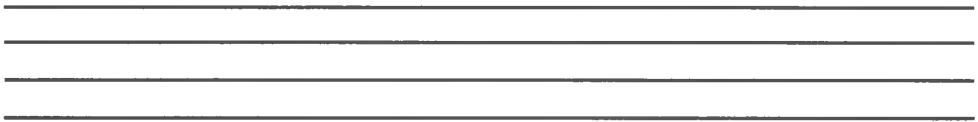
Figure 4.3
*Subscribing to a
mailing list.*
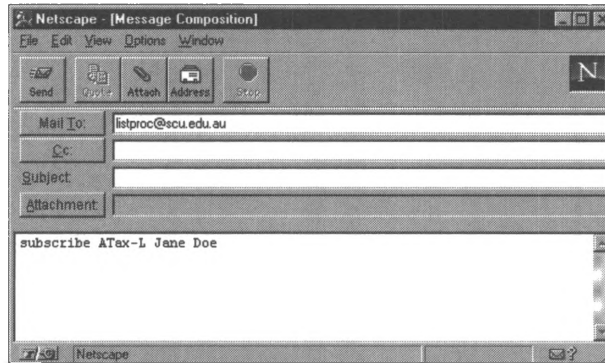
To determine exactly how to address the subscription message and how to type the body line of the request, you will need to have access to some type of information regarding the list in which you wish to participate. Tips on locating useful lists and their specific subscription requirements are discussed below and in Chapter 9, "Online Research."

After you have subscribed to a list, you will want to watch the postings for some time to become familiar with the list subjects and participants. The guidelines outlined above for appropriate Usenet participation apply to mailing lists as well. You will find a more in-depth discussion of the do's and don'ts of mailing list participation in Chapter 6, "Netiquette and Copyright." When you feel ready to send a comment or question to the members of the group, simply address your message to the group name at the home domain for the list. For instance, a message intended for the whole distribution list of the ATax-L mailing list would look like the one below.

Figure 4.4
*Creating a
subscription
mailing list
message.*
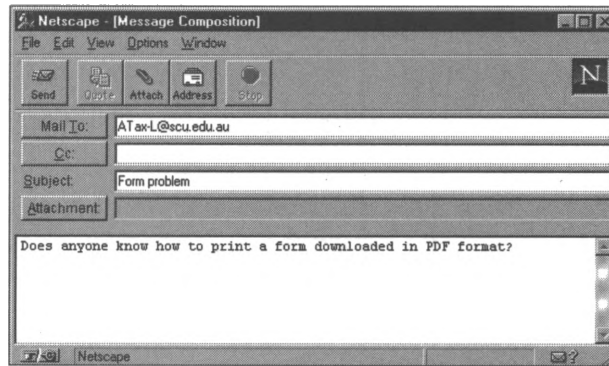
Because this message is addressed to the list name, it will be distributed to all persons currently subscribed to this mailing list.

The most difficult part of participating in mailing lists is discovering the lists that might be most interesting for you and appropriate for your needs. Many people hear about useful lists via word-of-mouth, Usenet newsgroups, or other professional interactions. There is one particularly helpful archive site of many mailing lists and their descriptions available via the World Wide Web. *The Liszt Directory of E-mail Discussion Groups* (**http://www.liszt.com**) allows users to search for mailing lists related to keyword subjects. This search engine is discussed in more detail in Chapter 9.

Once you have subscribed to pertinent lists, there is very little more for you to do except read, contribute, and support the list's activities. However, if you plan to be away from your computer for a while on vacation or business travel, you will want to have your messages temporarily held for you. The procedures to accomplish this hold vary–the guidelines sent to you when you subscribed to the list will include a specific command for this purpose. These guidelines also include instructions for how to un-subscribe from a list (usually the same as subscribing, only with "Unsubscribe" in place of "Subscribe" in the body of the

message), obtain a listing of all list subscribers, and other useful information, so print or save the instructions to disk for future reference.

Commercial Online Services

In this section, we will review three of the most popular commercial online services, *America Online, CompuServe,* and *Microsoft Network.* Each service offers specialized utilities, files, and reference databases that are very useful to accounting and finance professionals. Many people choose a commercial online service as their first avenue of access to the Internet. As they become more familiar with Internet tools and procedures, many move on to full-service accounts with Internet Service Providers. However, commercial online services continue to offer a selection of specialized resources that can be of great use in your information retrieval and research efforts. Below, we highlight some of these resources and give a general overview of the proprietary software used to access each service.

America Online

America Online (AOL) is a commercial online service that offers resources of interest to both small and large businesses. The *AOL* software includes rich content resources in 21 channel categories (see screen below), basic Internet services like e-mail, FTP, and Gopher, as well as an integrated Web browser.

Figure 4.5
Channels screen
of America
Online.

AOL content can be accessed in a number of ways, including menus that ask you to select increasingly narrow subjects, toolbar selections that bypass some of the intermediate selections, or through keywords that take you directly to the area of *AOL* services you wish to use. Menu selections begin in the Channels screen in which clicking on one of the 21 categories opens another window with more narrow subject choices. You can customize a menu for your own use of the service through the My AOL screen, which is accessed via the **My AOL** button on the toolbar.

Most *AOL* areas are labeled with corresponding keywords–when you find an area you like, check the keyword so you know how to return quickly. For example, in the bottom right corner of the Personal Finance window (below), the notation "Keyword: Personal Finance" tells you that entering the keyword **Personal Finance** will bring you to this menu.

Figure 4.6
The Personal
Finance menu on
America Online.
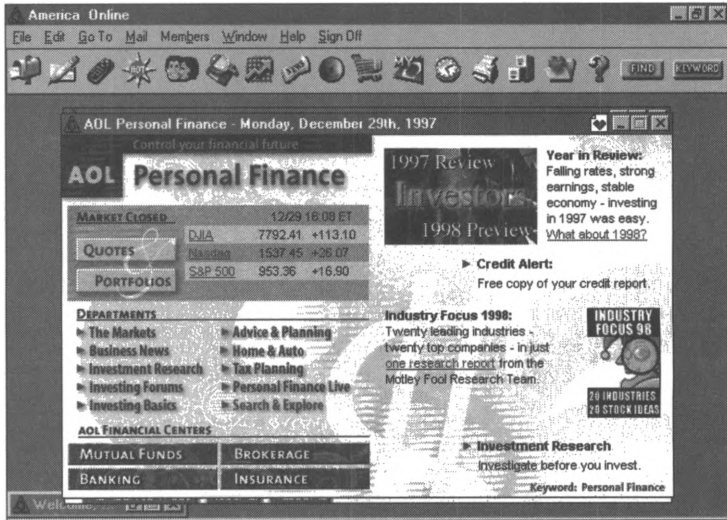
AOL has been a leader in offering a unique seamless interface between their content services and the Internet capabilities that subscribers can access through their *AOL* accounts. One of the most attractive features of *AOL* is that you may not need to launch the Web browser and complete a separate search of WWW sites when looking for information related to any of *AOL's* subject categories. Instead, the Web browser is integrated with *AOL's* other content sources. This means you can enter any *AOL* channel and find many *AOL* content resources, as well as related WWW sites that you can reach directly from that service category, or channel. If you double-click on a menu choice that is a WWW site, *AOL's* Web browser will launch and take you directly to the site's URL. If you have installed a version of the *AOL* software that did not include a copy of the WWW browser, a screen will display that gives instructions for downloading *AOL's* specialized version of *Internet Explorer*. Of course, you can also launch the Web browser as a separate step and search the Web through more traditional methods. To launch the Web browser, click on the globe icon on the toolbar.

There are obvious advantages to the *AOL* integrated service–*AOL* does the WWW searching and screening for you in the 21 channel categories. However, the choices made by *AOL* are only a starting point for WWW research. You will probably want to supplement the *AOL* search with a thorough follow-up on more traditional WWW searching techniques–research the links that are available in the most valuable sites to which *AOL* has led you, and visit one of the WWW search engines discussed in Chapter 9, "Online Research." Chapter 9 also includes a discussion of how to perform research using *America Online's* information content and what resources are available on this service for accounting and finance professionals.

CompuServe

Many businesspersons have been *CompuServe* customers for some time–it has been the leading commercial online service in the business sector for years. *CompuServe* provides a *Windows-*based software package for accessing the service, similar to the *America Online* interface discussed in the previous section. Called *CompuServe Information Manager*, or *CompuServe Interactive*, the software allows users to navigate this large commercial online service with relative ease, using standardized menus and screen formats. The opening screen provides a selection of large button icons, as illustrated below.

Figure 4.7
*Main Menu
screen of
CompuServe.*

Pressing the **Table of Contents** button results in the following screen, which contains 18 general service categories, along with three service groupings.

Figure 4.8
*Table of Contents
screen of
CompuServe.*

CompuServe is beginning to move many of its information resources onto the Web, so more and more of *CompuServe's* screens are Web-based. For instance, pressing the Internet button

on the Main Menu screen results in a screen with the Web address of **http://member.compuserve.com**. From this screen, you can access some of the newest services available through *CompuServe*, like basic Internet training and gateways to four popular Internet search engines. To find out more about performing general and business research on *CompuServe,* see the discussion in Chapter 9, "Online Research."

Perhaps the most useful areas on *CompuServe* are the discussion areas, called forums. To reach a forum, click on the **Forums & Communities** button from the Main Menu screen. You can choose forums of interest by following the nested menus under the Forums by Subject Groups listing, or you can search for forums that carry topics of interest to you through the **Find** tools on this screen. When you find a forum of interest, double-click on its name to enter the forum area. You will see buttons for the main areas of the forum, including Message Boards and File Libraries, which are organized into sub-topics. The first time you enter a forum, you will be asked to "join" the forum by entering your name and, if you wish, your interests into fields on a welcome screen. You are then free to post and reply to messages or join live forum conferences.

Microsoft Network

If you have installed *Windows 95* on your personal computer, you probably have seen the **Microsoft Network**, or **MSN**, icon on your desktop. A basic version of the *MSN* access software is included in the *Windows 95* operating system. To establish an account with *MSN*, you can simply launch the program and follow the on-screen instructions. Thereafter, when you launch the program, you will be connected to the *Microsoft Network* automatically. If the access software has been upgraded to

another version since you installed *Windows 95*, you will be prompted to initiate an upgrade of the program before signing on.

Similar to *America Online* and *CompuServe, Microsoft Network* provides a selection of information resources and features organized into various categories, as illustrated in the main screen below. *MSN* also provides customers with full access to the Internet in addition to the subscriber service, like the two commercial online services discussed above.

Figure 4.9
Main screen of Microsoft Network.
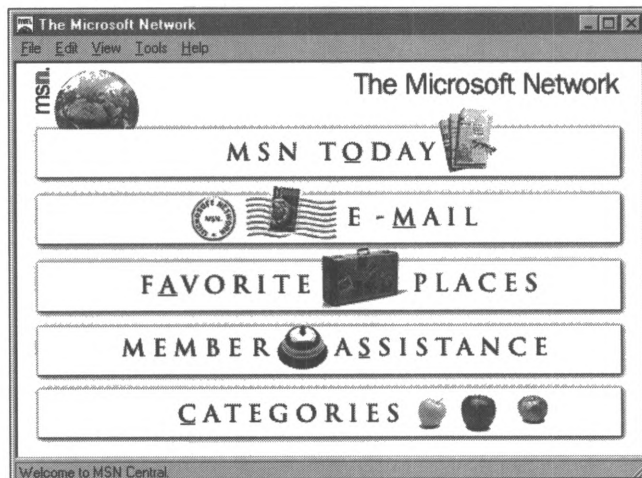
However, *MSN* differs somewhat from the other two commercial online services in that *Microsoft* also maintains an extensive Web site that can be accessed by the general public (**http://www.msn.com**) in addition to the proprietary content maintained on its subscriber service. Subscribers can access members-only areas of the Web site through their Web browser and a full-service Internet account in addition to visiting the service directly via the specialized access software.

By pressing the **Categories** button, you can access the major content areas of *MSN*, which are also called Channels. Some of the sub-topics within Channel menus link to Web pages; if you

double-click on one of these choices, *MSN* will automatically launch *Internet Explorer* and access the page via the browser software. The *MSN Classic Categories* icon within the Categories screen organizes *MSN* resources into subject areas, such as **Business & Finance** and **Computers & Software**. The Business & Finance category screen is illustrated below. Notice the globe and paper icon on the **Visit Microsoft Investor on the Web** item–this icon indicates that the item is a Web-based resource.

Figure 4.10
Business & Finance category of Microsoft Network.
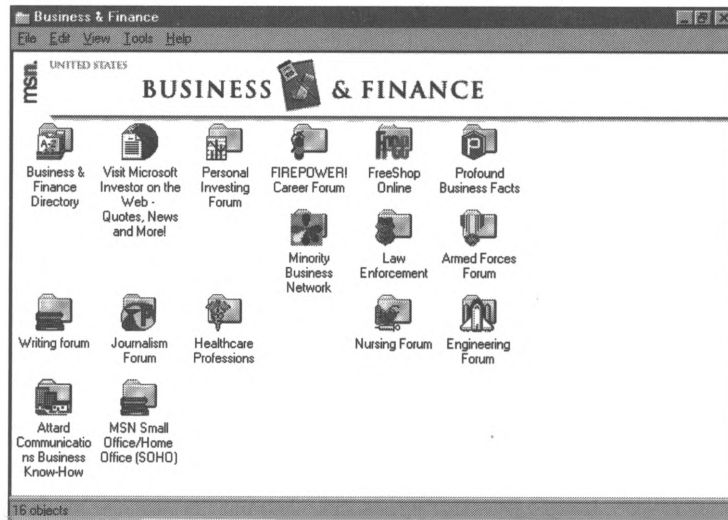
As with all commercial online services, individual users must decide for themselves the value of the information resources available on *MSN*. Some very experienced Internet users remain loyal customers of a commercial online service because the service offers a particular database, or news filtering tool, or discussion area that is only available on that service. Other users find that they would rather search for useful information on the Internet-at-large and skip the intermediary step of using the proprietary software supplied by commercial online services. It is certain, though, that millions of people have begun their Internet use through a commercial online service, and that the friendly and menu-oriented user interfaces of these services' software can
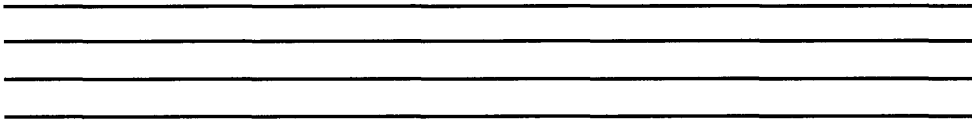
be a much easier way to become familiar with the online world. And, if you find an important tool on a commercial online service that makes your professional life more efficient, stay with it. It will be some time before Web sites and public-accessible databases are as consistently reliable and well organized as their commercial online service counterparts.

Chapter 5
Other Internet Tools

As the Internet has matured, certain functions have given way to others. For instance, as recently as a few years ago, most files on the Internet were stored in Internet sites only accessible through basic text or binary file transfers. With the advent of the World Wide Web, the look of Internet sites changed drastically. And, Internet software developers have begun to utilize new characteristics of the Internet infrastructure, such as the faster and larger communication channels described in Chapter 2. In this chapter, we'll look at two kinds of Internet tools that you might find useful: (1) two older, less sophisticated Internet functions, FTP and Gopher, and (2) leading-edge technology that represents the future of the Internet, such as video conferencing. This chapter covers the following topics:

- FTP.
- Gopher.
- Internet conferencing tools.
- Web TV.

FTP

File Transfer Protocol (FTP) is a standardized way for computers on the Internet to exchange many types of files, such as software programs, graphics, or text files. One of the biggest strengths of the Internet is that it connects many different types of computers, so a Macintosh user can retrieve a graphics file from an IBM mainframe server, for instance. As with most Internet functions, in FTP transfers, the user's software acts as a "client" that visits and retrieves files from a remote FTP computer, where the software acts as a "server."

In most cases, FTP sites extend the courtesy of anonymous access to the public-at-large through a unique sign-on convention used by Internet travelers all over the world. If the software you use to visit an FTP site prompts you for sign-on information, you should enter **anonymous** at the User ID prompt and your e-mail address as a password. Much of the FTP software available will require this sign-on procedure. However, most users access FTP sites directly through their Web browser software, and the software automatically handles the sign-on procedure.

Just as with other types of Internet sites, you will need to find the site addresses of useful FTP sites from other sources, such as online searches, tips from colleagues, and information drawn from Usenet newsgroups and subscription mailing lists. You will learn to perform these searches in Chapter 9. For now, let's suppose that you already know that you wish to visit the US Federal Government's *FedWorld* FTP site to retrieve the "1997 Tax Supplement - Business Section." You have discovered that the Internet address for *FedWorld* is **ftp://ftp.fedworld.gov**, and you know that the name of the file is */pub/irs-sups/supp-bus.txt*.

⇒ Open your Web browser.
⇒ In the address box, type the address of the *FedWorld*
    site, **ftp://ftp.fedworld.gov** (note that this address begins
    with the designator **ftp://**).
⇒ Press **<ENTER>**.

The parts of this instruction are as follows: (1) the **ftp://** portion
instructs the software that you are using the FTP function of the
Internet to access an FTP site; and (2) the **ftp.fedworld.gov** part of
the instruction is the address of the site you wish to visit–in this
case, the *FedWorld* FTP site. All these pieces of the instruction
together form the URL (Uniform Resource Locator) of the
FedWorld FTP site. As discussed in Chapter 1, URLs are the
commonly-accepted way of referring to sites on the Internet.

The string of information, */pub/irs-sups/supp-bus.txt*, actually
represents the full path you must use to locate the file, similar to
the way a file is named on your PC (except with forward instead
of backward slashes). You must travel down the hierarchy of
nested directories and folders to locate the file:

⇒ Click on the ***pub*** directory line to open it; you will see a
    list of sub-directories contained within the *pub*
    directory.
⇒ Click on the **irs-sups** directory folder; you will see a list
    of the contents of this directory.
⇒ Travel down the list of files until you find the *supp-
    bus.txt* file; click on the file name to open it, as
    illustrated below.

Figure 5.1
*Accessing a text
file at the
FedWorld FTP
site.*
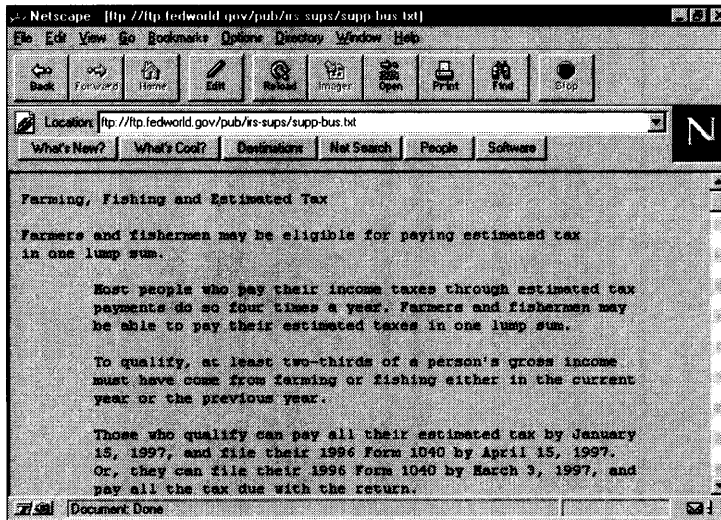
⇒ If you wish to save the file on your PC, you can pull
down the **File** menu and choose **Save As** to name the
file and choose the sub-directory on your PC in which
you wish to store the file. Many people choose to save
downloaded files to the **Temp** folder. (Note: This file is
a text file, so you should change the setting in the **Save
as Type** box to text or *.txt* if necessary.)

At other times, you may not know exactly which file you wish to
retrieve and you may wish to navigate around an FTP site to see
what is available. Many FTP sites include an "index" or *readme*
file in each directory that discusses the contents of the directory
in general and perhaps contains a listing of each filename along
with a brief description of the file. These files usually appear at
the top of a directory listing and are named generically with the
words "index" or "about" or "readme" included, such as:
readme.txt; about.asc, or *00index.txt.* For instance, the */pub*
directory of the Hewlett-Packard FTP support site contains several
.txt files, including a "readme" file, as illustrated below:

Figure 5.2
Finding directory information files at the Hewlett-Packard FTP site.
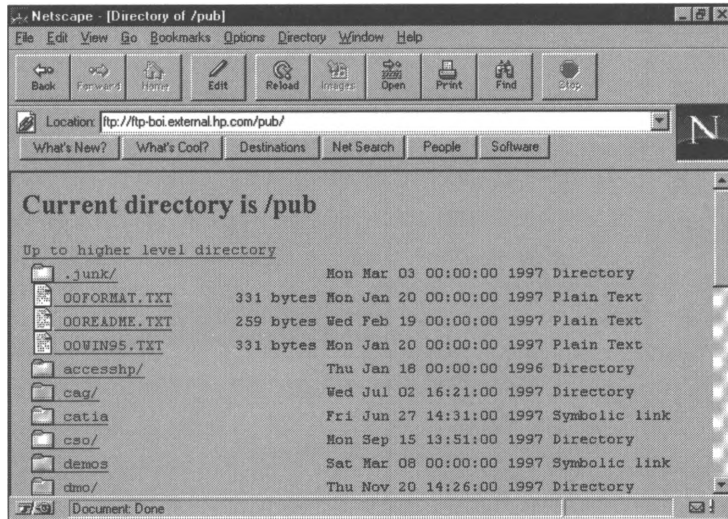
As you travel around FTP sites looking for useful files to download, you will soon discover that files are stored at these sites in all sorts of various formats. Some files, such as the 1997 Tax Supplement discussed above, are stored as text files and can be displayed and read by your Web browser immediately upon retrieval. Others, such as program files or graphic images, are specialized file types that you will need to use with other viewer software, which you can designate in your Web browser settings, as discussed in Chapter 3. Still others are stored at FTP sites in compressed formats, and you will need to expand, or de-compress them before you can use them. Most site indexes contain explanations of file types, and you can also tell quite a bit about the files by looking at their names. For instance, a file named *document.txt* is a text file; a file named *picture1.jpg* is a graphic file stored in the JPEG graphic format; and a file named *program.exe* is a binary program file stored in ready-to-use, executable form.

One file type that you will encounter often is a "zip" file, which is a file compressed using a standardized compression format

called Zip. Files compressed using this format end in the letters "zip," as in: *program.zip.* To use these files, you will need to decompress them using decompression software. One very popular decompression program is called *WinZip* and is available at many sites on the Internet as shareware. (Shareware is software that you can download and try for a fixed period and then buy after you have decided that it meets your needs.)

If you wish to download the *WinZip* program so you can use it to decompress files, follow these steps:

⇒ Open your Web browser.
⇒ In the address box, enter the following URL:
   http://www.winzip.com/winzip/download.htm.
⇒ Press **<ENTER>**, and the following screen will appear.

Figure 5.3
Downloading
WinZip file
decompression
software.
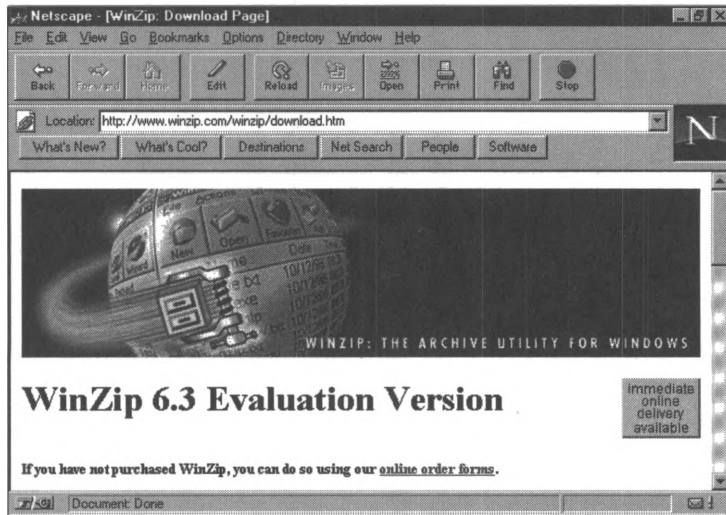
⇒ Select the appropriate version of *WinZip* for your PC by clicking on the name of the version. (For instance, *WinZip 6.3 SR-1* is the most recent version for *Windows 95* PCs as of this writing.) The name of the

version will appear in blue with an underline on your screen; when you click on it, your Web browser will begin the file retrieval process.

⇒ When prompted by your browser software, save the file to your hard disk.

⇒ Select a location on your PC's hard drive to store the downloaded file. We recommend the **Temp** folder or another temporary storage folder of your choosing.

⇒ When the file download is complete, run the file by pressing the **Start** button at the bottom left-hand corner of your *Windows 95* desktop, choosing **Run**, and using the *Browse...* button to locate the file (remember where you decided to store the file to complete this step–if you chose the *Windows 95* version of the file, it will be called *winzip95.exe*). Then press the **Open** button and **OK**.

⇒ Follow the on-screen instructions to install *WinZip* on your PC.

Now that you have downloaded and installed WinZip, you will be able to open *.zip* files and other types of compressed files that you obtain from Internet sites.

Although FTP makes it easy to obtain and use a myriad of files, it is important to remember that all documents, images, and software found on the Internet are the intellectual property of someone else. That is, someone created the file and uploaded it for a specific purpose or use, usually personal use by whoever downloads the file. For instance, if you download shareware, be sure to register and pay for your copy of the software if you intend to use it beyond the free trial period. If you download a FAQ document or other material written by someone else, remember that the author of the document retains copyright to the material and you must obtain permission from the author

before reproducing the document, in whole or in part. And, be aware of the possibility of virus infection when downloading programs to your computer, especially if you are acquiring them from an unfamiliar source. You can learn more about copyrights in Chapter 6 and more about virus protection in Chapter 7.

For those of you who subscribe to a commercial online service, be aware that you may be able to access FTP sites directly from your commercial service software, as opposed to using a Web browser. *CompuServe* has a special menu for users who wish to access FTP, as does *America Online*. If you are using a university or corporate mainframe system, you will need to determine the system requirements for accessing FTP–usually it is a menu choice or is accessible by typing **ftp** at the UNIX command line. If you are accessing the FTP site through a UNIX command line, you will need to be familiar with the following commands to navigate the tree structure. These commands should be very familiar to IBM-type PC users who have experience with DOS commands (but remember that UNIX uses forward slashes while DOS uses backward slashes):

dir	List the directory contents.
cd directoryname	Change directory to this directory.
cd..	Go back up one level.
get filename	Transfer the named file.

_____

_____

_____

_____

Gopher

After using the FTP function a couple of times to transfer files and software from remote sites to their personal computers, people often find that they develop a tremendous appetite for discovering and downloading information from the Internet. The number of files available is immense, and the sites offering them are varied and fascinating. The only problem is deciding how to find what you're looking for, and browsing around the directories in an FTP site can be cumbersome and cryptic. Another, more easy to navigate, type of Internet site is a Gopher site.

FTP was an early type of Internet site for making files available to the public, and Gopher is another, more advanced type. (World Wide Web is currently the most advanced type of site, as discussed in Chapter 3.) When you visit a Gopher site, you are presented with a much more friendly menu-type structure and you are usually able to access more descriptive materials about files at the site more easily. For example, notice how the screen below, from the Washington University Economics Gopher, offers much more description than the FTP screens illustrated above in the FTP section.

Figure 5.4
Opening screen of the Washington University Economics Gopher.
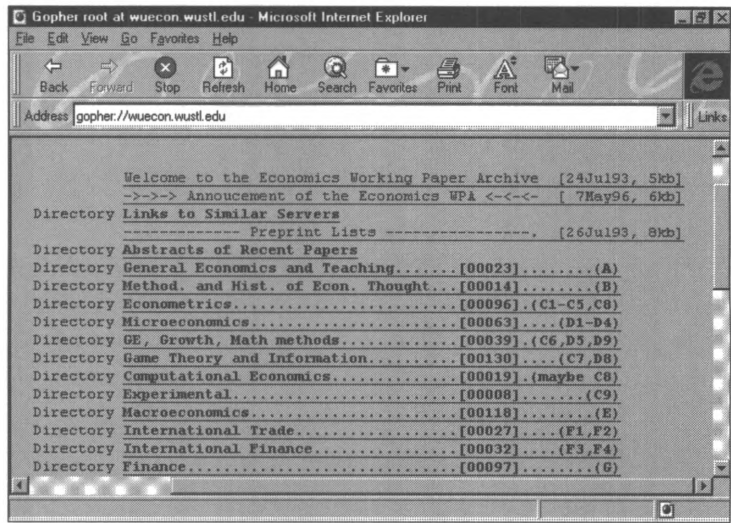
To use a Gopher, go to the Gopher's URL Internet address and select an entry that you find interesting. The result of your selection will be either another menu, a text file, or a keyword search input box. In this and most other ways, Gopher sites are very similar to FTP sites—they contain useful information and allow file downloads. To visit the Biz Gopher site of Kent State University, follow these steps:

⇒ Open your Web browser.
⇒ In the address box, type the following URL: **gopher://refmac.kent.edu/**.
⇒ Press **<ENTER>**, and the following screen will appear.

Figure 5.5

Biz Gopher site at Kent State University, home of Business Sources on the Net.
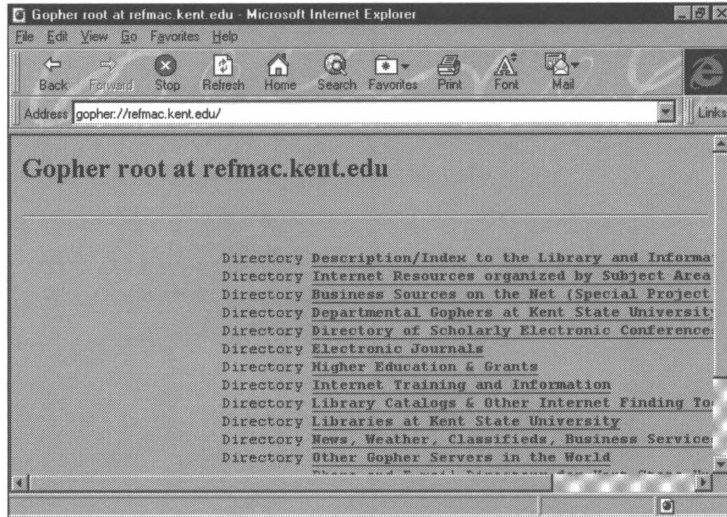
The item appearing on this menu entitled "Business Sources on the Net" is a very useful collection of Internet sites of interest to business professionals, organized by category. You may wish to download and browse it at your convenience, especially the category on "Accounting and Taxation," to find other Internet sites of interest.

On UNIX shell accounts, the command to invoke Gopher is simply **gopher**. On mainframe menu systems, there will be a menu selection for Gopher servers; the menu may even provide a list of frequently accessed sites. Commercial online services, such as *America Online* and *CompuServe*, provide a separate area for accessing Gopher sites directly from within the service software.

Internet Conferencing Tools

As communication lines are improved and their capacity expanded, it has become possible to send video and audio transmissions over the Internet in addition to digital data. Whereas Internet Relay Chat, or IRC, was an early way to conduct a "live," text-based conference over the Internet, video and audio conferencing tools are the leading-edge ways to achieve even better results. In this section, we'll take a look at Microsoft's newly-released *NetMeeting* tool as an example of a conferencing tool that combines screen images with voice, while also demonstrating how to download and use products in this new category of Internet software. We'll use White Pine's *CU-SeeMe* to investigate conferencing software that adds the feature of live video. Internet Phone will serve as an example of the group of products available related to Internet telephony. As you will see, the three types of products discussed in this section are rapidly collapsing into a single category of conferencing software. We predict that, before long, most Internet conferencing software will include a complete set of features that provide audio conferencing, live video transmissions, whiteboarding capabilities, application sharing, and text-based messaging.

Conferencing with NetMeeting

The applications of *NetMeeting* to the business and personal lives of financial professionals are extensive. With *NetMeeting*, training employees in remote locations becomes cost-efficient, and real-time conferencing with clients and customers adds a personal touch to services. Contract negotiations with long distance clients can be performed without travel costs, and telecommuters and traveling staff members will never miss a meeting. And, of course, you can "phone home" without the long distance phone charges,
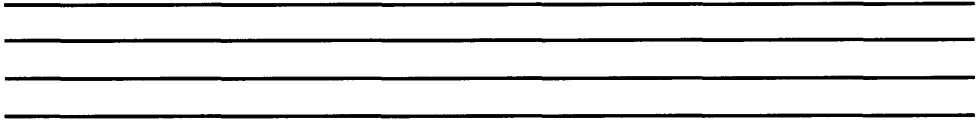
because you are using the Internet. Compare your current long
distance rates to your monthly charge with your Internet Service
Provider to get an idea of how much you can save using Internet
conferencing tools—and don't forget to add extra savings into your
total if you can substitute online conferences for meetings that
require travel and the cost of plane tickets and hotel rooms.

The requirements for running NetMeeting are practically standard
equipment on today's computers:

- PC with 486/66 or higher processor (Pentium
  recommended).
- 8 MB of RAM (16 MB recommended).
- Microsoft *Windows 95*.
- LAN connection, ISDN connection, or 14,400 bps or
  higher modem connection (28,800 bps recommended).
  In order to run *NetMeeting*, your Internet service
  provider must handle 32-bit applications. If your
  provider does not, you need to make an Internet
  connection via a full service Internet account that does.
- Sound card, speakers, and microphone, for the audio
  features of *NetMeeting*.

An installation Wizard helps you set up *NetMeeting*, including
testing the audio components (voice communication) in your
computer.

During installation, you must also register in a ULS (User
Location Service) directory, which is a directory of those who are
currently using *NetMeeting*. If your service provider does not host
a ULS, you can use *NetMeeting*'s default, Microsoft's ULS
(**http://uls.microsoft.com**). The ULS directory lists the name, e-
mail, city, state, and country of everyone registered and currently
online.

Once you have installed *NetMeeting,* you are ready to place a "call." Shortcut buttons and pull-down menus allow you to easily use the program. To invite others to meet, you simply "call" them either by clicking the person's name displayed in the ULS directory or by entering the party's computer address on the *NetMeeting* screen. The computer you are contacting "rings." When the receiving party accepts your call, you are ready to begin your conference.

NetMeeting has chat room, whiteboard, and application-sharing capabilities. Clicking the **Chat** shortcut button displays the chat screen on all participants' screens. This chat room is similar to those of commercial online services; however, it is private–only *NetMeeting* participants can view the screen.

The Whiteboard option allows you to use Microsoft *Paintbrush* and *Word* drawing icons to draw, type, or paste information from other *Windows 95* applications to the screen. By clicking other options, you can type text or highlight areas of the screen. Clicking the **New Page** button accesses a new screen for more demonstration. All parties are able to draw and highlight at the same time. Imagine pasting worksheet areas from *Excel* to the Whiteboard for in-depth analysis or displaying the latest *PowerPoint* marketing slide for discussion among remote staff members.

Figure 5.6
*Using Microsoft's
NetMeeting.*
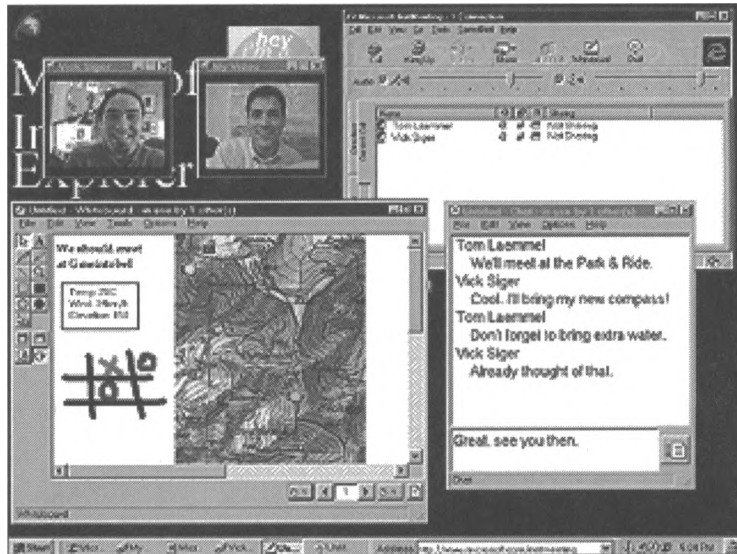
While all participants have the ability to collaborate on
Whiteboard, the most impressive feature of *NetMeeting* is its
Application Sharing feature. To share an application, you open
and run the *Windows 95* application on a participating computer,
then select **Collaborate**, allowing other meeting attendees to
share the application of the meeting host. Whether the object
under discussion is a *Word* document, *Excel* worksheet, or
another *Windows 95* application, attendees can take turns
making changes and commenting, without loading the
application on their computers. All the changes are saved to the
application host's computer, and the files can be transferred to all
attendees. Microsoft is currently including *NetMeeting* on *Internet
Explorer* disks. If you do not have a copy of the program, it is
available for download at the Microsoft Web site
(**http://www.microsoft.com/netmeeting/**).

Video Conferencing with CU-SeeMe

Originally developed by researchers at Cornell University, White Pine's *CU-SeeMe* is a program for conducting video conferences via the Internet, including the transmission of video, audio, text, and screen images. Like most of the software in this category, *CU-SeeMe* requires a newer computer system, or one with the following minimum features:

- 100 Mhz Pentium PC.
- *Windows 95* or *Windows NT 4.0*.
- 16 MB RAM and 10 MB hard disk space.
- Digital camera and video capture card.
- 16-bit sound card, microphone, and speakers.

To download the software, follow the instructions at White Pine's Web site at **http://www.cu-seeme.com**. Although screens will display asking you for personal information the first time you launch the program, the software will work even if you do not answer them.

From *CU-SeeMe*'s Phone Book screen, you can create "Rolodex" cards for persons you wish to call. Then you can initiate calls from these cards using the Speed Dial feature. Alternatively, you can use the Manual Dial feature to type in someone's address, or you can see all the *CU-SeeMe* users currently online by clicking on the **Who's Online** button. This software allows three types of video conferences: Point to Point, which connects one user to one other user; Group Conference, which requires that you connect to a specialized server, and Cybercast, which allows one user to transmit a video call to several other users simultaneously.

Internet Telephony with Internet Phone

VocalTec was one of the first companies to develop Internet telephony client software, and their *Internet Phone* program remains a leader in the market. *Internet Phone* has recently incorporated optional video features, which provide for live video images of your conference partner, much like the *CU-SeeMe* software described above. To use *Internet Phone* your system must meet the following requirements:

- Pentium 75 MHz PC or higher.
- 16 MB RAM.
- *Windows 95* or *Windows NT 4.0*.
- *Windows* Compatible Sound Card.
- If you wish to transmit video, you will need a parallel port camera or a video camera with a standard *Windows*-compatible video capture device; there is no special equipment needed to receive video transmissions.
- Microphone and speakers.
- A full-service, 32-bit Internet connection; 28.8 kbps or faster modem is recommended.

To download a free, two-week trial version of the program, visit VocalTec's Web site at **http://www.vocaltec.com**; you can also purchase the fully-functional version of the software at this site for $49.95. Be sure to click on the **User's Guide** link to retrieve this useful document in either HTML or PDF (Adobe *Acrobat*) format.

With *Internet Phone*, you can initiate a call directly using your call recipient's e-mail address. A new feature allows users to initiate phone calls from personal computers to regular telephones–part of the integrated transmission and messaging

wave in digital communication technology. The software provides features similar to regular telephone service, including Caller ID, Call Waiting, Muting, Blocking, and a Directory. Through the use of the VocalTec conferencing server, you can create audio conferences of up to 100 persons.

The features added recently to the *Internet Phone* program give us a glimpse of where all Internet conferencing tools will eventually head: a whiteboard for sharing documents and graphics with your call partner, text-based chat in addition to audio chat, and a Community Browser that organizes persons with similar interests into discussion groups.

Figure 5.7
Community Browser screen of VocalTec's Internet Phone software.
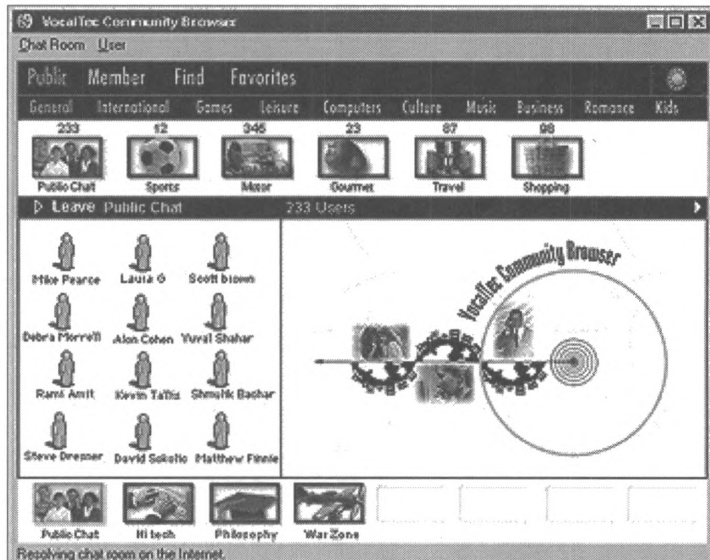
There is a wide range of other Internet telephony products available, including Voxware's *TeleVox* (**http://www.voxware.com**), Freetel Communications' *Freetel* (**http://www.freetel.com**), and Netscape's *CoolTalk* (**http://home.netscape.com/comprod/ products/navigator/version_3.0/communication/cooltalk/ index.html**). As with any Internet client software, be sure to check

the system requirements when downloading and installing any of these programs. In particular, check to see that the video, sound board, and audio capabilities of your computer are compatible with the conferencing or telephony program.

Web TV

For the millions of us who have computer access in our workplaces, a personal computer is a daily, taken-for-granted, tool. Many of us also have computers at home, doing duty for home budgeting and school research papers or as part of a home-based business. However, many households do not contain expensive personal computing equipment, and, up until now, they were left largely out of the Internet communication revolution. Web TV is one solution to that problem–for a few hundred dollars, anyone can now have access to electronic mail and the World Wide Web. For people who only wish to use these two features of the Internet, those who do not wish to spent the $2,000 necessary for a new personal computer system, or those who would like to experiment with the Internet before making such a big investment, Web TV is a viable electronic communication alternative.

With the Web TV terminal adapter unit, which contains a modem, you can use your television set as a "monitor" for an Internet connection via your regular phone line or, in the near future, through your television cable connection. You choose between several ways to control the software: a remote (infrared) keyboard, the TV's remote control unit, or a regular keyboard connected to the adapter unit. This limited Internet connection has both advantages and disadvantages. One of the biggest

advantages is the fact that TV screens are large and becoming
larger, with very high-resolution breakthroughs on the horizon.
Therefore, images viewed on Web TV are much larger and
clearer than their PC monitor counterparts. One shortcoming is
the very small set of functions available. If you wish to use any of
the many Internet functions not available via the World Wide
Web or e-mail, you will be disappointed. Users of Web TV pay
Internet access charges for time spent online, just like users with
a full service Internet account. The difference is really in the
hardware; Web TV simply provides a way to use your TV set as a
monitor, and the Web TV adapter serves as a very simple,
specialized computer.

Web TV Networks recently released what it calls its second
generation product, the WebTV Plus Receiver. The WebTV Plus
system gives viewers a better way to choose which shows to
watch by using TV Home and TV Listing features. TV Home
offers viewers a fast way to find descriptions about shows as they
flip through channels. TV Listings gives users an easy way to plan
their viewing with complete descriptions of all cable and
broadcast programming 48 hours in advance, as well as the
ability to scroll through channels and watch the currently
selected program all at the same time.

The WebTV Plus system also features TV Crossover Links, which
complement TV programs by providing quick access to Web sites
directly related to those shows. The system detects Web links
embedded in video broadcast and notifies viewers with a small
icon that appears on their TV screens. Viewers can then visit
related web sites where they might find breaking news about
their favorite stars, engage in online chatting with fans, check the
latest sports statistics during a game, or offer their feedback
through instantaneous polls.

In order to deliver this functionality, the WebTV Plus Receiver includes an advanced cable-ready tuner and a 3D-graphics engine providing viewers with WebPI, which brings picture-in-picture capability to standard televisions. The WebTV Plus Receiver also has a 1.1 GB hard drive offering local storage of multimedia content; a 56Kbps modem using Rockwell K56flex technology, which speeds up the retrieval time of web pages; and WebTV's VideoModem technology which can receive high-bandwidth data (1 Mbps) embedded in a conventional TV broadcast signal without disturbing the video content.

As the World Wide Web evolves to incorporate other Internet functions, such as Usenet newsgroups, Web TV will become a more powerful home Internet tool. For instance, users who wish to view and send Usenet newsgroup postings can currently do so via a Web browser by visiting the *DejaNews* site (**http://www.dejanews.com**), which provides a Web gateway to Usenet tools. And, many Web site administrators are working to migrate older, FTP- and Telnet-based Internet services to their Web sites. So before long, most Internet resources will be available to users of browser software, and the limitations of Web TV will diminish.

You can learn more about purchasing Web TV at their Web site (**http://www.webtv.com**). While there, you may wish to read their recently released white paper on the future of Internet television tools. Click on **The Future of Television** link, or access the document directly at **http://www.webtv.com/wpaperhtml/index.html**.

Chapter 6
Netiquette and Copyrights

Good Manners on the Net

Just like any other kind of manners, the rules of behavior on the
Internet, collectively called "Netiquette," are based mostly on
common sense and common goals. The Internet is a community
of millions of individuals interacting with each other. It has grown
by leaps and bounds over the last several years because it is the
fastest, most economical, most efficient way to communicate
with others. The tenets of Netiquette aim to keep the Net just that
way: fast, economical, and efficient. If you keep these goals in
mind during your Net travels, you'll avoid embarrassing errors
and project the competent, helpful image so important to
accounting professionals.

Some of the guidelines below have been culled from various
helpful documents and FAQs (lists of frequently asked questions)
on the Internet. We've added others, trying to keep in mind the
spirit of the Internet and the communications needs of
accountants. Keep in mind that the rules of Netiquette, rather
than being hard and fast, continue to evolve as the Internet
community grows. Some issues, such as cyberspace terms and
typing conventions, are still in the process of being settled. For
example, when Kent Information Services, Inc., first published its
reference guide in 1995, the word "e-mail" sometimes included a
hyphen, sometimes not. Publishers and editors went with their

instincts in choosing how to spell the word. We chose "e-mail,"
which turned out to be on the wrong side of the convention
announced later by the *New York Times* "and now followed by
most of the publishing industry;" this edition of *The CPA's Guide
to the Internet* represents our first use of the hyphenated "e-mail!"
On the subject of copyright, the US Congress continues to debate
how to protect information on the Internet, so electronic
copyright laws may be changing. Because of the evolving nature
of Internet terms, conventions, and policies, it's a good idea to
periodically check updated Netiquette or usage guides. Be sure to
browse the "Resource Catalog" of this book for places to find
more information.

E-Mail

Most of your Internet communication with individuals will be
through e-mail. A recent GVU survey endorsed by the World
Wide Web Consortium showed that 98% of Web users have and
use e-mail frequently; in fact, nearly 20% of the respondents said
they no longer use traditional postal mail! You'll certainly use e-
mail to correspond with clients and colleagues, and you may use
it to take up private conversations with people you've met online
(perhaps in a Usenet newsgroup or subscription mailing list). In
both cases, you will want your reader to be able to easily identify
your message, understand its contents clearly, and do both of
these things quickly. So, the Netiquette guidelines for e-mail aim
toward the objectives of identification, clarity, and brevity.

Identify Yourself and Your Message

If your mail program has an option for inserting your real name in the From field on your e-mail messages, use it. It is much easier to recognize a person's name than an e-mail address. Most UNIX shell accounts allow a user to customize the From field as an option while composing each message. PC-based mail management software allows the user to change the From field so it will appear in modified form on every message.

The following example illustrates how message identifiability works. Which messages are easier to identify? Which would you rather read?

Figure 6-1.
Using the From field to identify yourself in an e-mail message.
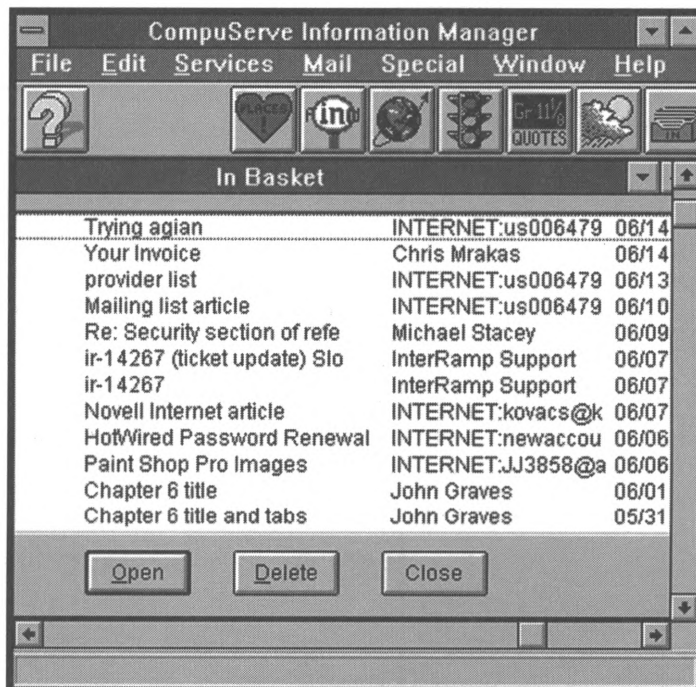
In addition, you can further identify your message by using a clear and descriptive subject line. Subjects like "Response,"

"Request," and "Query" are not very helpful to readers who may receive 50 such e-mails per day. On the other hand, subjects like "Request for Book Prices" or "Staff Meeting Minutes (4/30)" can help your readers to organize their correspondence and their workdays.

Write Clearly and Concisely

This particular Netiquette guideline is the subject of lively debate among Internet users of all types. There is certainly room for individual expression and style in e-mail writing, and each person must decide what it means to be clear and concise. Long-time Internet guru Mark Moraes has compiled a useful set of writing guidelines for Usenet postings; they apply equally well to all kinds of Internet correspondence. You can find this guide, called "Hints on Writing Style for Usenet," in the newsgroup *news.announce.newusers*, where it is posted regularly. In addition, there are some general points on which most people can agree when discussing the text of e-mail messages.

Your Reader Cannot See You

E-mail, although lightning fast and very cheap, leaves some important channels of interpersonal communication closed. In e-mail, you cannot highlight certain phrases in your message with facial expressions, body language, or gestures. While you may make a comment jokingly, your e-mail reader may take it seriously. Using emoticons such as a smiley face :) or markings such as the grin symbol <g> can help to make up for the chuckle your reader cannot hear.

In contrast, the Internet equivalent of shouting at someone is TYPING IN ALL CAPITAL LETTERS. You may be perfectly calm

and friendly, but the use of all capital letters will convey an aggressive tone in e-mail correspondence. Save the use of all caps for strong emphasis only, and you'll avoid startling your readers. This guideline applies to e-mail message subject lines as well. It is very annoying to be confronted with a list of e-mail headers shouting their subjects first thing in the morning on a busy office day.

Business as Usual

Always remember that the documents you send via the Internet are just as real, official, and enduring as the ones you send on your company letterhead. This means that you should give e-mail messages and discussion group postings the same attention as your printed correspondence. Take the time to check the spelling and grammar of your messages. Use the same professional tone in Usenet postings as you would in any other letter. Your e-mail messages might be stored on disk for months or years and used for later reference–make sure they represent you professionally.

In addition, some basic conventions of business communication become even more important in electronic communication. Perhaps the most important is making sure that the objective of your correspondence and the desired action of the reader are perfectly clear. You can test your message by reading it over before you send it and asking yourself what you would do if you received it. Will your reader know what action should be taken in response to your message? Have you identified an action step (like, "Please respond by December 11 if you will be attending the conference")? Does your reader know how to reach you, via phone or regular mail if not by e-mail? Is your reason for sending the message clear to your reader (for instance, "I am commenting on your draft of the overtime policy")?

Figure 6.2
Business Netiquette International, located at ***http://www.wp. com/fredfish/ Netiq.html****, provides up-to-date information and advice about Internet usage for business users.*
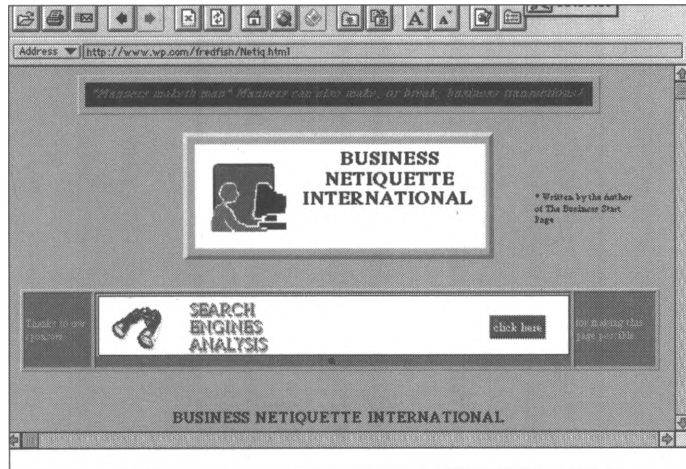
Use Excerpts Sparingly

Many Internet correspondents include excerpts of previous messages in their responses to e-mails or Usenet postings. This can be very helpful to a reader who can use the excerpt to identify the conversation to which the message belongs and place your response in context. The common practice is to enclose the excerpt in caret marks (< >) or double caret marks (<< >>) and to set it off from the rest of the message by indenting it or double-spacing it from the body of the message text, as in the example below. Many PC-based mail management programs now have automatic functions for handling excerpts, as do many UNIX shell mail management tools. In the example below, the writer has used an excerpt to remind the reader of a question she asked in her previous e-mail.

Figure 6.3
*Using excerpts in
an e-mail
message.*
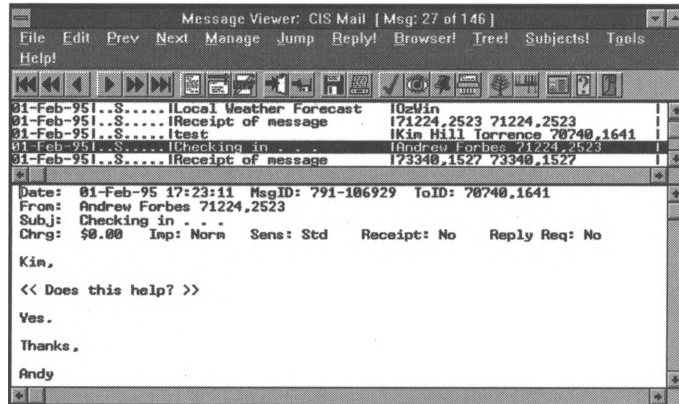
While this courtesy can be helpful, it can also be over used. Consider your reader's perspective when deciding whether or not to excerpt a message you're responding to. Will the excerpt help your reader remember an issue or topic of discussion? Will it clarify your message? Or will it merely add bulk to your message or take the place of a sentence or phrase that you could have written? We recommend using excerpts only when other ways of expressing your point are not as effective or feasible.

Keep Your Signature Simple

In e-mail jargon, the word "signature" refers to a standardized document closing that appears at the bottom of an e-mail message or Usenet posting. Many types of Internet accounts allow a user to create a personalized signature block that is automatically appended to each message the user sends. Most people use the signature section to include helpful contact information such as company name, company phone number, organizational affiliation, or return address. Some imaginative persons, however, use this space to create elaborate drawings with ASCII characters or to insert a favorite quote from a politician or philosopher. It's a matter of personal taste, of course, but we strongly recommend against elaborate, creative signatures.

_____

_____

_____

_____
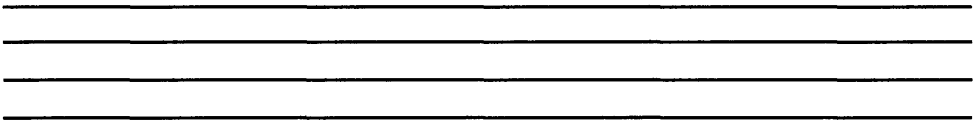
Again, the criterion for judging your own signature block is simple: does this signature contribute to the goal of fast, economical, efficient communication? If not, don't use it.

Usenet

The basic Netiquette guidelines for Usenet newsgroups are the same as those for e-mail, outlined above. However, the sheer number of persons participating in newsgroups makes for more potential problems. So, first remember that your Usenet posting is essentially an electronic mail message—one that will be delivered to hundreds or thousands of readers. Whatever you do will impact those thousands of persons, and you should plan accordingly. The guidelines outlined below have one thing in common: in newsgroups, time solves most problems. Take the time to learn about the subject of the newsgroup; take the time to think before sending a message; and give the other newsgroup subscribers a chance to respond or drop a volatile subject.

Know the Newsgroup

It's easy to identify "newbies" in a newsgroup (newbies are inexperienced Internet users). They are the people who post inappropriate questions; for instance, they post a message to the Celtic Culture newsgroup (*alt.celtic*) asking how to delete e-mail messages from their mail program inboxes. Also easy to spot are online "crabs." Crabs spend time correcting trivial facts in other postings. They split hairs on subjects tangent to the thread discussion. They are quick to point out spelling and grammar errors in others' messages. Even worse, newbies and crabs sometimes make postings under a particular thread subject that

are entirely irrelevant to the thread. If you spend a little time observing a particular newsgroup before jumping into the discussion, you'll avoid tipping anyone off to your newbie status or presenting yourself as an online crab.

First, subscribe to the newsgroup and do nothing but read the postings for a week. You'll soon be able to identify the frequent and prolific participants in the newsgroup and their particular areas of expertise. Second (and you can do this during your week of waiting and reading), download and read the newsgroup's FAQ (list of frequently asked questions). FAQs are some of the most useful resources available on the Net, compiling the questions frequently asked by users new to the group or new to the subject. The answers have been honed over time by experts on the subject. FAQs are often subject to public review and revision, so you can usually be confident that the information in this document is fairly accurate and current. Then, dip your toes into the newsgroup by posting a question or a response to someone else's question. By now, you'll be confident that you are posting your comment to the appropriate newsgroup in a relevant subject area. Keep your comments brief and to the point, and you're on your way to rewarding newsgroup interactions.

Put Out Fires

The Internet equivalent of picking bar fights is called "flaming." Flaming is the practice of being unnecessarily belligerent, rude, denigrating, or otherwise hostile in Internet e-mail, newsgroups, mailing lists, or other public accessible space on commercial online services, such as discussion forums. Flaming usually occurs in Usenet newsgroups, and it is annoying and time wasting for the thousands of other newsgroup members who wish to use the Internet to exchange useful information and take part in constructive conversations.

The best way to put out flames is to ignore them. If someone's posting is out of line or inappropriately negative and/or personal, simply don't respond. Perhaps the other newsgroup subscribers will follow suit, and the flamer will lose interest. Even if the debate continues, at least you are not stuck spending time on childish name calling. If you feel that you must respond to a flame, perhaps because it was directed at you or you feel strongly about the subject, compose your reply carefully and with a level head. Then, leave your computer keyboard for a few moments and send the reply only after you have returned and reconsidered sending it. If you cannot avoid the temptation of responding to a flame, send only one reply to avoid escalating the interchange into an unnecessary waste of time and Internet resources.

If you are having a hard time ending an online disagreement with someone who will not let the matter drop, you can report the harassing behavior to the system administrator of the offender's Internet service provider. The address of a system administrator is usually **sysadmin** followed by the domain, as in **sysadmin@ domain.name**. If this address does not work, you can try addressing a complaint to the system postmaster at **postmaster@ domain.name**. Either way, use this option as a last resort, because system administrators are busy people and arbitrating between Internet users is not a very good use of their time.

If you feel that any online behavior directed toward you or anyone else is illegal (such as physical threats or fraud), you should report this behavior to your local law enforcement authorities. As a last note of caution, remember that divulging your home address or phone number in a newsgroup posting is roughly equivalent to painting it on a billboard. Newsgroups are public discussions, and you have no control over who reads your postings. If you would like to share personal information with someone you have met online, make sure that you know and can

trust your correspondent, and then release the information only in a private e-mail message. <u>Never</u> release your credit card number or bank account number to anyone in a newsgroup. Legitimate vendors provide separate, secured circuits for online ordering, and they inform their customers of these security measures as part of the ordering process.

Mailing Lists

When participating in Internet mailing lists, you should follow the same guidelines as those described for Usenet, above. There is one other possible slip to make with mailings lists, however, and you should be careful to avoid it. When requesting information on a mailing list, subscribing to, or unsubscribing from the list, remember to address your e-mail message properly to the **listserv** or **listproc** as indicated in the subscription instructions. If you send such a message to the list name, your administrative message will be sent to all list subscribers. It will annoy them, embarrass you, and in the case of a new subscription will provide a very poor introduction for you in the group of Internet and professional peers you are hoping to join.

FTP, Gopher, and World Wide Web

Another way to extend courtesy on the Internet is to keep in mind that Internet resources are provided at very little direct cost to Internet users. Most of the information highway infrastructure has been built by communications companies, but much of the information content is being provided by universities, public organizations, and government agencies. When traveling to a particular site, especially a public or non-profit one, try to keep in mind the limited nature of the site's resources. Limit your access to that site to non-business hours in that time zone. For instance, if you wish to perform a search on the very helpful mailing list index at Indiana University (available at: **http://scwww.ucs. indiana.edu**) to find the names of all mailing lists related to auditing, you should wait until after 5:00 P.M. EST to do so.

You can also show good manners in your Internet travels by reporting problems or "bugs" to the appropriate system personnel. Most sites have contact information in a general *readme* file or on the WWW home page. Likewise, many FAQ and general information documents contain contact information for reporting errors, additions, or corrections to the document author or maintainer. In this case, limit your comments to those that are substantive and can be helpful. System personnel are likely to respond well to a helpful comment that provides a way to improve the service or document. They are not likely to respond well to someone who cannot resist making editorial comments on others' work, whether or not it is constructive.

Internet Relay Chat

Due to the casual and real-time nature of Chat discussions, the rules of Netiquette are quite loose on the chat channels of Internet Relay Chat (IRC) sites. Flaming is common, as are bad manners and interpersonal abuse of various other kinds (sexism, racism, and insensitivity). If you do not wish to expose yourself to such behavior, our best advice is to avoid offensive groups altogether. You can think of chat groups as parties--if you don't like the people who will be there, don't go. In Chat, as in any public area of the Internet, always keep in mind your personal confidentiality. Do not release your home address or phone number, or any information you would not want distributed to thousands of unknown persons.

The Single Biggest Error: Inappropriate Marketing

This subject covers a great deal of ground, and marketing on the Internet has become a murky area since the Net was opened for commercial use. An important distinction to remember is the difference between the public and the commercial areas of the Internet. If you keep this distinction in mind, you can avoid participating in inappropriate commercial activity in public Internet areas. Public areas are the newsgroups, mailing lists, and document repositories of sites open to the public. In general, commercial solicitation and marketing activities are prohibited in public areas. Commercial areas are sites established by for-profit entities specifically for commercial activity. You can conduct marketing in these areas only.

For instance, posting a newsgroup message listing your accounting expertise, contact information, and hourly fees is not permitted on Usenet–this is marketing in a public area. Posting such a message to many newsgroups (called "spamming") is very poor form and is prohibited by most Internet Service Providers (who will cancel your account if you do it). However, posting such a message in the Classified Advertisements section of a commercial online service such as *CompuServe* is entirely appropriate, and so is sending an e-mail message to someone in a newsgroup or mailing list who specifically requests this information.

Savvy users of the Internet realize the great benefit to be gained by establishing a presence as an expert in particular newsgroups or mailing lists. While this is not strictly considered marketing activity, it is certainly one way to promote your expertise and reputation. For instance, if you gain the respect and trust of newsgroup users by consistently answering questions on accounting topics with reliable and clear information, you'll probably find that other newsgroup subscribers occasionally contact you via private e-mail to inquire about your services. At this point, you are free to negotiate with this potential client and do any self-promotion you wish.

More than Manners: Copyright

An initial caveat: this section is intended to guide new Internet users in learning about the concept of copyright and the issues relating to copyright pertinent to Internet use. This is not legal advice or a substitute. If you think you need legal advice regarding your own material or your use of someone else's

copyrighted material, please consult with an attorney. Discussing the exact facts of your situation with an attorney is the best way to protect yourself.

What Is a Copyright?

The basic concept of copyright, although intimidating and confusing for many, is really fairly simple. The first portion of the word, "copy," refers to text–that is, words appearing in a certain order as expressed by a certain person or entity. The words you are reading in this guide constitute copy. They are words expressed by authors in a certain order and manner, and they appear here on the page as copy. The second part of copyright, the "right" part, refers to the legal concept of holding rights to intellectual property. So, a copyright is a way of expressing the legal rights of someone who has created an original text or work.

Basically, anyone who creates a work (and this category includes many non-language objects such as songs, photographs, and computer programs) holds a group of rights relating to the work's reproduction, distribution, revision, performance, and other related activities. Since 3/1/89, when the US adopted the International Berne Convention, the creator of an original work holds copyright to the work from the moment it is fixed in a tangible form, whether or not the document is published and whether or not a copyright notice appears on the work. Anyone who wishes to use the work for any purpose other than personal information is obligated to obtain the creator or copyright owner's permission to do so. This is the law, and it's that simple–use any portion of someone else's words or creative work without permission, and you've violated their copyright.

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What Is Fair Use?

In reality, and in the courts, there are certain circumstances in which one can technically violate copyrights of another without being legally liable. This group of circumstances is sometimes referred to as "fair use." Unfortunately, there are no objective measures of fair use, and this legal concept gets interpreted in many different ways. In general, fair use is reproduction or use of a work which does not harm the commercial value of the original work and also indicates no potential for commercial gain on the part of the user. Some examples of activities that could be considered fair use are: quoting a copyrighted work in a critical review of the work, reproduction of a small portion of a work for educational purposes, and using illustrative passages from a work in a scholarly article.

For our purposes, using the Internet to conduct business and personal communication, we can assume that everything appearing on the Internet in any form is copyrighted unless the document specifically states that its creator has released it to the public domain, thereby forfeiting all copyright benefits. This assumption applies to all objects on the Internet, including newsgroup postings, e-mail messages, computer programs, digitized photographs, clip art, and so on. Many files you will encounter on the Internet are already in violation of copyright by virtue of being posted to the Net; for instance, images scanned from published documents are the intellectual property of the document creator or publisher. Thus, you cannot use any file you find on the Internet for anything other than your personal information or its intended purpose (reading an e-mail, using a program on your personal computer, or responding to a posting) unless you have the permission of the work's creator. Period. This is the safe and courteous way to operate on the Internet, and it avoids possible confusion regarding permissible fair use, various

copyright laws and their years of effect, and legal interpretation of limited licenses.

For the most part, it's fairly easy to avoid infringing someone's copyright. Most importantly, copyright does not apply to facts and figures, only to the author's original way of expressing the information. For instance, as part of our research in creating this chapter, we have read Terry Carroll's excellent six-part FAQ on copyright available in many Usenet newsgroups or for FTP download from *rtfm.mit.edu* (you should download it and read it too–it's the most comprehensive and understandable document available regarding copyright issues and Internet use). Some of the facts we have used, such as the fact that the US adopted the Berne Convention in 1989, came from that document. However, we have refrained from using, or even substantially paraphrasing, Terry Carroll's own words and expression in that document, because such activities would infringe his copyright. It happens that Carroll has included a copyright notice on his FAQ, but we would be obliged to respect his copyright even if he had not done so.

If you wish to use someone's copyrighted material in your own document, permission is usually easy to obtain (provided, of course, that you will not benefit from the use at the author's expense). For instance, suppose that you would like to quote a paragraph of someone's informative mailing list message regarding relational databases in your own report for a client recommending the purchase of personal computer software. You can simply drop the author a note explaining your request and exactly how the material will be used. If the author grants permission, keep a copy of the letter or e-mail message for your file and proceed with your use. However, if you change the use you are making of the material, even if only by distributing it

more widely than you originally described, you must obtain permission again.

As you might assume, copyright violations are usually only litigated in serious cases where the creator/plaintiff has the financial resources to bring the suit to court and the defendant has made a blatant violation and has gained financially from the violation at the creator's expense. However, using someone else's material without obtaining permission, whether or not you intend to gain financially, is both against the law and is in very poor Netiquette taste. To keep the Internet the cooperative, mutually beneficial community it has come to be, always respect copyright and give permission freely for reasonable use of your own material.

What Is Copyright Notice?

The best way to ensure that people are aware that you intend to protect your own copyright to a work is to place a copyright notice on it. A notice is not necessary for a copyright to be in effect; however, if your document carries a notice, you can now easily show that a person who violated your copyright was indeed aware that the document was copyrighted, and this can be useful in litigation. To construct a copyright notice on your document, use these three components: (1) the letter "c" within a circle or the word copyright spelled out; (2) the year of the work's first publication; and (3) the name of the owner of the copyright. For instance, the copyright notice appearing on this guide is:

Copyright 1995, 1996, 1997, 1998. Kent Information Services, Inc.

What Is Copyright Registration?

Another level of protection for you as an author or creator of a work is to register your copyrighted work with the US Copyright Office. Registration consists of sending two copies of the work to the Copyright Office, along with a registration form and filing fee. Call the Copyright Office hotline at (202) 707-9100 to obtain information and registration packets for all types of works. US law currently requires a US copyright owner to register a work before infringement litigation. This may change, but registration is surely a good way to communicate your intent to protect a work.

You may also want to visit the Internet World Wide Web site at **http://www.benedict.com** (illustrated below). This site is dedicated entirely to issues of copyright and electronic communication.

Figure 6.4
Home page of The Copyright Web Site

Chapter 7
Personal Security

If you already have traveled the Internet, you know that there are
great resources and capabilities there for businesses. Global
connectivity provides telecommunications savings and allows
even small companies to have global reach. Online customer
support and feedback allow you to respond immediately to
customer problems. The opportunities are limitless, but along
with these opportunities come new hazards. This chapter surveys
general information about the security of Internet connections. It
addresses security as it relates to you as an individual personal
computer user. We also offer information that you will find useful
in your role as a manager in your own firm or organization. If
you need more information about information security in general,
including LAN security, physical security, and organizational
information security policies, you might wish to read *The CPA's
Guide to Information Security*, also published for the AICPA by
Kent Information Services, Inc. This chapter covers the following
topics:

- Personal information.
- Passwords.
- Viruses.
- Encryption.
- Acceptable use.
- Information access rights.

The original design of the Internet network (as described in Chapter 1) had two goals: file sharing, and remote logins over a wide area network. The exchange of electronic mail was added as an afterthought. The designers wanted to distribute computing power to reduce the disruption that might be caused by a "nuclear event." Accessibility and ease of use were the driving design issues. Today, the number of host computers connected to the Internet grows at a rate of fifteen percent per month. With so much traffic and so many users, security is becoming a more important consideration.

The responsibility for security on the Internet has never been centralized; each connected host must implement security for itself and for the protection of the network. Ignoring security may produce effects felt over the entire network. One company was informed that its administrative computer was being used to distribute an underground newsletter about cracking systems. No one at the company had any idea that this was going on. Later, they learned that information contained in the distributed letter was used to disrupt "911" service in a major city for hours.

Personal Information

Many Internet users are unaware of the conventions of network and Internet conduct, and, more importantly, they also are not familiar with the security risks of using computers in such an environment. You can avoid some of these risks by becoming aware of how and when to release personal information on computer networks, how to apply the standards of professional conduct in the online world, and how to protect sensitive or copyrighted organizational information. This section describes

how to handle personal information on the Internet and how to help your employees do the same.

In general, the "billboard maxim" is a good rule of thumb to remember when using all areas of the Internet. The billboard maxim goes something like: "When using the Internet, never post anything that you would not mind seeing on a billboard." Would you want your credit card number painted on a billboard? Probably not. Would you want your home address and phone number to be there? Would you wish to see your checking account number, the name and addresses of your kids' schools, or your car license plate number on a busy freeway billboard? See how it works? On the other hand, you probably wouldn't mind having your company name, your office address, your position title, or your e-mail address distributed publicly—many businesspersons routinely do this to promote their services. You might even feel comfortable painting your work phone number or pager number on a billboard. If you use this rule of thumb before posting personal information, you can avoid unintentionally compromising your own privacy.

In the case of transmitting credit card numbers, extra caution is mandatory. Never release your credit card number to anyone on the Internet through a public area such as Usenet or a subscription mailing list. Even e-mail is a risky way to transmit such information. Remember that the shared communication lines of the Internet can be compared to the telephone party lines of years gone by. Anyone with a couple of pieces of equipment and moderate programming skill can "crack" their way into Internet communication lines and search for distinctive sequences of characters like credit card numbers.

Reputable commercial online services, Internet Service Providers, and online vendors have put considerable effort toward

protecting your credit card number when you conduct online transactions. They will always inform you of these measures when asking you to provide your number. For instance, *CompuServe*, a major commercial online service, informs users that they are accessing the *CompuServe* computers through secured, closed telephone circuits when they provide credit card information during the initial procedure for obtaining an Internet account. In addition, commercial online services such as *CompuServe* provide secured communication lines for dial-up users, and they store credit card information on computers that are not attached to the Internet. Unless you are accessing your commercial online service account through an Internet-based function, like Telnet, your line is very secure. If you don't feel certain that appropriate security measures are in place, don't release your credit card number. Instead, send an e-mail to any prospective vendor asking what protection is in place, or find another way to order goods or services from that vendor.

Chris Hibbert, of the Computer Professionals for Social Responsibility, makes a very good argument for protecting your Social Security Number with the same rigor as any other confidential information. Hibbert reminds us that a Social Security Number is often the only piece of verifying information an institution will ask for before releasing highly sensitive information such as credit history or medical records to a requesting party. To learn about techniques for protecting yourself from invasion of privacy through access to your Social Security Number, retrieve and read the FAQ document at **ftp://cpsr.org/ cpsr/privacy/ssn/oldSSN/ssn.faq.html**. This site also contains other information on computer security and privacy issues and the group also maintains a Web site at **http://www.cpsr.org/dox/ home.html**.
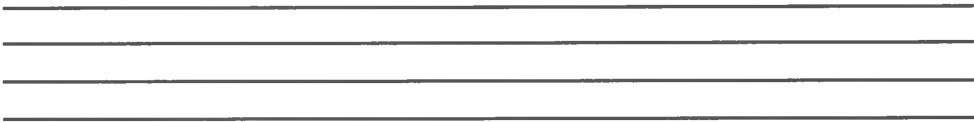
Figure 7.1
Computer Professionals for Social Responsibility Web site.
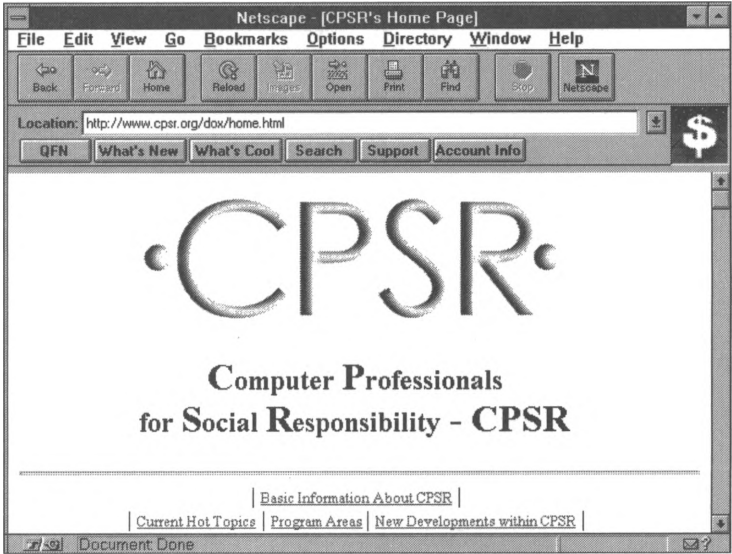
Passwords

Passwords are the oldest line of computer defense. Although passwords have been used for almost 30 years, they are still misunderstood and misused. Employees who think nothing of using a key to get into their offices may balk when asked to enter a password to use the company computer system. In the early days of mainframe computing, physical access to the computer console could be controlled and a system would have only 30 to 100 users. Today a computer that is fully connected to the Internet has millions of potential users. In this section you will learn to make your own computer system passwords safer, and, by extension, how to include such guidelines in company-wide practices.

If you have an account on a shared system, such as a *UNIX* system, you may think that since you have nothing sensitive in your account, you don't need to worry about the security of your password. Most system attacks involve more than just the account to which the intruder gains access; that account is used as a springboard for further attacks, so the security of the entire system depends on the security of each account. At Kent State University, the Department of Mathematics and Computer Science runs a large network of *UNIX* machines. The department was not concerned about password security, until a visiting professor left her account open to remote log-ins. Someone used her account to install and run programs designed to crack the root password to gain access to every file on the system. System administrators worked two weeks of 24-hour days to clean up and secure the system. You should make every effort to use a secure password. Implementing every other aspect of information security correctly can be instantly negated by ineffective user passwords.

Some common password problems are easy to avoid. The most common password security problems are "Joes." Joes are account passwords that are variations of the name of the account's owner. One consulting company theorized that there is at least one "Joe" account on every system, and found at least one such account on every client's system that the team tested. This problem most often results when users are assigned default passwords, such as their last names, when accounts are created, and then employees don't change them to something more secure. To avoid this problem, accounts should never be given default passwords that are easily guessed, and users should be informed how to change their passwords and advised to do so the first time they use their account to log-in to the system.

Another password problem occurs when accounts have no password or some commonly known default password. Some

application programs that need access to shared information will create an account for the program at installation and set the password to some common default. Even some operating systems set up guest or demo accounts with no password when they are installed. To prevent problems like these, always make sure that you understand the installation of system software and its effect on the password files. If the software requires shared accounts, be certain that you change the password to something other than the default so every purchaser of the software doesn't have access to the account on your machine.

Some users of your system may have accounts on many machines within the company or elsewhere. These users will often use the same password for each account they hold. Using the same password for different systems is secure only when the following applies:

- The two systems are logically equivalent, like two PC file servers in the same company.
- The two systems are run by the same information system center with the same security measures.

If the systems are run by different organizations, have different security levels, or have different operating systems, users should have a unique password for each system. Let's say that you have an account on your local file server and also on a commercial database system. If someone cracks your password on the local system and they discover that you have an account on the database server, the cracked password will be the first thing they try when they attempt to gain access to your other account.

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Password Security Checklist

Use this list to help yourself and your employees choose
passwords that are safe and appropriate.

1. Is your password shorter than eight characters?
    Increasing the length of your password from six to eight
    characters makes a cracker check many more
    possibilities.

2. Is your password "letmein," "password," "hello," or
    some other clever response to the password prompt?
    These are commonly known and are the first checked
    by cracker programs.

3. Is your password your log-in name in any form? Is it
    your license plate number, telephone number, street
    name, or the make of car you drive? Information like
    this is easy to discover, and so it makes an insecure
    password.

4. Is your password all digits (like "12345678"), or a
    repeated character (like "aaaaaaaa")? Is it a repeated
    sequence of digits, or a keyboard pattern (like
    "12341234" or "asdfasdf")? Passwords like these
    significantly decrease the length of time needed to
    crack a password.

5. Is your password in <u>Any</u> dictionary? Crackers first check
    words in online dictionaries, both in English and some
    other languages.

6. Is your password a word in a dictionary modified by
    prepending or appending a digit? Passwords like
    "house1" are not secure; cracker programs check
    appended and prepended digits as a matter of course.

7. Is your password a word constructed by rotating or
    reversing one of the above classes? For example, Frank
    may think that "knarf" (his name backwards) or "rankf"

(his name with the first character moved to the end) is more secure than his name, but this is not true.

8. Is your password an example taken from a printed source?

If you answered "no" to all of the questions above, your password is probably secure. If it is not, consider the following suggestions:

1. If the system distinguishes between upper and lower case letters in a password, mix the case of letters in your password. "TomCaT" is more secure than "tomcat" or "TOMCAT."
2. Use non-alphabetic characters <u>Inside</u> the password. "Tom3CaT" is more secure than "TomCaT" or "TomCaT3."
3. Choose a line or two from a favorite song or poem and use the first letters of each word. For example, "To be or not to be, that is the question" becomes "2Bon2btit?"
4. Choose two short words and connect them together with a punctuation character between them. For example: "dog+rain," "book!mug," "kid?goat."
5. Choose an adjective, a noun, a verb, and an adverb. This will make a (possibly nonsense) sentence that you can remember. Now use the first two letters of each word for your password. For example: "Orange Cars Fly Silently" becomes "OrCaFlSi."

You often will find warnings about not writing your passwords down. Keeping them online in a file is certainly not advised, nor is writing them on Post-It notes and sticking the notes to your monitor or to the underside of your keyboard. But, keeping a note in your purse or wallet containing your password is probably OK. It is better to have a secure password that you have to write down

to remember for the first couple of weeks than it is to have a password that is so easy to remember that anyone could crack it.

Viruses

The very mention of the word "virus" causes managers, system administrators, and personal computer users to shudder. Almost everyone has a story to tell about a co-worker or friend who lost that irreplaceable report or crucial database due to a damaging virus. A recent National Computer Security Association survey reports that about 98% of the corporations and large organizations in North America have experienced virus infection of their personal computers. But, the good news is that viruses rarely adversely affect computers immediately, and the damage is often minimal. With some basic information, a few precautions, and good software, you can use your PC with a high degree of confidence that it is safe from virus damage.

What Is a Computer Virus?

A computer virus is simply a program designed to reproduce and spread within a computer system or network without revealing its presence. A computer virus attaches to files or to boot sectors of hard or floppy disks (the portions of the disk that contain system configuration information). Once in a computer system, the virus replicates itself; in fact, some viruses do nothing else. Even so, there is no such thing as a truly harmless virus, since, at the very least, viruses expand, taking up hard-drive space and slowing the performance of a computer.

Viruses are typically classified by the way they "infect" a computer's system. For example, viruses that infect executable programs residing on a computer (such as .exe files) are referred to as "program viruses." Viruses that infect the boot section or partition tables on a hard disk or floppy disk are called "boot viruses." Viruses that are capable of infecting both are referred to as "multipartite viruses." Viruses that are contained within automated step sequences in a data file are called "macro" viruses, due to the fact that these step sequences are called macros by many software manufacturers. Because a virus is simply computer code, once it enters a computer system, it can spread by being transmitted along with any legitimate software or file that is running or stored on the computer or a floppy disk.

A typical virus program consists of four main parts: the replication instructions, the protection instructions, the trigger, and the payload. The replication instructions are simply the parts of the program that allow the virus to copy itself. The protection instructions are the parts of the program that protect the virus from being detected. (Protection can include encryption or a "stealth" technique that interferes with anti-virus software). The trigger is the part of the program that controls when the virus is triggered into activity. A virus can remain inactive on a computer for a long time before the trigger activates it. For example, a virus might remain inactive until the computer has been turned on a specific number of times or until the computer's clock indicates a certain day or time (such as the infamous Michelangelo virus that is triggered on March 6). The payload is that part of the program that is executed when the trigger is activated. Sometimes payloads are simply messages that indicate that the PC has been infected, but other payloads are more damaging, such as the deletion of files or the altering of data.

Once a computer is infected by a virus, many types and levels of damage can result. Some levels may be considered negligible, as in the cases of viruses that do nothing more than replicate or viruses that alter or delete files that can be easily reloaded when the viruses are removed. Other viruses might destroy all the files on a computer's hard drive, and, although this sounds like an overwhelming loss, if backups have been made regularly, even this level of damage can be easily corrected by removing the virus and reloading programs and data from the backups. More difficult to recover from are viruses which slowly corrupt data over a long period of time without ever revealing their presence in the system. In cases such as this, backups are corrupted as well, and data must be rebuilt from scratch. Perhaps the most dangerous types of viruses are those designed to do nothing except discover and report crucial system information, such as the password of the system administrator of a LAN. If one of these "discovery" viruses is successful, unlimited damage to the system and its data is possible.

Signs of Computer Viruses

Although these descriptions are chilling to those of us who depend heavily on our computers, there are simple ways to protect ourselves from these viruses and ways to recognize when certain types of viruses are residing on our systems. Some of the symptoms of a computer infected by a virus include:

- Changes in the sizes of programs.
- Longer load times for programs.
- Slower system operation.
- Unusual error messages.
- Reduced memory or disk space.
- Unusual screen activity.

- Incorrect changes in file dates and time information.
- Unexpected writes to a drive.

For instance, a journalist we know found that her laptop computer was infected with a version of the Word Concept virus. This is a macro virus with several variations that is carried in the *.doc* files created by Microsoft's very popular *Word for Windows* word processing program. The symptom she noticed was that the **Save As** command under the **File** menu did not work properly–it was disabled at odd times and did not allow her to save documents under new names. Fortunately, a quick trip to the National Computer Security Association, or NCSA, Web site was all she needed to download the correction for the virus (**http://www.ncsa.com**). By following the NCSA instructions for opening the "fix" document that contained ameliorative macros (illustrated below), she was able to remove the virus and repair all affected documents as she opened and re-saved them during the course of the next few weeks.

Figure 7.2
The "Fix" page for the Word Concept virus at the NCSA Web site.
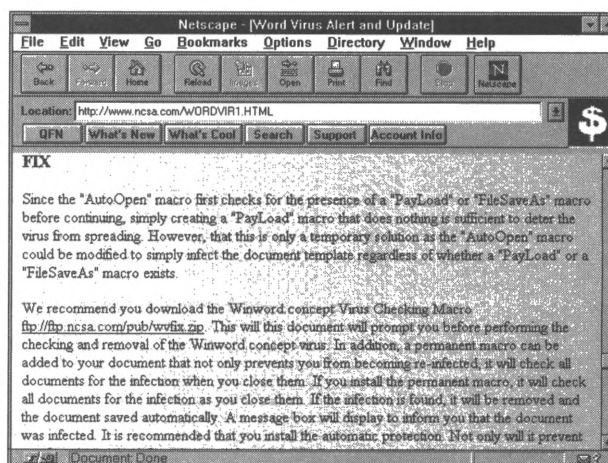
A systems engineer we know was not quite so fortunate. As she worked from her home office, she noticed over the course of a

couple of days that several data files on her primary PC seemed to be missing–she received error messages when trying to retrieve them. Within a few more days, she also noticed that some programs did not run properly, creating system errors and protection faults. After running disk analysis software, she discovered many corrupted and damaged files on the hard disk. More investigation with anti-virus software uncovered the fact that her hard disk contained a particularly destructive stealth virus in the boot sector, and that the virus had replicated to affect nearly all programs and data files on the PC. She was able to boot her PC from a floppy diskette with anti-virus protection and locate and delete the virus from the hard drive; however, the damage was irreversible and extensive. She spent several days re-installing her operating system and programs and chasing down duplicate copies of important documents and files. Because she uses her home PC to support clients remotely for her employer, a healthcare software company, the potential for spreading the virus was great. "My team spent a few frantic hours checking all my clients' systems for evidence of the virus," she reports. "Luckily, it had not spread, but if it had, we probably would have had to spend weeks repairing the damage."

Both these examples show how a seemingly unimportant system oddity can really be an indication of much more serious trouble. In the first example, the journalist should have investigated the change in available menu options right away, especially one she had used so regularly in the past, such as the **Save As** command. In the second example, the systems engineer should have immediately suspected trouble when data files began disappearing. Of course, both incidents probably could have been avoided through the regular use of anti-virus software.
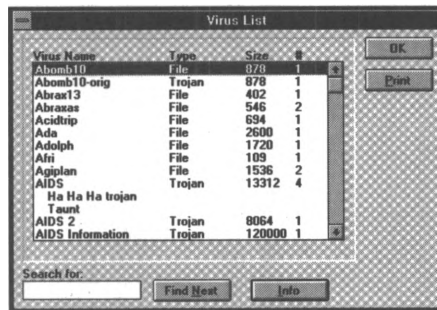
Protecting Your PC from Viruses

There are a few relatively simple steps you can take to eliminate the majority of virus threats to your documents and programs. The first, and most important, is to protect against the damage a virus might do by keeping complete and regular backups of your system. In addition, you should follow these guidelines:

1. Back up all your work and system files regularly.
2. Install and use reputable anti-virus software.
3. Update your anti-virus software regularly.
4. Always scan floppy disks and CD-ROMs for viruses.
5. Do not boot your PC from a floppy disk unless you are sure the disk is virus-free.
6. Whenever possible, use the write protect tab when using floppy disks to prevent viruses from copying themselves.
7. When downloading from the Internet, scan files for viruses before running them.
8. Use only licensed copies of software obtained from reputable sources.

The most effective way to avoid virus damage is to obtain virus detection software and to use it consistently. Most of these programs work by allowing you to perform scans of your random access memory (RAM), hard disk, and floppy disks for suspicious strings of executable code. Several, such as *Norton Anti-Virus,* also allow you to inoculate files on floppy disks or your hard disk to detect future virus infection (that is, the deposition of viruses known to the program). Some programs even allow you to keep them running in memory so that an infected program file can be caught as soon as it is copied, launched, or identified. And, the newest and most sophisticated virus protection software automatically scans files as they are downloaded from Internet sites to determine their safety.

One of the most important characteristics of virus protection software is its currency. A particular software package can only recognize viruses that have been identified, classified, and defined in the program. Most programs provide a virus definition table so that you can determine which viruses a particular program update can identify, such as the Virus List from *Microsoft Anti-Virus* program, illustrated below.

Figure 7.3
The Virus List screen of the Microsoft Anti-Virus program.

For this reason, most of the leading software manufacturers maintain extensive update programs through their Web sites. For instance, users of the popular McAfee anti-virus software, *VirusScan*, can visit the McAfee site at **http://www.mcafee.com** to download the very latest virus definition tables (DAT files) for their software, as shown below.

Figure 7.4
*Downloading anti-virus software updates from the McAfee Web site.*
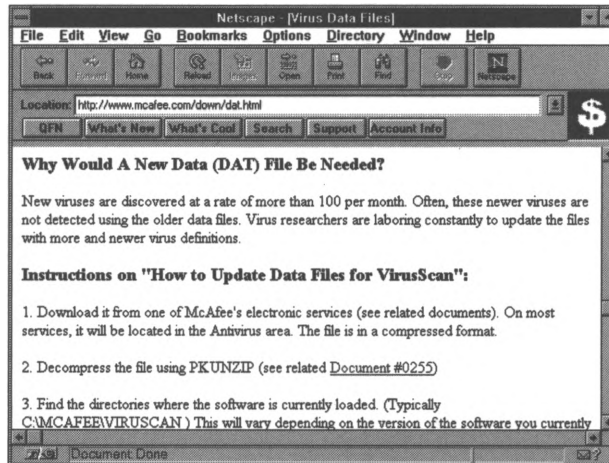
The NCSA survey mentioned above found that over two-thirds of virus infections among large organizations were caused by the use of infected floppy disks. Therefore, it is crucially important for you to scan every floppy disk every time you insert it into a drive on your computer. And, since the Word Concept virus and similar macro-type viruses are both very common and difficult to identify, you should scan floppies before opening any documents from them and scan documents attached to e-mail messages just as consistently as you scan program files.

Downloading and Installing Anti-Virus Software

Most virus protection software is available for online download. In the case of McAfee products, you can download a 30-day trial version from the McAfee Web site at **http://www.mcafee.com**. To download and install the *VirusScan* program, follow these steps:

⇒ Use your Web browser client software to visit the download page of the McAfee site at **http://www. mcafee.com/leads/evallead.html**, illustrated below.

Figure 7.5
*Download page
for McAfee's
VirusScan
program.*
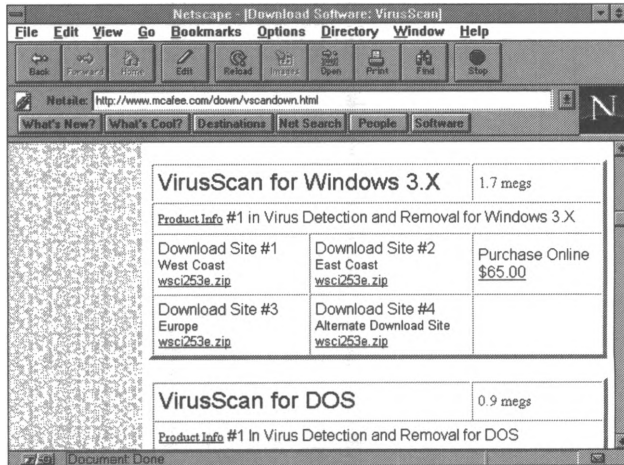
⇒ Fill in the requested information in the form on the page.

⇒ Click on the button labeled **Submit this form**.

⇒ On the next page, click on the link for the software you wish to download. For this example, we chose **VirusScan**.

⇒ On the next page, select the appropriate version for your PC's operating system and choose one of the compressed files to download, as illustrated below.

Figure 7.6
*Choosing a
version
of VirusScan.*
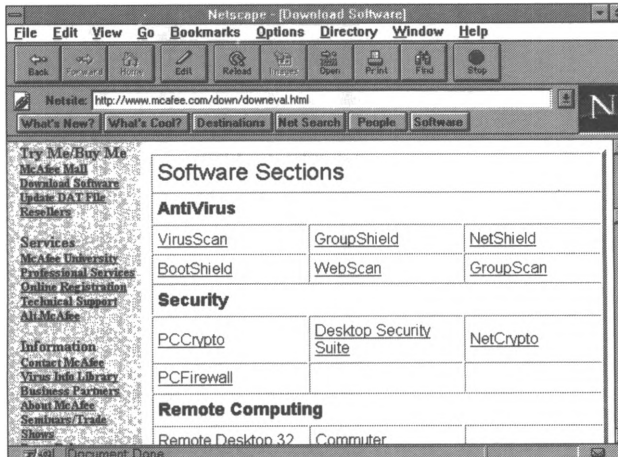
⇒ When prompted by your browser software, select the **temp** sub-directory for storing the downloaded file.

⇒ Unzip the downloaded file (called *X.zip*, where X is the name of the version you chose).

⇒ Run the *setup.exe* file by double-clicking on it in **File Manager**, selecting it through the **Run** function under the **File** menu of **Program Manager**, or executing it through *Windows 95* **Start** menu.

⇒ Follow the on-screen instructions to complete the program installation.

Using Anti-Virus Software

To use anti-virus software, you will need to follow the manufacturer's instructions, which can usually be found on the **Help** screens or in a *readme.txt* file supplied with the software. However, most virus software packages operate with similar features. The example described below uses the Microsoft *Anti-Virus* program.

⇒ Open the program by double-clicking on the Microsoft *Anti-Virus* icon (or choosing the program from the *Windows 95* **Start** menu).

⇒ Select a disk drive to scan for viruses by double-clicking on the drive in the left-hand box, as illustrated below.

Figure 7.7
Selecting a drive to scan for viruses with Microsoft Anti-Virus.
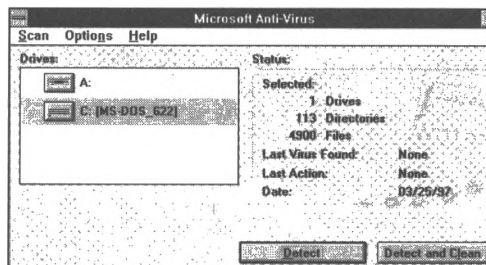
⇒ Choose either **Detect** or **Detect and Clean** by clicking on the appropriate button. If you choose Detect only, and the program finds a virus, you will be prompted to respond **OK** to a **Clean** function.

Many virus protection programs include an "options" or "preferences" menu in which you can customize your program's operation and select those functions of the software you wish to use. The **Options** screen of *Microsoft Anti-Virus* is shown below:

Figure 7.8
The Options screen of Microsoft Anti-Virus.
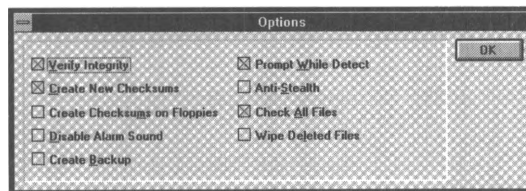
In addition, some products are designed to run as memory-resident programs, enabling them to check all files transmitted via a network or downloaded from the Internet as the transmission occurs (rather than the user performing a separate checking step before opening or executing the file).

If you are responsible for a network or for advising your clients on how to avoid losses due to computer viruses, you will need to make sure that you stay updated on new developments in this field and on the new viruses infecting computers. One way to do so is to regularly read the messages posted to the *comp.virus* Usenet newsgroup, or to subscribe to its companion e-mail discussion list, *Virus-L*. To subscribe to *Virus-L*, send a message addressed to **listserv@lehigh.edu** with the following in the body of the message: **SUB VIRUS-L Your Name**. Before posting any messages to the mailing list or newsgroup, be sure to read the excellent FAQ sheet on this subject maintained by Nick

FitzGerald. You can download the FAQ from the **comp.virus**
archive site at **ftp.infospace.com/pub/virus-l/**.

*Note: Because computer security experts understand the
importance of message encryption and authentication, you will
find that many documents distributed by them, including this
FAQ, are digitally signed, encrypted, or both. This FAQ is
digitally signed with Nick FitzGerald's PGP key, and you can use
PGP software to determine the authenticity of the copy you
download if you wish (see the next section of this chapter to
learn more about encryption).*

In addition to **comp.virus** and *Virus-L*, there is a wealth of
information available online about computer viruses. Many
companies that sell anti-virus software market their products
online. To attract potential buyers to their sites, they also provide
useful information about viruses and virus prevention. These sites
can be rich resources for virus research, and, not coincidentally,
very good sources for purchasing reputable virus prevention and
recovery software. One such site is the *Symantec Antivirus
Research Center* at **http://www.symantec.com/avcenter/
index.html**. The Symantec site includes a virus research library
with many useful descriptive documents, coverage of recent
viruses, a virus information database, a downloadable software
library, special coverage of Macintosh viruses, and, of course,
product information about Symantec software.

Figure 7.9
*The Symantec
Antivirus
Research Center
Web site.*

Another software site that offers valuable information is *Dr.
Solomon's Online* at **http://www.sands.com**. *Dr. Solomon's
Online* is an information center for users of Dr. Solomon's anti-
virus products. The site includes a virus tutorial, virus alerts, and
information about Dr. Solomon's software (such as technical
support, white papers, and independent comparative reviews).
Similarly, Seven Locks Software at **http://www.sevenlocks.com**
provides a good deal of technical information in support of their
Safe@Home anti-virus product. A list of white papers available at
this site includes topics such as "Viruses and *Windows NT*,"
"Virus Prevention Policies that Work," and "Managing Computer
Virus Incidents."

Other virus resources are developed and maintained by groups
without particular software products to market, such as the
National Computer Security Association at **http://www.ncsa.com**.
The NCSA describes its mission this way: "To foster improvement
in all aspects of world-wide digital security, reliability and ethics,
providing key services to three principal constituencies: end users
of digital technologies, computer and communications industry
product developers and vendors, and computer and information

security experts." To fulfill these objectives, the NCSA provides access to an in-depth virus study (in addition to the survey discussed above), a listing of conferences and seminars, a catalog of books and journals on information security issues, virus information alerts, and links to NCSA certified software producers.

Figure 7.10
Web site of the National Computer Security Association.
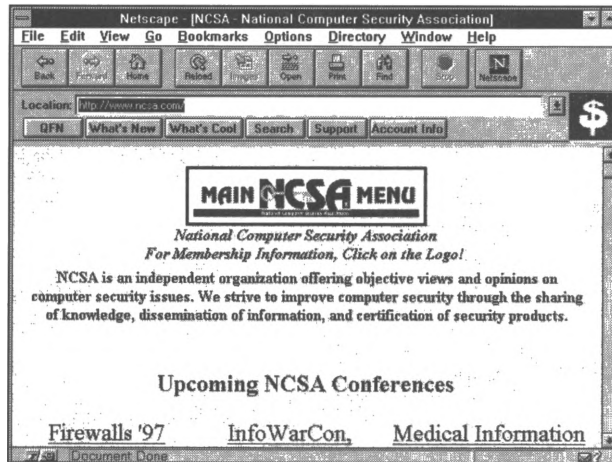
To find more specific information on a particular virus, visit Data Fellows *Virus News Updates* page at **http://www.datafellows.fi/news/vir-news/**. At this site you can access a database of information about viruses through an alphabetical listing or through a keyword search form. The database entries provide descriptions of how viruses spread, what they do, and alerts users to any variants of the virus that may also be circulating.

Encryption

However careful you and your employees may be about your organization's information, there may be times when the sensitive and valuable information your company has worked long and hard to compile and store is exposed to the "open air." Perhaps an element of your physical security system will fail, and data files will be taken from computer storage. Perhaps your company will wish to send e-mail and work files over a network using public telephone lines, such as the Internet, or conduct electronic commerce through a company World Wide Web site. Or, perhaps your organization wishes to transmit sensitive material, such as payroll records, over the Internet, a wide area network (WAN), or a local area network (LAN). The best way to keep information private and secure when transmitting it or storing it is to make it unreadable and unrecognizable through a process called encryption.

An Old Strategy Meets the Information Age

Encrypting information through the use of a secret code is an age-old tactic. For thousands of years, political leaders have encoded messages before sending them via messenger, or mail, or radio wave, to friends and allies. The "shift-by-three" code of Julius Caesar is one famous legend: the recipients of the ruler's messages could only read them by replacing each letter in the message text with a letter three positions away from it in the alphabet. For instance, the word "hello" would be encoded to appear as "khoor," and the recipient could decode it by shifting each letter three positions to its left in the listing of alphabet letters.

Today, the study of encryption and decryption, called cryptology, is a field populated by experts in mathematics, information theory, and computer science. Simple schemes such as "shift-by-three" have developed into complex algebraic algorithms, and most of the activities of cryptologists center on computers and sophisticated software. Discovering the secret codes used in encryption, through a process called cryptanalysis, is considered the necessary basic training for all aspiring cryptologists and anyone who sets out to create a credible encryption system. Some cryptanalysis techniques used in World War II are believed to be so advanced and valuable that they are still categorized as "classified" by the US government.

A Few Basic Concepts

No matter how sophisticated the mathematical techniques behind an encryption system are, there are a few concepts that are common to all systems. For instance, any process of encryption endeavors to create a ciphertext (an encoded, unreadable string of characters) from a plaintext (the original characters of the message). This is the process of encrypting, or encoding, information. The reverse process of creating plaintext from ciphertext is called decrypting, or decoding.

Encryption software is based on the mathematical conversion of plaintext to ciphertext (and back) through the use of a mathematical formula called an algorithm. A key, which is a unique string of characters, is fed into the algorithm along with the text to be encrypted. Thus, keys become part of the process that is used to encode and decode messages. Keys are widely used in many types of computer programs. For instance, your word processing software might have a function that uses a password key to lock and unlock your documents. File

compression utilities, such as *WinZip*, use various compression and decompression keys to make files more compact for storage.

Encryption systems can be classified according to how they handle the creation and distribution of these unique strings of characters called keys. Symmetric encryption systems require both the sender and recipient of the data to have the same key, and they are often called secret key systems. The private key is used by the sender to encrypt the data and the very same key is used again by the recipient to decrypt the data. In this type of system, two or more correspondents must each have a copy of the program or secret key. While this type of system is a very efficient way to keep messages secure, it also has disadvantages. To use a secret key system, you must know the person with whom you wish to exchange messages and provide them with the software and secret key in advance of sending any messages. In addition, the secret key must be sent through a secure channel (not the Internet), because if the secret key is intercepted, the security of all messages among members of the group using the system will be compromised.

An example of a secret key system is *Kerberos*, developed by the Massachusetts Institute of Technology (MIT). In this system, there is a designated Internet site called the Kerberos server that generates keys whenever a group of users wishes to send messages. Another secret key system is called *DES* (see the "Governmental Issues" section below for more discussion of *DES*). Parties that wish to share encoded messages use a common numerical string (*DES* key) along with the *DES* program to encode and decode messages.

Asymmetric encryption systems, in contrast, assign one pair of keys each to the sender and the receiver. Also called public key systems, asymmetric encryption tools provide for the sender and

receiver to have both a public key and a private key. Public key systems were designed so that users would not need to access other sites to generate keys and so users could distribute keys through unsecured channels, such as the Internet. Users distribute their public keys to anyone who wishes to send a secure message. Public keys are posted at key distribution sites so that anyone with access to the Internet can acquire anyone else's public key.

For example, if a client wanted to send private financial data to her accountant over the Internet using a public key system, she would locate and verify the accountant's public key, use the accountant's public key to encrypt her file with encryption software, and send the encrypted file via e-mail to the accountant. (Anyone who knows that the accountant has a public key could visit the Internet site serving as the repository of public keys for the accountant's chosen encryption system and do the same thing.) The accountant would then use his private key, which only he knows, to decrypt the message after receiving it. *PGP*, or *Pretty Good Privacy*, is an example of a public key encryption system. To better understand the differences between private key and public key systems, compare Figures 7.12 and 7.13

Figure 7.12
Message traffic flow in a secret key system.
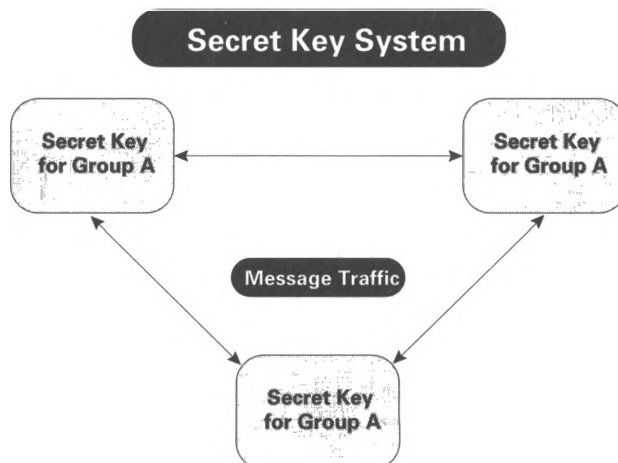
Figure 7.13
*Message traffic
flow in a public
key system.*
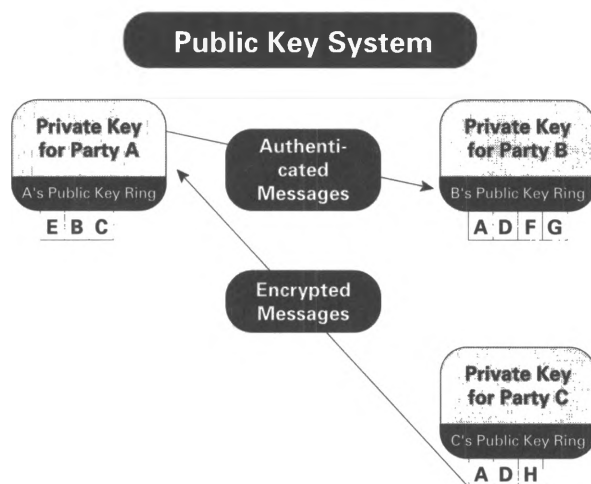
In both symmetric and asymmetric encryption systems, the length of the key is a crucial factor. In a world where sophisticated computer programs can be used to analyze and break encryption schemes, the longer the key, the more robust the encryption system. Because cryptanalysis techniques use various probability schemes to discover keys, the time required to break a system increases exponentially with each incremental increase in key length. This is why both the sales hype and the technical discussions of encryption center on key length. And, this is why the US government is concerned with encryption systems and their export.

In addition to encrypting and decrypting data, encryption software vendors often also build in features that protect files from being altered in transit or from being transmitted by impostors. The process of verifying that a message was sent by the person who has signed it and that it has not been altered during transmission is called authentication. In practice, authentication usually uses a form of digital signature to assure that a document has been sent legitimately by its stated sender and that the contents remain unaltered. In public key systems, a

message recipient can also use someone's public key to verify their digital signature and thus assure that the message is authentic.

Uses of Encryption

Individuals and organizations generally use encryption for three purposes: (1) to protect archived data; (2) to protect e-mail transmissions; and (3) to protect World Wide Web transmissions, such as electronic commerce transactions.

Archival Encryption

As mentioned above, one of the factors determining whether or not an encryption system is "breakable" through cryptanalysis techniques is time—figured as how much computing power is needed to perform the cryptanalysis. The longer it takes to discover a system's key, the more secure it is considered to be. However, the factor of time impacts different data types differently. For instance, the time an e-mail message must remain secure and confidential might be only one day, while banking account information and personnel records need to be kept confidential for much longer. Therefore, many experts recommend that organizations use much stronger encryption systems for archived data than for message transmission. So, when planning for the security of an organization's archived information, you should consider both its physical security (see Chapter 3) and the merits of the encryption system used.

E-mail Encryption

The most popular system used for the encryption of e-mail messages is *PGP, or Pretty Good Privacy*, developed by Philip Zimmerman and others. *PGP* uses a formula to create a numerical string (key) from two prime numbers using the RSA, Inc. public-key system invented in 1977 by Ron Rivest, Adi

Shamir, and Leonard Adleman. The key is used to encode messages, and to encode them, one must know the two original prime numbers. *PGP* public keys can also be used to authenticate signatures and ensure message integrity, as discussed above. For instance, a bank may wish to send its customers a message changing a deposit procedure. The bank can use *PGP* to create an elaborate digital signature that contains not only the bank's signature but also an encrypted digest of the message. The customer can process the bank's message and signature with *PGP* and the bank's public key and verify that the message was from the bank and that it was not altered on its way.

PGP is available for non commercial use by using Telnet to visit the **net-dist.mit.edu** site. Log-in as **getpgp**, answer the questions, and then use FTP to visit the **net-dist.mit.edu** site and follow the directions to download and install the software. *PGP* for commercial use is available from PGP Inc. (***http://www.pgp. com***). The commercial version, called *WinPGP*, is much more integrated with *Windows* software programs and provides an efficient cut-and-paste method of encrypting and decrypting messages.

In addition to third party encryption systems, such as *PGP*, various e-mail programs are beginning to include encryption as components of e-mail composition and transmission software. One protocol gaining acceptance as a broad standard for Internet e-mail security is S/MIME, based on the RSA encryption system. When using an e-mail package, such *as Netscape Mail* or *Eudora Pro*, that supports S/MIME, encryption and decryption takes place transparently to the user. As the export issues surrounding encryption systems are resolved and users pressure software makers for easier ways to protect Internet messages, this type of embedded encryption will become more and more popular.

World Wide Web Encryption

In the continuing debate about Internet standards, the encryption of HTTP transmissions is a hot topic. At stake is the security of all electronic commerce conducted via Web sites. Some companies, like Netscape, are advocating for standardization on open, non-proprietary security schemes, such as their proposed Secure Sockets Layer, or SSL. Other firms, especially makers of specialized electronic commerce systems, would like to see each site using the software of their choice, which may or may not be based on a proprietary encryption system.

As of this printing, SSL seems to be fast gaining acceptance as a standard for secure Web transmissions. As Netscape has envisioned it, SSL is a layer of protocol located logically between Internet client software (such as software used to access the Telnet, FTP, or Usenet functions of the Internet) and the TCP/IP software (also called the TCP/IP stack or the winsock). In addition to data encryption based on the RSA system, SSL provides for server authentication, client authentication, and message integrity. When accessing a server that supports SSL, you will see that the protocol indicator at the beginning of the URL begins with HTTPS (as opposed to HTTP). In addition, if you are using an SSL-enabled WWW browser you will see an indication on your browser screen that you are connected with a secure server–for instance, when using Netscape *Navigator*, the small key icon at the lower left-hand corner of the browser screen changes from a broken key to an intact key, as illustrated below on the order screen for Netscape's *Enterprise Server* software.

Figure 7.14
*Secure WWW
connection to a
Netscape server.*
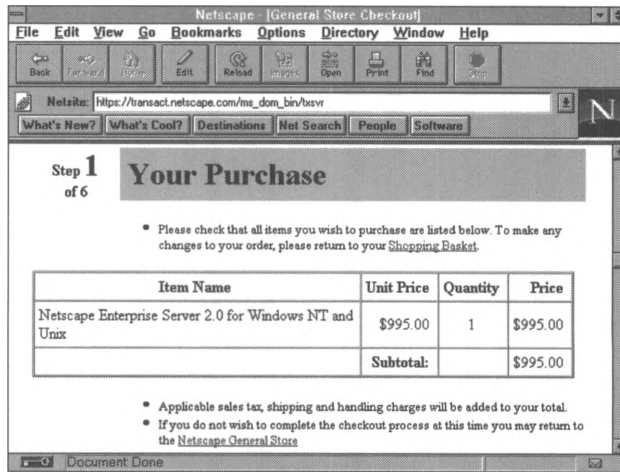
When you are sending information, such as credit card data or
account information, to an SSL enabled server with an SSL
enabled client, the data is encrypted automatically with the
server's public key on the client side and is decrypted with a
private key on the server side. The same is true in reverse;
however, the private and public keys are generated randomly by
the client software and the user is not required to perform any
special decrypting steps. Netscape *Navigator* informs the user
when a secure form has been requested through the browser
software with the following screen.

Figure 7.15
*Security
Information
screen of
Netscape
Navigator.*
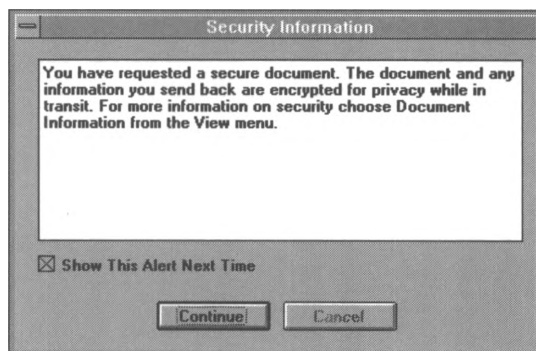
Choosing Encryption Software

Software makers will come and go, but the basics of choosing good encryption software are relatively simple. Use the two sections below to establish what your objectives are in encrypting data and to measure the marketing claims of software companies.

Organizational Encryption Objectives

For many users of computer based encryption, preserving the contents of a message is as important as protecting its secrecy. Damage caused by tampering can often be worse than damage caused by disclosure. For example, it may be disquieting to discover that a cracker has read the contents of your funds transfer authorization, but it's a disaster for him to change the transfer destination to his own account.

Encryption by itself does not protect a message from tampering. In fact, there are several techniques for changing the contents of an encrypted message without ever figuring out the encryption key. If the integrity of your messages is important, don't rely on just secrecy to protect them. Check how the vendor protects messages from undetected modification.

Key Sizes

Even if a cipher is secure against analytical attacks (which form the basis of most cryptanalysis techniques), it will be vulnerable to brute-force attacks with moderate computing power if the key is too small. In a brute-force attack, the attacker simply tries every possible key until the right one is found. How long this takes depends on the size of the key and the amount of processing power available. So when trying to secure data, you need to consider how long it must remain secure and how much computing power an attacker can use. Any reliable encryption software vendor should be able to provide you with estimates of

how long it would take to break the system it uses and the conditions under which that could occur.

Keys vs. Passphrases

A key is not the same thing as a passphrase or password. In order to resist cryptanalysis techniques, all possible keys must be equally probable. If some keys are more likely to be used than others, then an unauthorized person can use this information to reduce the work needed to break the cipher. Essentially, the key must be random. However, a passphrase generally needs to be easy to remember, so it has significantly less randomness than its length suggests. For example, a 20-letter English phrase, rather than having 20 x 8 = 150 bits of randomness, only has about 20 x 2 = 40 bits of randomness. So, most encryption software will convert a passphrase into a key through a process called hashing or key initialization. Avoid encryption systems that skip this phase by using a password directly as a key.

Implementation Environment

Other factors that can influence the relative security of a product are related to its environment. For example, in software based encryption packages, is there any plaintext that's written to disk (perhaps in temporary files)? What about operating systems that have the ability to swap processes out of memory on to disk? When something to be encrypted has its plaintext counterpart deleted, is the extent of its deletion a standard removal of its name from the directory contents, or has it been written over? If it's been written over, how well has it been written over? Is that level of security an issue for you? Are you storing encryption system keys on a multi-user machine? If so, the likelihood of having your keys illicitly accessed is much higher.

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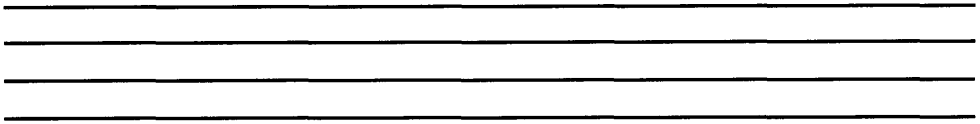
Software Warning Signs

Below is a list of claims and practices that should make you think twice about a particular software vendor. Some very reputable systems might use one of these marketing angles to promote their product, but, in general, any vendor that makes impossible claims or unreasonable assurances is probably overstating their system's security. When buying encryption software, that old adage is unfortunately true: "If it sounds too good to be true, it probably is."

Trust Us, We Know What We're Doing

Perhaps the biggest warning sign of all is the "trust us, we know what we're doing" message that's either stated directly or implied by the vendor. This message is usually communicated in lieu of a complete explanation of the security features of the product, with the implication that describing the product in exhaustive detail would somehow compromise the secret "inner workings" of the system. If the vendor is concerned about the security of their system after describing exactly how it works, it is certainly of questionable effectiveness. Regardless of whether or not they tell, cryptanalysts will be able to figure it out.

Technobabble

If the vendor's description appears to be confusing nonsense, it may very well be so, even to an expert in the field. One sign of technobabble is a description which uses newly invented terms or trademarked terms without actually explaining how the system works. Technobabble is a good way to confuse a potential user and to mask the vendor's own lack of expertise. And consider this: if the marketing material isn't clear, will the user manual be any better? Even the best product can be compromised if it isn't used properly. If you can't understand what a vendor is saying, you're probably better off finding something that makes more sense.

Secret Algorithms

Avoid software which uses secret algorithms. This is not considered a safe means of protecting data. If the vendor isn't confident that its encryption method can withstand scrutiny, then you should be wary of trusting it. A common excuse for not disclosing an algorithm is that "crackers might try to break the program's security." While this may be a valid concern, it should be noted that sophisticated cryptanalysts can reverse-engineer the program to see how it works anyway. This is not a problem if the algorithm is strong and the program is implemented properly. Using a well known and trusted algorithm, providing technical notes explaining the implementation, and making the source code available are signs that a vendor is confident about its product's security.

Revolutionary Breakthroughs

Beware of any vendor who claims to have invented a "new type of cryptography" or a "revolutionary breakthrough." True breakthroughs are likely to show up in research literature, and professionals in the field typically won't trust them until after years of analysis, when they're not so new anymore. The strength of any encryption scheme is only proven by the test of time.

Unbreakability

Some vendors will claim that their software is "unbreakable;" however, no algorithm is unbreakable. Even the best algorithms are susceptible to brute-force attacks, though this can be impractical if the key is large enough. Some companies that claim unbreakability actually have serious reasons for saying so. Unfortunately, these reasons generally depend on some narrow definition of what it means to "break" security. For example, one-time pads (see the next section) are technically unbreakable as far as secrecy goes, but only if several difficult and important conditions are true. Even then, they are trivially vulnerable to

known plaintext attacks on the message's integrity. Other systems may be unbreakable only if one of the communicating devices (such as a laptop computer) isn't stolen. So be sure to find out exactly what the "unbreakable" properties of the system are, and see if the more breakable parts of the system also provide adequate security.

One-Time-Pads

A vendor might claim the system uses a one-time-pad (OTP), which is provably unbreakable. Technically, the encrypted output of an OTP system is equally likely to decrypt to any same size plaintext. For example, the ciphertext below:

598v *$ _+~xCtMB0

has an equal chance of decrypting to any of these:

The answer is yes
The answer is no!
You are so naive!

An OTP system works by having a "pad" of random bits in the possession of both the sender and recipient, but absolutely no one else. Originally, paper pads were used–thus, the term "pad." The pad must be sent from one party to the other securely. To encrypt an n-bit message, the next n bits in the pad are used as a key. After the bits are used from the pad, they're destroyed, and can never be used again.

The bits in the pad cannot be generated by an algorithm or other encryption tool. They must be truly random, using a real random source such as specialized hardware. The real limitation to practical use of OTPs is the generation and distribution of truly random keys. You have to distribute at least one bit of key for

every bit of data transmitted. So OTPs are awkward for general purpose cryptography. Further, if pads are provided by a vendor, you cannot verify the quality of the pads. Also, some vendors may try to confuse random session keys or initialization vectors with OTPs.

Recoverable Keys

If there is a key-backup or key-escrow system, are you in control of the backup and organizational implementation of key escrow or does someone else hold a copy of the key? If the vendor claims it can recover lost keys without using some type of key-escrow service, the security is obviously flawed.

Exportable from the USA

If the software is made in the USA, can it be exported? As discussed above, strong cryptography is considered dangerous munitions by the United States and requires approval from the US State Department before it can leave the country. Chances are, if the software has been approved for export, the algorithm is weak or crackable, as the recent demonstrations of the exportable version of Netscape *Navigator* demonstrate.

Military Grade

Many encryption system vendors claim that their system is "military grade." This is a meaningless term, since there isn't a standard that defines "military grade," other than the fact that a system is actually being used by various armed forces. Unfortunately, many reputable makers of reliable encryption software use this marketing claim.

Other Considerations:
- Avoid vendors who don't seem to understand any concepts described in this section.
- Avoid any system that doesn't let you generate your own keys (e.g., the vendor sends you keys in the mail, or keys are embedded in the copy of the software you buy).
- Avoid anything that allows someone inappropriately accessing the software on a particular PC to retrieve encrypted data without needing some sort of key or passphrase.
- Beware of products that are designed for a specific task, such as data archiving, and have encryption as an additional feature. Typically, it's better to use an encryption utility for encryption, rather than some tool designed for another purpose that adds encryption as an afterthought.
- No product is secure if used improperly. Make sure that your organization includes the appropriate use of encryption systems in procedures and policies.
- Interface isn't everything: user-friendliness is important, but be wary of a system that puts too much emphasis on ease of use without due consideration to cryptographic strength.

Since the experts in cryptology are computer scientists and theoretical mathematicians, you can find lots of discussion among cryptologists on the Internet. The Usenet newsgroup *sci.crypt* is the place to find serious, theoretical discussion of new encryption systems and their testing. For discussion of general social and regulatory issues regarding encryption tools, try *talk.politics.crtpto*. In *misc.legal.computing*, you can find lively debate about issues like the patenting of encryption technologies, privacy rights, and government involvement.

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The very long, 10-part *Cryptography FAQ* provides a comprehensive overview of the terms and concepts cryptologists use to discuss their work. You can find it in the **sci.crypt** newsgroup (posted every 21 days), and the most recent version is archived at **ftp://rtfm.mit.edu/pub/usenet/news.answers/cryptogrophy.faq/**. Section 3 of this document, titled "Basic Cryptology," is an especially useful basic introduction to various kinds of systems and their efficacy.

The RSA Data Security Web site is another good source of general encryption information and discussions of organizational issues involving information security (**http://www.rsa.com**). At this site, you can find a very informative FAQ on export issues called "Answers to Frequently Asked Questions About Cryptography Export Laws" in Adobe *Acrobat* PDF format. In addition, RSA publishes a customer newsletter called *Ciphertext*, each issue of which is also posted as a PDF file at the Web site.

If you want to learn more about Secure Sockets Layer (SSL) and Netscape's plans for its integration into browser software and other Internet functions, take a look at the following two online documents: *On Internet Security* (**http://home.mcom.com/info/security-doc.html**) and *Netscape Data Security: An Overview of Implementations and Plans from Netscape Communications* (**http://home.mcom.com/newsref/ref/netscape-security.html**). You can also subscribe to Netscape's discussion mailing list about SSL by sending mail to **ssl-talk-request@netscape.com** and including the word **subscribe** in the body of your message.

Acceptable Use

The phrase "acceptable use" covers a wide range of behavior and activities. In general, it is used to describe what an organization will allow employees and users to do with its computer systems. Acceptable use parameters can clarify issues such as whether or not employees are permitted to use computers for personal work such as freelance jobs or college papers, whether or not games or other non work related activities are allowed, and what the intended uses of organizational computer systems are. For instance, the "Acceptable Use" section of the Security Policy of the Queensland Parallel Supercomputing Facilities stipulates that the following activities are prohibited by users of computer resources: (1) playing games; (2) accessing other computers to play games; (3) antisocial activities; and (4) activities that are likely to detrimentally affect other users (see the full policy online at **http://www.qpsf.edu.au/admin/security.html**).

Many organizations documents the terms of acceptable use of computer equipment, along with the penalties for deviating from acceptable uses, in the form of an employee policy. You may wish to document such terms in a Computer Use Policy to be distributed to all employees. When defining what will constitute acceptable use of your organization's computers, you may want to consider specifically prohibiting the following types of uses, depending on the level of protection you wish to enforce:

- Personal correspondence via e-mail.
- Personal work.
- Playing computer games.
- Installing personal software.
- Violating any software license agreement.

- Distribution of proprietary or confidential company information.
- Accessing, or attempting to access, unauthorized confidential information, files, or data.
- Any illegal activity under federal, state, or local law.
- Using computers for any purposes other than specifically defined in an acceptable use statement (such as using a specific set of applications or programs to complete work related tasks).

Information Access Rights

In addition to the risks posed by misconduct, you will probably wish to protect certain types of confidential or proprietary information that resides on either stand-alone computers or networked computers in your office. When thinking about internal information access rights, you can use the simple analogy of a filing cabinet to consider the threats and alternatives for protection. For instance, if you are the payroll manager of a large corporation, it is likely that you keep your hard copy payroll files under lock and key all day long. Probably only one or two other persons have access to these files–maybe your secretary and perhaps your boss, the vice president of administration. If a manager of a particular department comes to you for payroll information on her department's employees, you will release to her the files relevant to her own employees, not the files for her peer managers or the employees of another department. It would be understood that this manager would not release the payroll information for one employee to another, and that she would not publish her department's payroll information company-wide or over the World Wide Web.

Now, for comparison, let's suppose that you have an automated payroll software system that runs from the server of your local area network. Perhaps that system has built-in password authorization levels in place for managers to access information in their employees' payroll records. Perhaps the system administrator has implemented a step whereby a manager can only read that information, but to change it, say, to give an employee a pay raise, she must have the approval of you, the payroll manager. These are useful security measures, and you should use them as appropriate for your organization, but their efficacy depends on each authorized person using the information only as intended. As an example: what good would the multi-level password system be if the manager accessed the confidential information in an authorized manner, but then printed it on her laser printer, photocopied it, and gave a copy to each company employee?

What you need in this instance is a clear definition of the information access rights of each level of employee in your organization. Even if these "rights" are defined by software parameters, you should document why they are in place and how employees should handle data after they have retrieved it. If, for instance, the marketing research your company spends millions of dollars to conduct is crucial to its competitiveness, employees should be made aware that it is proprietary, protected information. We know of one company that administers its local area network as follows: each employee has only a workstation computer and operating software on their desk; all application software and data reside on the network server; and it is a violation of policy for any employee to store any company data on the hard drive of their desktop computer workstation–period. Another firm handles the same issue in this slightly different way: each department stores the data necessary for its operation in a separate sub-directory of the network server; certain employees

have password rights to retrieve (but not modify) the data in certain departments' sub-directories; however, no one is authorized to store a copy of protected data from another department's sub-directory in their own department's sub-directory.

When deciding about information access rights, you can use a rule of thumb common to the medical and legal professions, called the "need to know" rule. According to this rule, only employees who need to know information to perform their jobs should have it. For instance, a manager who evaluates employees' performance and grants merit raises obviously needs to know her employees' salaries, but very few other people do. Everyone in the company probably needs to know the contents of the company's strategic plan, but very few people need to know the competitor analysis on which certain aspects of the plan were based. As you work through the level of information that particular classes of employees "need to know," you can use a table to keep track of your decisions.

All of the issues discussed in this chapter can be documented in a Computer Use Policy and distributed to all employees. Employees should be made aware of their responsibilities for performing information security tasks such as virus scanning, encryption of messages, and protection of physical equipment. To begin a Computer Use Policy, you can use the following topics as a starting point.

- Acceptable use parameters.
- Devising and using appropriate system passwords.
- Releasing personal information over the Internet.
- Appropriate and professional Internet behavior.

- Releasing confidential or proprietary organizational information to anyone, internal or external.
- Guidelines for use of copyrighted material.

The policy should state clearly what the penalties will be for violation of certain terms, and whom employees should contact if they need clarification of topics covered in the policy.

If you decide to establish a Computer Use Policy for employees, there are several samples available online that you can use as a basis. One well researched one is provided by the Computer Professionals for Social Responsibility group discussed above. At their Web site (**http://www.cpsr.org**), CPSR provides "A sample E-mail and Voice-mail policy" (**http://www.cpsr.org/dox/program/e-mailpolicy.html**). ON Technology, a provider of network security software, has issued a white paper to help companies compose Internet usage policies, available at **http://www.on.com**.

The Privacy Rights Clearinghouse, a non-profit group begun at the University of San Diego, operates a Web site located at **http://www.privacyrights.org/**. Here you can find a series of papers on personal security and privacy and how technology affects individual rights. This site also contains a list of useful links on security and privacy issues.

Chapter 8
Enhancing Your Practice with Internet Technology

In previous chapters of the 1998 *CPA's Guide to the Internet*, we've talked mostly about how you can use the Internet to enhance your own communication, information retrieval, and research tasks. To take advantage of the immensely valuable resources available, you simply need to select an Internet service option that meets your particular needs–whether it be a commercial online service (like *CompuServe*), a UNIX shell account, or a SLIP/PPP connection through an Internet Service Provider (ISP). To perform these e-mail, Usenet, FTP, Gopher, and World Wide Web tasks, you need only obtain access to the "client" portion of the client/server functionality of the Internet.

However, the time will come when you will begin to think about how your company or practice can enhance its client base, revenue, or competitive position through offering services on the Internet. According to a recent Robert Half survey of business executives, marketing is the largest single business use of the Internet. Since it is an efficient and economical way to reach, potentially, millions of customers, your decisions will not be centered on <u>whether</u> to establish Internet presence but on how to exploit this new medium in your company's best interests.

One way to take advantage of Internet technology is to establish a Web site for your practice or firm. Another is to serve as an Internet consultant for clients interested in establishing Internet presence. Still another valuable business use is to incorporate Internet technologies on an internal network, enhancing communication among employees in a cost-effective manner. Whether you assume the role of "Internet advocate" in your firm, make recommendations to clients, or add Internet technologies to an already existing network structure in your organization, you will need to be familiar with the "server" side of client/server technology. This chapter will help you think about how you can use Internet technologies to enhance the operations of your practice or firm.

Figure 8.1
At the Accounting Professionals Resource Center, hosted by Kent Information Services, you will find an index of World Wide Web sites maintained by CPA firms like this one.
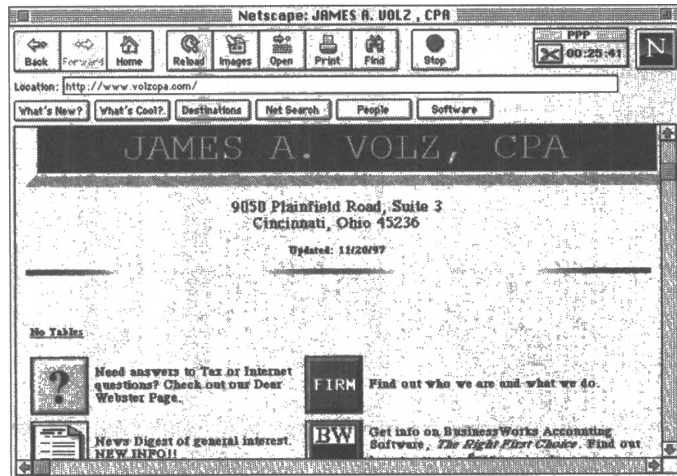
Business in the 21st Century: The World Wide Web

When most people think of the Internet they think of the World Wide Web, and it's easy to see why. While Usenet, FTP, and Gopher are useful tools, the Web provides a universal library of knowledge in an attractive, fun-to-use package. With its intriguing point-and-click links, attractive text, graphics, and sound, the WWW is an appealing, global hypertext network that supports the following:

- Multimedia applications
- Integrated graphics
- File downloads and transfers
- Remote logins
- Sophisticated security tools
- Client/server distributed processing
- And much more

With the advent of sophisticated graphical user interfaces such as Microsoft *Internet Explorer* and Netscape *Navigator*, Web users can access sophisticated looking documents. These documents are built using a formatting language called Hypertext Mark-up Language (HTML). HTML documents feature the unique ability to transfer users to other Web sites through "links," which typically appear either as words in blue type or as interactive buttons. Through clicking on blue highlighted text (or an interactive button), Web users are automatically transported from the current Web page to another, related Web page with useful information. This new page might be at the same Web site, or it may be at an entirely different site.

Since World Wide Web documents have a distinctive, often polished look, people are beginning to consider the Internet an

appropriate publication medium. Here we are using publishing in the broadest sense possible–publishing as a way of distributing unique or original information. While the ASCII and binary files available at FTP and Gopher sites are extremely useful and valuable, they are not generally nice to look at. Sometimes appearance has no impact, as in the case of software code. But, especially when the aim is marketing, documents benefit from the niceties of various fonts, proportional spacing, and fixed formatting. In part because WWW documents are enhanced in these ways, the Web is the fastest growing part of the Internet.

For these reasons, if you intend to establish an Internet presence by providing either company information or information content on the Internet, you will probably want to do it through a Web home page. Using the unique technology of WWW links, you can enhance the content you provide to users at your Web site by making other useful sites available to them in organized, contextual format. To make the most of your Internet presence, make sure that your Web pages are polished, visually pleasing, and free of typographical and grammatical errors. Many CPAs are hiring communication professionals to help with this aspect of Internet service; however, a thorough explanation of using HTML is contained in Appendix 8-1 of this book.

Marketing and Company Information

As we mentioned above, the biggest and most rapidly growing commercial use of the Internet is marketing. Many consumer-oriented enterprises have joined the online shopping areas of commercial services such as *America Online*, using the medium to provide catalogs, order information, and even to conduct transactions. Companies of all sizes are rushing to establish

World Wide Web home pages to advertise products and services.

Figure 8.2
Amazon.com, the giant online bookseller, is a good example of a successful Internet storefront.

To establish a WWW home page, you will need to gain access to Internet server software. To do this, you must either contract with an Internet Presence Provider (IPP)–a company that will sell you time and services on their large, established Internet site–or establish your own Internet site. Either option allows you the opportunity to designate an individual domain name (**yourfirmname.com**); the real differences between these two options are complexity and cost.

Whichever option you choose, providing company information on the Web is an excellent way to distribute contact and service information to potential clients, employees, and colleagues on a demand basis. Regardless of time zone differences, business hours, project volume, and staffing considerations, people will be able to browse your home page, retrieve the information they need, and have access to your firm whenever they wish.

Information Content

Whatever your professional specialty, you probably have developed a considerable repository of information that would be useful to your clients if they could access it conveniently. For instance, you might already have a question and answer document pertaining to a particularly complex tax area. Or you may be an IS consultant who has developed extensive documentation for a group of LAN clients. Perhaps, like Kent Information Services, Inc., your firm provides training or reference materials. In the online world, documents such as these, when provided in electronic format, are called "information content." As long as the information you have created is not copyrighted to someone else (see Chapter 6 for a discussion of copyright issues), you can provide it to whomever you wish in whatever form you wish. Information content is the stuff of online research, and it is the holy grail of most sophisticated Internet users. One often hears an experienced Internet user tell a friend, "You should have seen the content at that site! I'll give you the address so you can access that great bibliography" (or list, or FAQ, or text of federal regulations, or insert-name-of-content-here).

Figure 8.3
*The power of
online content is
shown here at the
Internal Revenue
Service WWW
site.*
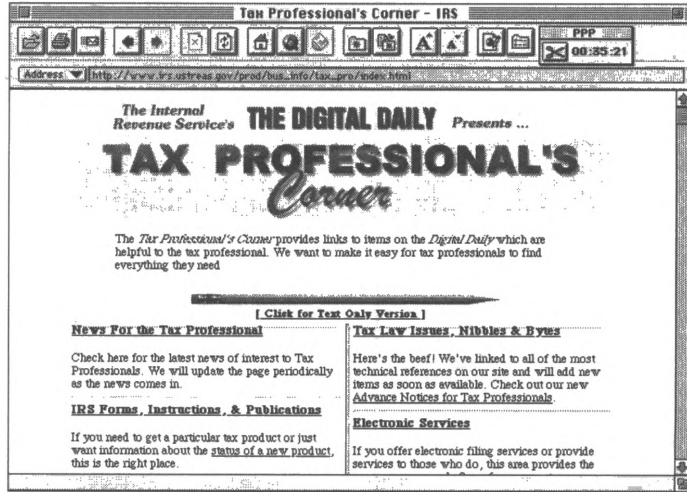
If you've ever accessed an FTP site to browse through Usenet archives or have visited the *FedWorld* gopher site to download tax forms, you know the power of online content. As you begin to think of yourself as an Internet presence, consider what content you could provide. Think about how online access to frequently requested information could improve your office's workflow and efficiency. Ask your clients what they would like to be able to access from you. Take a look at what other accountants and firms are providing. However you develop your solution, make sure you fully benefit from your hard work and expertise by making the professional information you have created available to the persons who need it most—your clients.

Professional Presence and Professionalism

There are many ways to communicate a competent and professional (or, unfortunately, an incompetent and unprofessional) image via the Internet. The most important aspect of Internet presence is observing Netiquette, the rules and standards for online conduct. See Chapter 6 for a

discussion of Netiquette and how to avoid making embarrassing or damaging mistakes when conducting online activities.

In addition, consider how you approach your e-mail, Usenet messages, and subscription mailing list postings. The days are gone when the Internet was a closed, private community of computer programmers and research scientists. Today, a potential audience of 200 million persons can read your Usenet postings. Hundreds or thousands of professionals with similar interests will see your mailing list messages; some of them are bound to be potential employers, employees, or clients. Posting e-mail messages with your company name in the signature block is commensurate with sending them out on company letterhead. Professionalism is crucial in the online arena, and wise Internet users exercise the same judgment in their Internet activities as they do in every other aspect of their professional conduct.

For instance, would you send out a business letter without proofreading it? If not, make sure that you proofread your electronic correspondence for spelling and grammar errors. Would you use profanity in a phone conversation with a client? An Internet Chat (IRC) conference is comparable to a phone call. Would you call a colleague ignorant, dishonest, or worse at a professional luncheon? If you wouldn't, then don't do it in a Usenet posting either. Remember that your keystrokes are being recorded and archived at many Internet sites around the world. It won't be long before reporters learn to monitor the online statements of business leaders and prospective office holders. Future generations will have ready access to much more of our current electronic communication than we realize. And clients and business associates see it every day.

On a more positive note, there are many ways to convey a professional, informed image on the Internet. For instance, maintaining an active dialogue with other accounting professionals on the accounting related Usenet groups and subscription mailing lists can subtly enhance your professional reputation. Helping others by answering questions and providing referrals to other online resources can win you potential clients. If you wish to establish yourself as a recognized expert in a particular specialty, you should make sure that your name is attached to lots of valuable information in cyberspace. If you have the time and energy to make an even bigger commitment, you can start a moderated mailing list on a topic of your own choosing. Forming your own Usenet group is also an option, but it is a complicated process with many Internet community approval steps.

Where to Start: The WWW Checklist

Like most new ideas, the establishment of an Internet presence requires an internal advocate who is constantly promoting Internet use. The following checklist is written so that the questions can be answered by the Internet advocate. An analysis of that advocate's needs will probably determine whether or not the organization as a whole moves forward.

Analyze the answers and weigh the importance of each question to your particular business (or you may want to use the checklist when deciding what kind of Internet presence a client should establish). If you are concerned about the privacy of information passed over the Internet and want to learn how to ensure its security with encryption, see Chapter 7, "Personal Security."

Figure 8.4

World Wide Web Questions	Yes	No
1. Do you need information from businesses, governmental units, etc.?	☐	☐
2. Do you provide certain information for free that could be provided more economically over the Internet?	☐	☐
3. Do you wish to present information to the public that would enhance your marketing effort?	☐	☐
4. If you establish a site on the World Wide Web, how much personnel effort and costs will be required to keep the content at the site fresh and interesting?	☐	☐
5. Do you wish to sell goods or services at your World Wide Web site?	☐	☐

If you answered yes to question 1, you need an Internet connection through either a commercial online service or an Internet access provider if the ongoing monthly benefit would be more than $10.00 per month.

If you answered yes to questions 2 through 5, you are considering establishing a site on the World Wide Web. The out-of-pocket costs range from $30.00 per month for a minimal home page at a low cost Internet Service Provider or commercial online service to about $200.00 per month or more for a more substantial site at an Internet Presence Provider.

The cost of a unique domain name is generally included in the cost of a business account at an Internet Presence Provider which is a minimum of $200.00 for setup charges and at least $40.00 per month. That total may include full e-mail services and other Internet services like a Web home page. The cost of an individual e-mail account is about thirty dollars for setup charges and as little as $9.00 per month after setup. The initial

costs are even less if you sign up with a commercial online service like *America Online* or *CompuServe*. However, the hourly costs for extra services and transactional costs for e-mail at a commercial online service may make this option too costly once your online time exceeds ten hours per month.

The most substantial cost will probably be in the initial Web design and ongoing content maintenance. You can set up a very simple Web home page on your own. However, to use complex elements such as photographs and image maps, you may need professional assistance. You may wish to consider obtaining graphic design and editorial support for your Web pages, just as you would do for any publication developed by your firm. In addition, you should remember that the key to keeping visitors coming back to your Web site is "content, content, content." If your content grows stale, an interesting design won't bring visitors back. But if your home page is well designed, visually pleasing, and provides a wide variety of links and interesting content, visitors will browse it frequently.

An Internet Presence Provider or Your Own Facility

Many of the solutions outlined above call for establishing a business account at an Internet Presence Provider that would provide 10 to 30 megabytes of storage, a World Wide Web server, an FTP server, e-mail, etc., for around $200.00 a month. In contrast, the major out-of-pocket costs of establishing your own small server are listed below.

Machine costs	$4,000.00
56K dedicated line costs for one year	5,000.00
Telephone line costs	1,500.00
Software (unless you like UNIX)	500.00
	$11,000.00

Many small businesses are turning to off-site Internet Presence Providers to provide their Internet sites because they cost less than buying an internal server, pose no security threat to internal LANs, and provide twenty-four hour monitoring, seven days a week.

Developing Content for Your Web Site

In order to design a Web site, you need to know at least the basics of Hyper Text Mark-up Language, a series of tags that define document layout and presentation on the World Wide Web. HTML tags are special embedded directions that are not displayed by the browser, but tell the browser how to display the contents of the document, including text, images, and other support media. HTML is <u>not</u> a programming language, a desktop publishing tool, or a word-processing program. Its fundamental purpose is to define the structure and appearance of documents so that they can be quickly and easily accessed across computers, even computers using different operating systems and running different software.

HTML tags, which are often paired, tell a Web browser how to treat the text between them—from defining appearance to

creating links to other sites. For example, you can surround text with the paired HTML tags **<STRONG> </STRONG>** to tell a Web browser to represent those words more strongly than the other text in the document. Most browsers will treat this tag sequence as a command to display the text between the tags in boldfaced lettering. Word-processed documents are similarly defined by codes that tell the word processor how to represent text, but those codes do not appear on the final document. In the near future, HTML tags may become as transparent a means to encode Web documents as word-processor codes are in other kinds of text.

There are HTML tags that allow nearly any effect you may wish to create in a document—listing, italicizing, underlining, paragraph breaks, headings, and many, many others. A quick review of an online source such as the CERN and National Center for Supercomputing Applications (NCSA) sites will be sufficient to get you started creating documents to display on your Web browser, or you can refer to the list of common HTML tags found in Appendix 8-1.

Web Browser Variations

Although most Web browsers can read HTML tags that conform to HTML 2.0 standards, each browser will display documents with slight variations. In fact, many special features used commonly in Netscape compliant documents use standards that are not HTML 2.0, and cannot be displayed in all browsers. For instance, look at this Netscape *Navigator* display of one of the pages at the Kent Information Services, Inc., Web site:

Figure 8.5
*Kent Information
Services, Inc.,
Web page
displayed in
Netscape
Navigator.*
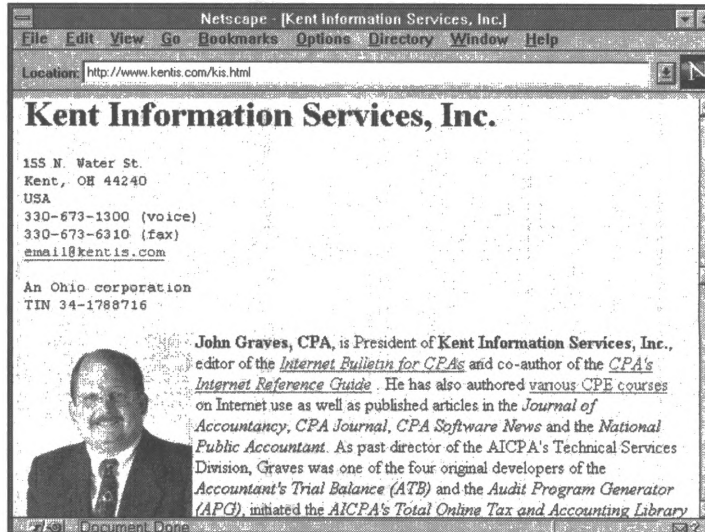
Now, compare the *Navigator* display to the same document displayed in *Spry Mosaic*:

Figure 8.6
*The same page
displayed in Spry
Mosaic.*
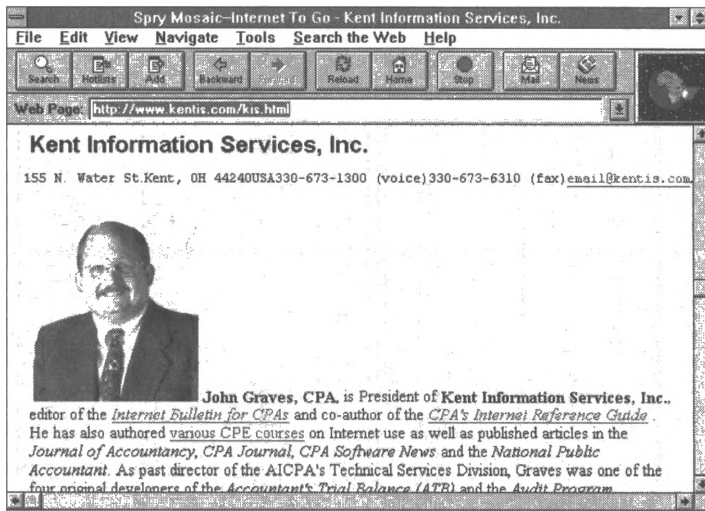
Notice that the HTML tags that tell the browser to break the lines of the address and phone number information in the

Navigator display are ignored by *Mosaic*. As a result, the information runs off the *Mosaic* display page. Notice also that the HTML tag that tells the browser to run display text next to the image is ignored by *Mosaic*, so the text is displayed below the picture instead. As the browser market is taken over by two predominant players, Microsoft's *Internet Explorer* and Netscape's *Navigator*, the differences in display may decrease or disappear altogether. For now, when developing HTML documents for your Web site, keep these variations in mind. Recognize that clients, potential clients, competitors, and business partners who visit your site may be using various browsers, so whenever possible, design your documents so that they display well in as many browsers as possible.

In addition to design and presentation features, you should also consider other applications that can be run through some Web browsers (such as e-mail) and the security features of browsers (such as the encryption features available with *Navigator* and *Internet Explorer*).

Using Helper Applications

As you have learned from your own Web surfing, Web browsers are powerful and versatile software tools–but they do have limits. Computer users create a vast number of files in various programs and save them with any number of file extensions that identify the programs needed to open them again. Web browsers recognize HTML and some other types of files (such as text and GIF files), and users may even add plug-ins to browser software that will allow it to display non-HTML documents in the Web browser window. But to display some types of documents, Web browsers require help.

As you know, the driving ideal in the development of the WWW is the integration of various kinds of data into a single, user-friendly interface. To meet this goal, Web developers rely on MIME (Multi-Purpose Internet Mail Extension). Originally, MIME was used to enhance the abilities of electronic mail. Using headers attached to the e-mail message, MIME identifies the type of content in the message and, when necessary, delivers the message into the application program associated with the content type. MIME can be used in the same way to associate files retrieved through a Web browser with the application files that can read them.

Users may have already configured their Web browsers to play sound files or, perhaps, to display video or motion files. But they can also configure browsers to recognize the extensions of the files used most often in your industry and to "hand off" these non-HTML files to the appropriate program. For example, if your organization develops many Microsoft *Word* files, and you anticipate that visitors to your site may also use Microsoft *Word*, you could make various *Word* files available on your server and advise your clients to configure their Web browsers to recognize the *Word* files, run the *Word* programs loaded on their own computers, and open the retrieved files in *Word* where they can read, print, or edit them.

For example, to add a helper application to those recognized by *Navigator*, open the **Options** pull-down menu on the *Navigator* menu bar and select **General Preferences**. From the tabbed selections, choose **Helpers**, and you will see a screen that lists helper applications currently recognized by your browser. To add a new application, click on **Create New Type**. In the form that opens, identify the basic MIME type (in this example, an application program) and identify the more specific MIME subtype (*MS Word*):

Figure 8.7
Configuring Netscape Navigator to recognize Microsoft Word as a helper application.
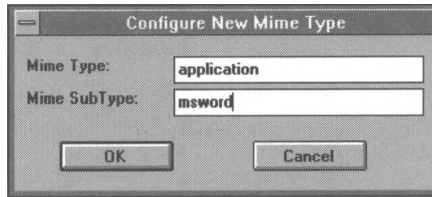
When you click on **OK**, you will be returned to the **Helpers** screen where you can identify the file extensions associated with the application program (*doc* and *wrd*) and the name and location of the application program (c:\winword\winword.exe). When you click on **OK** again, your new application will be added to the list of helper applications, as in the screen below:

Figure 8.8
Adding Microsoft Word to the Navigator helper applications.
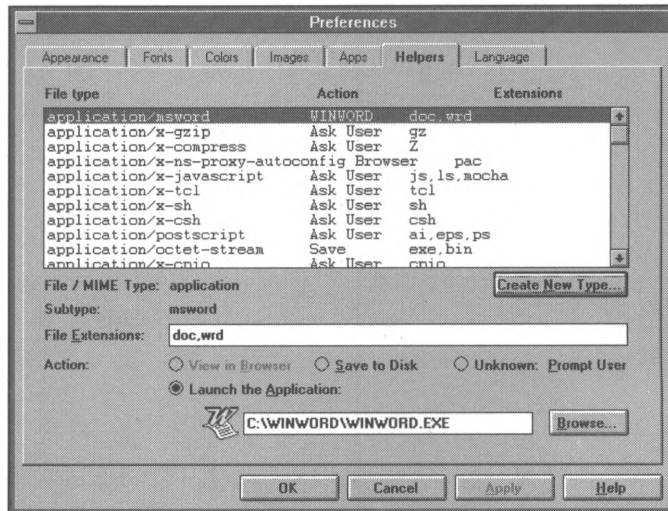
Another method for displaying previously created documents on your site, while maintaining their original format and layout, is to use a page definition language (PDL) to capture layout and format data. Special software can be used to create and display PDL documents. The most popular type of PDL software is Adobe's *Portable Document Format* (PDF), available at **http://www.adobe.com**; in fact, the IRS makes tax forms and

instructions, as well as other documents, available for free download using Adobe PDF. To read PDF files, your clients will need to have Adobe readers available on their computers. Luckily, Adobe readers, such as *Acrobat* and the new *Amber* plug-in for Netscape *Navigator*, are available for free on the Internet. PDF is a universal electronic format, so users of any platform can view and print PDF files.

Converting Pre-Existing Documents

Depending on the forms in which your organization's documents exist, making pre-existing content available on your Web site may be easier than you think. Crucial data may be brought into your site immediately by simply copying documents into simple text files (ASCII) and then framing the documents with a few easy-to-learn HTML tags. Brochures and other promotional documents can be scanned and presented as solid blocks in a graphic (this is not a feasible solution if disk space is limited). Eventually, however, you will want to convert most of your site documents to HTML files so that you can build in hyperlinks and make full use of the power of Web presentation.

Pre-existing documents that are available in electronic form can be converted to HTML documents through any of a variety of automatic conversion tools. For example, word-processed documents created in both Microsoft *Word* or *WordPerfect* can be converted to HTML through simple-to-use add-on modules. Although these tools can convert most word-processed features into comparable HTML effects, you should still expect to spend some time touching up these documents to refine the HTML tags. *HTML Transit* is a more sophisticated conversion program that will automatically take a set of source files in *Word*, convert them to HTML, extract all the graphics and store them

as GIFs (a common image format for Web display), build a hyperlinked table of contents and index, and even add navigation buttons at the top and bottom of each page.

There are also a variety of tools available for converting other types of documents, such as spreadsheets with important statistical data, into HTML. Microsoft's *Accounting Analysis Pac (AAP)* for Microsoft *Excel* works with packages like *PeachTree, Simply Accounting, ACCPAC,* and *M*A*S 90*. It provides a series of functions to import data, to produce standard financial reports, and to perform what-if analyses (including the effect of selling assets, adding or paying back loans, changing pricing or product mix, and buying or leasing decisions). Once *AAP* brings the data into *Excel*, Microsoft's free HTML Wizard add-on for *Excel (Internet Assistant for Excel)* creates an HTML representation of the data. The Wizard leads the user through defining the ranges that will become a table, choosing whether to preserve formatting, and defining header and footer areas for titles and internal documentation; the Wizard then saves the HTML file either separately or in an existing document. *AAP*'s primary competitor is *F9* from Synex Systems. *F9* is more expensive than *AAP*, but works with Lotus *1-2-3*, Corel's *Quattro Pro*, and Microsoft *Excel*. *F9* is also available in versions that integrate with most high-end accounting software packages.

Before investing valuable time into rebuilding key documents, contact the support staff for the software in which you have created them. You may find that a conversion module is available that can make your move to HTML simple and painless.

To learn how to build HTML documents from scratch, consult Appendix 8-1 of this guide, which includes both basic and

advanced instructions for HTML design. Although Web site
design seems like a complicated process, you will see from
reading the Appendix that anyone with the desire to invest a
little time in understanding HTML tags can begin creating
professional looking documents to post online.

Intranets: The Proprietary Internet

In 1994, systems staff responsible for developing corporate Web
sites on the Internet realized that the same technology could be
used to distribute information within the workplace. In fact,
Web sites could be built inside organizations without being
connected to the Internet at all–the intranet was born!

Put simply, an intranet is an internal network that runs on the
same TCP/IP protocols as the Internet. More specifically, an
intranet is a network on which various documents formatted
with a special system of tags and stored on a Web server can be
accessed by users through desktop terminals running Web
browser software.

Intranets use the simple document creation method of HTML as
an economical and accessible alternative for producing and
distributing in-house documents, such as employee handbooks,
department reports, budgets, company announcements, and
events calendars. Intranets are currently being used for a range
of other activities such as telephone and address lists, marketing
materials, corporate databases, simple groupware applications
(like scheduling), and enhanced communication (such as e-
mail, discussion lists, and conferencing).

Although WWW technology is the most visible and publicized aspect of intranets, it is only one of the Internet resources that can be useful to internal networks. In fact, the entire collection of protocols and tools used on the Internet (such as FTP, Gopher, and newsreaders) can be used to provide wide scale, integrated connectivity and easy-to-use, fast communication in the business workplace. Because the sites run on internal networks, bandwidth isn't as restricted as it often is on busy Internet transmission lines, so even audio and video can be incorporated without hurting the network's performance. Intranets also improve company performance by facilitating collaboration and data sharing, even among employees working in different offices or different countries. Intranets can even solve a problem many companies have been struggling with for years: sharing data across different computer types running different software.

The Intranet Boom: Some Reasons

The rate at which Intranets are being implemented is really quite extraordinary. In a recent study, *Information Week* found that 75% of the Chief Information Officers they surveyed plan to increase technology spending and to begin implementing internal client/server technology. Business Research Group reports that 23% of the 169 medium-sized and large companies included in their study already have implemented or have plans to implement intranets.

The California based market research company, Zona Research (**http://www.zonaresearch.com/**) predicts that sales of software to run intranet servers will soon exceed $4 billion. Based on

their report, "Internet and Intranet: 1997 Markets, Opportunities, and Trends," Zona estimates that the market for Internet/intranet products and services (dubbed Adjusted Gross Internet Product, or AGIP) was nearly $35 billion in 1996, will exceed $100 billion by the year 2000. They report that the communications sector accounts for 42% of the current overall market, further defining the intranet as the significant opportunity for Internet technology vendors.

A recent study by Forrester Research Inc. (**http://www.forrester. com**) may help to shed some light on these statistics and what seems an unbelievable increase in intranet server sales. Forrester predicts that, by the year 2000, most companies will replace their proprietary Network Operating Systems (NOS) with full time intranets. According to Forrester, most organization will select intranet technologies because their existing networks:

1. Do not permit external communications to flow smoothly.
2. Do not offer sufficient system flexibility.
3. Require specialized skills from staff members.

External Communication

One of the weaknesses that Forrester suggests will compel organizations to consider replacing their existing networks with an intranet is the failure of typical network operating systems to support a dependable and easy-to-use flow of information between internal and external networks. Since TCP/IP was designed in part to allow for the distribution of information across various types of networks, intranets offer a feasible solution to this NOS deficiency. For example, some retailers must purchase costly electronic data interchange (EDI) software

to place electronic orders from their suppliers with their existing networks. With an intranet, however, only a Web browser is necessary for placing an order. The retailer is simply given the password to access the area of the supplier's intranet where orders are processed. The rest of each organization's intranet remains safely protected behind other firewalls.

System Flexibility

When an organization selects a proprietary NOS, it is also forced to select particular software based on compatibility with the NOS rather than the needs of the system's users. Also, sticking with one proprietary software provider means that whenever that producer decides an upgrade is necessary, the organization must buy the entire upgrade package. Changing to a different NOS is one solution, but it's time-consuming and expensive. With intranets, on the other hand, the open-protocol nature of TCP/IP allows the organization to pick programs from different vendors. An organization with an intranet is more cost-effective because the intranet empowers it to purchase only the software applications the staff actually uses. If the firm decides that one software package would fit its needs best in one area (for instance, payroll) and another software program from a different vendor would be better for processing orders, the intranet will allow both of those packages to be accessed by users on any type of computer, as long as he or she has the appropriate Web interface and security clearance.

Specialized Skills

Finally, intranet usage is expected to increase dramatically over the use of NOSs because, with an intranet, neither support staff nor users are forced to learn multiple languages or technologies

to keep the intranet's systems up to date or to perform basic tasks. In an intranet, all Internet and organizational applications are stored in the same network and accessed by the same command prompts, through a simple Web browser.

By the year 2000, Forrester envisions that, within companies that implemented intranets early, all directories will be converted into TCP/IP and all employees will have digital IDs. Security tools such as encryption keys will also be distributed in order to handle access control and the secure transfer of sensitive data. Finally, organizations will move all documents and work onto the intranet, and they will allow the organization's clients access to parts of this internal Web.

The statistics are compelling, and the fact is that the architecture necessary for running intranets is already in place for many companies. If your organization has an existing network structure, read Appendix 8-2, which explains how to add an intranet on a Local Area Network. As long as it can support TCP/IP, any network will do.

If you need to build an intranet from scratch, you will have to select an operating system and a Web Server. The most popular operating systems for intranets include *Windows NT* (**http://www.microsoft.com**), *MacOS* (**http://www.apple.com**), *Novell* (**http://www.novell.com**), and various flavors of *UNIX*. There are dozens of Web server programs, ranging from no-frills freebies to more comprehensive programs with built-in management and tracking features, but the most widely used is the free *NCSA HTTPd*, a *UNIX*-based server available from the University of Illinois at **http://hoohoo.ncsa.uiuc.edu**.

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Intranet Applications

Now that you are considering implementing intranet technologies for your firm, let's look at some of the ways they are being used in organizations today. Common applications of intranet technology include the following:

- Publishing documents.
- Human resources management.
- Simple office applications.
- Displaying corporate, departmental, or individual home pages.
- Collaboration and workgroup applications.
- Customer support.
- Ordering and inventory.

Publishing Documents

Some organizations implementing intranets do nothing more than publish organizational documents, but if you take a few moments to consider the costs of printing and updating publications, you will understand why. In fact, intranets may allow you to disseminate useful material that could not have been printed cost-effectively for general distribution. Some documents you might consider for intranet publication include quality management initiatives, purchasing procedures, security guidelines, or any number of other documents that exist for most organizations–probably in someone's filing cabinet. Publishing these documents on your intranet allows any and all staff members to access them on an as-needed basis, resulting in a well informed staff, higher accuracy rates, and less time spent searching for answers to questions in remotely stored (and frequently outdated) documents.

In addition to publishing organizational documents, intranets allow organizations to make often used reference materials available to staff members. These documents may be simple telephone directories for staff and clients, industry standards and guidelines, software handbooks, or even databases that the organization has spent years developing. Using available gateway programs, you can offer a friendly Web interface for your existing databases or use various database development programs to build new databases for data that is often used by your staff.

By using file transfer applications, either through a separate FTP software program or through a Web browser, organizations can use intranets and central Web servers to let staff members download software from a central storage area. Rather than distributing software through diskettes (the most typical method of transferring viruses and software corruptions in and between organizations), the site-licensed software is available for download from a secure location whenever the staff member needs it. Organizations can distribute patches and updates in the same way, insuring that all staff members have immediate access to the most up-to-date versions of crucial software.

Human Resources Management

Human Resources professionals have been quick to see the value of intranets for sharing information among staff members. Human resources documents (such as procedural documents, job announcements, employee manuals, and benefits information) can be made easily accessible on an intranet where staff members can access up-to-date information whenever they need it. Many organizations are developing interactive resources for Human Resources management such as

the benefits worksheet below developed by Logical Designs
Solutions (**http://www.lds.com**) for AT&T:

Figure 8.9
*AT&T's Benefit
Decisions
Modeling Tool.*
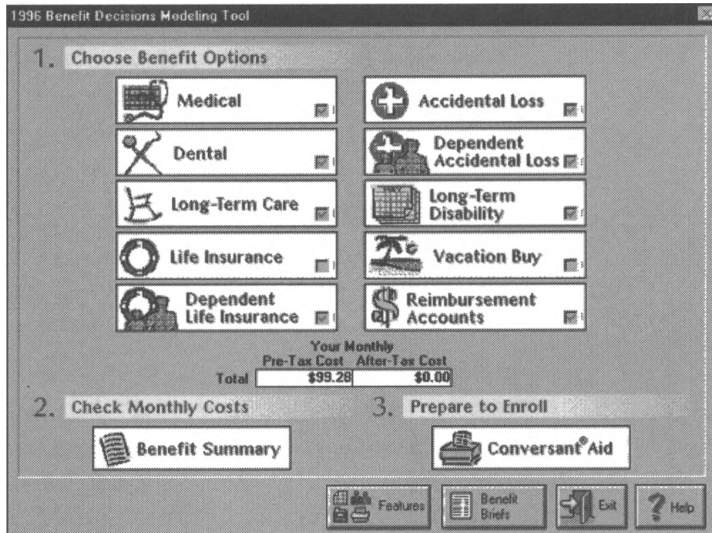
In addition, intranets support various types of data, including
audio and video that can be used to develop training materials
that users can access when they join the staff or whenever they
require assistance with particular problems. According to Ben
Jones (**ben@astral.magic.ca**), a digital media consultant with
inSite Communications,

> It is easy to implement a cost-effective online training
> program using existing materials which may have to be
> converted to HTML format. Bear in mind that documents
> done in Persuasion or Adobe Acrobat are also suitable for
> closed-network intranet distribution. The learning curve
> associated with intranet-related materials is minimal given
> the ease of use of such software as Netscape Navigator.
> Moreover, by placing more training materials online, you'll
> free up employee resources which otherwise would be
> devoted to the redundant task of showing new employees
> "the ropes" (or upgrading their skills). I typically develop

intranets to have a built-in tour as soon as a new user is registered with the personnel database. A tour should take no more than five minutes, and if effectively implemented is essentially an online training vehicle, demonstrating each of the various components and resources of the intranet. Other training materials may be placed online from a wide variety of departments.

Simple Office Applications

Intranets support various simple groupware functions such as scheduling, sign-up sheets for professional events, or surveys for staff or clients. You can also run various office applications through a simple Web front-end as helper programs, such as word processors, spreadsheets, *PowerPoint* slides, or even simple cardfile programs. By adding your organization's most often used software programs to the applications recognized by your browser, your staff can retrieve specially formatted documents (such as *Word.doc* files) from the intranet server and display, read, or even edit the files in the software in which it was created.

Many organizations are even using intranets to provide support to staff members as they complete typical daily tasks. For example, the Federal Communications Commission Helpdesk offers online support for FCC staff and manages registration for FCC training events. Greg Baker, the FCC Web Master, describes the Helpdesk in this way:

Our intranet Helpdesk is located in our headquarters building and is staffed by approximately 10 people who support all of the Commission's 3000 employees in more than thirty locations across the country. The Helpdesk has a page that describes policies, services, and allows users to send problems by a form to the Helpdesk staff. The Helpdesk then logs the questions in the same manner as if

they received a call or e-mail and follows up with a call or e-mail. We also have a large detailed Helpdesk FAQ section that goes through steps to correct problems. We offer online registration for training courses through the Helpdesk, where users view course information, prerequisites, general audience level, and schedules. They can fill out a form and register for specific courses online.

Displaying Home Pages

Intranets typically use at least a company home page to act as a table of contents that links to other material available on the Web and displays major organizational announcements, such as the demo home page below.

Figure 8.10
Apple's ACME Fruit and Nut Company sample home page.

Some organizations even offer separate home pages for individual departments or for individual employees. There is some debate among Web administrators about whether or not personal home pages for staff members are useful or are simply

unmanageable and unnecessary security risks. But many believe
such pages can be valuable organizational tools where users
can publish information of interest to the rest of the company
and use them as tools for searching and navigating the intranet
and Internet.

Collaboration and Workgroups

Most organizations, even the most technologically
disadvantaged, recognize the growing importance of electronic
mail for communication between staff members and with
clients, vendors, and business partners. Intranets are capable of
collapsing the often separate external and internal e-mail
functions that many organizations must rely on when they use
proprietary NOSs. In addition, intranets allow for a wide variety
of collaboration and enhanced workgroup features, including
white boards (screens that can be marked up simultaneously by
collaborators at various locations) and Web-based discussion
boards where users can post and read messages on various
topics, such as the board illustrated below.

Figure 8.11
Web-based discussions at the Intranet Journal's "Soundings" page.
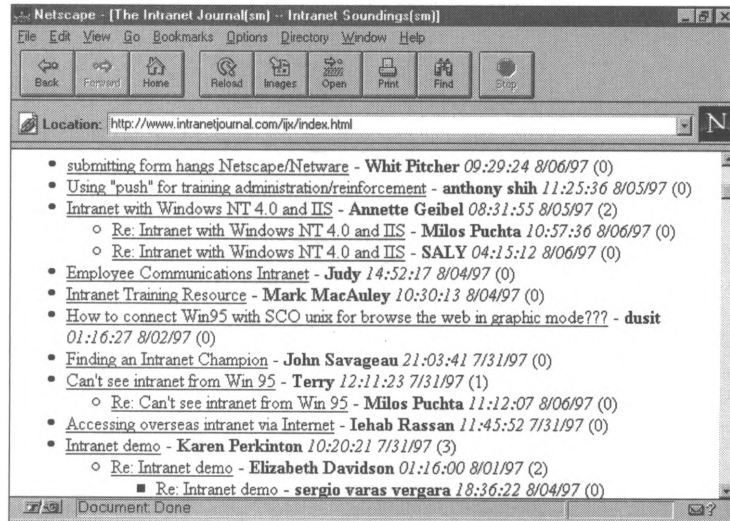
Customer Support

The availability of up-to-date information will empower your support staff to offer the best support possible in a timely fashion. But you will also be able to empower your clients to answer their own questions by offering them access to a list of Frequently Asked Questions (FAQ) that you can post on your intranet. Ask your support staff what questions they are most often asked, and simply write up solutions to these problems and post them in an area of your intranet that is accessible to clients. These materials can be made available twenty-four hours a day and seven days a week. Your clients will no longer be at the mercy of answering machines or time zone dilemmas, and their satisfaction with your organization will skyrocket.

Ordering and Inventory

Intranets can improve your customer service in other ways, including allowing an automated and secure process for

accepting orders. Using Web based fill-in forms, clients can select items to order (after checking for availability in an online catalog, perhaps). Systems can even be constructed to automatically update your inventory records and send e-mail responses to customers (verifications and delivery dates, for instance). American Tech, Inc., offers an online demonstration of purchasing software for intranets at **http://www.purchasingnet. com**. To make a purchase using American Tech, Inc.'s software, a customer would simply fill out a form by checking items in a table like the one below.

Figure 8.12
Placing an order using PurchasingNet.

After selecting items, the customer clicks on the **Order Items Checked Above** button to see a "shopping cart" total, which gives a list of items ordered, their prices, and the order's total cost.

Figure 8.13
Totalling an order using PurchasingNet.

At this point, the customer can either return to the ordering form, modify the items listed on this page, or submit the order for processing. After submitting the order to be processed, the customer fills out another form to provide payment and shipping information.

Figure 8.14
Processing an order using PurchasingNet.
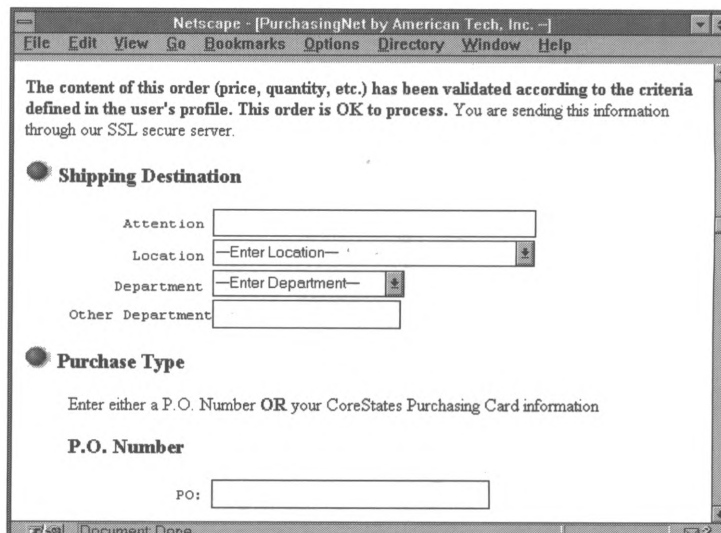
American Tech, Inc., is just one of the many software companies developing these types of Web-based transaction programs.

Should You Build an Intranet?

Admittedly, some of these applications are not commonly used in even the most Web literate workplaces, but it is only a matter of time before they become commonplace features in any business environment. Imagine the applications of this technology to your own or your clients' typical business processes when considering the current and future applications of your intranet.

When considering adding intranet technology to an organization (or, perhaps, when proposing intranet innovations to management), consider and research the questions on the "Do You Need An Intranet?" worksheet on the next page. You may even want to photocopy and distribute the worksheet to other key decision makers in your organization to stimulate an informed discussion of intranet applications.

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Do You Need an Intranet?

Step One: Resource Management Assessment

List resources used frequently by staff members (such as databases and standards), and list crucial resources used infrequently by staff members (such as employee handbooks). When you've completed your list, answer the following questions:

* How much does it cost your organization to print in-house documents?

* Would it be less expensive to print these documents electronically on your intranet?

* Would an intranet simplify the process of keeping resources up to date?

Step Two: Office Performance Assessment

Examine long-distance calls, postage records, data and software sharing, team work, and collaboration in your organization and then answer the following questions:

* Would the costs of long-distance calls, postage, and faxing be reduced if your staff members were connected with one another, clients, and business partners on an intranet?

* Would staff performance improve if vendors, business partners, and software providers offered Web pages to showcase their new technologies and provide training, help, and updates for your staff?

* Would an intranet allow you to share information across multiple platforms more simply than your current procedures for solving this problem?

* Would office performance improve if staff members in your organization could access training materials whenever they needed them?

Step Three: Client Service Assessment

Solicit feedback from staff and clients to define weaknesses and strengths in the service you currently provide to your clients, and then, answer the questions below:

* Would customer support be improved if support staff could access current information about products, services, and prices on an intranet?

* Would staff support hours be reduced if clients had access to support and ordering information on your intranet?

* Would your organization be empowered to pursue new markets by keeping out-of-office staff members in contact with the office through an intranet?

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If you answered yes to any of the questions above, it may be time for you to learn more about intranets–how they work and how to build them for your organization.

Chapter 9
Online Research

In the world of information science, running searches for online information is both an exact science and a creative art. Library professionals spend years in training to use specific search and retrieval schemes and specialized research tools. They go on to make careers locating and obtaining information for the rest of us, as any visit to a corporate information center will demonstrate. But now that the technology of the Internet has delivered access to millions of files and databases to each of our desktops, the rest of us need to learn to survive in the world of targeted searches.

One of the elements that characterizes Internet research is that the tools (electronic indexes and search engines) frequently change. Even so, the basic concepts of searching remain the same. And understanding these basic research concepts and strategies will ensure that you have the skills to efficiently use any new research tool that comes along. Basically, there are two approaches to online research: browsing and searching. Essentially, browsing is manual searching (much like browsing the shelves of a library) and searching is a more focused approach that often uses indexed search tools to isolate particular resources (much like a library catalog). Just as you might combine both approaches in traditional library research (using a catalog to isolate the area devoted to your topic and then browsing the shelves for relevant items), most often, solving a research problem online requires a combination of automated searching and

intelligent browsing. For example, even if you plan to complete a focused automated search on a particular subject, you will need to browse in order to find the specialized online search tool(s) most likely to give you the results you want. So, as you can see, browsing and searching go hand-in-hand when performing online research.

However, even when you choose to employ browsing (or "surfing") as part of your approach to online research, it is important to approach any research problem with a logical strategy. In this chapter, we will describe a research strategy that includes the following five steps:

1. Identify the components and scope of the research problem.
2. Develop a research plan.
3. Select appropriate indexes and/or search engines.
4. If necessary, refine the search.
5. Evaluate the results.

Identify the Research Problem

When facing a research problem, it is important to spend some time thinking about the problem's parameters. In short, what is the research question you must answer? In some cases, the answer to this question may be obvious. For example, when researching software options for a client, you may have a very specific research objective: to locate software that completes a certain task. However, when you spend some time thinking about the research problem, you will also realize that there are other related questions that must also be answered. For example, is the

software compatible with your client's existing system? And what does it cost?

Another factor you may need to consider is the amount of information that you need. For example, if you need only a single fact or statistic to complete a proposal or report, you might choose to use online resources that are similar to those available at library reference desks. One online source for this type of information is the Reference Center of the *Internet Public Library* (**http://www.ipl.org/ref**):

Figure 9.1
The Reference Center of the Internet Public Library.
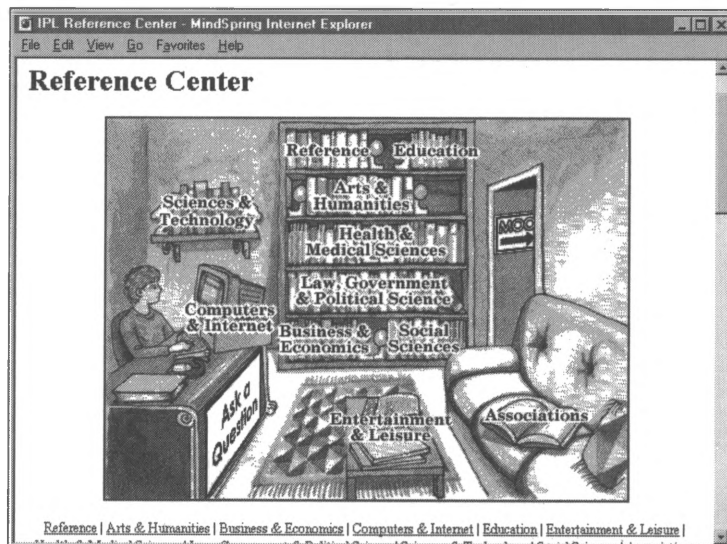
From this site, you can access a wealth of reference resources–dictionaries, atlases, phone directories, books of quotations, etc. These types of quick reference resources offer fast answers to frequently asked business questions. However, if you need the statistic and some background on the related issues, or the organization that collected the statistic, you may need to consult a more in-depth resource, the original source of the

statistic, or several sources. Obviously, doing so requires a different set of research steps.

As you may have already discovered, one of the drawbacks of Internet research is information overload. After all, the Internet is the largest research resource in the world, offering easy access to, literally, millions of information resources. As you begin to research a topic, you may often find yourself drawn into directions that you did not anticipate. Sometimes, allowing yourself to follow these unexpected twists and turns may lead you to a valuable breakthrough or insight. In other cases, when your timeline is tight and your mission reasonably focused, following these unexpected leads, although interesting, will not contribute to completing the project at hand. To help avoid the temptation to follow every lead that you encounter, develop a structure for organizing the answer(s) you want to find. Imagine your research effort as a series of labeled boxes, each one waiting to be filled with particular information components. If the material you've located does not fill the box, then move on. Having a clear mental picture of your research goals will help you complete your task successfully and efficiently.

Develop a Research Plan

After you have identified the research problem and have projected the type of answer you need to find, you are ready to develop a research plan. Your research plan is simply a planned logical approach to acquiring the type of information you have determined that you need. Since most online search tools work by allowing you to enter keywords into a database, the most important element of your research plan is developing a list of

likely keywords that you can use in a search string to lead you to items related to your topic.

As you know from other types of research with which you are familiar, in many print and electronic indexes, readers use keywords (that identify the major topics included in the resource) to locate particular pages on which information related to that keyword appears. Using keywords in electronic indexes is a similar process. The primary difference is that the computer program that manages and maintains the electronic index uses the keyword(s) you enter to automatically screen the items included in its database for any instances of the selected keyword(s). The program then displays a list of "hits," items included in its index that contain the keyword. When thinking about keywords that are likely to result in the types of hits your research requires, it is important to remember that the computer programs which run these indexes do not automatically look for related keywords or synonyms. Therefore, you must consider the words and word variations that may need to be used in subsequent searches to find all the relevant resources available.

Another component of your research for which you should plan in advance is a methodology for keeping track of sources. As we mentioned earlier, you may find yourself searching various sites and following links to diverse resources. Although you may never leave your desk, it is quite easy to "get lost" on the Internet. To avoid this, leave a trail of breadcrumbs to track your progress. If your Web browser includes a component that will track a history of your session, you can use this history to find your way back to the resources that you've used. (Often this history can be accessed under the **View** menu or through a pull-down selection list that appears under the **Address** box.) Even this history, however, is likely to supply only the URL of the site, without any other identifying information. Therefore, it is important to

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consider the types of information you will need to collect about the resources that you visit. For example, you may wish to track the URLs, authors, organizations, publication dates, etc. Your decisions will depend in part on how you intend to use the information you find (see Chapter 6 for a discussion of copyright considerations).

Select a Search Tool

When faced with a research problem, there are many ways to proceed, and many different types of tools available. Some search tools are focused; that is, they are not intended to be comprehensive, but rather are limited by subject or media type. For example, Archie is a focused tool that searches only FTPs and EDGAR (**http://www.sec.gov**) is a focused tool that searches only SEC filings available to the public.

Figure 9.2
Using the EDGAR database to search SEC filings.
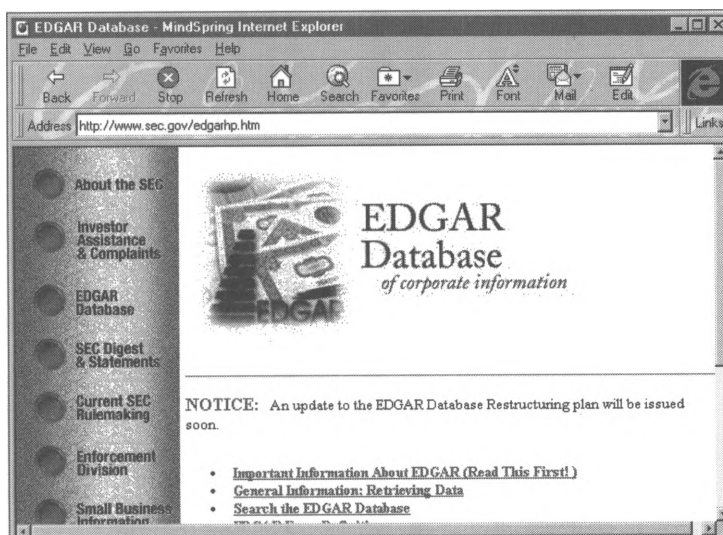
Other searching services are intended to be comprehensive, to
search all the information available to them regardless of media
type or subject. For instance, Lycos is a WWW search tool that
searches Internet materials on any subject and often crosses
media types, listing Gopher, FTP, and WWW pages. (WWW
search tools are increasingly moving in this direction, allowing
users to cross media-type boundaries and access various types of
Internet resources through a Web browser.) In the sections that
follow, we will review various types of search tools and strategies
for using them. Although the interfaces used with these tools and
the particulars of the programs that run them change frequently,
this overview will help you determine which tools might offer the
most reasonable starting points for the research problems you are
facing.

Topic-Specific Internet Sites

One of the best ways to complete research on the Internet is to
use a topic-specific Internet site. These sites are typically
maintained by a specialist in a particular field who voluntarily
plays the role of librarian by reviewing and indexing resources on
particular topics. Frequently, the owners of these sites provide
extensive linked lists of links to resources that are related to the
topic that is the site owner's area of expertise. Internet users
benefit from the time these professionals have spent reading and
amassing knowledge in their particular field of interest. Two
particularly good sites for accounting and auditing resources are
Kaplan's Audit Resource List (**http://members.aol.com/auditnet/
karl.htm**) maintained by Jim Kaplan, CIA, author of *Auditor's
Guide to Internet Resources*, and the *Site Seeker* directory
(**http://www.kentis.com/siteseeker**) maintained by Kent
Information Services, Inc.

Figure 9.3
The Site Seeker directory of resources.
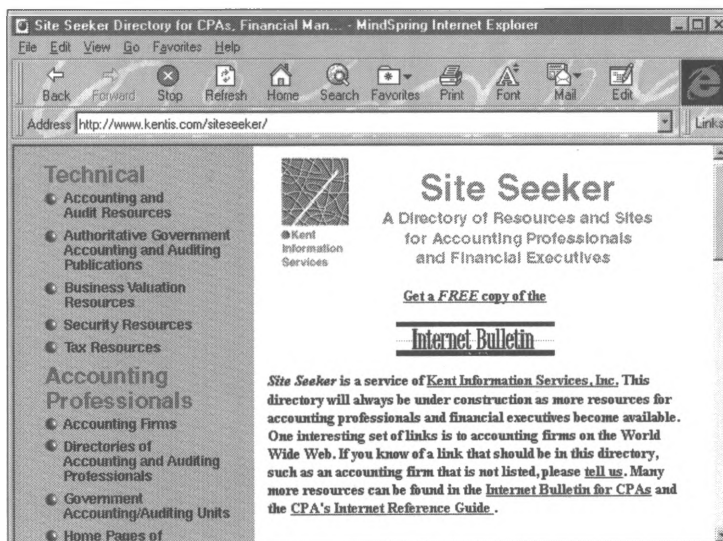
Newsgroups and Mailing Lists

In addition to the many well known and specialized resources for accounting and financial information, CPAs often need to consult resources outside their field–for industry backgrounds, economic indicators, software support, or even general business information. Two useful tools for completing this kind of research on the Internet are newsgroups and mailing lists. Newsgroup and mailing list postings are some of the richest sources of information written by professionals in many varying fields. As you know, newsgroups and mailing lists are topic oriented forums where users post questions and responses, and discuss issues of interest in their particular fields.

Many of these discussion groups maintain FAQ (Frequently Asked Questions) files that contain information commonly known by list participants, and archives of past postings that can be searched by keyword(s). To obtain a FAQ, simply scan the group's postings for a document labeled "FAQ." You can also access lists of FAQs

that you can browse and search. One resource for FAQ lists is the
FTP site **rtfm.mit.edu**. Follow the path */pub/usenet-by-group* to
browse the list of newsgroups you can search. On the WWW,
you can visit the FAQ listing maintained by Ohio State University
at **http://www.cis.ohio-state.edu/hypertext/faq/usenet/
FAQ-List.html**. This list can be browsed alphabetically or
searched by keyword(s).

Once you have located the FAQ for the group in which you are
interested, you have already located a great resource for
answering basic questions. But the FAQ will most likely contain
information about other relevant FAQs and resources, as well as
information about an archive, if the group has one available. For
example, a CPA researching home office tax deductions using the
keyword "tax" at the Ohio State site would find a Tax FAQ
maintained by the newsgroup *misc.taxes*. Included in the FAQ
are listings of other Usenet FAQs and mailing lists on tax issues,
and addresses for archives of the group's postings.

To locate materials available in newsgroups and mailing lists,
without screening the postings yourself use services such as *Deja
News* at **http://www.dejanews.com/**. *Deja News* offers a
searchable Usenet news archive that allows users to search by
keyword(s), and to limit the search further by newsgroup, date, or
author. To search mailing lists, use the *Liszt* search tool at
http://www.liszt.com.

Figure 9.4
*The Liszt mailing
list directory.*
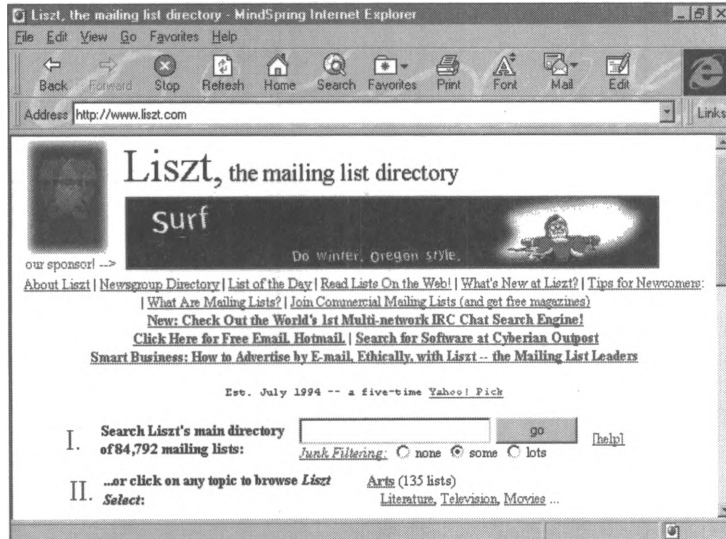
Archie

As you remember, FTP is a standardized way for computers on
the Internet to exchange files. Let's suppose that, unlike the
examples described in our earlier discussion of FTP, you do not
know the specific FTP file you wish to retrieve, or even the site
where it is available. Suppose that you only know that you are
interested in obtaining a mortgage amortization program for your
Macintosh computer at home. A quick visit to an Archie site to
search on the word "amortization" will help you locate what you
want. Archie is a text-based character searching program that
resides on a growing list of Internet sites world-wide. With
Archie, you can search the titles and keywords of files on all
known FTP sites for the information you are seeking. The results
of an Archie search will be displayed as a list of files, their
keyword descriptions, and their corresponding domains and full
path names.

When you use Archie, you will see a **Search** screen, in which you will be asked to supply your search criteria. Since the oldest and most popular Archie server sites tend to be busy often, we suggest that you use a lesser-known Archie site or one not in the US (For instance, the site **archie.th-darmstadt.de** tends to be available during US evening hours).

If you are using a UNIX command line, you will need to use the Telnet function to go to an Archie site:

archie.ac.il
archie.ans.net
archie.au
archie.doc.ic.ac.uk
archie.edvx.uni-linz.ac.at
archie.funet.fi
archie.hana.nm.kr
archie.internic.net
archie.kr
archie.luth.se
archie.ncu.edu.tw
archie.rediris.es
archie.rutgers.edu
archie.sogang.ac.kr
archie.sura.net
archie.switch.ch
archie.th-darmstadt.de
archie.unipi.it
archie.univie.ac.at
archie.unl.edu
archie.uqam.ca
archie.wide.ad.jp

When you connect with the site, log-in as **archie**, set the search mode if necessary, and type **prog*filename***, where filename is the name of the file or keyword you are seeking.

You can also access various Archie gateway sites on the WWW. These sites allow you to run Archie searches through your Web browser. One Archie gateway on the World Wide Web is available at **http://www.isa-j.co.jp/cgi-bin/archie.html**.

Figure 9.5
Using a Web browser to run an Archie search.

When we ran a search for amortization software, we found a total of 17 entries containing the word "amortization." To obtain any of these items, you would need to select a file to retrieve and use the FTP function to transfer the file to your computer.

Veronica

Veronica is a search tool that provides access to information resources held on most of the world's Gopher servers. (In addition, Veronica includes references to many resources provided by other types of information servers, such as WWW

servers, Usenet archives, and Telnet-accessible information services.) Veronica can be accessed through any Gopher-specific client or through a multiprotocol browser (such as *Navigator or Explorer*). The client software may include Veronica as a starting point, or you may need to visit the *Veronica Home Menu* at **gopher://veronica.scs.unr.edu:70/11/veronica**, where you will find a list of Veronica servers.

Veronica finds resources by searching for words in titles of Gopher directories. To complete a Veronica title search, choose Veronica from the menu of some Gopher server and enter a query, a set of words related to your topic. When the search is complete, you will retrieve a list of directories that contain major holdings that you can open. The results will be presented as a Gopher menu that you can browse. (Alternately, you can search all data types to receive a list of files in various formats and directories that you can open and review. You may also specify only certain types of Gopher resources. All Veronica sites have a FAQ list that includes advice on composing search queries, using search operators, and using the Veronica options.) The screen below shows the results of a Veronica search using the keyword **depreciation**. The search was performed on a Veronica server using WWW browser software.

Figure 9.6
Veronica search results displayed in Internet Explorer.
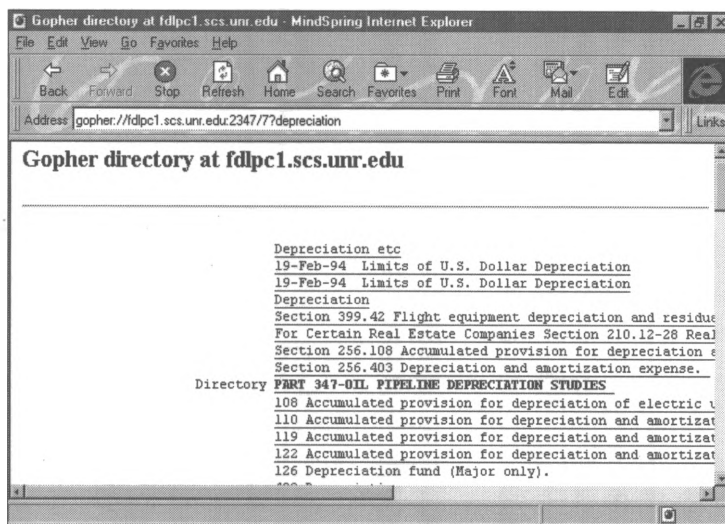
WWW Search Engines

Increasingly, the most common way to complete research on the Internet is to use a World Wide Web search engine. These search engines are simply Internet sites running special software. This search engine software performs a variety of functions.

1. It automatically "surfs" the Internet collecting information about the Internet sites it encounters.
2. It catalogs information about the sites it encounters.
3. It processes requests from users to retrieve index items from its catalog that match certain criteria.

While all search engines have these basic functions in common, not all search engines are created equally. In fact, there are a number of differences that distinguish search engines from one another and that you will need to consider when selecting the WWW search engines you will rely on most frequently. Some questions you will need to ask about the search engines you use are listed below.

- How frequently is the search engine's database updated?
- Does the program create indexes from the full text of the sites it encounters or only from abstracts?
- How "deeply" does the program index a site; that is, how many levels of the site are indexed by following links?
- How does the program determine the most relevant matches when a client requests a search of the database?
- How large is the index?

Luckily, as with many other topics, you will find that other professionals have been wrestling with these distinctions and have much useful information to share. A good site to visit when assessing the variations between the most popular search engines is the Calafia Consulting site. The owners of this site have developed a detailed chart describing the differences between search engines (**http://searchenginewatch.com/features.htm**). A few minutes studying this frequently updated resource will go a long way toward filling in the information you need to make sensible choices about the search engines on which you rely.

Figure 9.7
Calafia Consulting's Search Engine Features Comparison Chart.

Search Engine Features Comparison Chart - MindSpring Internet Explorer

File Edit View Go Favorites Help

Search Engine	AltaVista	Excite	HotBot	InfoSeek	Lycos	Northern Light	Web Crawler
Size (pages in mills)	Big (100)	Big (55)	Big (80)	Medium (30)	Medium (30)	Big (30 to 50)	Small (2)
Pages crawled per day	10 million	3 million	Up to 10 million	-	6 to 10 million	-	-
Freshness	1 day to 3 months	1 to 3 weeks	1 day to 2 weeks	Minutes to 2 months	1 to 2 weeks	2 weeks	Updated weekly
Date	Yes	No	File Date	No	Yes (via detailed display)	File Date	No

Crawling --- Factors that affect if and when a page is indexed ---							
Search Engine	AltaVista	Excite	HotBot	InfoSeek	Lycos	Northern Light	Web Crawler
Submitted Pages	1 day	3 weeks	1 to 2 days	Within minutes	1 to 2 weeks	2 weeks	1 - 3 weeks
Non-submitted pages	1 to 3 months	3 weeks	2 weeks	1 - 2 months	1 to 2 weeks	2 weeks	Not added, in most cases
Depth	No limit	No limit	No limit	Sample	Sample	No limit	Sample
Frames Support	No	No	No	Yes	Yes	-	No

Using a Search Engine

Having described the points that search engines have in common, and some of the points that distinguish them from one another, let's take a look at a sample search engine, AltaVista, available at **http://www.altavista.digital.com**. The opening screen of the AltaVista search engine is fairly intuitive to use. The first step is to select from various settings that control the general scope of the search and the language(s) that documents may appear in, and then enter your keyword(s). In general, in AltaVista and in other search engines, multi-word search strings result in more focused results, so enter two or three words related to your topic.

Figure 9.8
Entering keywords in the AltaVista search engine.
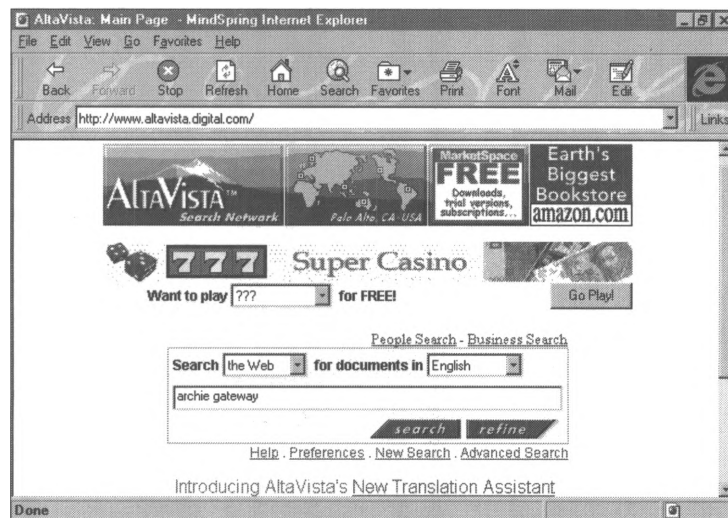
When the **search** button is clicked the program compares the keywords you entered to the items in its database and displays a listing of items that appear to be matches.

Figure 9.9
An AltaVista "hits" listing.
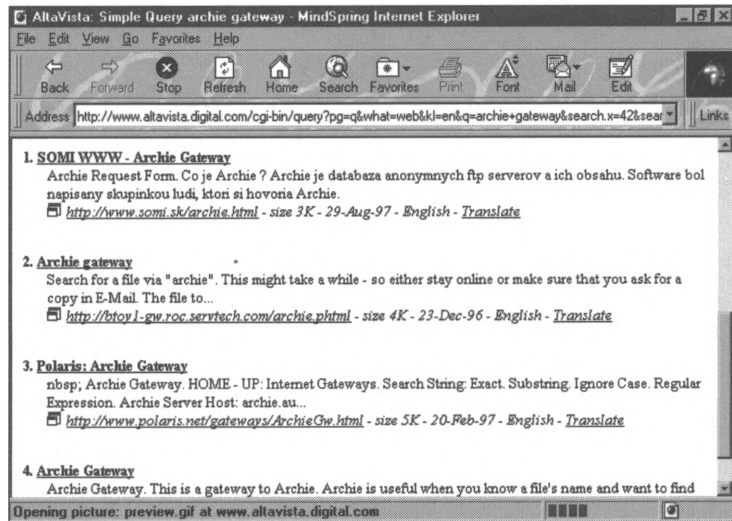
Each of the listings includes a link to the listed item, so when you find an item that interests you, click the link to access the site. When you are done with the resource, click the **Back** button on your Web browser to return to the listing of hits and select a new lead to follow. It's that simple!

The best way to learn about WWW search engines is to use them and begin to build an experiential sense of what works and what doesn't work. Other sites with WWW search engines and directories that you may want to try are listed below:

ALIWEB	**http://web.nexor.co.uk/public/aliweb/search/doc/form.html**
CUSI	**http://web.nexor.co.uk/susi/cusi.html**
Einet Galaxy	**http://www.einet.net/**
Infoseek	**http://www.infoseek.com**
Metacrawler	**http://www.metacrawler.com**
Lycos	**http://www.lycos.com**
Open Text	**http://www.opentext.com**

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| WebCrawler | **http://webcrawler.com** |
| Yahoo | **http://www.yahoo.com** |
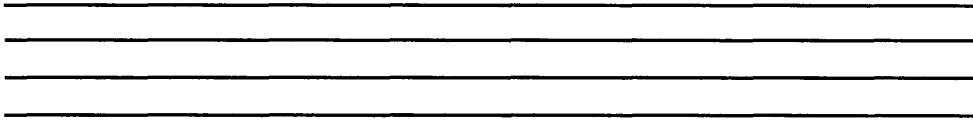
Commercial Online Services

If you belong to a commercial online service, such as *America Online*, *CompuServe*, *Prodigy*, or *Microsoft Network*, you have access to all the resources available on the Internet and a number of other resources available only to members of these services. To their credit, these services are frequently updated and the basic interfaces changed to make use of the newest tools and resources that become available. As a result, many of the screens that we will use as illustrations in this section may appear differently by the time this book goes to press! Even so, just as with other types of research tools, the basic strategies used to interact with these particular search tools remain the same, and, with a little creative searching, you should have little difficulty finding the content areas you are seeking. Most commercial online services provide three primary methods for locating resources. The first and most obvious is the opening screen, which typically consists of a listing of large topic groups. For example, the screen below illustrates the opening topic listing (called "Channels") in *America Online*.

Figure 9.9
*The Channels
menu in America
Online.*

CompuServe offers a similar listing that clusters content under broad categories. For example, in *CompuServe 3.0*, click on the **Table of Contents** option on the Main Menu that appears on the CompuServe Home Desktop.

Selecting one of these topic groups will open a screen area that allows you to select from more specific listings of resources that are related to that general topic and listed in a menu or displayed as buttons. Clicking on the **Personal Finance** channel in *AOL*, for example, opens the following screen area, from which the user can select various news, articles, forums, and topic groups:

Figure 9.10
*AOL's Personal
Finance area.*
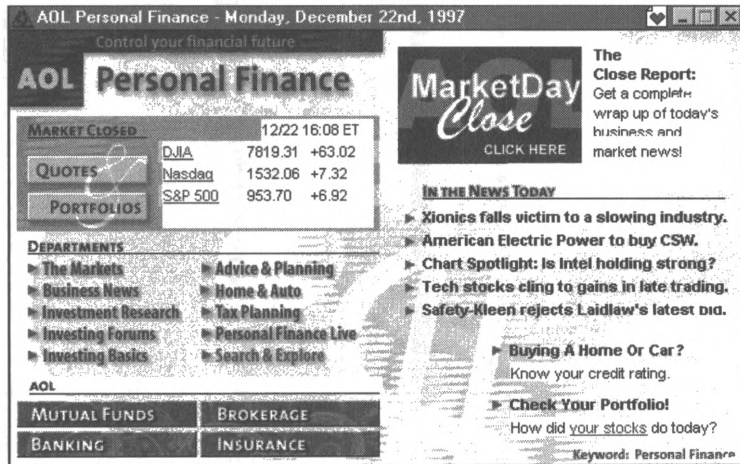
The second way to access information through a commercial
online service is through keywords. Various screen areas in the
services are associated with keywords that can be used to take
users directly to a service area, thereby avoiding the additional
steps needed to work through the menus. For example, notice
that in the Personal Finance screen illustrated above, the keyword
"Personal Finance" appears in the lower right corner. Clicking on
the **Keyword** button that appears on the toolbar opens a keyword
dialog box in which you can enter a keyword. *CompuServe* uses
a similar dialog box, known as the Go box and keywords that
correspond to the CompuServe Services Index (CSI). Click the **Go**
button on the toolbar to open the dialog box shown below.

Figure 9.11
*Entering a
keyword in the
CompuServe Go
box.*
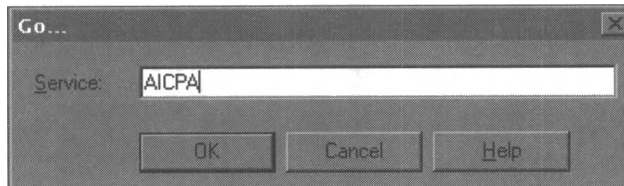
Entering one of the CSI designations into the Go dialog box and pressing the **OK** button takes *CompuServe* users directly to the resource they wish to access.

The third way to complete research using a commercial online service is to access the service's "search" or "find" tool. These tools can be used to search the contents of the service's information resources using keywords. The results appear as lists of content areas in which that keyword appears. For example, the screen below shows the *AOL* Find Central tool, accessed by clicking on the **Find** button on the toolbar.

Figure 9.12
Using Find Central to locate resources on America Online.
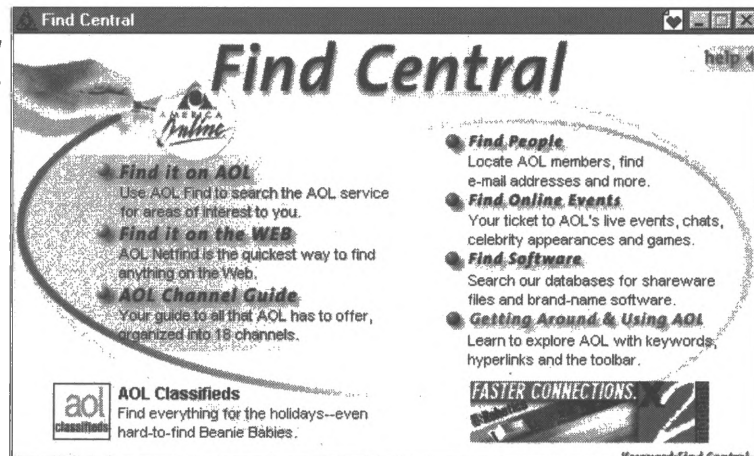
This screen summarizes the various ways to search both *America Online* and Internet resources. Click the **Find it on AOL** option to open a window in which you can enter your keyword. When I enter the keyword **tax** in this internal search engine, the following list of items is displayed:
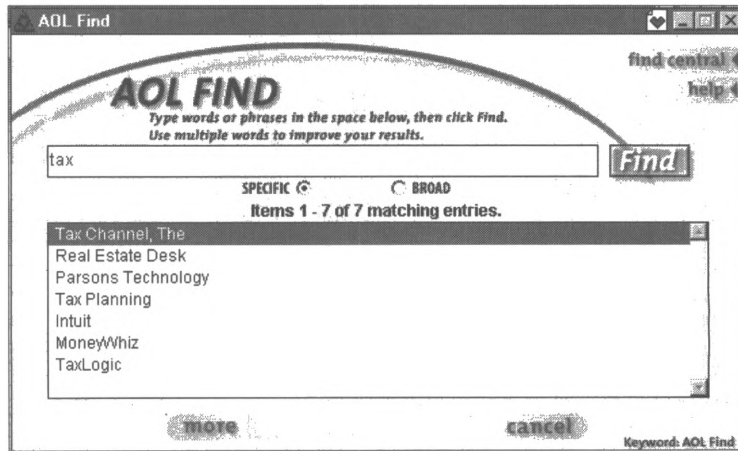
To access any of these content areas, simply use your mouse to double-click the item. As you might imagine, *CompuServe* offers a similar tool that can be accessed by clicking the **Find** button on main screen.

News

Commercial online services are very useful resources for tracking current news. For example, *AOL* offers many ways to access news on both general and specific topics. You can reach news sources from nearly any category in the Channels menu. For example, in the Personal Finance area, you can access news about the stock market by clicking on any of the items listed under the "In the News Today" heading. You can also access current news through the News option on the Channels menu, or narrow your news search by entering a keyword like **Business News** in the Keyword dialog box, which would take you to this *AOL* area:

Figure 9.14
Accessing business news in AOL.

You can further narrow your news search by choosing from the menu of news departments.

Similarly, *CompuServe* carries a content area specifically focused on news–the NewsRoom. Click on **News/Weather** on the Table of Contents or enter **NewsRoom** in the Go dialog box. The Newsroom offers a wide range of news resources for *CompuServe* users, illustrated below.

Figure 9.15
*Accessing news in
the CompuServe
NewsRoom.*
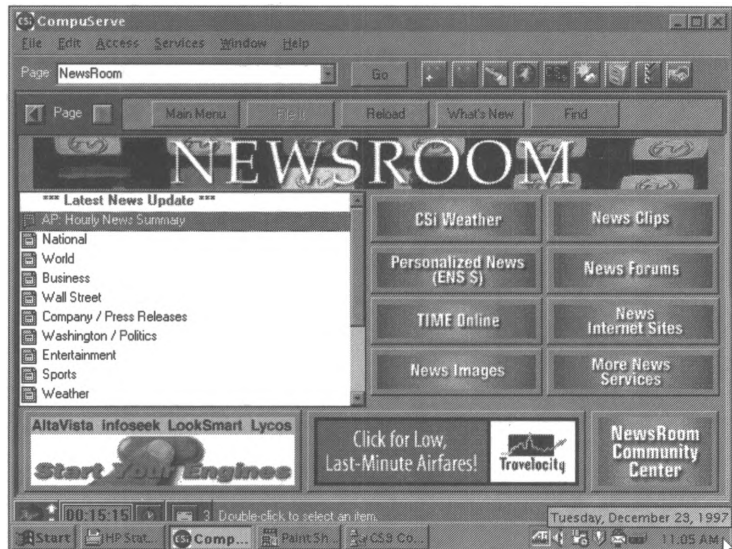
In addition, a good selection of what the information industry
calls "news feeds" are available through commercial online
services. For example, for specific business information updated
daily on *CompuServe,* check the Business Wire, an area
specifically designated for business-related press releases and
company news (GO TBW). Business Wire is part of the extended
services group, which means that you pay a small hourly fee for
using it. You can also create a customized news-clipping service
for yourself by using the Executive News Service (GO ENS). Your
self-defined news folder will search the general and business
news for you and select those articles daily that meet your
keyword search criteria.

General Reference

Commercial online services also offer access to important and well-known business databases. *CompuServe* offers what is, to our knowledge, the most unique and friendly access available to a large group of the *Dialog* online databases through a gateway called Knowledge Index (GO KI). Knowledge Index provides a significantly reduced hourly rate during the evenings and weekends ($21.00 per hour) for access to the well known family of *Dialog* information products through either menu or command-line techniques. Together, the *Dialog* offerings include over 100 full-text and bibliographic databases covering more than 50,000 journals and general periodicals. General commercial access to these databases can run over $100.00 per hour, so this service represents significant savings. *CompuServe* asks that you reserve the information you obtain through Knowledge Index for individual use only and that you not sell or otherwise distribute the information you download through this discounted service.

If you don't feel up to the rigorous searching necessary to use *Dialog* databases, you can use many reference databases directly through *CompuServe*. Two of the most useful are Business Database Plus (GO BUSDB) and Computer Database Plus (GO COMPDB). Both are based on databases developed by Information Access Company, and both provide wide-ranging coverage of industry and trade periodicals. For instance, Computer Database Plus covers publications such as *PC Magazine*, *MacUser*, *PC Week*, and *Communications of the ACM*, providing either the full text of the original article or an abstract of it for each article indexed. You can search for articles by subject, company name, and product name, and you pay for

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only those records you choose to download and read in addition to a minimal per-minute charge of $0.25.

Commercial Databases

In addition to research tools offered directly over the Internet, there is an important group of commercial databases offered through either direct dial-up online connections or Telnet. These databases are highly indexed and can be searched using parameters from specific fields, such as author or publication date. Used for years by professional researchers and librarians, commercial databases offer the capability of performing a very narrowly targeted search for specific facts or articles. Individual databases establish carefully selected lists of source publications from which they draw their content, such as trade magazines, market research reports, or scholarly publications.

It is fortunate that searches using commercial databases can be so specific, because the providers of these databases usually charge a substantial hourly fee for using the database as well as a per-item fee for retrieving items matching the search criteria. Before spending much time using a commercial database, make sure that you understand the pricing structure and item charges. When you are searching for, say, a particular article published in a personal computing magazine comparing the three leading PC-based payroll software packages, using a commercial database can be a very good value, but, in general, these types of databases are not good places to spend time browsing. When making decisions about which commercial database(s) to use, consider the following three points:

1. Content—Does the database include all the types of business information that you need?

2. Pricing—Does the service charge for connect time, searches, or only selected articles?
3. Interface—Does the client software include an easy-to-use interface?

The *Dialog* service, provided by Knight-Ridder, is a good place to start when examining commercial database options. *Dialog* is comprised of a group of more than 400 databases, some with scopes as specific as abstracts of biomedical research articles or industry newsletters. The *Dialog* home page, at **http://www.dialog.com/info/home/**, provides account information, along with descriptions of the databases and a tool for determining whether or not the *Dialog* databases would return relevant items on your query.

Figure 9.16
The Dialog Corporation home page.
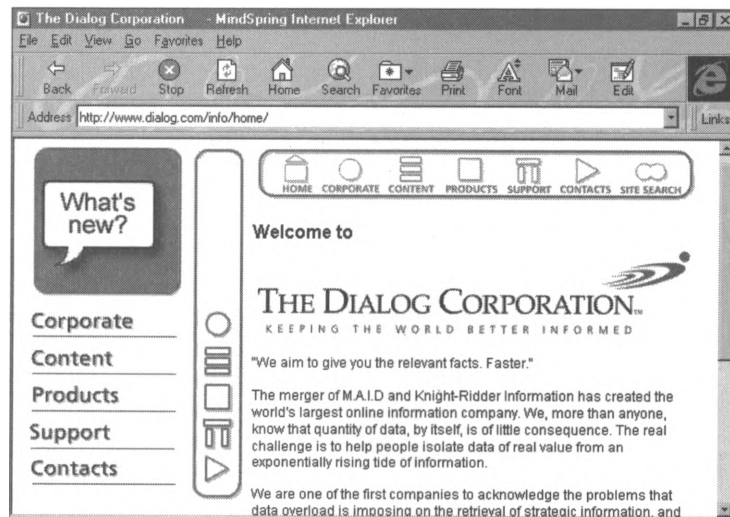
As mentioned earlier in this chapter, *Dialog* databases are also available for an affordable $21 per hour through *CompuServe* on a service called Knowledge Index (GO KI). To show the power of the types of publications indexed in this database, we did a search on a very specific question: what are the current trends in

the accounting software industry? We used the menu-assisted search option in Knowledge Index and used the search string **accounting software and trends**. More than 3,000 hits were returned for this search, including the following article from *Accounting Today*:

Figure 9.17
Knowledge Index displays a Dialog database hit.
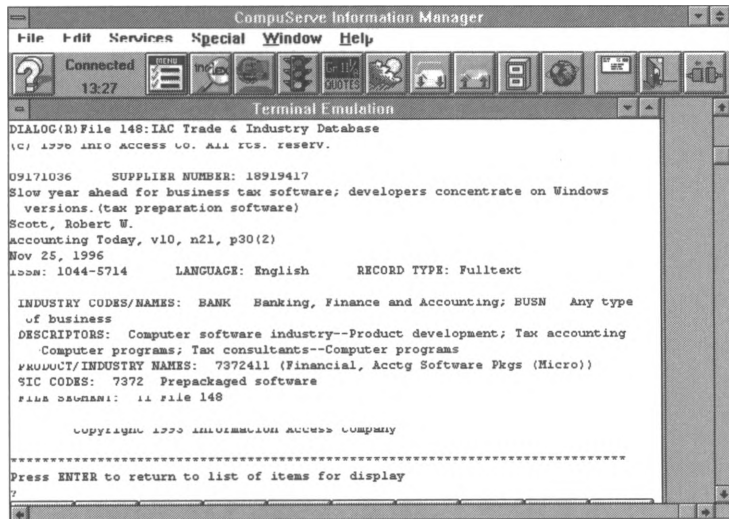
To acquire the full text of this article, you could check for the publication in your firm library, check at the local business or university library, or contact *Dialog* through their Web site to order it through their faxback service.

LEXIS-NEXIS is another large commercial information provider used often by businesspersons. Visit the *LEXIS-NEXIS* home page, at **http://www.lexis-nexis.com**, for more information about content sources, pricing, and client software.

Figure 9.18
*The LEXIS-NEXIS
home page.*
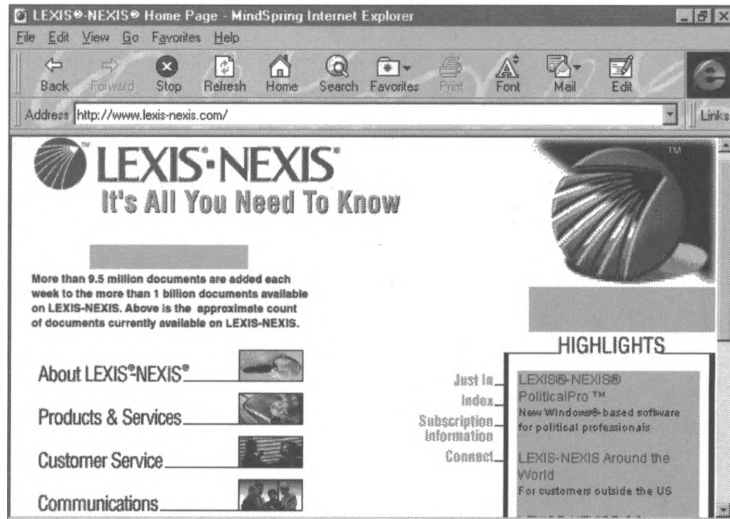
You may also wish to research specialized client software offered
by *LEXIS-NEXIS,* such as *Accounting Professional,* which provides
a *Windows*-based interface to many of the most useful
accounting databases in *LEXIS-NEXIS.* (*Accounting Professional* is
targeted to accounting firms with 11 or more professionals and is
priced in a flat-fee structure starting at $1,000 per month for a
firm of 11-20 accountants.)

The *Accounting Professional* program groups *LEXIS-NEXIS*
information sources into five categories: Tax, Audit & Accounting,
Financial, News, and Additional Sources. Within each category,
the publications are divided more specifically into subsets. For
instance, the Tax subject grouping allows a user to select the
categories of State Cases, Federal Cases, or All Cases, depending
on the scope of the search. Each category is described in detail at
the bottom of the selection screen, as illustrated below.

Figure 9.19
Viewing subsets of the Accounting Professional subject groups.
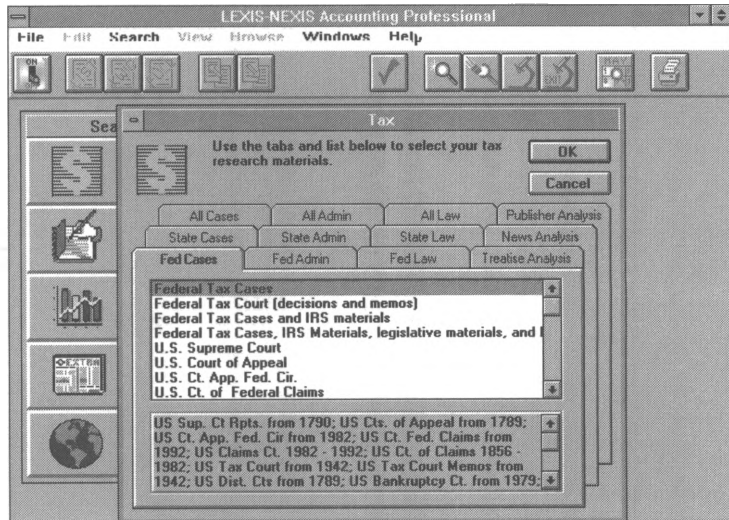
When you locate articles that fulfill your research needs, you can browse through the articles (most of which are available in full text) while online and mark items for download at the end of your session.

A third commercial database you may wish to consider is the *Dow Jones News-Retrieval* service. Visit the *Dow Jones Interactive Publishing* Web site (**http://bis.dowjones.com**) to find out more about news and information sources included in this database and the service's pricing structure.

Figure 9.20
The Dow Jones Interactive Publishing Web site.
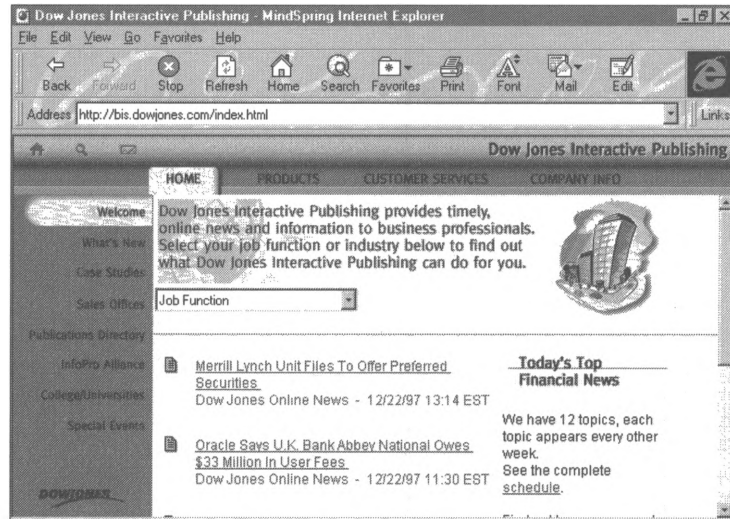
Once you have examined the available databases and made your decision, you are ready to use the database. To use a commercial database, you first need to establish an account with an online provider that carries the database and then you are ready to begin your research.

Refine Your Results

Although you will likely never say, "There is nothing on the Internet about this topic," you may often say, "There are so many Internet resources on this topic, I don't know where to begin." This may be especially frustrating with search tools that supply lists of results without providing additional information about those results. Refining your research results will be much easier when you use search tools that rate the relevance of the items retrieved from your search, or provide abstracts, excerpts, or other descriptive materials. Some provide relevance rankings to

show the user how closely the retrieved items matched the search criteria. Ranking systems vary in methodology, but most assign points for where and how frequently the search terms appear in an entry. Keep this in mind when choosing the search engines you will use, because, on the Internet, retrieving the largest number of items isn't necessarily the best solution to a research problem. In fact, you may find yourself spending hours sorting through the lists to identify useful resources if your search engine does not offer information to help you distinguish the wheat from the chaff. In this section we will describe three strategies you can employ to refine your search and locate the documents you really need.

1. Use search restriction characters, words, and symbols.
2. Use more than one search engine.
3. Use internal search engines.

Restricting the Search

The simplest way to restrict or expand the number of items you retrieve in a search is to use any of the operators or symbols recognized by the search engine you are using. Although the specific symbols, words, and characters recognized by various search engines may differ, the most common, Boolean operators, are recognized by most. The most often used Boolean operators and the effects they can have on your search results are described below.

OR

The OR operator is useful for the first phases of a search, when you are not exactly sure what information is available on your topic or what words are used to categorize it. When used between two words, the OR operator instructs the search tool to

retrieve any record containing either of the words. For instance, the search query

management OR accounting

would retrieve items containing either the word "management" or the term "accounting," as illustrated below:

OR
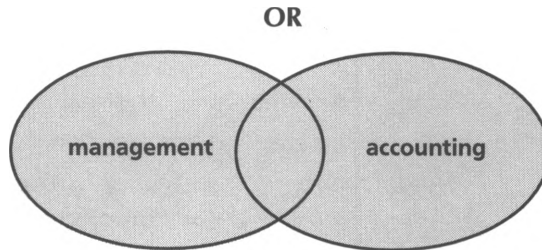
Once you view the types of items containing either word, you might want to narrow your search by dropping one term and confining your search to the other. For instance, you might find that the records indexed under the term "accounting" are more relevant to your research question than those indexed under "management." Or, as in the example below, you might find that the items related to the specific field of "management accounting" must contain both words, not simply either one. Because OR is the Boolean operator that returns the most "hits" (items meeting the search criteria), search queries containing OR are very broad and sometimes return items that are not relevant.

AND

If you need to pose a more specific query, use the Boolean operator AND, which limits results to those items that contain both (or all) of the search terms in your query. Again using the two words from the example above, the search query

management AND accounting

would retrieve only those items containing both words in the same item, as illustrated below:

AND
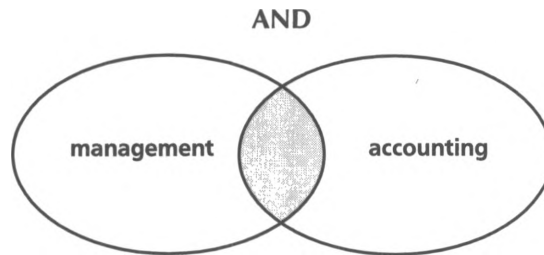
As the shaded area shows, this search query would return a much smaller set of hits, and the items would be more applicable to the field of management accounting. To demonstrate the difference between the OR and the AND operator, we ran the two searches above using Veronica. The search query "management OR accounting" returned over 31,000 items, while the query "management AND accounting" returned a much more manageable 176 items.

NOT

The last of the three most common Boolean operators is the word NOT. The NOT operator is used to eliminate records containing a particular word or combination of words from your search results. For instance, if you are performing a general search on auditing practices, you might wish to exclude items dealing with the very specific discipline of "government auditing." To make this exclusion, you could construct your search query as:

auditing NOT government

This search would return all items containing the word "auditing" except for those that also contain the word "government," as illustrated below:

NOT
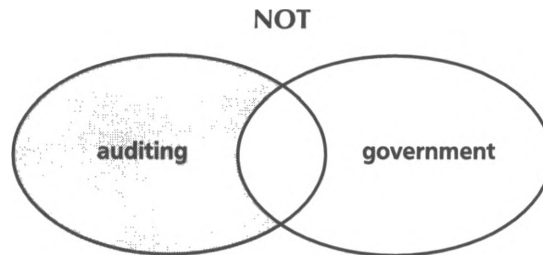
When you visit a search site, always read the instructions or help file before beginning your search. Each search engine has different parameters for using upper- and lower-case letters and combining Boolean operators, and some offer special methods of refining queries. Another good method for refining your search is to run a few searches experimentally to see what results are returned. By browsing through your results list, you can determine whether or not your strategy is returning relevant items. Then, you can construct a search strategy using the Boolean operators OR, AND, and NOT to improve your results.

Other Tools for Restricting a Search

As mentioned above, there are various other characters and symbols that can be used to refine searches by defining the relationships between words in your search strings. For example, many search engines recognized that words placed within quotation marks should be treated as a phrase; in other words, in order for an item to qualify as a hit, the words in the search string must appear together. For example, the keyword string **tax and software** will retrieve any items that contain the word "tax" and the word "software." But the search string **"tax software"** will retrieve only items in which the words "tax" and "software" appear together. As you can imagine, the results of these searches will be quite different.

The best way to determine what symbols and characters are recognized by a search engine is to access the engines Help or

Advanced Searching documents. For example, in the AltaVista WWW search engine that we demonstrated earlier, clicking on the **Help** option opens the document shown below.

Figure 9.21
AltaVista's Help document helps you restrict your search.
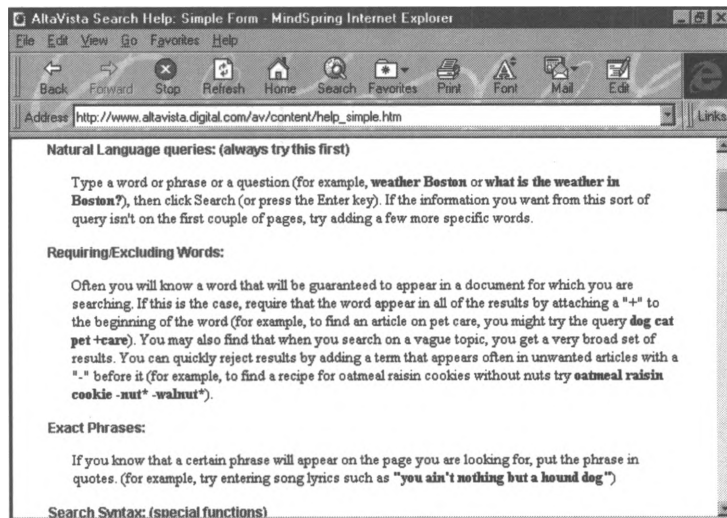
Among other things, from this document, we learn that AltaVista can support natural language queries and exact phrases, can allow you to require or exclude certain words from your search strings, can find pages that include specific graphic files, can sort results listings into various topic categories, and much more!

Use More Than One Engine

As mentioned earlier in this chapter, not all search engines are the same. For example, although each WWW search engine runs using a similar software program, one that automatically follows links and searches for items to add to the engine's database, the engines will not necessarily locate the same items or follow the same links. In addition, the databases used by these search engines are supplemented by entries submitted by Webmasters and Internet publishers, who may catalog their sites with several,

but not all search engines. Finally, different engines support different types of operators and search restricting devices. The bottom line is that a search string entered in one search engine will not retrieve the same results as the identical search string entered in another search engine. When performing comprehensive research, it is a good idea to run your search on several engines.

One way to economize on the time spent running multiple searches is to use a tool known as a metasearch engine. Metasearch engines are special software programs that allow you to run your keywords through several search engines at one time. In addition, these kinds of tools can be configured to manage and update frequently repeated searches. Obviously, this will bring you more hits more quickly, and it eliminates the need for you to learn multiple search engine interfaces. Two good metasearch engines you may wish to explore are:

ForeFront's *Web Seeker* **http://www.ffg.com/seeker**
Quaterdeck's *WebCompass* **http://www.qdeck.com**

Use Internal Search Engines

Sometimes efficient researching requires more than finding a site where the information you need is available. Often the best Web sites consist of many pages of information that must be sifted through to find the particular item you need. Most sophisticated and lengthy Web sites include some internal searching tool to help you find your way to the specific items you need. For example, when researching a Microsoft software product, one of the first places you will want to visit is the Microsoft site. But, as you may know, Microsoft's Web site is enormous, including hundreds of pages relating to various products and services. To help users navigate the site, Microsoft also provides an internal

searching tool that catalogs and searches only the contents of the Microsoft site.

Another example of a site with an internal search engine is the Kent Information Services, Inc., *Site Seeker* directory. This site consists of an extensive listing of resources for accounting and financial professionals. To help users navigate the site and hone in on the resources they need quickly, Kent Information Services, Inc., provides the internal search tool, illustrated below.

Figure 9.22
Site Seeker's
internal search
engine.
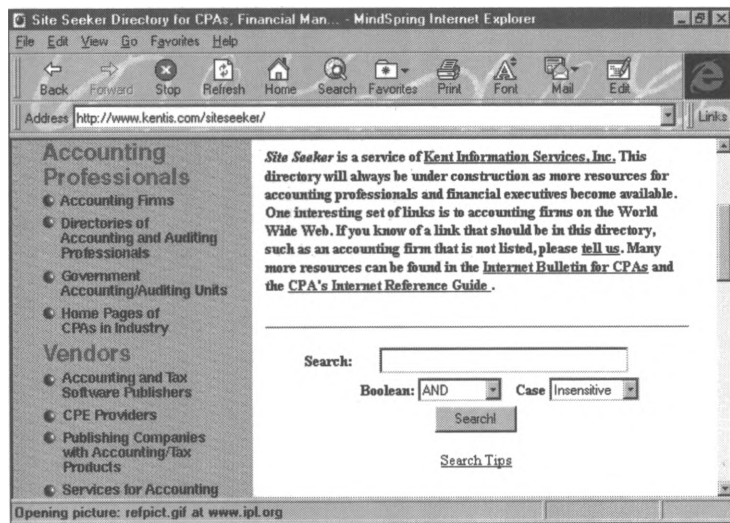
To use this tool, simply type a keyword string into the search box and click the **Search!** button. The search engine will search the contents of the Kent Information Services, Inc., Web site for items that include the keywords.

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Evaluate the Results

The Internet is the largest resource for the distribution of information the world has ever seen. Unfortunately, not every report, article, and opinion posted on the Internet is a reliable source for a business professional. Although this may seem obvious, according to Paul Gilster, author of *Digital Literacy,*

> *There's a lingering public perception . . . of the computer's ferocious accuracy: computers don't make mistakes. Couple that with the general public's sense of the Internet as having been developed by the academic-scientific community, under government auspices, as a high-level information source, and you do indeed have some people accepting far too quickly any information that appears on a computer screen simply because it does appear on a screen. (http://208.4.153.2/diglit.htm)*

To protect yourself from using inauthentic and unreliable information in your professional documents, be certain that you have acceptable answers to the questions below before quoting Internet resources.

Who posted the information?

The Internet is the largest source of information content in the world. It is also unmoderated. That means that anyone can post anything. Unfortunately, many individuals with distinct political and personal agendas (and, often, with few authentic credentials) post articles and research that may seem, on the surface, to be quite credible resources. Don't be deceived. Before using any resource that you find on the Internet, review the background and credentials of the author. This information will provide you with a good basis for deciding whether or not the information is reputable. Also pay attention to the type of organization that published the resource. This can be determined by the address.

For example, an address that ends in *com* indicates that the resource was published by a commercial organization, which may have marketing or promotional motives.

What is the purpose of the information?

As noted above, individual authors and organizations often have very specific reasons for publishing materials on the Internet. For example, many hardware vendors publish information about hardware components in order to market their particular products. Before using any information you find on the Internet, be certain to evaluate the motivations of the content provider. That is not to say that materials with a marketing or promotional agenda should be dismissed; many organizations publish very informative and even-handed white papers and research articles to promote their products and expertise.

What is the original source of the information?

Researched articles often rely heavily on the work of other researchers, incorporating conclusions and facts gleaned from any number of other sources. When you encounter a fact or quote that you wish to use, which has been quoted by another researcher, always locate the original source before proceeding. It is important to verify the accuracy and the context of the information. Is the fact quoted in a way that reflects the original researcher's conclusions, or has the fact been distorted in a way that might compromise its value?

When was the information published?

Internet technology allows anyone to easily publish documents. And then, just as easily, those documents can be updated. Even so, much information published on the Internet is infrequently updated, if it is updated at all. Be certain to look for dates that indicate the currency of Internet materials before using them in

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your own research because outdated information may not be accurate.

After you have determined that the resource is valid and accurate, then you can use the item with confidence in your own work.

Internet Research Worksheet

To help you as you complete Internet research, you may wish to use the worksheet on the following page to plan and implement a successful Internet research strategy.

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Internet Research Worksheet

Identify the Research Problem

What is the question?

What are related questions?

What types of answers do you need?

Develop a Research Plan

What keywords will you use?

How will you track sources?

What information do you need about each source?

Select a Research Tool

Do you need a tool focused on a specific information type?

Do you need a tool focused on a specific content category?

Do you need a comprehensive tool?

Do you need a specialized tool, such as a commercial database?

Do you know the address of the tool you wish to use or will you need to use a general search engine to find a more specific research tool?

Refine the Results

Does your search tool support Boolean operators?

Does your search tool support other devices for restricting searches?

What other search tools will you try?

Do you need to invest in a metasearch tool?

Evaluate the Results

Who posted the information?

What is the intended purpose of the information?

What is the original source of the information?

When was the information published?

Internet Resources for Accounting Professionals

Accounting

Academy of Accounting Historians

Site of a non-profit organization dedicated to the history of accounting and auditing and its relation to past and current business practices. Provides links to other accounting and business history sites.

http://weatherhead.cwru.edu/Accounting/

ACCHANGE

Subscription mailing list for public accountants, industry professionals, and academics on accounting education and curriculum.

Subscribe through: listserv@mcmuse.mc.maricopa.edu

Accountant's Home Page

A collection of links to sites of interest to professionals in the fields of accounting, finance, and business. Among the links provided are Thomas, Internal Revenue Service, and Small Business Administration.

http://www.computercpa.com/

Accounting and Tax Database (See Databases)

Accounting, Auditing & Accountability (journal)
    http://www.mcb.co.uk/liblink/aaaj/jourhome.htm

Accounting Firms
    Robert C. Alario, CPA
        http://www.cyber-cpa.com/ma01.html
    Alder, Green & Hansson
        http://www.aghcpa.com/
    C.W. Amos & Company, LLC
        http://www.cwamos.com
    Arthur Andersen & Co., SC
        http://www.arthurandersen.com/
    Andersen Consulting
        http://www.ac.com/
    Michael M. Arons, CPA
        http://www.olac.com/arons/
    Aronson, Fetridge & Weigle, CPAs
        http://www.afwcpa.com
    Karen Hope Bachman, CPA
        http://www.summitmedia.com/cpa/
    Patricia Bagley, CPA, PC
        http://www.digex.net/herndon/biz/bagley.html
    Charles Bailly & Company, P.L.L.P.
        http://www.cbailly.com
    Baker Newman & Noyes
        http://www.bnncpa.com/
    Barnes, Welding, Cook & O'Connor, Inc., CPAs
        http://www.multiverse.com/bwco/
    Gregory Barsanti, CPA
        http://www.sover.net/%7Epjarvis/barsanti.html
    BDO Dunwoody (Canada)
        http://www.bdo.ca/
    Al Beane, CPA
        http://community.net/community/solano/business/
        albeane.html

Berenson & Co.
> http://www.berenson.com

Klaus Beyer
> http://www.beyer-steuerberater.de/english.html

David M. Bialick, CPA
> http://www.earthlink.net/dbialick

Big Apple CPA and Consulting Firm-Glickman, Rubin & Gaft
> http://www.dewittplaza.com/Apple/main.htm

Blackman Kallick & Bartelstein, LLP
> http://www.bkbcpa.com

Blanchet CPA
> http://pbn.net:80/pbn/referalls/accountants/blanchet.htm

Joshua A. Blau, CPA
> http://www.tagsys.com/Ads/Accountant/accountant.html

Fred Blauer and Associates, CPAs (Canada)
> http://www.cam.org/%7Efblauer/serv_bus.htm

Bober, Markey & Company
> http://www.bobermarkey.com

James Bones & Associates
> http://calproptax.com/

Bonham & Co., CPAs
> http://www.ice.net/private/bonham/bonham.html

Brief, Rotfarb, Wynbarg, Cappe
> http://www.brwc.com

Karen Stevenson Brown, CPA
> http://www.ice.net/~kstevens/

Jack D. Burson, CPA
> http://www.olac.com/

John Butler, CPA
> http://www.aros.net/~jbutler/

Burkhardt & Co.
> http://www.cinti.net/burkhardt

Caldwell & Bodenheimer
> http://www.covesoft.com/caldwell/

Chapski & Chapski, CPAs, LLP
    http://www.umich.edu/%7Echapski/
Checkers, Simon & Rosner
    http://www.checkers-llp.com/
Choquette & Co. (Canada)
    http://www.income.com/
Clark, Schaefer, Hackett & Co.
    http://www.cshco.com
Paul Clough, CPA
    http://www.turbosales.com/~turbos/paulc/
Cohen & Co.
    http://www.cohencpa.com/
Eric E. Cohen, CPA, CPIM
    http://www.servtech.com/re/acct.html
Cohen, Greenstein and Company
    http://world.std.com/~harvey
Coopers & Lybrand
    http://www.CoLybrand.com/
Coopers & Lybrand (United Kingdom)
    http://www.coopers.co.uk/welcome.html
Coughlin & Gomola, CPAs
    http://www.connix.com/~garyg/
Kathy K. Cregan, CPA
    http://www.av.qnet.com/%7Ekkc/
Hillary L. Crosby, CPA
    http://www.hlca.com/hlca/
DeLellis & Co., CPA
    http://www.vcnet.com/DeLellis/
Deloitte & Touche
    http://www.dttus.com/
Deloitte & Touche (Bermuda)
    http://turnpike.net//emporium/D/dtpage1/index.html
Elder & Associates
    http://www.elder-assoc-cpa.com

English Miller & Co.
    http://ourworld.compuserve.com/homepages/
    EnglishMiller
Ernst & Young
    http://www.ey.com/
R.A. Fischler & Co.
    http://www.rafcpa.com
Howard Fisherman, CPA
    http://www.specdata.com/hfcpa/
Forsyth Financial Services, Management Accountants
    http://www.sentex.net/~ffs/
Freed Maxick Sachs & Murphy, PC
    http://www.fmsmpc.com
Friedman & Fuller, PC, CPAs
    http://www.ffgroup.com/
Friedman Kannenberg & Associates, CPAs
    http://www.csi-infinet.com/friedman.htm
GBQ/Nesser Consulting Group, Ltd.
    http://www.iwaynet.net/~nesser
Paula Gilles Maurano & Com, CPAs
    http://www.maurano.com/
Roxanne Goldberg, CPA
    http://www.telesphere.com/ts/rgcpa/index.html
Goldstein Golub Kessler & Company, PC
    http://www.ggk.com/
Grant Thornton LLP
    http://www.gt-us.com/
Dan Gray, CPA
    http://www.netquest.net/gary.adams
Grobstein, Horwath and Company, LLP
    http://www.horwathcal.com
Sallie A. Hagen, CPA, PC
    http://www.netcpa.com
Earl Hall, CPA
    http://www.wolfe.net/~earl/

Craig L. Hardison, CPA
http://www.iadfw.net/craig/index.html

Hargrave & Hargrave, CPA
http://taxwizard.com/

John K. Haslock, CPA
http://www.cyberzine.org/html/CPA/cpapage.html

Haugen, Springer & Co.
http://www.hsco.com

Hayes & Associates, CPAs
http://www.hayescpa.com

Hayes, Debeck, Stewart & Little, CAs (Canada)
http://www.islandnet.com/~hdsl/hdsl.html

Hungerford, Alrin, Nichols & Carter, P.C.
http://www.hanc.com

Integrated Business Services, Ltd.
http://www.geocities.com/WallStreet/5895

Johnson and Scarborough, CPAs
http://www.jscpa.com/

Roger A. Kahan, CPA
http://www.rak-1.com/

Katz Cassidy, CPAs
http://www.primenet.com/~laig/proserve/cpa/
cpa0001b.htm

Kidsons Impey (United Kingdom)
http://www.kidsons.co.uk/kidsons/hlb.html

Patrick Kissane, CA
http://www.taunet.net.au/pat/

Kostin, Ruffkess & Company, LLC
http://www.kostin.com/

KPMG Peat Marwick
http://hp.rad.kpmg.com/WWW/SSC/home.html

KPMG Peat Marwick (Canada)
http://www.kpmg.ca/

Kurtz & Kurtz, CPAs
http://www.mcny.com/kurzkurz/

Kushner, La Graize, and Moore, CPAs
    http://www.communique.net/~klmcpa/
LaFollette, Jansa, Brandt & Co., LLP
    http://www.ljbco.com
Barbara L. Leary, CPA
    http://www1.magnus1.com/cta/b11/b11_home.html
Lindgren, Callihan, Van Osdol and Co., Ltd.
    http://www.essex1.com/people/kappy/lcv.htm
Philip K. Lippincott, CPA
    http://www.pkl-profit.com
Sherman L. Lubin, CPA
    http://www.netrunner.net/~rhomer/sll.htm
V F Mather & Co.
    http://www.personal.u-net.com/~mather/
Mathis, West, Huffines & Co., P.C.
    http://www.mwhpc.com
Matthews, Reich, Perna & Rootermond, P.C.
    http://www.mrpr.com
Ronnie C. McClure, CPA
    http://rampages.onramp.net/~rmphdcpa/
McConnell Galloway Botteselle, CGAs (Canada)
    http://www.helinet.com/MGB/
McGladrey & Pullen - Renaissance Consulting Division
    http://www.mcgladrey.com
McNulty & Co., CPAs
    http://www.review.net/cpa/
Raymond Miner, CPA
    http://www.onramp.net/%7Efneworld/networking.html
Anne Mitchell, CPA
    http://slv.net/taxprep/cpa1/mitchell.htm
Mithcell, Emert & Hill, P.C. (Knoxville, TN)
    http://www.mehcpa.com
Alan Moore, CPA
    http://www.infi.net/moore/

Moore Stephens North America, LLC
   http://www.msnainc.com/
Morrison Brown Argiz & Company
   http://www.shadow.net/mba/
Murphy Green & Co.
   http://www.mcn.org/A/MGCO/
Arthur Naman, CPA
   http://www.ccsi.com/~anaman/
Jerry Newman, CPA
   http://www.5010geary.com/frisco/frisco.htm
Peter Norton, CPA
   http://www.corpinfohub.com/norton.htm
Obara, Kidwell & Company
   http://users.aol.com/okc250/homepage.htm
Ormsby & Mackan (Toronto)
   http://www.io.org/%7Efmackan/
Charles J. Ozeck, CPA
   http://www.dprint.com/cocpa/
Parks, Palmer, Turner & Yemenidjian, CPA
   http://www.laig.com/proserve/ppty/
People-Friendly Business Solutions (Penelope BM Hedges,
CA, CSV) (Canada)
   http://mindlink.net/Penelope_Hedges/pfbs-1.htm
Pester & Co.
   http://www.taxcpa.com
Pielech & Pielech, CPAs
   http://www.pielech.com
Presnell Gage Accounting & Consulting
   http://www.presnellgage.com
Price Waterhouse
   http://www.pw.com/
Price Waterhouse - Montreal (French language)
   http://services.bunyip.com:7101/default.html
Read & Bose, CPAs
   http://www.oregontrail.net/readbose/peer.html

Richman Associates, CPAs

    http://www.websys.com/richman/home.html

Peter Jason Riley, CPA

    http://www.pjrcpa.com

Rogers & Co., CPAs, PC

    http://www.exempt5.com

Micheal A. Ross, CPA

    http://rampages.onramp.net/~bizplan/

Rowrotham & Company, Inc., CPAs

    http://www.slip.net/~cpas/

Edward Ryan and Co, CAs (England)

    http://www.edward-ryan.co.uk

Andrew Sadowski, CPA

    http://business.poland.net/sadowski/

Sareen & Associates

    http://www.sareen-assoc.com

Walter C. Schmidt, CPA

    http://www.dorsai.org/%7Ewalts/index.html

Hugo Schouten, CPA (Australia)

    http://www.ozemail.com.au/~dutch/

Schwartz, Cohen & Co.

    http://www.azcpa.com/

Seager, Seager, Webb, Inc.

    http://www.sswinc.com/

Carolyn Sechler, CPA

    http://www.indirect.com/www/carolyn/

Second Shift, Inc.

    http://www.accounting.com/%7Ercahill/ssftcpa.htm

BDO Seidman, LLP (US member firm)

    http://www.bdo.com

Simpson & Osborne, CPAs

    http://www.sandocpas.com/

Bradford L. Smith, CPA

    http://worldmall.com/msti/bsmith.htm

Donald A. Smith, CPA
http://ids.net/%7Edsmith/mtb.html
David Somers & Associates, CPAs
http://web2.airmail.com/%7Edsacpa/mainpage.htm
Spaeth & Batterberry, Ltd.
http://sabltd.com
Swarts & Co., CPA
http://www.internex.com/multipresence/swarts.html
Tax Advice, Inc. - Virgil E. Knedlik, CPA
http://www.theworld.com/money/taxes/ta/ta.htm
The PC CPA (tm)
http://pages.prodigy.com/apc_cpa/
Thomas, Doll & Co., CPAs
http://www.ispot.com/TDC/
Thomas & Walters, CPAs
http://slv.net/taxprep/cpa1/thomas.htm
Thompson, Greenspon & Co.
http://www.tgccpa.com
Urbach Kahn & Werlin PC, CPAs
http://www.ukw.com
Varney, Mills, Rogers, Burnett & Associates
http://www.varney.com/
Kathleen Villard, CPA
http://www.teknetix.com/v.html
Virchow, Krause, & Company, LLP
http://www.virchowkrause.com
James A. Volz, CPA
http://home.sprynet.com/sprynet/volzcpa
White & Associates, CPAs
http://www.whiteassoc.com/%7Eleewhite/homepage.html
Wiener, Strickler & Perez, PC
http://members.aol.com/wsandp/

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Accounting News Network

A databank for accountants and tax practitioners. Features include the "Accountant's Calendar," a listing of industry events and tax deadlines; "Issue of the Week;" and "Accountant's Productivity Tools," which offers demos of new technologies. The site is a joint venture of Microsoft and Faulkner & Gray.

http://www.microsoft.com/smallbiz/ann

AI/ES Section of AAA (Artificial Intelligence/Expert Systems Section of the American Accounting Association)

Provides links to scholarly research in the accounting field including teaching materials and the _International Journal of Intelligent Systems in Accounting, Finance and Management._

http://www.bus.orst.edu:80/faculty/brownc/aies/
aieshome.htm

American Accounting Association Home Page

Provides general information about the Association as well as useful links to Yahoo and other resources of particular interest to accounting professionals.

http://www.rutgers.edu:80/Accounting/raw/aaa/aaa.htm

ANet

One of three complementary sites of the International Accounting Network, which includes the Summa Project and Rutgers University sites. Hosted by Southern Cross University, ANet contains information on accounting and auditing software and new technology, a bibliography of online publications, and a listing of conferences.

http://www.rutgers.edu/Accounting/anet/

ANet mailing lists include:

ANews-L - News

AAAES-L - American Accounting Association AI/ES Section Newsletter

AAATC-L - American Accounting Association Teaching and Curriculum Section Newsletter

AAcrdn-L - Accounting Program Accreditation

AAccSys-L - Accounting Information Systems

AAudit-L - Auditing

ABooks-L - New Books

AEthics-L - Ethics

AEthnog-L - Accounting Ethnography

AFinAcc-L - Financial Accounting

AGvNFP-L - Governmental and Not-for-Profit Accounting

AIntAcc-L - International Accounting

AIntSys-L - Intelligent and Expert Systems

AJobs-L - Academic Positions

AMgtAcc-L - Management Accounting

AOilAcc-L - Extractive Industries

AProfsn-L - Academic/Profession Interface

ASocial-L - Social Accounting

AStdnt-L - Accounting Student List
ATax-L - Taxation
ATeach-L - Teaching and Learning
ATechno-L - Accounting and Technology
ATwoYear-L - US Two-Year College System
    Subscribe through e-mail to Listproc@scu.edu.au with
    message: SUBSCRIBE listname yourname

Arthur Andersen

This site of the Big Six firm features "A Brief History of
Accounting," an animated review of the industry which takes
visitors from the first known transaction records in 3600 B.C.
to modern times. Visitors must have Netscape *Navigator* and
Macromedia *Shockwave*, both of which are available through
links at the site.
    http://www.arthurandersen.com/firmwide/new/

Bisk Publishing Co.

This site provides information about the education resources
available for business law, accounting, and tax professionals.
The site includes a demo of their CPE program, a catalog,
state board of accountancy requirements, and other
professional information.
    http://www.bisk.com

California CPA's Education Foundation

A continuing education service for accountants. Contains
information on seminars and CPE events and provides links
to the "Electronic Accountant" Newswire service and CPE
Exchange articles.
    http://www.calcpaed.org

CPENet

Nonprofit Internet continuing education service for financial professionals, with course offerings that include Medicare Cost Reimbursement, Risk Assessment, and Audit of Advanced Systems among others.

http://uu-gna.mit.edu:8001/~compass/

The Cyber-Accountant (See Taxes)

Cyber-Accountant Forum

A discussion group for accountants who do business on the Web. Topics include career opportunities on the Internet, electronic marketing and consulting, and intranets.

http://www.lacher.com/cyber_accountant/

Department of Accounting, Finance, and Information Systems

A University of Canterbury, Christchurch, New Zealand WWW site with links to sources on accounting, finance and information systems at university, commercial, and government sites.

http://www.afis.canterbury.ac.nz/afishome.html
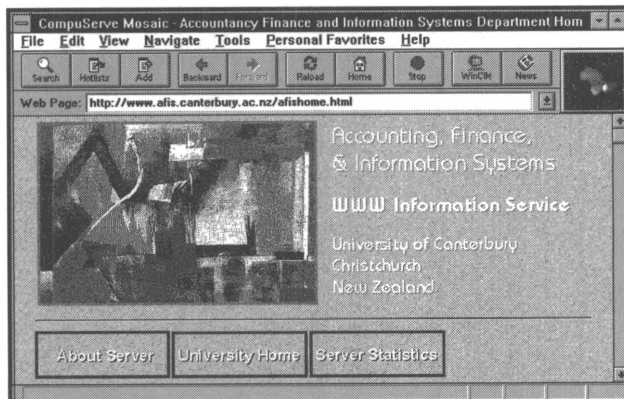
The Electronic Accountant

An e-zine published by Faulkner & Gray, this site is updated three times per day to offer the most recent industry news, features, and reviews of Web sites of interest to accountants. Also provides a list of discussion groups.

http://www.electronicaccountant.com

Enterprise 2000 and Network Press home page

A management and network organization serving the accounting profession. Users can order books and reports published by the Network Press, receive a catalog of Enterprise 2000 services, or participate in a discussion forum for CPAs. For information, e-mail network@sam.neosoft.com.

http://www.NeoSoft.com/neopolis/e2000/

Financial Economics Network

Internet discussion group where subscribers exchange ideas and information through e-mail on banking, accounting, stocks, bonds, corporate filings, etc.

Subscribe through e-mail to
listserv@wsuvm1.csc.wsu.edu
with message: subscribe fen yourname

General Accounting Office

Provides resources for government auditors. The GAO's General Policies/Procedures and Communications Manual is available for download.

http://www.gao.gov

Gleim Publications

This site provides information about CPA, CIA, and CMA exams, how to pass the exams, and order forms for books and software.

http://www.gleim.com

ICAEW

Site maintained by the Institute of Chartered Accountants of England and Wales for its members and the worldwide accounting community. Includes links to many accounting-related sites and is the graphic-intensive counterpart of the Summa Project at the University of Exeter, which is primarily text based.

http://www.icaew.co.uk/
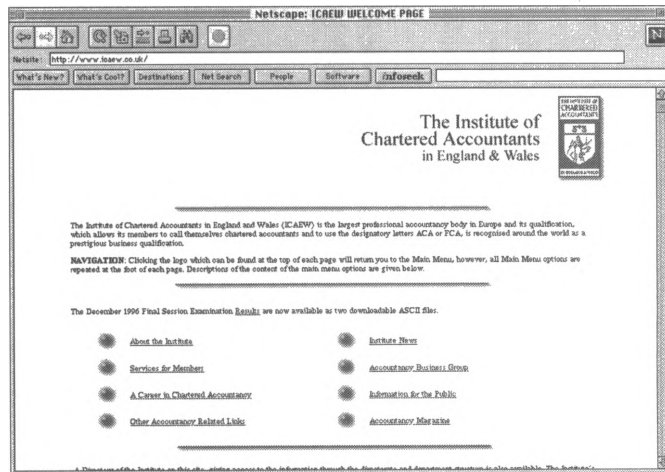
Institute of Management Accountants (IMA) Bulletin Board

Lists employment opportunities, new publications bibliographies, catalog of publications, CMA exam information, continuing education information, news, articles, and a research forum.

Dial 1-800-229-1268

K2 Enterprises

The K2 Enterprises home page is the contact point for information about K2 Enterprises' CPE seminars and conferences. The site also offers a list of Internet sites on accounting and non-accounting topics.

http://www.K2E.com

Kent Information Services, Inc.

Provides links to sites of interest to accounting professionals as well as information about the services and products offered by Kent Information Services, Inc., including the *CPA's Internet Reference Guide*. The site also provides descriptive and ordering information about the CPE courses offered by Kent Information Services, Inc., sample articles from the *Internet Bulletin for CPAs*, and the Site Seeker area which includes an extensive list of resources for Accounting Professionals.

http://www.kentis.com
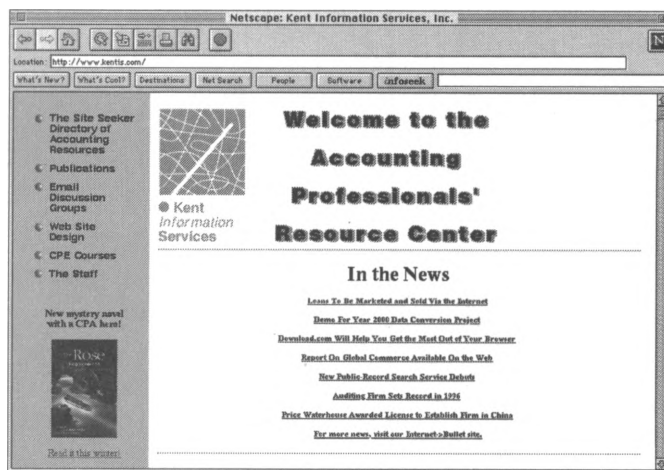
McGraw-Hill

The publisher provides information about self-study courses that fulfill CPE credit requirements.

http://www.mhcec.com/mkcec/mkcpe.html

Pacioli Center at Loyola College in Maryland

Hosts a mailing list called AECM-L (Accounting Education using Computers and Multimedia) which discusses how hardware and software can be used in accounting education.

Subscribe through e-mail to MAILSERV@LOYOLA.EDU

Rutgers Accounting Web

The accounting department Internet site of Rutgers University provides a list of Internet resources for accountants.

http//www.rutgers.edu/Accounting/raw.htm
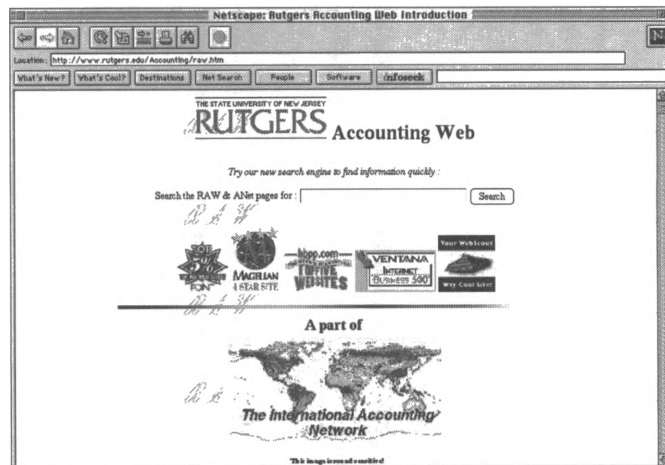
School Business Official's Internet Pathfinder

Includes links to technology information and an Accountants' Resources center. Provided by the Florida Information Resource Network.

http://www.firn.edu/~asbo
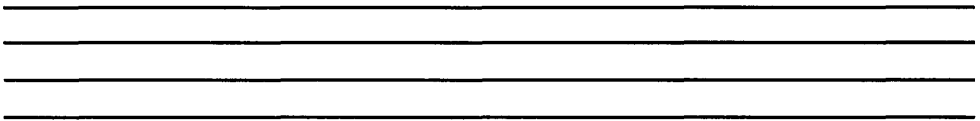
Software Publishers

A Bit Better Software Publishing
http://www.eskimo.com/~realtime/

AccuFile (electronic filing for tax professionals)
http://www.vans-inc.com

APPX Software, Inc.
http://www.appx.com:80/appxhome.html

Brentmark Software
http://www.brentmark.com

Business Logic Corporation
http://www.blcorp.com

CaseWare International
http://www.caseware.com:80/

CoolTax Canadian Tax Software
http://www.cooltax.com/

Creative Solutions
http://www.cbsolution.com/index.htm

DacEasy, Inc., Small Business Center
http://www.daceasy.com

Financial Navigator International
http://www.finnav.com:80/

Great Plains Software
http://www.gps.com

Grifftax
http://www.grifftax.com

Heritage Software (CPELOG)
http://www.halcyon.com/cpelog/

Independent Systems and Programming, Inc.
http://www.taxsoft.com

Infomast, Inc.
http://singapore.com:80/products/infomast/infomast.htm

Intuit, Inc.
http://www.intuit.com

Majengo Paperless Audit Software (UK)
http://www.majengo.com

Micro Information Products (non-profit and governmental agencies)
http://www.mipinc.com
Monnet Financial Systems
http://www.monnet.com/
Navision Software
http://www.navision-us.com
Parsons Technology (an Intuit Company)
http://www.parsonstech.com
Peachtree Accounting
http://www.peachtree.com
Platinum Software
http://www.platsoft.com
Plus & Minus Accounting Software
http://talyon.com:80/talyon.html
Pro Taxes, Inc. (Canada)
http://www.protaxes.com/tmplocx.html
Professional EDI Tax Return Software (Florida)
http://member.aol.com/proedi
Red Wing Business Systems
http://www.redwingsoftware.com
Rock Creek Technologies
http://www.rockcreek.com
Satori Software
http://www.satorisw.com/
SBT Accounting Systems, Inc.
http://www.sbtcorp.com/
SCS/Compute
http://www.scscom.com/
Seagate Software
http://www.img.seagatesoftware.com
Solomon Software
http://www.solomon.com/
State of the Art, Inc.
http://www.stateoftheart.com/

STF Services Corporation
   http://www.stfservices.com
Tax Resources (specializes in audit defense)
   http://www.uniqueds.com/taxaudit/
Taxbyte Canadian Software
   http://www.taxbyte.com
TaxPrep Information Systems
   UR L http://www.taxprep.com/
Taxware International
   http://www.taxware.com/
Timeslips Corporation
   http://timeslips.com/

Summa Project at the University of Exeter, Exeter UK
Links to a number of UK and other sites of interest to
accountants in public practice, industry, and government, like
FINWeb, EDGAR, Security and Exchange Commission's
online database, Financial Executive Journal, and Global
Network Navigator.
   http://www.icaew.org.uk/

Tax Accounting and Professional Network (TAPNet)
Bulletin board provides tax and accounting professionals a
means to obtain feedback and share information with
colleagues on tax accounting issues.
   Dial (603)585-9170

University Accounting Departments

Aberdeen University Department of Accountancy

http://www.abdn.ac.uk/~acc025

University of Iowa Accounting Department

http://www.biz.uiowa.edu/acct/

Pacioli Center at Loyola College, Maryland

http://pacioli.loyola.edu/pub

Louisiana State University Accounting Department

http://www.lib.lsu.edu/bus/account.html

Oregon State University Accounting Department

http://www.bus.orst.edu/cob/acctng/acctng.htm

Rutgers Accounting Web at Rutgers University

http://www.rutgers.edu/accounting/raw.htm

Washington Accounting Network (Waccnet)

Maintains listing of accounting information and mailing lists as well as the AuditNet Resource List. Lists are available through anonymous ftp.

For information, e-mail earl@eskimo.org

Auditing

AAudit-L

Subscription discussion group on auditing issues.

Subscribe through e-mail to LISTPROC@scu.edu.au with the message: SUBSCRIBE AAudit-L yourname

ACAU-L

Listserve for college and university auditors.

Contact Chuck Jefferis through e-mail at cjefferi@moose.uvm.edu

ACL mailing list

Moderated discussion forum for issues related to using ACL
(Audit Command Language) software. (ACL is a PC-based
software program that allows users to read, analyze, and
report on data from mainframe, mini, and microcomputers.)
> Subscribe through e-mail to listserv@etsuadmn.etsu.edu
> with message: SUB ACL-L yourname

Association for Computing Machinery

ACM is an organization dedicated to information technology.
They have a special interest group for Security, Audit and
Control that can be accessed from this site.
> http://www.acm.org/sigs

Association of College and University Auditors (ACUA)

The ACUA has set up an ACUA Library that contains audit
programs, audit reports, questionnaires, guides, program
reviews and other resources about audits for institutions of
higher education. The file also has an index that lists and
describes all the available resources.
> http://www.acua.org/acua.htm

Association of Healthcare Internal Auditors (AHIA)

The only international organization dedicated to the
advancement of the healthcare internal auditing profession.
> E-mail AHIA's Executive Vice President at
> Charlie Dal@aol.com

Audit-L

A general audit discussion list open to auditors from all
industries and companies with emphasis on auditing issues
that cross industry/organizational lines.
> Subscribe through e-mail to listserv@etsuadmn.etsu.edu
> with message: SUB AUDIT-L yourname

AuditNet Accounting, Audit, and Financial Management E-mail Directory

Lists contact information for accounting, auditing, and financial management professionals as well as related mailing lists.

http://www.cowan.edu.au/mra/home.htm
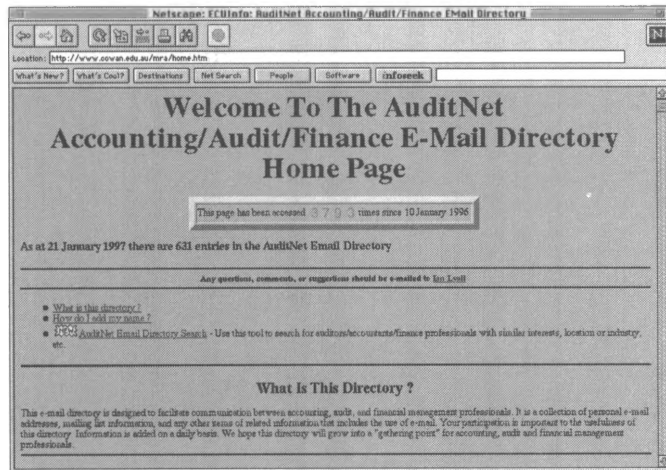
AuditNet E-mail Listing

E-mail address listing for auditors in government, industry, and academic institutions. Listing in AEL is by request.

E-mail request to Jim Kaplan at jkaplan@capaccess.org

AuditNet Resource List

Listing of Internet resources pertaining to auditing compiled by Jim Kaplan.

http://www.unf.edu/students/jmayer/arl.html
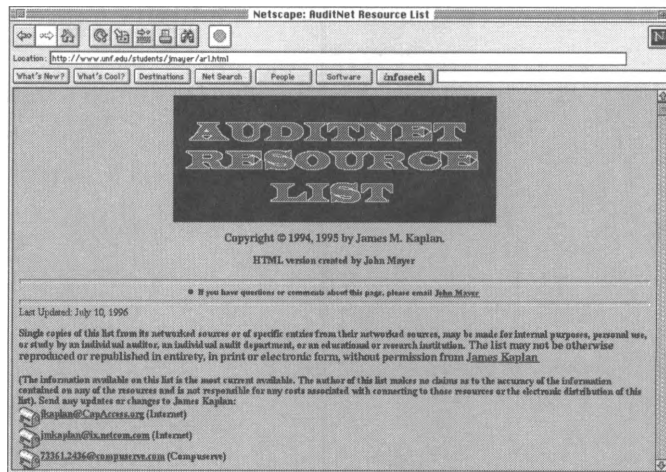
AuditNet Software Sharing

An FTP posting of audit programs shared through listservers.
ftp://ftp.unf.edu in directory pub/auditnet/programs

Auditor General of Canada

A report containing more than 1000 pages of information
organized by the results of studies and audits completed.
gopher://gopher.phoenix.ca:70/11/auditor

Australian Universities Internal Audit mailing list

Available to all Internal Audit staff of Australian Universities
(and other interested auditors).
Subscribe through e-mail to INTAUDIT-L-REQUEST@
Levels.UniSA.Edu.Au with message: Subscribe INAUDIT-L

"Building and Auditing a Trusted Network Environment with Netware 4"

Novell has included a great deal of general information about auditing networks at this site. They also market their own network software and auditing software.

> http://occam.sjf.novell.com:8080/nw410.english/
> trustenu/1.toc

Columbia University Internal Audit

This section of the Columbia University Web site includes "A Guide to Internal Controls," "Internal Control Issues," and "Auditing at Columbia University: A Service to Management."

> http://www.columbia.edu/cu/ia/index.html

Commerce Business Daily (See Government and Governmental Accounting)

CPENet (See Accounting)

CTI-CCC-AUDIT mailing list

Sponsored by the Centre for Accounting, Finance, and Management at the School of Information Systems, University of East Anglia, UK.

> Subscribe through e-mail to mailbase@mailbase.ac.uk
> with message: Join cti-acc-audit firstname lastname

FinanceNet Financial Audits mailing list.

See FinanceNet mailing lists under Government and Governmental Accounting.

Fin-audits

FinanceNet mailing list for discussions of auditing topics like relations between CFO and audit communities, agency audit findings, follow-up and validation procedures, and financial audit resources.

Flowcharting BBS

Online bulletin board assistance from Patton & Patton, makers of Flowcharting software.

Dial 408-778-9697

Government Accounting/Auditing Units

Albuquerque, New Mexico, Internal Auditing Department

http://www.cabq.gov/aud/home.html

California State Controller's Office

http://www.sco.ca.gov/gragraph.htm

Columbia University Internal Audit

http://www.columbia.edu/cu/ia

Florida State Comptroller

htp://www.dbf.state.fl.us/

Indiana University Internal Audit

http://www.indiana.edu/~iuaudit/main.html

Texas Comptroller of Public Accounts

http://www.window.texas.gov/comptrol/compinfo.html

University of Florida Office of Inspector General

http://nervm.nerdc.ufl.edu/~ufoig

University of Massachusetts Controller

http://www.umassp.edu/html/controllers.html

University of Massachusetts Internal Audit

http://www.umassp.edu/html/auditors.html

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"A Guide to Understanding Audit in Trusted Systems"
> This useful resource for auditors is presented by the National
> Computer Security Center and offers guidelines for Internet
> and intranet security audits.
>> http://bilbo.isu.edu/security/isl/audit.html

IGNet
> Internet-based electronic communications network that
> collects and exchanges information of interest to the
> Inspector General community in all levels of government.
>> gopher://www.sbaonline.sba.gov:70/11/ignet

Information Security Discussion List
> A non-moderated Internet mailing list for information security
> and auditing professionals in government, industry, and
> academic institutions.
>> Subscribe through e-mail to listserv@etsuadmn.etsu.edu
>> with message: SUB INFSEC-L yourname

Internal Audit World Wide Web (IAWWW)
> A production prototype demonstration project for
> warehousing information related to the internal auditing
> profession across lines of associations, countries, and
> industries. Includes sections for electronic discussions, white
> papers, various auditing specialty disciplines, and industry-
> specific information.
>> http://www.bitwise.net/iawww/
>> IAWWW-HOMEPAGE-CM.HTML
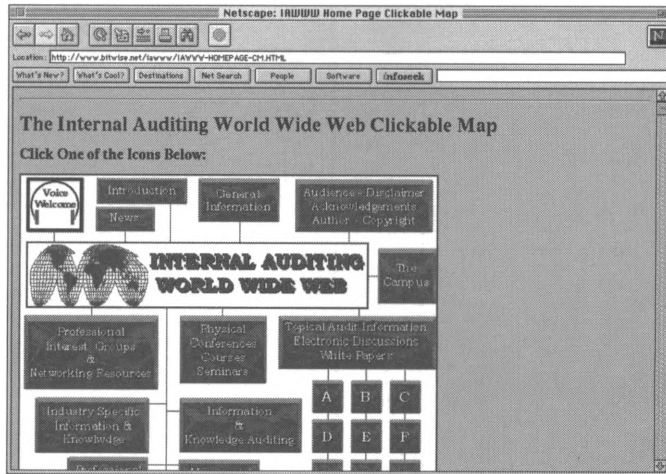
JohnSon's Accounting/Auditing Page

Student page at University of North Florida with links to the Office of Management and Budget, Governmental Accounting and Standards Board, The Yellow Book, and much more.

http://www.unf.edu/students/jmayer/account.html

Managerial Auditing (journal)

http://www.mcb.co.uk/liblink/maj/jourhome.htm

Minnesota Office of the Legislative Auditor

Provides history of the office, information about the Financial Audit and Program Evaluation Divisions, copies of audit reports including a report on Performance Budgeting, links to the Minnesota legislature Gopher server, and Federal, state, and Internet resources for auditors.

http://www.auditor.leg.state.mn.us/

Netscape: MN OFFICE OF THE LEGISLATIVE AUDITOR

Location: http://www.auditor.leg.state.mn.us/

What's New? | What's Cool? | Destinations | Net Search | People | Software | Infoseek |

MINNESOTA OFFICE OF THE LEGISLATIVE AUDITOR

Gen. Office Info. | Financial Audit Div. | Program Eval. Div. | Reports Produced by the OLA | Other Info. Resources | Email to the Web-Master

The Office of the Legislative Auditor is a non-partisan post-audit and evaluation agency, reporting to the Minnesota State Legislature. The office conducts financial and compliance audits of state agencies and program evaluations of state and local governmental functions.

The Legislative Auditor, appointed to his post by the 16-member Legislative Audit Commission, directs a staff of 80 professionals. The office was created in 1973, replacing the century-old Public Examiner's Office. At the same time, responsibility for financial auditing of local government in Minnesota was transferred to the State Auditor, an elected constitutional official.

To get a view of Minnesota's State Capitol, please view the historical pictures.

Look here for a listing of Employment Opportunities within the Legislative Auditor's Office.

Mailing Address Attention: Receptionist, 1st Floor So., Centennial Bldg., 658 Cedar St., St. Paul, MN, 55155-1603

[General Office Information] [Financial Audit Division Information] [Program Evaluation Division Information]
[Information on Reports Produced by the Legislative Auditor's Office] [Other Information Resources] [Send a Message to the Webmaster] [OLA Home Page]

Multnomah County Auditor's Office Homepage (Oregon)

Includes summaries of recent auditor's reports, an index of past reports, office profile, and an auditor's column.

http://www.multnomah.lib.or.us/aud/

National Association of Local Government Auditors (NALGA)

Available through City of Albuquerque, New Mexico. Posts excerpts from the LGANewsletter including audit report abstracts. Future postings will include office and committee listings, NALGA mission and objectives, conference and training information. There is also a mailing list for NALGA members and other interested auditors.

Subscribe through e-mail to jkaplan@capaccess.org

National Computer Security Association (NCSA) Forum Auditing Section

Manages a *CompuServe* forum on computer security and ethics with an auditing section that provides auditing professionals with an online real-time international communications forum for discussing auditing and audit-related security issues. Participants share resources, technical knowledge, professional standards, product information, ideas, audit reports, audit programs, training, and job opportunities.

E-mail 75300.2557@compuserve.com

National Intergovernmental Audit Forum Electronic (NIAF) Conference

Provides newsletters, bulletins, files, and message area for government auditors.

Access GAO Office of Policy's BBS and join Conference 5.

The New South Wales Audit Office Site

This site provides information about the office, reports, and publications.

http://www.audit.nsw.gov.au/

Newsgroup

Alt.business.internal-audit

"Tools to Detect System and Process Activities"

This site, maintained by the Center for Scientific Computing in Finland, lists and describes the various tools that you can use to monitor system and process activities.

http://www.csc.fi/sbs/metaflops
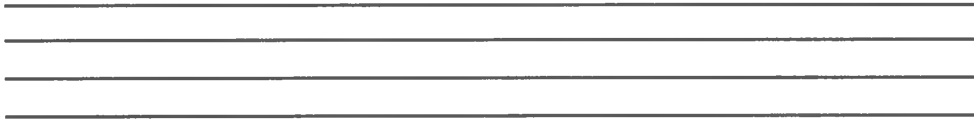
WIU Internal Auditing Home Page

Site at Western Illinois University with information on university auditing procedures and links to other internal auditing sites.

http://www.ecnet.users/miaud/wiu/index.htm

Business

Association for Computing Machinery

The ACM, an organization dedicated to information technology, offers a special interest group on business information technology.

http://www.acm.org/
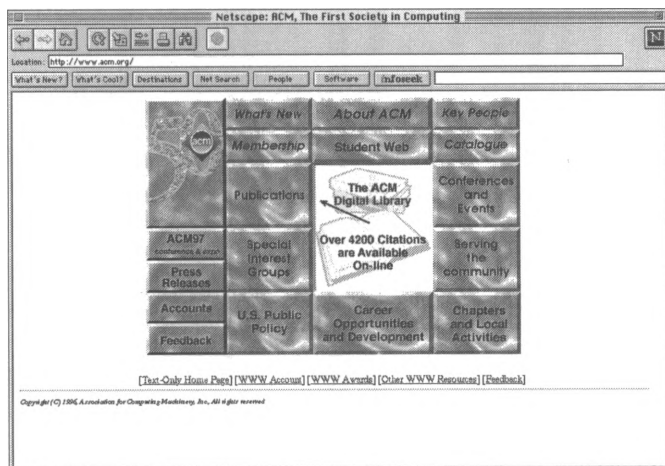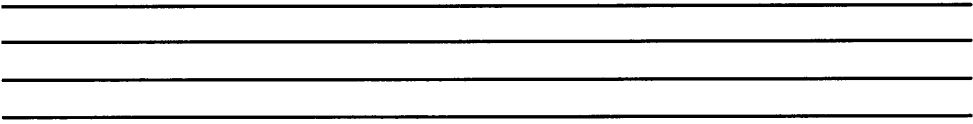
Biz Info Search

This Prentice Hall directory maintains more than 1000 links for business owners, managers, investors, and financial professionals. Visitors can search via modem or, for high-speed access, via T1 or ISDN.

http://www.bizinfosearch.com/

The Business Guide

An uncopyrighted electronic book by Sam Sterberg that explores the Internet both as a tool for business and a place of business. Chapters emphasize on using the Internet to improve marketing and communication strategies.

http://www.nstn.ca/bizguide/a-toc.html

Business Resource Center

Hosted by a consulting firm, this Web site offers information on a variety of topics pertinent to businesses, including start-up, management, marketing, news, and finance. Visitors can network via discussion groups.

http://www.kcilink.com/brc/

Business Sources on the Net

Extensive list of business resources on the Internet maintained at Kent State University.

ftp://zeus.kent.edu

BusinessWeek Online

The online version of the print magazine. This site offers technology-related business news and analysis and features *Maven*, a computer-buying guide.

http://www.businessweek.com/

Commerce Business Daily (See Government and Governmental Accounting)

CommerceNet

An Internet-based electronic marketplace for businesses that typically depend on paper-based transactions (catalogs, soliciting bids, and placing orders).

http://www.commerce.net:80

The Dictionary of Financial Risk Management

This interactive online version of Gary Gastineau and Mark Kritzman's book is featured on the American Stock Exchange Web site. Visitors can retrieve concise definitions and explanations for thousands of terms, phrases, and concepts associated with the management of financial risk. From the home page, click on Site Map. The dictionary is listed under "Resources."

http://www.amex.com

The Directory of High-Tech Associations

Young & Associates, a public relations agency, sponsors this searchable high-tech association directory, which consists of 83 trade and professional groups ranging from telecommunications-based to Internet-related organizations. Available at no cost, the Directory allows for subject searches and offers information about conferences, issues, locations, publications, and more.

http://www.ya.com/

Dun and Bradstreet

Business server with tutorials and extensive articles on marketing, research, and planning.

http://www.dnb.com/

Entrepreneur Information Guide

Provides links to multiple sites that deal with entrepreneurship and the Internet, including starting a business on the net, advertising electronically, and setting up a Web site.

http://www.magpage.com/"rispoli/

The Entrepreneur Network

This site is sponsored by a non-profit group that promotes communication among entrepreneurs in the Midwest. Besides offering a networking channel for business owners, the organization publishes a monthly newsletter and provides information on business opportunities and resources. The national 800 number is 1-800-468-8871.

http://TENonline.org/index.html

Entrepreneurs on the Web

A Web site that offers a searchable index of business resources on the Internet including FAQs, directories, and information about newsletters, with special emphasis on entrepreneurial businesses.

http://www.eotw.com//business_info.html

FINWeb

The highly-rated Financial Economics WWW server managed at University of Texas in Austin maintains a list of Internet resources on economics and finance-related topics. Includes Financial Economics Network, Journal of Finance, Financial Executive Journal, Resources for Economists on the Internet, and EDGAR, which provides SEC reports and statements on publicly-traded companies.

http://www.finweb.com

Independent Business

A young, graphics-based site geared to the entrepreneur. The range of topics includes start-ups, marketing, minority concerns, planning, and advertising. The site also provides classifieds, a search engine for business-related topics, and a Daily Business Newspaper.

http://www.clickit.com/touch/independ.htm

Institute of Management and Administration (IOMA)

A leading publisher of business and management information on the Internet. Monthly newsletters provide articles for managers and executives in virtually every industry sector. Also provides a business directory of resources and discussion groups.

http://www.ioma.com/index.html

International Association for Human Resource Information Management

An information center for human resource managers and business owners. Emphasis is on networking, educational opportunities such as seminars and trade shows, news, and job opportunities.

http://www.ihrim.org/

Internet Business Pages

Yellow pages for Internet businesses.

gopher://gopher.msen.com:105

Journal of Financial Abstracts

Produced by the Financial Economics Network, this site publishes abstracts of research in financial economics and related topics.

Subscribe through e-mail to MarrM@clemson.edu

"Let's Talk Business" Network

Online companion to the "Let's Talk Business" syndicated radio program, this site features two online magazines, FAQs, lists of books and publications, and a library of audio clips of interest to entrepreneurs and consultants.

http://www.ltbn.com

National Association of Purchasing Management (NAPM)

Silicon Valley NAPM chapter's WWW page includes articles for purchasing and supply management professionals and a library collection of books, video and audio cassettes on purchasing, materials, operations, and business management.

http://catalog.com/napmsv/
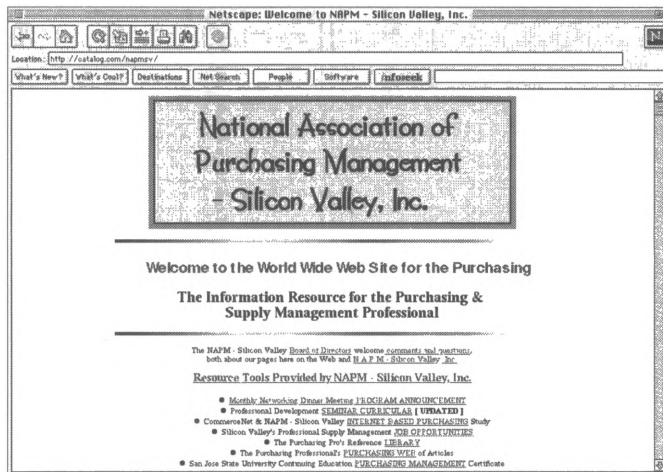
National Business Incubation Association

A resource center for the development of business incubators,
this site gives contact information for the NBIA, lists
publications and conferences, and provides information
about state associations.

http://www.nbia.org/

Newsgroup FAQ

alt.business.multi-level

Newsgroups

alt.business.misc
alt.business.multi-level
biz.comp.services
biz.books
biz.general
biz.misc
clari.nb.business
misc.business.consulting
misc.entrepreneurs
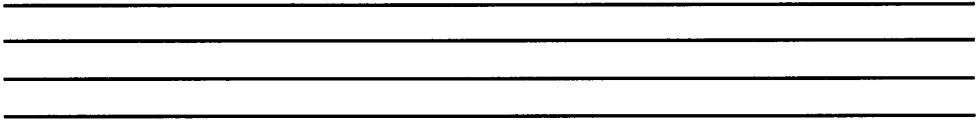
PC Computing

The Ziff-Davis electronic magazine for technology-minded business professionals features "1001 Downloads" and "1001 Web sites."

http://www4.zdnet.com/pccomp/

Research Institute for Small and Emerging Business

This is the home page of a non-profit research and educational organization. Links to a variety of information for small business owners and entrepreneurs, including online articles about government policies. Formerly known as the Small Business Foundation of America.

http://web.miep.org/sbfa/

Small BizNet

Offered by the Edward Lowe Foundation, this site contains a library of more than 4000 business-related documents, some of which are in the public domain and can be accessed for free. Also provides a link to *Entrepreneurs Edge* magazine, allowing visitors to view back issues before subscribing.

http://www.lowe.org/smbiznet/index.htm

Small Business Administration Online (See Government and Governmental Accounting)

Small Business Resource

A Microsoft site for entrepreneurs and emerging companies. The "Start, Run, Grow" program discusses business start-up, strategic planning, and marketing.

http://www.microsoft.com/smallbiz/default.htm

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Smart Business Supersite

A center for consultants and business owners, this site explores topics such as starting a practice, adding and serving clients, and marketing a business or practice. A search service, product information, career resources, and a "people finder" directory of experts and consultants are provided, along with lists of pertinent articles and books.

http://www.smartbiz.com/sbs/cats/consult.htm

The Vine

The "Venture Information Network for Entrepreneurs" connects entrepreneurs, service providers, and venture capitalists. National 800 number is: 1-800-975-VINE.

http://www.thevine.com

Business Process Redesign

Business Process Redesign: An Overview

This white paper written by Yogesh Malhotra from the Katz School of Business, University of Pittsburgh, outlines Business Process Redesign–from the myths that say it's a euphemism for downsizing to the benefits it provides in the form of costs control and information management.

http://www.pitt.edu/~malhotra/bpr.htm
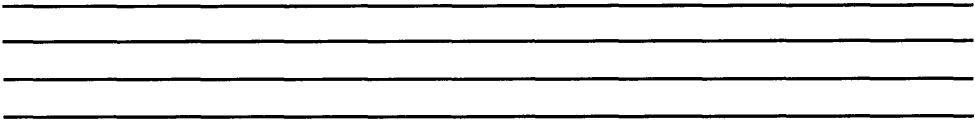
Business Process Reengineering *Analysis and Recommendations*

William W. Chu, Wan Ching Lin, Van Le, Maureen Weicher, and Dominic Yu from the City University of New York define Business Process Redesign and discuss ways of implementing it in business, give case study examples, and provide a useful bibliography at the end.

http://www.netlib.com/bpr1.htm

The Computer Information Centre

Offers online technical, supplier, and consultant information. This site also provides connections to all of the major BPR sites.

http://www.compinfo.co.uk/tpbpr.htm

The Electronic College of Process Innovation

Written and maintained by the US Department of Defense, this site outlines a methodology for Business Process Redesign called Process Management. The site offers a step-by-step guide for implementing global changes in an organization.

http://www.dtic.dla.mil/c3i/bprcd/3003.html

The Enabling Role of EDI in Business Process Re-Engineering

This white paper by Bob Roberts discusses EDI as an enabling tool that can be used in conjunction with Business Process Redesign, rather than using EDI as just another technology in competition with a company's existing systems.

http://infosys.kingston.ac.uk/isschool/Staff/Papers/Roberts/EDI_BPR.html

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The Wider Research Context of Business Process Analysis

Dr. Rod Coombs and Richard Hull have written this paper, published by the Manchester School of Management, UMIST, England. This paper maintains that Business Process Redesign is not clearly defined and that it should be seen as an emergent business paradigm; it also discusses ten major points in the paradigm, including competitiveness, entrepreneurship, supply-chain management, and others.

http://bprc.warwick.ac.uk/umist1.html

Business Valuation and Litigation

(See also Investments)

Appraisals Professionals Online

A Telnet site that displays the standards set by the American Society of Business Appraisers.

telnet://apo.com

Fedworld (See Government and Governmental Accounting)

Computer Consulting

(See also HTML and Web Design, Small Networks, Modems,
Security, and Software)

Apple Software Updates

Apple computer users can find a list of WWW update sites
here.

ftp://ftp.info.apple.com

Apple Support Information

Online support with helpful information and downloadable files.

http://www.info.apple.com/
ftp://info.apple.com

Babel: A Glossary of Computer Oriented Abbreviations and Acronyms

ftp://www.access.digex.net/~ikind/babel95c.html
ftp://mailbase.ac.uk

get pub/lists/lis-iis/files/e-access-inet.txt

gopher://gopher.temple.edu

Select Computer Resources and Information
Internet and Bitnet Information (Help-Net)
Glossary of . . . (babel.txt)

E-mail listserv@vm.temple.edu with message: GET BABEL95A
TXT HELP-NET

The Computer Law Observer

This free monthly newsletter covers legal issues relating to
the Internet, computers, software, and technology.

http://www.lawcircle.com/observer

Dictionary of Computing
Glossary of computer terminology.
http://wombat.doc.ic.ac.uk/
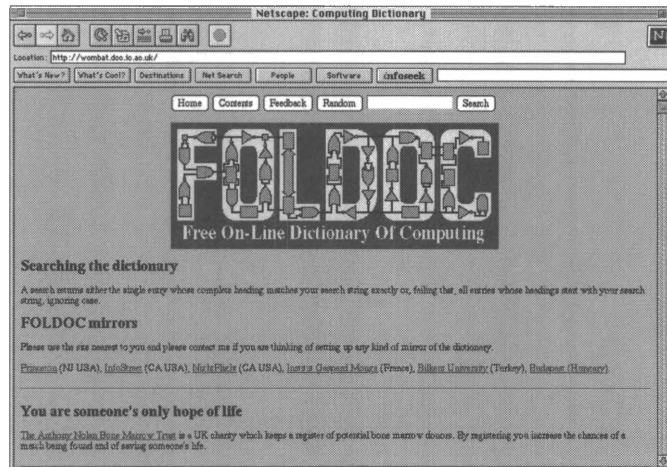
Hewlett Packard
WWW site provides an overview of Hewlett Packard printers
and other products, new product information, maintenance
bulletins, press releases, and Hewlett Packard office phone
numbers. The FTP site provides access to drivers, utilities,
and support files for Hewlett Packard printers and other
products.
http://www.hp.com
ftp://ftp-boi.external.hp.com

Microsoft
Microsoft product-support information, marketing
information, and a software library.
http://www.microsoft.com/

Newsgroups
alt.computer.consultants
biz.books.technical

University of Illinois' National Center for Supercomputing Applications
Provides an HTML primer.
http://www.ncsa.uiuc.edu/General/Internet/WWW/
HTMLPrimer.html
http://grove.ufl.edu/NCSA_HTML_Primer

World Wide Web Consortium
This industry consortium contributes to the development of WWW standards and provides useful information for both developers and users, including specifications information, various prototypes, and sample applications to demonstrate new technologies.
http://www.w3.org/

ZD Internet MegaSite
Companion site to the ZD *Internet Magazine*, a publication for Internet and intranet users. The site contains product reviews, industry news, and demos and downloads.
http://www.zdimag.com

Databases

Commercial Business Information Services (See Business)

Knight-Ridder Information

A commercial online information provider that allows users who have accounts with them to access their databases. Offers resource databases for business, research, and science professionals that include Datastar, KR Business Base, and Dialogue.

http://www.dialog.com
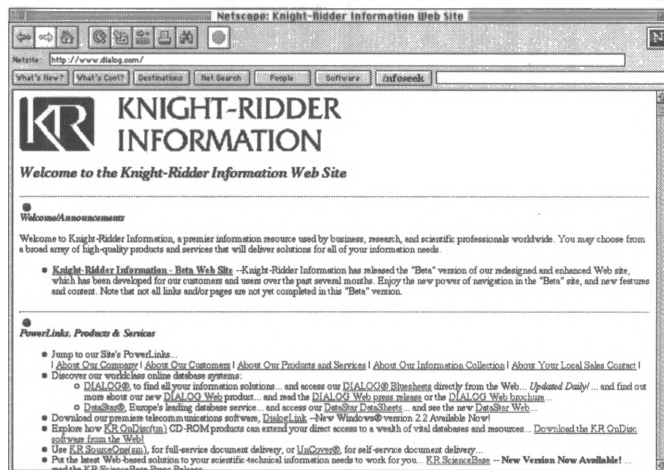
Some sample databases are described below:

ABI Inform

Bibliographic citations and summaries of articles related to business. A few of the subjects covered include CPA firms, computers, accounting, taxation, and investment analysis.
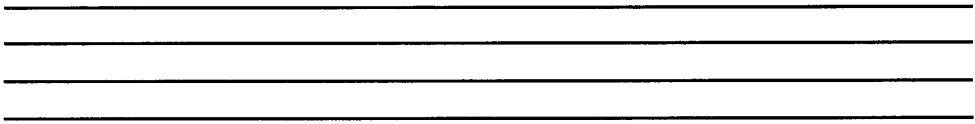
Accounting and Tax Database

Indexes and abstracts articles from accounting, taxation, and financial management publications (and other business related sources). A few of the subjects covered include accounting, auditing, government and management accounting, and tax preparation.

Investext

Provides reports that supplement annual and quarterly reports on publicly traded companies. Reports comment on sales and earnings, market share projections, and expenditures for research and development. Subjects covered also include investment strategy, securities, forecasts, and analysis.

Newsletter Database

Contains the full text of newsletters from various industries such as financial services, computers and electronics, general technology, and telecommunications.

PROMT (Predicasts Overview of Markets and Technology)

International industry database that provides abstracts and full-text records from important business sources. Subjects covered include financial reporting, software, communications, and financial services.

Tax Notes Today Database

Analyses and summaries of legislative, judicial, regulatory, and policy documents related to Federal taxation. Includes coverage of subjects such as IRS regulations, treasury reports, and scholarly tax articles.

SEC EDGAR Database (See Investments)

Electronic Commerce

BankNet

An online bank that allows you to open an account and purchase products on the Internet.

http://mkn.co.uk/bank

Buyer's Guide to Electronic Commerce

A guide that includes a listing and descriptions of products from many companies that deal in electronic commerce and EDI.

http://www.e-com.com/buyersguide/

CALS

The Commerce at Light Speed Web page includes information on CALS technology and an extensive search page with links to other electronic commerce-, EDI-, and CALS- related sites.

http://www.cals.com/

CommerceLink

A Web page that offers shopping opportunities on the Web, information on other electronic commerce servers, and a chat room for electronic commerce discussion.

http://www.outreach.com/commercelink/
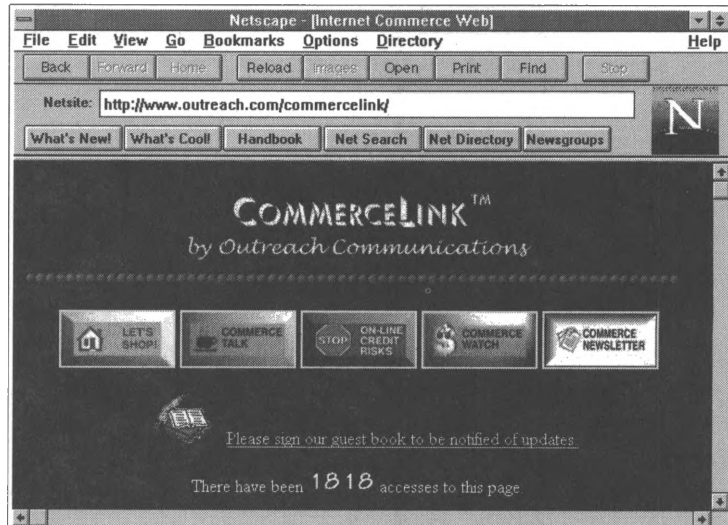
CommerceNet

A consortium of over 150 companies (including leading banks, VANs, ISPs, and online services companies) that are working together to make the Internet into a global marketplace. The site includes news and a very useful search page.

http://www.commerce.net/

EC World

A free online publication covering the fast-moving technological breakthroughs in the world of electronic commerce.

http://ecworld.utexas.edu/

EDI World

A monthly magazine on electronic commerce.

http://www.ediworld.com

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EIDX

Electronics Industry Data Exchange Association is a non-profit organization that includes many companies involved in electronic commerce and EDI. The Web page is a forum for electronic commerce issues that includes a long list of links to sites concerning electronic commerce, EDI, and security.

http://www.eidx.org/
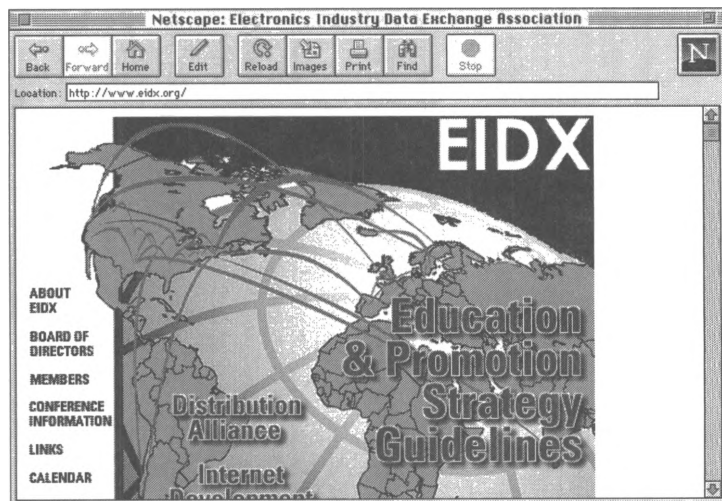
Electronic Commerce Resource Center for Small Businesses and SME's (Small to Medium Enterprises)

A Web page provided by the George Washington University Center for Advancement of Small Business that includes information ranging from the history of the Internet to the newest technology in EC pertaining to small businesses.

http://gwis2.circ.gwu.edu/%7Erwill/

Electronic Commerce World Institute

This site offers information about electronic commerce, EDI, and CALS. It has a virtual exhibition hall of companies involved in electronic commerce and security, a resource center, and a search page.

http://www.ecworld.org/

Electronic Payment Systems

Atomic Software

http://www.atomic-software.com/

Checkfree

http://www.checkfree.com/

CyberCash

http://www.cybercash.com/

Data Transfer Associates, Inc.

http://www.datatransfer.com/index.html

Digicash

http://www.digicash.com/

First Virtual

http://www.fv.com/

MPACT Immedia

http://www.mpactimmedia.com/

NetCash

http://www.netbank.com:80/~netcash/

Open Market

http://www.openmarket.com/

The Emergence of Electronic Commerce on the Internet

This paper by Walt Scacchi of the USC School of Business Administration discusses the implications of the Internet for modern businesses and strategic planners, the opportunity for using the Internet in business, and the research projects that USC is currently running on business and the Internet.

http://www.usc.edu/dept/ATRIUM/Papers/
Electronic_Commerce.html

ESD

A German company involved in development of hardware used in homebanking and electronic commerce.

http://www.esd.de/

The Future of Electronic Commerce: Building the Imarket

This site features a *Powerpoint* slide presentation on the past, present, and future of electronic commerce.

http://www.commerce.net/about/future/index.html

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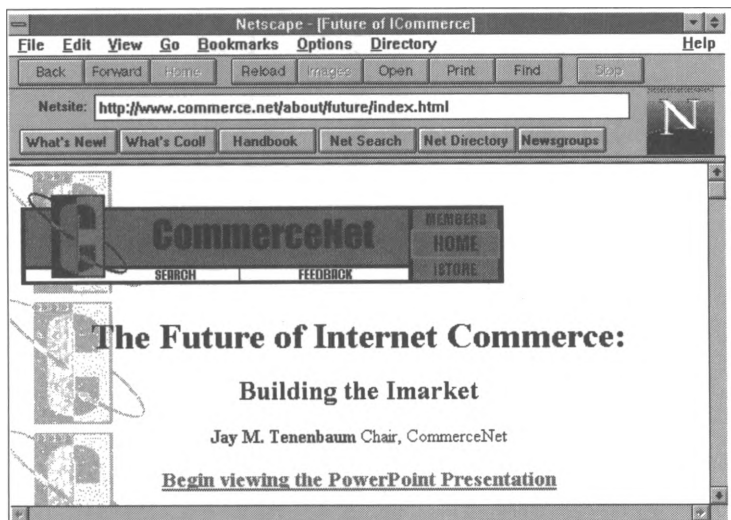
IfBG Money and Payment Systems

A collection of links to sites concerning the history of money, digital money, electronic payment systems, corporations and projects concerning electronic payment, and credit card and card services.

http://www.wiso.gwdg.de/ifbg/geld.html

Interactive Age

A magazine devoted to the latest Internet and electronic commerce news.

http://techweb.cmp.com/techweb/ia/current

Internet Electronic Commerce

This site explains the basics of electronic commerce, connects electronic commerce to Business Process Redesign, describes the benefits of electronic commerce, and finally markets the services of site developers for implementing a commerce site.

http://www.bja.com/iec.htm

An Introduction to Electronic Commerce

Published by the BT (British Telecommunications) Electronic Commerce Innovation Centre, this site offers an introduction to electronic commerce.

http://www.cf.ac.uk/uwcc/masts/ecic/eleccomm.html

SBT's Web Series for Internet Commerce

Software Business Technologies offers a line of electronic commerce products and accounting software.

http://www.sbt.com/sbtlib/pwso.html

Stefan Brands Home Page

A cryptography consultant discusses the workings of electronic cash and payment. The site includes publications on electronic cash and has a detailed explanation of one electronic cash system.

http://www.cwi.nl/~brands/index.html

Sun Microsystem's Internet Commerce Group

Offers services and advice to companies that want to offer network services and do commerce over the Internet. They also offer news and other Internet commerce services links.

http://www.incog.com/

Year-X Electronic Commerce Information Center

This site provides news, events, a directory of services and software, and a long list of links.

http://www.year-x.co.uk/ec/home.htm

Electronic Data Interchange

DynamicWeb Transaction Systems

This company develops electronic commerce solutions
designed to bridge traditional EDI networks and the Internet.
The site contains information on products as well as FAQs
about electronic data interchange.

http://www.dynamicweb.com

EDI InfoNet

Site provided by Washington Publishing Company, publisher
of the newsletter *EC/EDI Insider*. Also contains the draft EDI
Implementation Guides of the Health Care Task Group of the
Insurance Subcommittee of the American National Standards
Institute, Accredited Standards Committee X12 (ANSI ASC
X12N TG2).

http://www.wpc-edi.com/

EDI Reference Desk

The Data Interchange Standards Association (DISA) is
secretariat to the Accredited Standards Committee (ASC) X12,
a group chartered by the American National Standards
Institute (ANSI). This site is full of good information on the
various technical standards used in EDI systems, because this
group is closest to the committees that set the standards. It
contains a list of other Internet EDI resources containing links
to related topics and various governmental sites.

http://www.disa.org/edi/edihome.htp

EIDX (See Electronic Commerce)

Electronic Commerce World Institute

Formerly the EDI World Institute, this organization gathers information on the worldwide implementation of EDI, EC, and CALS. Called the *EC World Institute Global Reference Site*, this site collects many useful background documents on EDI, including interactive forums, and an online magazine.

http://www.ecworld.org

Federal EDI

This site is a good starting point for research on the US government's use of EDI technology in Federal computer systems and relationships with Federal contractors. It contains the US Department of Commerce National Institute of Standards and Technology's architecture document related to EDI conventions used in Federal procurement systems.

http://snad.ncsl.nist.gov/dartg/edi/fededi.html

GE Information Services

Provides business-to-business electronic commerce and EDI solutions for more than 40,000 trading partners.

http://www.geis.com/

Harbinger Express

Offered by Harbinger Corp., this Internet-based service eliminates the need to license EDI translation software and subscribe to value-added networks. Users can read and respond to business documents such as purchase orders and invoices using Netscape *Navigator* or Microsoft *Internet Explorer*.

http://harbx.net/
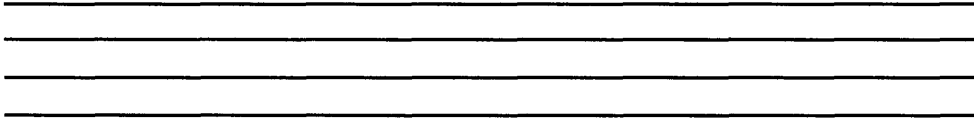
IETF-EDI Working Group FAQ: EDI Meets the Internet

This FAQ is a good introduction to how developers are approaching EDI systems that use the Internet as a communications channel. The document is well organized and includes a useful "Organizational Issues" chapter that discusses how companies might assess their current systems and business relationships when considering implementing EDI.

http://www.va.gov/publ/standard/edifaq/index.htm

Premenos' Electronic Commerce Resource Guide

This producer of EC and EDI software provides a well-organized set of online EDI standards for reference at this site--both UN/EDIFACT and ASC X12. In addition, the entire text of the *Staples EDI Implementation Guide*, the EDI manual for Premenos customer Staples, is online as an example of corporate EDI documents.

http://www.premenos.com

Sterling Commerce

Sterling, one of the industry-leading producers of EC and EDI software, also operates one of the largest North American EDI VANs. In addition to descriptions of their products and services, their site includes a collection of white papers and descriptive documents about EC and EDI technology.

http://www.stercomm.com

Government and Governmental Accounting

Association of Government Accountants

Information including AGA background, conference listing, details of Certified Government Financial Manager Program, and AGA Newsletter.

gopher://financenet.gov

Access Documents, Publications, and Standards. Click on Central Agencies, Councils and Task Forces.

Association of Government Accountants Mailing List.

Subscribe through e-mail to listproc@financenet.gov with message: subscribe AGA yourname

Code of Federal Regulations

Compiled by the Office of the Federal Register of the National Archives and Records Administration. Allows users to search through the server by describing the kind of information they need in a menu.

http://www.pls.com:8001/his/cfr.html

Commerce Business Daily

Official listing of all Federal contracting opportunities and awards over $25,000. Government audit and consulting opportunities are listed in the professional services section. Try an online keyword search at no charge at

telnet://cbd.savvy.com

gopher://usic.savvy.com

Log in as "guest."

For subscription information, contact Counterpoint through e-mail to info@counterpoint.com or call (800)998-4515.

Department of the Treasury

This site provides information on treasury officers, bureaus, services, and links to related government sites like FedWorld and the Internal Revenue Service.

http://www.ustreas.gov

Federal Register

Provides access to the *Federal Register* that you can search by keywords.

telnet://unclib.lib.unc.edu then choose US Government Databases, then GPO Access.

FedWorld

Site of the US Department of Commerce's National Technical Information Service. FedWorld offers statistical analyses, speeches by Federal officials, software, mailing lists, publications, etc.

ftp://ftp.fedworld.gov

http://www.fedworld.gov

telnet://fedworld.gov

FinanceNet

Network of professional governmental financial management organizations, agencies, and departments that share information for improving financial management throughout all levels of government. Accountants, auditors, and financial managers share information about topics like financial management, news, experiences, software, comments on financial documents, best practices, and resources.

http://www.financenet.gov

Newsgroup news.financenet.gov
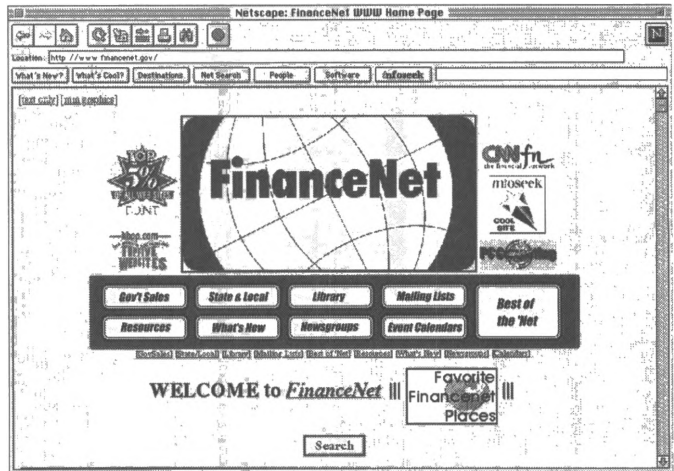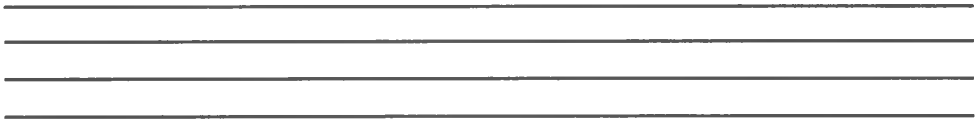
FinanceNet mailing lists include:

News - Distributes information of interest to Federal, international, state, and local public finance professionals.

GovSales - Announcements of the public sale of assets posted by Federal, state, and local governments.

State-County - Discussion of government financial stewardship and taxpayer accountability at all levels of government.

MuniNet - Discussion of financial accountability and stewardship of municipalities, towns, and townships.

BudgetNet - Discussion of revenue, appropriation, and budget issues at all levels of government.

Events Calendar - Listing of national and local government professional events.

Int-controls - Discussion of Federal Financial Managers Integrity Act, Office of Management and Budget high-risk list, government waste, fraud and abuse of resources, Inspector General audit findings, selected OMB circulars, and management control reviews.

Fin-systems - Discussion of all aspects of systems management including systems integration, core systems,

system requirements, computer hardware and software, contractors, useful life, and general improvements.
Perf-measures - Discussion of issues related to the Government Performance and Results Act of 1993.
Fin-policy - Discussion of financial management policies.
Fin-reporting - Discussion of issues related to financial reporting requirements of Treasury and Office of Management and Budget, financial statements, and reporting issues.
Fin-audits - Discussion of auditing topics like relations between CFO and audit communities, agency audit findings, follow-up and validation procedures, and financial audit resources.
Asset-liab-mgt - Discussion of issues related to balance sheets.
Fin-training - Discussion of financial-management training issues and resources.
Payroll - Discussion of payroll issues.
Travel - Discussion of travel administration.
Procurement - Discussion of issues related to procurement, especially the Federal Electronic Commerce Acquisition Team and electronic data exchange.

For mailing lists information, e-mail info@financenet.gov
    Subscribe by e-mail to listproc@financenet.gov with
    message: subscribe list-name yourname

General Accounting Office Page at US Government Printing Office
Free database of publicly released GAO reports beginning with February 1995.
    http://www.access.gpo.gov/gao/index.html

Government Printing Office

An electronic bulletin board that lists free and for-sale print and electronic products. Subscriptions to the *Federal Register* are available here. Sample the information available through the *Federal Register* site described above.

> http://www.gpo.gov/
> telnet://federal.bbs.gpo.gov

Library of Congress

Gopher server of the Library of Congress with information about the government and the Library of Congress (including sources like the *Online Business Center*).

> gopher://marvel.loc.gov

Small Business Administration Online

Home page of the Small Business Administration with a mission statement and information about starting, financing, and expanding small businesses, as well as links to other business and government sites.

> http://www.sbaonline.sba.gov/

Thomas–US Congress on the Internet

Named for Thomas Jefferson, this site provides links to the full text of pending legislation with search capabilities for pending laws, and to the US House of Representatives Gopher site that lists House members and committees and daily committee hearing schedules.

> http://thomas.loc.gov/

US Department of Commerce Internet Site for Economic, Trade & Business Information

STAT-USA contains press releases, daily economics news, and statistical information from government agencies.

> http://www.stat-usa.gov

HTML and Web Design

(See also Software)

Conversion Tools

Access Internet Assistant
http://www.microsoft.com/msaccess/internet/ia/
Excel Internet Assistant
http://www.microsoft.com/msexcel/internet/ia/
Microsoft Schedule+ Internet Assistant
http://www.microsoft.com/msscheduleplus/internet/ia/
PowerPoint Internet Assistant
http://www.microsoft.com/mspowerpoint/internet/ia/
Word Internet Assistant
http://www.microsoft.com/msword/internet/ia/

Discussion Group Software

WebBoard: Web Conferencing System Software
http://webboard.ora.com/
Web Crossing
http://webx.lundeen.com/
WebNotes
http://webnotes.ostech.com/
Workgroup Web Forum
http://www.digital.com/info/nis/wgw/
wgwforum_abastract.htm

Front Page 1.1

This HTML editor, available from Microsoft, has a wizard that
guides you through making your Web page.
http://www.microsoft.com/intranet/prodinfo.htm

Graphics Software

Adobe Illustrator

http://www.adobe.com/prodindex/illlustrator/

Adobe Photoshop

http://www.adobe.com/prodindex/photoshop/main.html

Kai Powertools

http://the.tech.mit.edu/KPT/KPT.html

LView Pro

http://www.lview.com

Macromedia FreeHand

http://www.macromedia.com/text/software/

Map Edit

http://www.boutell.com/mapedit/

Map THIS

http://galadriel.ecaetc.ohio-state.edu/tc/mt/

Web Map

http://www.city.net/cnx/software/webmap.html

HTML Editors and Converters

Access Internet Assistant

http://www.microsoft.com/msaccess/internet/ia/

Corel WEB.DESIGNER

http://techweb.cmp.com/products/techtools/html/
corel.html

Excel Internet Assistant

http://www.microsoft.com/msexcel/internet/ia/

HotDog Professional 2.0

http://techweb.cmp.com/products/techtools/html/
hotdog.html

HoTMetaL Pro 3.0

http://techweb.cmp.com/products/techtools/html/
hotmetal.html

HTML Transit

http://www.infoaccess.com/products/transit/httoc.htm

InContext Spider
    http://techweb.cmp.com/products/techtools/html/
    spider.html
Live Markup
    http://www.mediatec.com/mediatech/
Microsoft FrontPage 1.1
    http://techweb.cmp.com/products/techtools/html/
    frontpage.html
Microsoft Internet Assistant
    http://www.microsoft.com/internet/
Microsoft Schedule+ Internet Assistant
    http://www.microsoft.com/msscheduleplus/internet/ia/
TILE for Lotus Notes
    http://tile.net/info/
Web Author for Word
    http://www.qdeck.com/qdeck/products/WebAuthr/
WebIt
    http://futures.wharton.upenn.edu/~attau791/webit.html
Word Internet Assistant
    http://www.microsoft.com/msword/internet/ia/
WordPerfect Internet Publisher
    http://wp.novell.com/elecpub/intpub.htm
WPTOHTML for WordPerfect for DOS
    ftp://oak.oakland.edu/SimTel/msdos/wordperf/
    wpt60d10.zip

HTML Transit Authoring Tool
    This site advertises software that does template-based
    production of HTML pages and conversion of documents
    from different word-processing programs into HTML.
        http://www.process.com/htmltrans/trdata.htp

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Hypertext Mark-Up Language Site in Cern, Switzerland

Provides links to guides on HTML and how to construct World Wide Web pages.

http://info.cern.ch/hypertext/WWW/MarkUp/MarkUp.html

Link Checkers

InContext WebAnalyzer

http://www.incontext.ca/products/analyze.html

NetCarta WebMapper

http://www.netcarta.com/prod/

SiteSweeper

http://www.sitetech.com/SiteSweeper/Sweeper.htm

Lochnet Reference Guide

This site provides connections to books and publications that explain the HTML language.

http://www.lochnet.com/lochusa/usrefer.htm

Logging

3Dstats

http://www.netstore.de/Supply/3Dstats/

Analog

http://www.statslab.cam.ac.uk/~sret1/analog/

net.Analysis Desktop

http://www.netgen.com/products/net.Analysis/

WebTrends

http://www.egsoftware.com/PRODUCTS/WEBTREND/DEF_MAIN.HTM

Multimedia

Fountain

http://www.caligari.com/lvltwo/Zcalgari.html

Internet Wave.

http://www.vocaltec.com
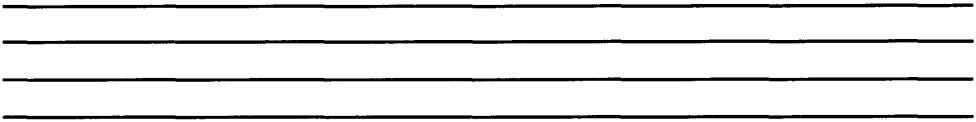
Real Audio

http://www.realaudio.com/

Stream Works

http://www.xingtech.com/streams/info/

streamwk_gen_info.html

True Speech

http://www.dspg.com

VDO Live

http://www.vdolive.com/

WebFX

http://www.paperinc.com/

Wirl

http://www.vream.com/

Newsgroups

comp.infosystems.www.providers

alt.hypertext

comp.infosystems.www.users

comp.infosystems.www.authoring.html

Other Applications

UWI Masque (electronic business forms software for
intranets)

http://www.uwi.bc.ca

W3.COM (tracking and customization software)

http://w3.com/

Search Tools

Excite
> http://www.excite.com/

Glimpse HTTP
> http://glimpse.cs.arizona.edu:1994/ghttp/

Personal Library Software
> http://www.pls.com/

Verity
> http://www.verity.com/

Web Server Software

American Internet's *SiteBuilder*
> http://www.american.com/sitebuilder.htm

InterNotes Web Publisher
> http://www.lotus.com/inotes/

Microsoft's *Internet Information Server*
> http://www.microsoft.com/infoserv/

Netscape's *FastTrack*
> http://www.netscape.com/comprod/server_central/
> product/fast_track/index.html

O'Reilly and Associates' *WebSite*
> http://website.ora.com/

Process Software's *Purveyor Intraserver*
> http://www.process.com/pintnet.htp

Process Software's *Purveyor WebServer*
> http://www.process.com/intranets/dynamic.htp

SuperWeb Server
> http://www.frontiertech.com/products/superweb.htm

Webmaster Reference Library

Reference guide with links to sources about running a Web
site, getting a server running, building Web pages, and
HTML.
> http://webreference.com

Insurance

American Risk and Insurance Association (ARIA)

Provides application and membership information for the American Risk and Insurance Association, as well as links to other sites.

http://131.96.94.5/ARIA.HTM

Federal Deposit Insurance Corporation (FDIC)

WWW home page has information on US banking, the Bank Insurance Fund, Savings Association Insurance Fund, consumer information, press releases, links to Statistics on Banking, and information about acquiring assets owned by the FDIC.

http://www.fdic.gov
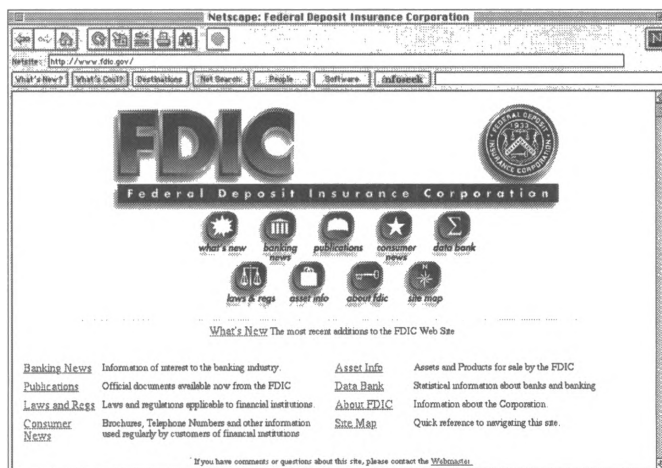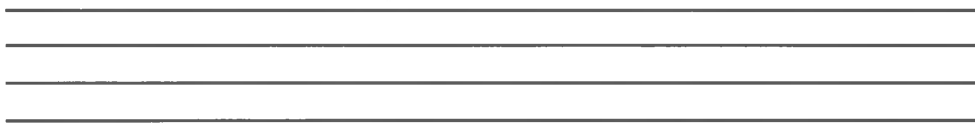
Intranets

(See also Network)

Action Technologies

A consulting and development firm, Action Technologies'
home page provides links to their services and products.
http://www.actiontech.com/

Netscape - [Action Technologies Home Page]

File   Edit   View   Go   Bookmarks   Options   Directory   Help

Back   Forward   Home   Reload   Images   Open   Print   Find   Stop

Netsite: http://www.actiontech.com/

HOME   PRODUCTS   CUSTOMERS/PARTNERS   CONSULTING/EDUCATION   RESOURCES   ABOUT ACTION   CONTACT US

PRODUCTS   WHAT'S NEW AT ACTION?!

- Action Metro
- ActionWorkflow Process Builder
- ActionWorkflow Process Manager
- Action Product Line Summary

July 15, 1996
Action launches a new site on its Web dedicated to Action Metro. Visit this site to download Metro for a free, 30-day evaluation and learn what our customers and the press are saying

Aufrance Associates

This package of software for the Internet includes calendar software, a tool kit, real estate software, survey software, e-mail software, and security software.

http://highsierra.com/highsierra/products.htm

Collabra Software, Inc.

Makers of group conferencing products, Collabra Software offers links to their products from their home page, where you can watch a demo and download software. It also offers customer profiles and groupware.

http://www.collabra.com/
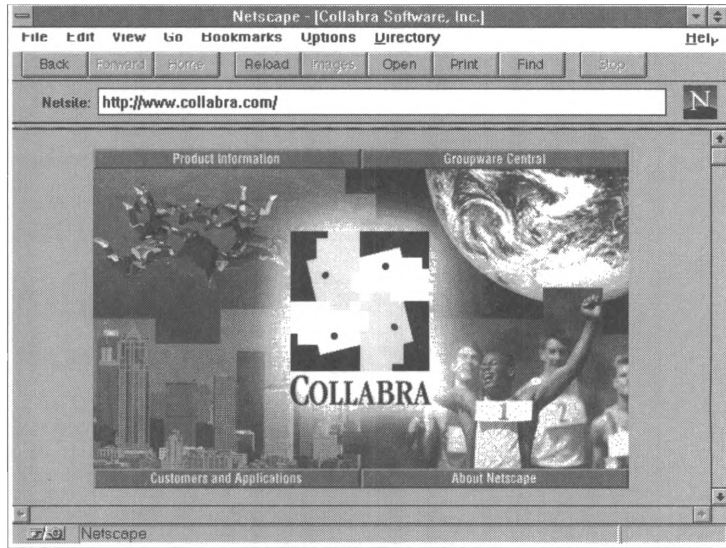
Cyberatlas Intranet Statistics

This site offers information and statistics about intranet use.

http://www.cyberatlas.com/intranet.html

Delrina Corporation

Delrina's home page provides links to product information. You can retrieve their software, which is structured to interact with whatever system you have: Windows, Mac, UNIX, DOS.

http://www.delrina.com/

The Design and Implementation of a Corporate Web

An online seminar/slide show that guides you through the planning and building of an intranet.

http://www.cio.com/WebMaster/sem1_intro.html

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Digital's Enterprise Web
Digital provides a solid general introduction to intranets and their uses, advantages, and shortcomings.
http://www.digital.com/info/internet/enterprise.html

"Finding the Right Intranet Technologies to Buy"
Written by David Strom, this paper describes the intranet technologies available today.
http://www.strom.com/pubwork/intra2.html

"For Internal Use Only"
Jenny C. McCune describes the process that Eli Lilly went through to build an intranet and how their intranet saves them time and money.
http://www.beyondcomputingmag.com/current/
network.html

Frontier Technologies Incorporated
These developers offer a link to their intranet tutorial, links to their products, and e-mail links to technical support.
http://www.frontiertech.com

"Here Comes the Intranet"
This special report featured in _Business Week_ in February, 1996, is posted by the Mobile Area Free-Net in Alabama.
http://www.wkrg.com/~glendas/intranet.htm

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│  Here Comes the Intranet                                          │
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│  Date: Fri, 16 Feb 1996 1                                         │
│  Business Week: February 26, 1996                                 │
│  Department: Cover Story: SPECIAL REPORT                          │
│  HERE COMES THE INTRANET                                          │
│                                                                   │
│  And it could be the simple solution to companywide information-on-demand │
│                                                                   │
│  In the brief annals of doing business on the Internet, Federal Express Corp.'s customer Web site has │
│  become a legendary success story. The package-delivery giant, which moves 2.4 million pieces │
│  every day, put up a server in November, 1994, on the World Wide Web that gave customers a │
│  direct window into FedEx' package tracking database. By letting 12,000 customers per day click │
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Imagic Communications

This Australian firm specializes in Internet and intranet design and implementation.

http://www.imagic.com.au/~magi/

"Inside Web Sites: An Introduction to Intranets"

John Graves and Jacqueline Justice analyze the benefits of intranets and introduce the basics of implementation.

http://www.microsoft.com/industry/acc/intra-en.html

"The IntraNet Architecture: Managing Information in the New Paradigm"

In this paper, Dr. Steven Telleen outlines a strategy for managing the information-creation process in an intranet.

http://www.amdahl.com/doc/products/bsg/intra/infra.html
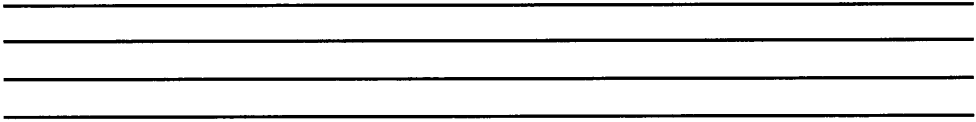
Intranet Case Studies, Profiles, and Demos

Acme Fruit and Nut Company

http://www.acmefruit.com/

"American Red Cross Worldwide Internet/Intranet Network"

http://www.brill.com/intranet/ijnews.html

Amoco's Intranet Story

http://www.cio.com/WebMaster/0796_amoco_1.html

Digital

http://www.digital.com:80/info/internet/enterprise.html

Elias

http://elias.lifecom.com/

Fletcher Challenge Intranet Success Story

http://www.process.com/news/fletch.htp

Kaiser Permanente's Intranet Success Story

http://www.process.com/news/Kaiser.htp

National Semiconductor

http://www.nsc.com/

Netscape Customer Profiles

http://home.netscape.com/comprod/at_work/

customer_profiles/index.html

Sandia and the Intranet

http://www.cio.com/WebMaster/sid_nov95.html

http://www.cio.com/WebMaster/feature_nov95.html

Texas Comptroller of Public Accounts

http://www.window.state.tx.us/poc/poc.html

Tyson Foods' Intranet Success Story

http://www.process.com/news/tyson.htp

Intranet Communications

This site explains the basics of an intranet, advertises Intranet
Communications' products and services, and links to other
intranet-related sites.

http://www.intranetcommunications.com/

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│ ─            Netscape - [Intranet Communications]        ▼ ▲ │
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│ Location: http://www.intranetcommunications.com/         [N] │
│ ┌───────────┬─────────────────────────────────────────────┐ │
│ │   FREE    │  Intranet Communications                    │ │
│ │ INTRANET  │  ─────────────────────────────────────────  │ │
│ │   DEMO!   │  Intranet Communications provides medium    │ │
│ │           │  and large organizations the best custom,   │ │
│ │  WWW News │  scaleable knowledge distribution systems   │ │
│ │           │  that allow manipulation of relational      │ │
│ │ Intranets │  databases, project collaboration, workflow │ │
│ │           │  management, document distribution, and     │ │
│ │ Products  │  integration with customers and suppliers   │ │
│ │           │  via the Internet to minimize costs and     │ │
│ │  Contact  │  maximize employee productivity.            │ │
│ │           │                                             │ │
│ │  Events   │  What is an intranet?                       │ │
│ │           │                                             │ │
│ │           │  An intranet is a groupware application     │ │
│ │           │  that centralizes knowledge, facilitates    │ │
│ │           │  collaboration, and expedites the flow of   │ │
│ │           │  information. An intranet is typically      │ │
│ │           │  based on Internet and WWW technology       │ │
│ │           │  because it is inexpensive, simple to use   │ │
│ │           │  and can be made easily accessible to       │ │
│ └───────────┴─────────────────────────────────────────────┘ │
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"IntraNet Concepts: White Papers and Further Reading"

This site provides links to three white papers on intranet
methodology, adaptive innovation, and intranet infrastructure,
all written by Steve Telleen of Amdahl Corporation.
   http://www.amdahl.com/doc/products/bsg/intra/
   concepts.html

The Intranet: A Corporate Revolution

This site includes a document that introduces both the
Internet and intranets. This page links to other documents
that define terms like "Web server" and "Java."
   http://www.intranet.co.uk/intranet/intranet.html
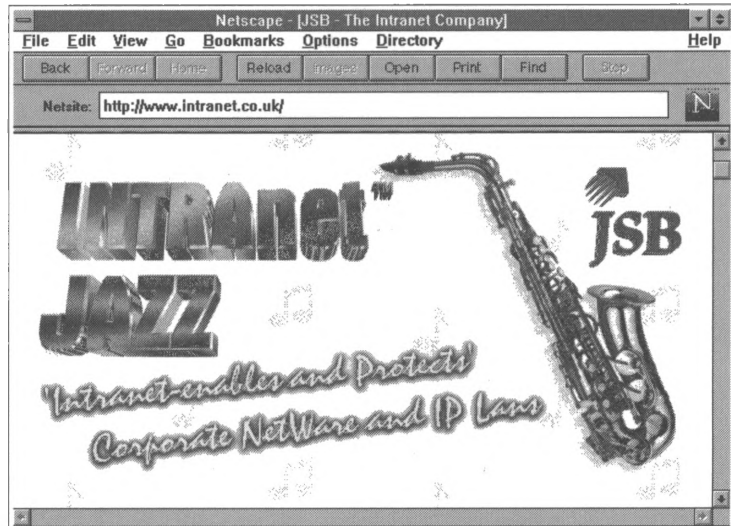
Intranet Design Magazine

An online magazine devoted to intranet issues and edited by Gordon Benett, author of *Introducing Intranets*.

http://www.innergy.com/

Intranet Exchange

This site is a Web-based discussion board devoted to intranet issues.

http://www.innergy.com/ix/index.html

The Intranet Journal

An interactive online Internet site, the *Journal* offers a wealth of information, including a FAQ, news announcements, links to other online intranet resources, and opinion and analysis articles written by a variety of professionals from many fields.

http://www.brill.com/intranet
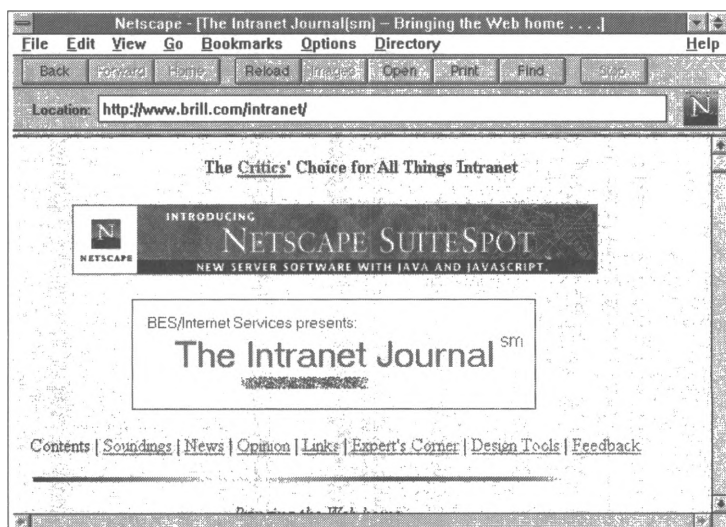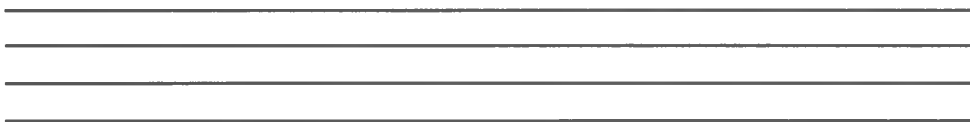
"IntraNet Methodology: Concepts and Rationale"

Dr. Steven Telleen gives an introduction to intranets and their impact in terms of information management. He also offers a general overview of the management framework of intranet teams and users.

> http://www.amdahl.com/doc/products/bsg/intra/
> concepts1.html

"Intranet Recommendations"

This essay by Arnold Kling describes his experiences in consulting for businesses implementing intranets and offers advice based on those experiences.

> http://www.homefair.com/late96/intranet/intranet.html

Intranet Resource Solution

Process Software Corporation has put up this Web site to offer links to other sites about intranets, including intranet profiles and intranet tools.

> http://www.process.com/intranets

"Intranets and Adaptive Innovation: The Move from Control to Coordination in Today's Organizations"

Dr. Steven Telleen describes the new style of planning and management that intranets require, and he offers advice on how to manage your implementation and upkeep teams.

http://www.amdahl.com/doc/products/bsg/intra/adapt.html

"Intranets: Internet Technologies Deployed Behind the Firewall for Corporate Productivity"

Written by Lee Levitt for the INET '96 Annual Meeting, this paper is a reprint of a presentation given at the conference.

http://www.process.com/intranets.wp2.htp

Intranets Projects from Netscape

An interview by Joseph Maglitta that focuses on AT&T's implementation of a corporate intranet.

http://www.computerworld.com/intranets/intra_projects.html

Links

Links to companies using intranets, conferencing tools, educational materials, newsgroups, search tools, and server and software sites are provided at this site.

http://www.brill.com/intranet/links.html

Microsoft Intranet Strategy Day

This site, maintained by Microsoft, has links to news articles, case studies, whitepapers, products and demos, announcements, and free Microsoft software downloads for creating an intranet.

http://www.microsoft.com/intranet/

Netrex, Inc.

This company's site offers connections to their hardware and software products, their services, and their Internet and Web tools.

http://www.netrex.com

Netscape

Netscape offers links through their Intranet Solutions area to intranet demos, profiles, whitepapers, seminars, and clippings. It also offers links to their intranet tools.

http://www.netscape.com

Open Text

This site displays basic descriptive materials, recent statistics, press clippings, examples of organizations using intranets, guidelines for evaluating intranet technologies for your organization, and a demonstration of an Open Text *LiveLink* Intranet.

http://www.opentext.com
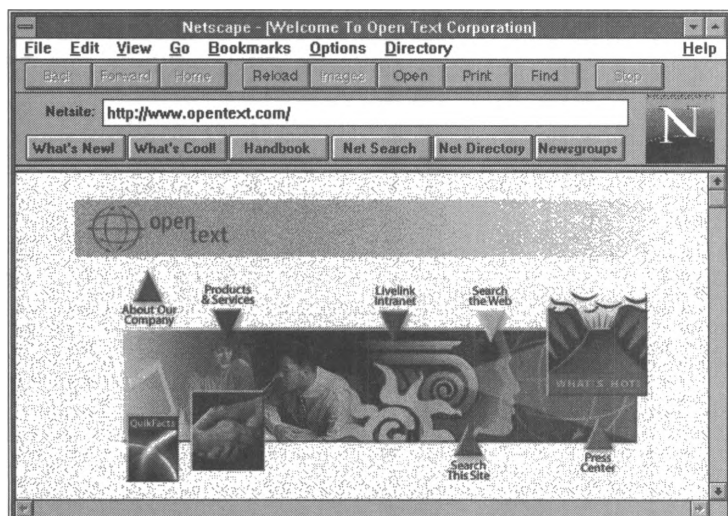
"Practical Advice for Implementing Corporate Intranets"
By Michael Millikin, this paper is reprinted from
Telecommunications and describes one method of
implementing an intranet in the corporate world.
http://www.brill.com/intranet/ijnews.html

"Project Management"
This site describes all the personnel necessary to implement
an intranet, outlines the job of each team member, and offers
advice on managing the team.
http://www.mec.state.me.us/mec/mdplan/apdx-b.htm

**"Publishing with World-Wide Web Technology: Methodologies
for the Internet and Intranets"**
Paul Rogers is author of this white paper explaining the
details of Internet and intranet publishing and management.
http://www.imagic.com.au/~magi/intra.html

Purveyor Intrakit
All the tools necessary to Web-enable ISVS, VARS, and OEMs
is found in this kit to start your own intranet.
http://www.process.com/intranets/intrakit.htp

"Serving Up a Winning Intranet Solution"
This report from Process Software Corporation includes a
simple explanation of intranets, the advantages of having an
intranet, a short explanation of how to construct an intranet,
what intranets can do, and how secure intranets can be.
http://www.process.com/intranets/solution.htp

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"Soundings"

A moderated message exchange on the Web, this board includes postings on user surveys, document management, intranet software, and success cases.

http://www.brill.com/intranet/ijx/index.html

Strom's "The Intranet Information Page"

David Strom presents links to other sites addressing all aspects of the intranet–from planning to implementation.

http://www.strom.com/pubwork/intranet.html

WebMaster's Intranet Resource Center

A Web page with links to other intranet resources on the Web. The links include white pages, software advertisements, and general information.

http://www.cio.com/WebMaster/wm_irc.html

"Working Together, Apart"

In this excerpt from his new book, _Introducing Intranets_, Gordon Benett describes the new distributed decision making and implementation structure that is evolving along with Internet and intranet technology.

http://www.innergy.com/foresite.html

Workman Associates' "Building a Corporate Intranet"

This seminar, written by Ryan Bernard (author of _The Corporate Intranet_), covers a broad range of topics, including historical perspectives on the development of Web technologies, their corporate applications, and advice for implementing Web technologies internally.

http://www.webcom.com/wordmark/sem_1.html

Investments

Asia Online

Provides information on commercial and investment opportunities in Asia. The site includes a searchable database of WWW resources in and about Asia, an events directory, and links to Asian corporations on the Web.

http://www.asia-online.com/

Bank Net

Provides daily business news as well as information about, and links to, investment sites, including securities firms, FAQs, and International resources.

http://bank.net:80/

Chicago Mercantile Exchange

Provides short articles on pertinent stock market terms, a glossary of trading terminology, and CME membership information.

http://www.cme.com

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DataQuest Incorporated

A global market research and consulting company serving high-technology and financial professionals through resources such as press releases, newsletters, subscription research services, and an industry report catalog.

http://www.dataquest.com/

Direct IPO

Developed jointly by Direct IPO and Blueprint Interactive, this site helps small companies find capital via the Internet. Includes information on direct vs. underwritten initial public offerings, historical information on direct IPOs, breaking news, and company spotlights. Also links to *Edgar Interactive*, a searchable database of public companies.

http://www.directipo.com

FAQ

misc.invest FAQ

http://www.cis.ohio-state.edu/hypertext/faq/bngusenet/
misc/invest/top.html
gopher://wuecon.wustl.edu

FILL (Financial Information Link Library)

This site provides a collection of links to finance-related topics from all over the world.

http://www.mbnet.mb.ca:80/~russell/

Financial Economics Network (See Accounting)

Futures Market Newsletter

A weekly newsletter that features information about commodities and currency futures.

Subscribe through e-mail to cyhuang@tpts1.seed.net.tw

InterActive Nest Egg

This site includes "NestEgg Magazine" and columns on topics pertinent to investing, such as "Eye on Wall Street," "The Web on Wall Street," and "Wall Street Watch."
http://nestegg.iddis.com

Investext Database (See Databases)

InvesTools

A registered service that compiles current and historical price and volume graphs for 10,000 US equities and 7000 mutual funds. Most are archived back to 1994. Click on "Company Index" to access historical charts.
http://www.investools.com/

Investor Web

This site provides links to a variety of investment-related resources for both beginning and experienced investors.
http://www.investorweb.com:80

Los Angeles Times Market Beat

Tom Petruno's column about investing and financial markets. Subscribe through e-mail to petruno@netcom.com with SUBSCRIBE in the subject line.

Mutual Fund Vendors

These sites offer prospectuses, deliver marketing information about products, and offer other services for investors.

CGM Funds	http://cgmfunds.com
Fidelity	http://www.fid-inv.com/
Invesco	http://www.invesco.com
Merrill Lynch	http://www.ml.com
Vanguard	http://www.vanguard.com/

Networth

Provides mutual fund prices and graphs, listings and samples of financial newsletters, and question and answer forms.

http://networth.galt.com

Newsgroups

clari.biz.earnings

misc.invest

misc.invest.canada

misc.invest.financial-plan

misc.invest.funds

misc.invest.stock

misc.invest.technical

misc.market.biz

NYSENet Data

This site offers free current and historical information on entire-market volume for the New York Stock Exchange.

http://www.nyse.com/
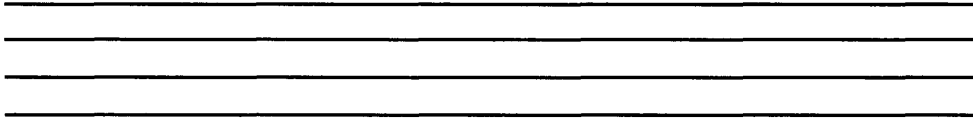
PCQuote

This provider of online and real-time stock quotes has added
a free, integrated business news service. Offered in
partnership with News Alert, Inc., the service provides access
to real-time headlines and complete stories from wire
services.

http://www.pcquote.com

PeerScape

Sponsored by Deloitte & Touche, Peerscape is an Internet
system for comparative performance analysis of companies
and industries. Users can compare one company to its peer
group along a set of performance measures, and receive
investment bank analysis and research in Adobe PDF format.

http://www.peerscape.com/

Primate Software, Inc.

This site archives 130,000 symbols of stocks, bonds, mutual
funds, and futures from all major exchanges. The monthly
service fee includes a *Windows* software package and allows
250,000 quotes per month.

http://www.primate.com/

Quote.Com

Provides financial market data including stock quotes,
futures, mutual funds and bonds, news, and analysis.

http://www.quote.com/
ftp://ftp.quote.com

SEC EDGAR Database

Provides access to 1994 and 1995 SEC filings that are available to the public.

http://www.sec.gov
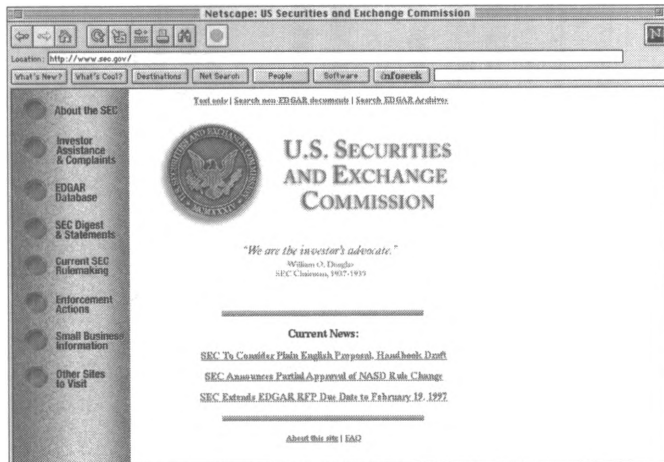
StockMaster

This site provides recent stock market information, including daily closing prices and one-year graphs of historical prices.

http://www.stockmaster.com

Streetnet Online Investors Guide

Provides corporate annual reports, 10-Qs and 10-Ks, as well as links to other financial servers on the Internet.

http://www.streetnet.com:80

Trader's Access

This site archives more than 120,000 stock symbols with daily, weekly, and monthly data back to 1989.

http://www.tbspinc.com/

VentureSource

Hosted by VentureOne, a research firm for the venture capital industry, this site allows subscribers to find detailed information on more than 6000 venture-backed companies, 15,000 financing transactions, and 30,000 key executives. Clients who request information typically receive a response within five business days.

http://www.v1.com/

Wall Street Directory

Provides connections to sources of information such as market predictions, brokerage services, software demos, and advisory services.

http://www.wsdinc.com/
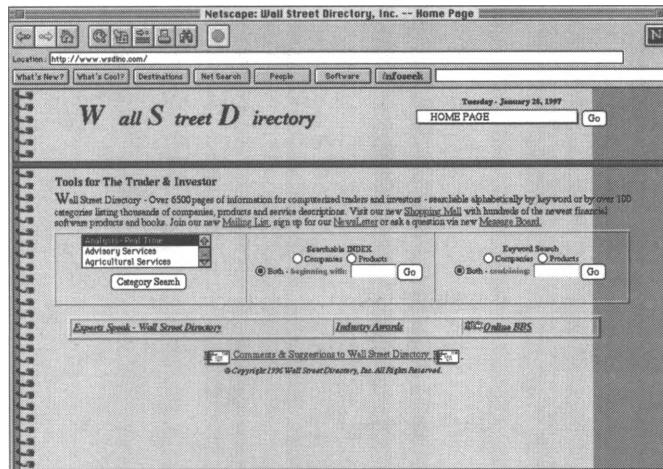
Yahoo

Provides a searchable database of corporate reports for companies registered with Yahoo.

http://www.yahoo.com/economy/markets_and_investments/corporate_reports/

Marketing

(See also Computer Consulting and HTML and Web Design)

American Business Information's Sales Leads USA

This site provides business-to-business marketing information, including marketing-strategy guidance and a database of potential clients gathered from resources such as Yellow Pages, Business White Pages, press releases, and business magazines.

http://www.abii.com/

American Demographics, Inc.

A Dow-Jones Web site that links to three publications (*American Demographics*, *Marketing Tools*, and *Forecast*) focusing on marketing strategies. Also features news releases, a bookstore, and a search facility for business resources.

http://www.marketingtools.com/

American Marketing Association

Provides contact information for members of the AMA and a message statement and information on how to join for nonmembers.

http://www.ama.org

American Wholesale Marketers Association

This non-profit trade organization presents information on trade shows and conferences, marketing publications, and products. The home page provides additional links for research and networking.

http://www.webplus.net/awma/

Anywhere Online

This site represents a partnership between ASI Market Research, Nielsen Media, and Yankelovich Partners. Contains market research studies, links to related sites, e-mail addresses for online marketing, and a discussion group.

http://www.anywhereonline.com/

CyberAtlas

A Web site dedicated to advertising on the Internet. Offers information and analysis on demographics, advertising venues, and media planning, as well as resources such as newsgroups, newsletters, FAQs, and market research centers.

www.cyberatlas.com/

Forrester Research
> Presented by the Forrester Research Company, this site reports on Internet marketing research and technology.
>> http://www.forrester.com/

Gebbie Press
> Publishes an "all-in-one" directory of national media, categorized by type, with contact numbers for advertising and promotion purposes. The list is available in print format or on disk. Price list is at http://www.gebbieinc.com/prices.htm.
>> http://www.gebbieinc.com/

INET-Marketing
> Mailing list for discussion of marketing on the Internet, measuring demographics, and conducting transactions.
>> Subscribe through e-mail to listproc@einet.net with message: subscribe INET-marketing yourname.

International Association of Business Communication
> Hosted by Just In Time Marketing, this site offers a research bank of business information on marketing and communication.
>> http://www.iabc.com//homepage.htm

Larry Chase's Web Digest for Marketers
> Net marketing site with advice on Web marketing and design. The link to the Chase On-Line Marketing Strategies Home Page leads to various articles on Internet marketing.
>> http://www.wdfm.com/

The List of Lists

Hosted by Vivian Neou, this is a directory of special-interest group mailing lists that provides brief descriptions of each listing as well as contact information.

http://catalog.com/vivian/interest-group-search.html

Marketing and Media Planning Resource Center

Presents information on electronic marketing, including e-publications, tools for networking, and a newsletter archive indexed according to subject. Presented by CIO Communications.

http://www.cio.com/marketing/commhome.html

Martech

Mailing list for discussion of marketing with technology-based tools.

Subscribe through e-mail to listserv@usa.net with message

subscribe MARTECH yourname

MouseTracks

This site provides a listing of marketing resources, including marketing mailing lists, marketing service firms, and links to information about marketing publications.

http://nsns.com:80/MouseTracks/

Network Marketing Yellow Pages

A directory of home-based businesses.

http://www.network-marketing.com/nmyp/nmyp.htm

Newsgroups
clari.biz.market.news
misc.invest
misc.invest.technical
biz.marketplace

Project 2000
A research project devoted to examining the marketing
implications of computer-mediated environments like WWW.
The home page provides links to other sites of interest to
Internet marketers, including surveys, articles, and book
reviews.
http://www2000.ogsm.vanderbilt.edu/

Surveys
Survey Net's Internet Users Survey
http://www.survey.net/
Network Wizards Domain Survey
http://www.nw.com
Texas Internet Consulting Domain Survey
http://www.tic.com

Web Marketing Information Center
Provides links to more than 300 articles that deal with online
marketing. Information ranges from setting up a Web site to
discussions of Internet marketing theory.
http://www.wilsonweb.com/rfwilson/webmarket/

Modems

Curt's High-Speed Modems Page

This site provides basic modem information on topics that include data compression, initialization strings, hardware setup, and links to other modem news, support, and manufacturer's sites.

http://www.teleport.com/~curt/modems.html

Fax Modem FAQ

http://www.rahul.net:80/wolfgang/fax.html

International Telecommunication Union

This site is the home page of the international organization where governments and the private sector coordinate global telecommunication networks and services. The site also provides links to ITU resources including ITU publications, training programs, and press releases.

http://www.itu.ch:80/index.html

Manufacturers

Boca Research, Inc.

http://www.bocaresearch.com

Diamond Multimedia

http://www.supra.com

Global Village Communications

http://www.globalvillag.com

Microcom

http://www.microcom.com

Motorola

http://www.mot.com/mims/isg/Products/

Dial_Products.html

Telebit

http://www.telebit.com/

USRobotics

http://www.usr.com:80

Zoom

http://www.zoomtel.com

Newsgroups

comp.dcom.modems

comp.sys.ibm.pc.hardware.comm

misc.forsale.computers.modems

WH Networks

This page provides links to various FAQs and informative
sites on topics such as initialization strings, modem
standards, fax questions, and installation problems.

http://www.rahul.net:80/wolfgang/tech.html

Netiquette

CNI-COPYRIGHT

Mailing list for discussion of copyright questions.
Subscribe through e-mail to listserv@cni.org with
message:subscribe CNI-COPYRIGHT yourname

Copyright Clearance Center

This site is the home page of an organization that helps
individual, professional, and academic users gain permission
to photocopy copyrighted materials.
http://www.copyright.com

The Core Rules of Netiquette

This online guide for Internet behavior is maintained by
Albion Books.
http://www.albion.com/netiquette/corerules.html

Fenwick and West

This intellectual-property law firm is making papers available
that discuss topics related to copyright and licensing issues of
creating multimedia.
ftp://ftp.eff.org:/pub/CAF/law

Library of Congress Copyright Database

This site provides the Library of Congress database of
information about works registered in the US Copyright
Office since 1978 as well as general information about
copyright.
telnet://locis.loc.gov

Newsgroups

    news. announce.newusers (with hints on writing for
Usenet postings compiled by Mark Moraes.)

    misc.int-property

    misc.legal.computing

World Wide Web Copyright Page

Provides copyright information for commercial and casual Internet users.

    http://www.benedict.com
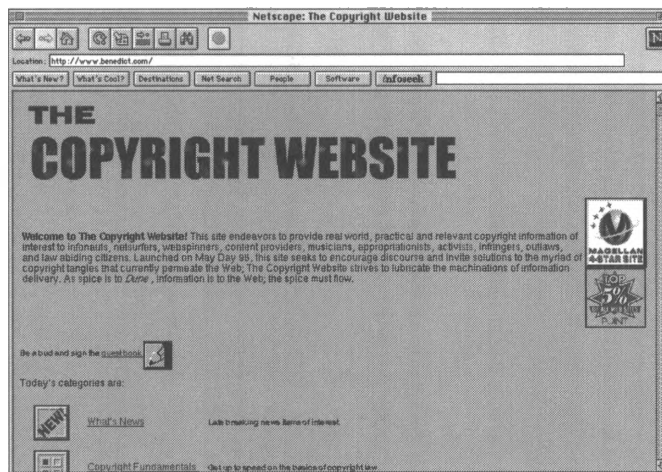
News

China News Digest

Provides news from China and other information services to users interested in China-related affairs.

http://www.cnd.org

CNN Financial Network

This site provides pages with recent financial and business news from all over the globe and includes a searchable database.

http://www.cnnfn.com/

Commercial News Services on the WWW

Provides a listing of commercial news services available through the World Wide Web.

http://www.jou.ufl.edu/commres/webjou.htm

The Daily News–Links

This site provides links to World Wide Web sites that provide news from regions around the world.

http://www.cs.vu.nl/~gerben/news.html

Editor and Publisher Interactive

This online newspaper for publishers and journalists provides a list of newspaper publishers with online services.

http://www.mediainfo.com:80/edpub/

Electronic Newsstand

Provides articles from magazines, newsletters, and book publishers with a special category for business publications and links to other business sources on the Internet.

http://www.enews.com

The Internet->Bullet

A weekly online news publication by Kent Information Services, Inc. Covers information technology and news of interest to financial professionals.

http://www.kentis.com/bullet

Lexis-Nexis Tracker

Designed for attorneys, tax management consultants, and other professionals, this service features an array of legal information as well as targeted news, business, and financial sources.

http://www.lexis-nexis.com/

Mercury Mail

Customized news by e-mail.

http://www.merc.com/
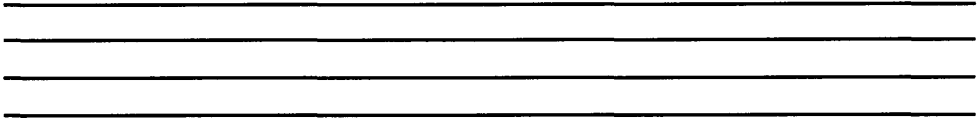
Newshare Syndicate

Provides a listing of online news sources and a digest of news from each arranged by subjects, such as business, sports, and weather.

http://newshare.com:8001/synd/contents.html

PR Newswire

PR Newswire's continuous newsfeed provides news in areas like technology, financial, and company news.

http://www.prnewswire.com

Tokyo Kaleido Scoop

In addition to news from Japan, this site provides a directory of Asian sites on the World Wide Web.

http://www.smn.co.jp/

Programming

Application Programming Interface (API)

Netscape's API is explained at this site, which also offers programming and design tips.

http://home.netscape.com/newsref/std/server_api.html

CGI Configuration: NCSA HTTPd Tutorial

A basic introduction to CGI and more advanced programming notes and guidelines are offered at this site.

http://hoohoo.ncsa.uiuc.edu/cgi/

comp.infosystems.www.authoring.cgi

A Usenet newsgroup devoted to discussions of CGI scripting.

comp.lang.java.programming

A Usenet newsgroup devoted to discussions of Java programming.

Java

This site defines Java and explains its applications.

http://www.intranet.co.uk/intranet/sidebars/java.html

The NSAPI Versus the CGI Interface

This site includes an overview of the limitations of CGI and a discussion of the benefits of API programming within the context of a Netscape server.

http://home.netscape.com/newsref/std/nsapi_vs_cgi.html

"SSI, CGI, or API? Choosing the Right Tool for the Job"

This paper by Rob Denny describes these three programming languages and details how to choose the language to best meet your intranet needs.

http://solo.dc3.com/white/extending.html

Virtual Directory Structure: NCSA HTTPd Tutorial

This site includes a basic introduction to SSI and more advanced programming notes and guidelines.

http://hoohoo.ncsa.uiuc.edu/docs/tutorials/includes.html

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Searching

(See also Databases)

ABC–A Business Compass
This engine provides subscribers with links to more than
1000 business sites, searchable by subject, industry, or
geography.
http://www.abcompass.com/

Aliweb
A World Wide Web searching tool that queries the Aliweb
database. The database catalogs sites based on descriptions
of the services they provide.
http://web.nexor.co.uk/public/aliweb/search/doc/
form.html

All-in-One Search Page
This site is a directory of directories, providing a descriptive
listing of Internet search tools.
http://www.albany.net/allinone/

Alta Vista
This search engine searches WWW sites and newsgroups by
keyword(s).
http://www.altavista.digital.com

Archie

Searches titles and keywords of files on all known FTP sites.

Some access sites include:
 archie.ac.il
 archie.ans.net
 archie.au
 archie.doc.ic.ac.uk
 archie.edvx.uni-linz.ac.at
 archie.funet.fi
 archie.hana.nm.kr
 archie.internic.net
 archie.kr
 archie.luth.se
 archie.ncu.edu.tw
 archie.rediris.es
 archie.rutgers.edu
 archie.sogang.ac.kr
 archie.sura.net
 archie.switch.ch
 archie.th-darmstadt.de
 archie.unipi.it
 archie.univie.ac.at
 archie.unl.edu
 archie.uqam.ca
 archie.wide.ad.jp

Colorado Alliance of Research Libraries

CARL provides online library catalogs, article indexes, and information databases.
 telnet://pac.carl.org
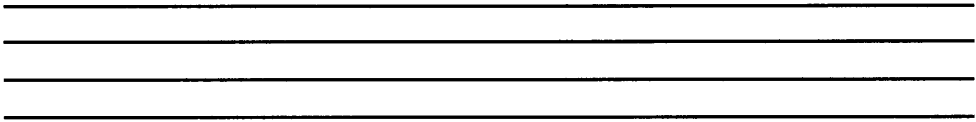
Deja News Research Service

This site searches a Usenet news archive.

http://www.dejanews.com:80/

Einet Galaxy

An Internet subject index that allows users to browse by
subject categories or search World Wide Web, Gopher, and
Telnet sites simultaneously using keyword(s).

http://www.einet.net/

Information SuperLibrary "Search the Internet" Page

This site lists, describes, and links to a wide variety of
Internet search tools.

http://www.mcp.com/general/search/srcheng.html

Infoseek

This engine searches WWW sites, Usenet, public databases,
and commercial databases.

http://www2.infoseek.com/

Library of Congress

Provides an extensive list of Web searching and index
resources

http://lcweb.loc.gov/global/explore.html

Liszt Mailing List Directory

Allows users to find mailing lists related to keyword subjects.

http://scwww.ucs.indiana.edu/mlarchive/

Lycos 250

An index of World Wide Web sites, Gopher files, and FTP
files that allows users to query by keywords or browse
subject categories.

http://www.lycos.com

Magellan

This search engine retrieves lists of sites that are fully described, reviewed, and rated.

http://www.mckinley.com/

Ohio State University's FAQ index

Allows user to search for lists of frequently asked questions (FAQs) related to keyword subjects.

http://www.cis.ohio-state.edu/hypertext/faq/usenet/

Resources Meta-Index

Bibliography of search tools on the Internet.

http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/
MetaIndex.html

Search Tools

Excite

http://www.excite.com/

Glimpse HTTP

http://glimpse.cs.arizona.edu:1994/ghttp/

LiveLink Search

http://www.opentext.com/livelink/

Personal Library Software

http://www.pls.com/

Verity

http://www.verity.com/

Ultra Infoseek

Infoseek's updated engine has advanced the size of the database, as well as the way it handles queries. The service features a "virtual real-time index of the Internet" with continuous updates of the database.

http://ultra.infoseek.com/

Veronica Home Menu

This Gopher menu provides access to Veronica servers, as well as various documents about using Veronica.

gopher://veronica.scs.unr.edu:70/11/veronica

WebCrawler

A large index of Internet sites and their contents that users can search by keywords.

http://www.webcrawler.com

Yahoo

An index of World Wide Web sites, Gopher files, FTP files, and some newsgroups with content descriptions. Yahoo can work like a Gopher menu, allowing the user to choose increasingly more specific categories to narrow the search.

http://www.yahoo.com

Security

Argus Systems Group, Inc.

Security systems for UNIX platforms and Microsoft *Windows NT* networked environments.

http://www.decaf.com/

Arthur Andersen's Computer Risk Management

Consulting services in information systems auditing and risk security.

http://www.arthurandersen.com/bus_info/services/crm/index.htm

Atlantic Computing Technology Corporation

This Connecticut-based consulting company specializes in Internet issues, particularly information security and network audits.

http://www.atlantic.com

Barracuda Security

A vendor that provides physical security products, such as alarms and indelible-dye cards.

http://www.powernet.co.uk/barracuda/

Business Protection Products

The security division of Datamation Systems provides anti-theft devices such as cables and enclosures, security pads, sound alarms, board protection, disk drive locks, and other products to protect physical assets.

http://www.pc-security.com/

CCC Online

This site is maintained by the Copyright Clearance Center, a not-for-profit group that helps organizations comply with US copyright law.

http://www.copyright.com

Central Command Virus Protection

This provider of anti-virus solutions offers information on products as well as a database of known viruses, links to other software and hardware vendors, and information from research organizations.

http://www.command-hq.com/

CERT

Computer Emergency Response Team's server with articles about security concerns, tools for evaluating security, and an archive of alerts about break-in attempts.

ftp://cert.sei.cmu.edu/pub

CERT Security Advisories

Indexed list of Computer Emergency Response Team's warnings issued to mailing lists about security-related problems.

WAIS cert-advisories.src

Check Point Software Technologies

Producer of information security solutions, including firewalls.

http://www.checkpoint.com/

CMS Technologies

A provider of physical security products.

http://www.cmstech.com/

COAST

Based at the Purdue University Department of Computer Sciences, the Computer Operations, Audit, and Security Technology site represents a "multiple project, multiple investigator effort" in information security research. Current and past sponsors of COAST include IBM, Security Dynamics, Hewlett Packard, Sun Microsystems, the Hughes Research Laboratories, the US National Security Agency, and others. This site maintains a valuable index of online resources and puts out an "irregularly-published" electronic newsletter.

http://www.cs.purdue.edu/coast/coast.html

Computer Operations, Audit, and Security Technology (See Auditing)

Computer Professionals for Social Responsibility

This non-profit group of computer scientists and others focuses on the social impact of computers and technology. The Internet Library site, sponsored by Sunnyside Computing, offers information about the organization, links to other sites, a discussion group on the history of cyberspace, and examination of such issues as privacy rights and technology ethics.

http://www.cpsr.org

Computer Security Products, Inc.

This vendor manufactures physical security equipment.

http://www.ComputerSecurity.com/

Computer Security Resource Clearinghouse

Offers security awareness and training information, publications, conferences, software tools, as well as security alerts and prevention measures.

ftp://csrc.ncsl.nist.gov or 129.6.54.11

gopher://csrc.ncsl.nist.gov or 129.6.54.11

http://csrc.ncsl.nist.gov/
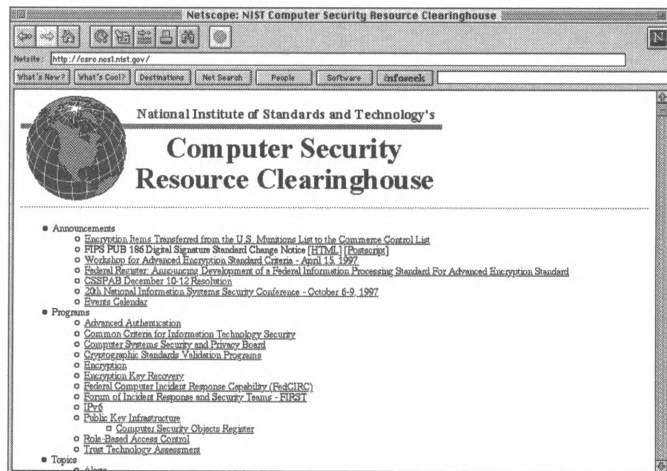
Computers and Information Resources (CIRT) Home Page

This site provides links to resources about ethics and security. The site was established by Dr. David Grisham, Security Administrator for the University of New Mexico.

http://www.unm.edu/cirt/irc/svcs/secpage.html

ftp://ftp.unm.edu

The Corporate Security Resources Page

A central resource for security information and related sites available on the Internet.

http://chelsea.ios.com/%7Eglenz/

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Cryptography, PGP, and Your Privacy Web Page

This site provides links and information about computer and network security, including a series of electronic manuals for managers.

http://www.gocsi.com

CSI (Computer Security Institute) Home Page

This site provides links and information about computer security, including a series of electronic manuals for managers such as "Manager's Guide to E-mail Security."

http://www.gocsi.com

Cylink Corporation

Specializes in encryption and network security solutions.

http://www.cylink.com/

Data Fellows Virus News Updates

At this site, you can access a database of information about viruses either alphabetically or through a key word search.

http://www.datafellows.fi/news/vir-news/

Disaster Recovery Journal

This journal archives articles and vendor information and provides links to other security-related organizations.

http://www.drj.com/

Dr Solomon's Online

An information center for users of Dr Solomon's antivirus software, this site also provides a "Virus Encyclopedia," a tutorial about viruses, virus alerts, and articles on viruses and hoaxes.

http://www.sands.com

http://www.drsolomon.com

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Dynasoft

This company's products include computer security solutions
for client/server environments, including UNIX, and a
smartcard-based PC security system.

Firewalls mailing list

Listserve focused on the subject of Firewalls and Internet
Security.

> Subscribe through e-mail to majordomo@greatcircle.com
> with message: subscribe firewalls-digest

FIRST

The Forum of Incident Response and Security Teams is a
coalition of more than 30 computer security incident
response teams from government, commercial organizations,
and academic institutions.

> http://www.first.org/

GreatCircle Associates

A firm that specializes in training and consulting on Internet
security firewall systems.

> http://www.greatcircle.com/

"A Guide to Understanding Audit in Trusted Systems" (See
Auditing)

IBM Anti-Virus Online

This electronic magazine disseminates information about
computer viruses through articles, virus and hoax alerts, and
technical support from IBM labs.

> http://www.av.ibm.com/

Information Security Discussion List

A non-moderated Internet discussion list for information-security and auditing professionals in government, industry, and academic institutions.

Subscribe through e-mail to listserv@etsuadmn.etsu.edu with message: SUB INFSEC-L yourname

Information Systems Security Certification Consortium, (ISC)2

A non-profit corporation established in 1989 to develop a certification program for information security specialists.

http://www.isc2.org/isc2.htm#isc2

International Association for Cryptologic Research (IACR)

A non-profit scientific organization dedicated to furthering research in cryptology and related fields.

http://www.swcp.com/~iac

International Cryptography Pages

This site in Finland details international sources for software and information on cryptography, concentrating on software and information outside the US.

http://www.cs.hut.fi/crypto

InterNIC *Site Security Handbook*

This document is a popular reference guide for Internet Security issues.

http://internic.net

Koehn Consulting

This firm specializes in disaster planning recovery.

http://www.mailbag.com/users/koehn/drp.html

Livermore Software Laboratories

Hosts a firewall tutorial that discusses potential security
threats and gives an overview on firewall technology,
products, and implementation.
http://www.lsli.com/

McAfee Software

Maker of the anti-virus software, *VirusScan.*
http://www.mcafee.com

Memco Software

Provides enterprise security solutions, including UNIX, single-
sign-on, and distributed security administration. The site also
offers security news, resources, and other information.
http://www.memco.com/

National Computer Security Association

An independent organization that acts as a clearinghouse of
information security issues. The site offers information on
cryptography, firewalls, and anti-virus products, and hosts a
message board for the discussion of information security
topics. The NCSA also certifies security products.
http://www.ncsa.com

NCSA Tutorials

From this page, you can access a number of security-related
tutorials on topics such as "Access Control and User
Authentication" and "Setting Up a Secure Server."
http://hoohoo.ncsa.uiuc.edu/

Netscape Data Security

Netscape devotes a section of its site to discussing Internet
security concerns and how its SSL protocol works.
http://home.mcom.com/newsref/ref/netscape-security.html

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Newsgroups

       alt.security

       comp.admin.policy

       comp.os.ms-windows

       comp.security.announce

       comp.security.firewalls

       comp.security.misc

       comp.security.unix

       comp.society.privacy

       comp.sys.ibm.as400.misc

       comp.virus

       misc.legal.computing

       sci.crypt

       talk.politics.crypto

NIST Computer Security Publications

Provides security publications through e-mail.

       E-mail docserver@csrc.ncsl.nist.gov with message: send
       index to receive a list of NIST publications.
       E-mail docserver@csrc.ncsl.nist.gov with message: send
       document filename to retrieve copies through e-mail.
       Subscribe to Computer System Security Laboratory
       Newsletter by e-mail to mailserve@nist.gov with
message:
       subscribe csl-newsletter.

OSHA

The Web site of the US Department of Labor's Occupational
Safety and Health Administration contains information on
workplace violence concerns, safety, programs, services and
safety compliance issues.

       http://www.osha.gov/

Pretty Good Privacy, Inc.

This home page of the digital-privacy software company features product information and demos for security tools.

http://www.pgp.com

Privacy Rights Clearinghouse

At the site of this non-profit group based in San Diego, you can find papers on personal security and privacy and how technology affects individual rights.

http://www.privacyrights.org/

RSA Data Security Inc.

Vendor of security software and encryption technologies.

http://www.rsa.com

Purveyor Encrypt Webserver for Windows NT

This site describes software that provides encryption of data in transactions on the intranet. You can order directly from the site.

http://www.process.com/purchase/purencry.htp

Rutgers University Network Services WWW Security

Maintains an index of resources, including current security issues, mailing lists, and a list of documents under discussion by the WTS Working Group.

http://www-ns.rutgers.edu/www-security/index.html

Safetynet

Developer of anti-virus, workstation inventory, and other security software.

http://www.safetynet.com/

Security Dynamics

Provides information security hardware and software products. Holds a patent on the SecurID Card, a personal identification token supported by various host, server, and network systems.

> http://www.securid.com

Security First Technologies

Develops system security for UNIX, networks, and Internet communication authenticity products.

> http://www.sware.com/

Security for Businesses on the Internet

Web page with links to PGP and Kerberos software, companies that make digital-money and secure products, Cert's software archives, and security FAQs.

> http://www.catalog.com/mrm/security.html

The Security Resource Net

This site of the National Security Institute offers information on security related topics including computer alerts, products, a virtual security library, and more.

> http://www.nsi.org/

Security Management Online

Online version of the American Society for Industrial Security's monthly magazine. This site contains news and resources, updates on security issues, a discussion forum, and a marketplace of security-related products and services.

> http://www.securitymanagement.com/home.html

Seven Locks Software

This software company, maker of the *Safe@Home* anti-virus product, provides technical information and white papers on virus identification and prevention.

http://www.sevenlocks.com

"Snake Oil FAQ"

This document by Matt Curtin, chief scientist with Megasoft, Inc., explains how encryption systems work and offers tips on how to choose encryption software.

ftp://rtfm.mit.edu/pub/usenet/news.answers/
cryptography-faq/snake-oil

SSL Protocol Internet Draft

This site offers the highly technical Internet Draft describing the various features and implementation standards for Secure Sockets Layer security protocols.

ftp://ietf.cnri.reston.va.us/internet-drafts/
draft-freier-ssl-version3-01.txt

Symantec Antivirus Research Center

Symantec, maker of antivirus software, maintains a research library of recent computer viruses, a virus information database, information about Symantec products, and special coverage of Macintosh viruses.

http://www.symantec.com/avcenter.index.html

Technologic

An Atlanta-based corporation that specializes in network security and firewalls.

http://www.tlogic.com/

Tecmar Technologies

A producer of tape backup and data storage hardware.

http://www.tecmar.com

Telstra Corporation

This Australian company offers a Computer and Network Security Reference Index with links to WWW resources, software vendors and information security consultants, FTP sites, FAQs, and advisory agencies such as CERT and NIST.

http://www.telstra.com/au/info/security.html

Trusted Information Systems, Inc.

Provides security analysis and risk assessments, firewalls, mail encryption, and other tools for network and computer systems security.

http://www.tis.com

UniTrends Software Corporation

This software company provides specialized backup or utility software for the UNIX platform.

http://www.unitrends.com

The World Wide Web Security FAQ

This frequently-browsed FAQ provides an overview of security concerns and potential solutions. Topics include: threats to security, how to run a secure server, how to protect confidential documents, CGI scripts, client-side security, and information on Windows, UNIX, and Macintosh servers.

http://www.genome.wi.mit.edu/WWW/faqs/
www-security-faq.html

The WWW Virtual Library–Cryptography
> Links to many WWW resources on cryptography, PGP
> encryption programs, and other privacy-related WWW
> sources.
>> http://world.std.com/~franl/crypto.html

Small Networks

3Com
> This leading manufacturer of Network Interface Cards
> provides technology news, product information, and
> customer support.
>> http://www.3com.com/

ARDIS
> Claiming to be the largest provider of wireless networking in
> the US, this company offers information about its products
> and remote networking capabilities.
>> http://www.ardis.com

Artisoft
> This site provides information on products, support and
> training, and upgrades from the makers of LANtastic.
>> http://www.artisoft.com/

Bay Networks

This company offers products and services for networks of all
sizes, from desktop connectivity to service provider
backbones. Specializes in "adaptive networking" for
enterprise intranets. The site is searchable by key word and
maintains a database about network products, services,
technical innovations, and industry trends.

http://www.baynetworks.com

"Building and Auditing a Trusted Network Environment with Netware 4" (See Auditing)

Cabling FAQs

The Massachusetts Institute of Technology hosts this extensive
list of Frequently-Asked Questions about network cables.

ftp://rtfm/mit.edu/pub/usenet/news.answers/LANs/
cabling-faq

Charles Spurgeon's Ethernet Page

This page discusses Ethernet LAN Technology, including the
original 10-Mbps system, the 100 Mbps system, and Gigabit
Ethernet.

http://www.host.ots.utexas.edu/ethernet/
ethernet-home.html

Coffeehouse on the Internet

This is a question/answer and comment forum for persons
interested in client/server computing. Randy Langel of IBM
Southern California Consulting and Services answers daily
questions and posts topics that discuss how organizations can
implement client/server systems.

http://www.onr.com/oz/house.html

Communication Week Interactive

Billing itself as "the Home Page for the Networked
Generation," this electronic magazine features a news
department with audio updates; information about products
and services for small networks and the Internet; and
NetCentral, a list of online resources about the Internet,
intranets, and Local Area Networks.

http://techweb.cmp.com/cw/cwi

Compatible Systems, Inc.

Provider of Internet solutions for businesses.

http://www.compatible.com/

Data Communications on the Web

This free electronic magazine is designed for managers of
corporate networks. The site includes a "Products and
Services Buying Guide" that gives results of comparative lab
tests of network products.

http://www.data.com/

Digital Equipment Corporation Network Products Page

This section of the company's site includes a product list,
announcements of technology seminars, information on
training and events, and "customer application stories,"
which detail real-world solutions. Company stories are
indexed by company, industry, and product family.

http://www.networks.digital.com

Dobe Microsystems Online
> This firm, located in Eden Prairie, Minnesota, specializes in standard and customized designs for small networks and workgroups. Maintains a "Technology and Trends" magazine and provides lists of readings, a technology news page, and product and consulting information.
>> http://www.dobemicro.com/

Glossary of Networking Terms
> This helpful reference is maintained by Novell.
>> http://www.novell.com/icd/nip/nbg2iig.html

IBM Networking
> This page provides links to network hardware products and software solutions developed by IBM. It also features news stories about networking technology, software support information, and numerous links to other networking resources.
>> http://www.networking.ibm.com

Inside NetWare
> This electronic magazine offers tips for users and administrators of Novell *NetWare*. The publisher, Cobb Group, provides a free sample issue online.
>> http://www.cobb.com/inw/

Internet Knowledge Exchange (IKE)
> An interactive database designed to provide LAN support for UB network customers. At this site UB customers are taken step-by-step through network installation in order to resolve network problems.
>> http://www.ub.com:80/

Intranet Resources

One of the oldest, most comprehensive online resources about intranets. Features include FAQs, a Discussion Board, Internet and intranet news, articles and white papers, and an "Introduction to Intranets" tutorial for beginners.

http://www.intrack.com/intranet/

Introducing Windows 95

This database for users of the *Windows 95* operating system provides links to shareware sites, articles and white papers, betas, and plug-ins.

http://www.wlyn.com/win95.htm

Invisible Software

Contains a *Windows 95* Troubleshooting guide for installation and implementation of advanced features, such as peer-to-peer networking.

http://www.invisiblesoft.com/

KMJ Communications

Maintains a database of Network Interface Cards organized by type and vendor.

http://www.kmj.com/nic.html

LANTimes Online

This electronic magazine offers news about networking products, feature articles on management and installation issues, analysis of industry trends, and a Testing Center that reviews products. The index is searchable by subject.

http://www.wcmh.com/lantimes

Management Solutions

Quarterly Internet magazine about network and systems management.

Subscribe through e-mail to majordomo@netmgrs.co.uk with message: subscribe msia youraddress

Microsoft Windows NT Security and Administration

Hosted by New Technology Research, this site archives white papers about NT security and administrative issues.

http://www.ntresearch.com/

NetWare Connection Online

Aimed toward users of Novell *NetWare*, this site features articles, archives of past issues, and an online bookstore. A hard copy subscription is also available.

http://www.novell/nwc/

NetWare Users International

An independent, non-profit group of *NetWare* professionals maintains this site to support *NetWare* group users worldwide. Members receive product demonstrations, *conference information, and a monthly newsletter.*

http://www.novell.com/nui/

Network Computing Online

This electronic magazine explores all aspects of networking, from hardware and software to management issues. Includes news, features, and how-to articles about product implementation. The subscription is free.

http://techweb.cmp.com/nc/docs/

Network Interface Card Buyers Directory

LANTimes Online hosts this directory of NICs, which includes a product index and direct links to vendors.

http://www.lantimes.com/lantimes/buyers/index/slll.html

Network Management

Archive base for the newsgroup *comp.dcom.net-management* with FAQs, protocol-specific mailing lists, bibliographies, product descriptions, and links to other network management sites.

http://smurfland.cit.buffalo.edu/NetMan/index.html

Network Management Basics

This document, maintained by Cisco Systems, covers the background and evolution of networking and network management, including issues such as security and network auditing.

http://cio.cisco.com/univercd/data/doc/cinternet/ito/ 55018.htm

Network Management Mailing List

Discussion group for issues related to network management, including platform, station, and application issues.

Subscribe through e-mail to majordomo@netmgrs.co.uk with message: subscribe nms youraddress

Network Protocols FAQ

This FAQ list covers information on SLIP/PPP, Dynamic Host Configuration, Distributed Computing Environment, and more.

http://www.nst.doit.wisc.edu/network/protocols.html

Network World Fusion

A free electronic magazine about enterprise computing.
Maintains a large list of other online resources.
http://www.nwfusion.com/

Networking 101

This page of links for Macintosh users includes information
about LocalTalk and Ethernet, networking basics, and how to
connect Macintosh computers to PCs.
http://www.ambrisiasw.com/netgames/network

Networking: A Primer

This white paper at the Bay Networks site describes the
evolution of Local Area Networks and explains basic
terminology and operations, including how to connect a LAN
to the Internet.
http://baynetworks.com/Products/Papers/wp-primer.html

Newsgroups

bit.listserv.novell
comp.dcom.lans.novell
comp.os.netware.announce
comp.os.netware.connectivity
comp.os.netware.misc
comp.os.netware.security
comp.dcom.lans.ethernet
comp.dcom.lans.misc
comp.dcom.lans.token-ring
comp.dcom.net-management
comp.protocols.tcp-ip

Novell

The company maintains a large database about its products and services. The home page links to separate departments, including *Intranetware*, *GroupWise*, *ManageWise*, Beta Programs, and Novell/NT integration.

http://www.novell.com
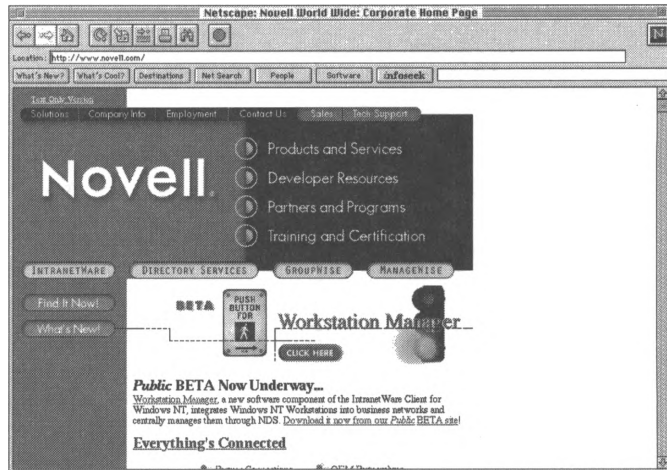
Novell FAQ

Choose from among FAQ lists for listserv groups.

http://mft.ucs.ed.ac.uk/novell/faq/nov-faq.htm

Novell NetWare Self-Teaching Tutorials

A list of video tutorials that help users master new and advanced features of Novell NetWare. The Tutorials are priced at $59.95 each.

http://www.candico.com/training/windows/n/
netwarecne4.html

Novell Networking Primer

This document explains basic concepts of networking and introduces readers to *NetWare* and other Novell products. Hardware, Internet connectivity, and operating systems are some of the topics covered.

    http://www.novell.com/manuals/primer.html

Novell Software Utilities

Maintained by Softseek.com, this site lists utilities and tools for Novell *NetWare*, including auditing, e-mail, and security helper applications. Click on the product name to read a review.

    http://www.softseek.com/Utilities/Networking/Novell/
    index.htm

Public Dialup Internet Access List (PDIAL)

Directory of public or commercial Internet access service providers.

    ftp://ftp.best.com:/pub/kaminski

Small Business Networking Solutions

Sponsored by Joseph Williams and Associates, an independent consulting firm, this site offers overviews of *Windows 95* Peer-to-Peer networking and Novell systems.

    http://jwa.perdido-key.com/network.htm

Upgrading from Windows 95 to Windows NT

Microsoft gives tips for users planning to migrate from the *Windows 95* operating system to *Windows NT*.

    http://www.microsoft.com/networkstation/95tontw.htm
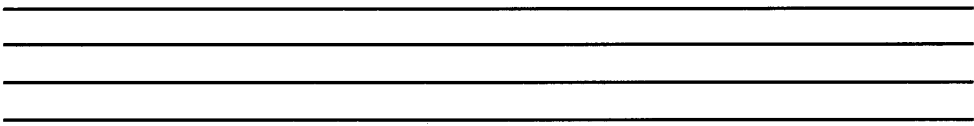
Virtual Motion

> This company develops and markets software products for
> LAN-to-Internet access, network security, remote networking,
> and network management.
>> http://www.virtualmotion.com/

Windows 95 Information Page

> Sponsored by the Windows Information Network, a Canadian
> user group, this site offers news updates and maintains
> information on books, online resources, vendors, newsletters,
> electronic magazines, and Microsoft Corp.
>> http://www.mbnet.mb.ca/win/Windows95.htm/

Windows 95 Magazine

> This online magazine reviews software applications, explains
> features of the *Windows 95* operating system, and announces
> shareware products. Back issues are archived.
>> http://www.win95mag.com/

Windows 95 White Paper Tips and Tricks

> Hosted by New Technology Research, this site lists white
> papers about *Windows 95*, including installation,
> Troubleshooting, multimedia, tips and tricks, anti-virus
> software, and online resources.
>> http://www.ntresearch.com/Win95.htm

Windows 95.com

> A service of Jenesys, LLC, this site maintains a database about
> *Windows 95*, covering user tips, 32-bit shareware and driver
> updates, and bugs and fixes. The Networking department
> features advice on installation and troubleshooting, and an
> Internet glossary.
>> http://www.windows95.com/

Windows NT

Information about *Windows NT* from Microsoft Corp.
http://www.microsoft.com/networkstation/details.htm

The Windows NT Information Network

This site claims to be the largest resource of NT information
on the Internet. Covers a range of topics, including
shareware, product news and updates, and NT service packs.
Searchable by keyword.
http://w3.ime.net/~pcteb/index.html/

Windows NT Magazine

This online magazine, published by Duke Communications
International, Inc., provides news, reviews, and product
services for *Windows NT.* A "Solutions Directory" currently
under construction will index more than 10,000 NT-
compatible software solutions for businesses. The site
requires a frames-capable browser.
http://www.winntmag.com

Windows NT Tips

Hosted by JSI Inc., this site bills itself as "Your Windows NT
Resource." Provides information on a variety of topics,
including applications and features, administrative policies,
and network management.
http://www.jsiinc.com/reghack.htm

The World Wide Web Security FAQ

A frequently-browsed FAQ providing an overview of security
concerns and solutions. Topics include: threats to security;
how to run a secure server; how to protect confidential
documents; CGI scripts; client-side security; and information
on Windows, UNIX, and Macintosh servers.
http://www.genome.wi.mit.edu/WWW/faqs/
www-security-faq.html

Software

(See also Software Publishers under Accounting heading.)

Adobe Acrobat Reader
Reader for Portable Document Format (PDF).
ftp://fwux.fedworld.gov/pun/irs_utl

CU-SeeMe
Basic and technical information about CU-SeeMe is available
at the WWW site listed below, and CU-SeeMe software can
be downloaded from the FTP site.
http://CU-SeeMe.cornell.edu
ftp://seeme.cornell.edu

DirectWare
Allows users to search for software by product or category
and order through e-mail.
gopher://gopher.nstn.ns.ca/e-mail/odyssey/dw-tes

GIF and JPEG Graphics
GIF and JPEG graphics as well as other shareware graphics
are available from this FTP site.
ftp://wuarchive.wustl.edu/pub/gif

GIF and JPEG viewing software
GIF and JPEG viewing software for *Windows* (LVIEW and
WINJPEG) can be accessed from this FTP site.
ftp://ftp.ftp.com/support/pub/windows

Gopher Software
Gopher Software Distribution for Gopher server and client software for Macintosh, Unix, Windows, Windows NT NEXT, Vax/VMS, Amiga, DOS, and VM/CMS.
gopher://boombox.micro.umn.edu/1/gopher
E-mail for information gopher@boombox.micro.umn.edu

Internet Relay Chat
For Windows
ftp://ftp.psi.com
For DOS
ftp://ftp.funet.fi/pub/unix/irc/msdos
For Macintosh
ftp://ftp.funet.fi/pub/unix/irc/mac

LISTPROC or the Unix Listserver (known as ListProcessor as of version 6.0a)
Provides functions similar to LISTSERV software but runs only on Unix computers. Support is provided for public and private hierarchical archives, moderated and non-moderated lists, peer lists, peer servers, private lists, address aliasing, news connections and gateways, mail queuing, digests, list ownership, owner preferences, crash recovery, batch processing, configurable headers, regular expressions, archive searching, and live-user connections via TCP/IP.
ftp://cs.bu.edu/pub/listserv
Request a guide through e-mail to a LISTPROC address with the message: help.

Listserv (LSOFT Listserv)

The original listserv software written by Eric Thomas.

http://www.lsoft.com

ftp://ftp.lsoft.com

E-mail for information info@bitnic.educom.org

Macintosh

Software for all purposes including virus-protection software, graphics viewing, sound applications, Quicktime applications, and much more.

ftp://uiarchive.uiuc.edu

ftp://ftp.apple.com

Mailserv

Vax/VMS-based e-mail distribution management software for discussion lists and electronic journals. However, it does not have automated discussion list archiving, nor file archive searching capabilities. Mailserv is included with the very widely used PMDF mail agent software package, available from Innosoft International, Inc., of Claremont, California.

For a guide, e-mail mailserv@ac.dal.ca with message: help

For a directory of e-conferences available on a specific mailserv site, e-mail to that e-mail address with the message: lists

MAJORDOMO

Unix-based e-mail distribution management software for discussion lists and electronic journals, written by Brent Chapman. Its development emerged out of discussions of the Internet Engineering Task Force Listserv Working Group. It functions similarly to other LISTSERV-like software in that commands sent as the text of e-mail messages are received by the MAJORDOMO software and processed.

ftp://ftp.GreatCircle.com in directory pub/majordomo

For information e-mail listmanager-owner@lanl.gov

Mosaic

World Wide Web Client Software

ftp://ftp.ncsa.uiuc.edu/Web

Netscape

World Wide Web Client software

http://home.netscape.com/

Newsgroups

biz.comp.software

biz.software

comp.databases

comp.mail.multimedia

Pegasus Mail and the Charon Internet Gateway Software

ftp://risc.ua.edu/pub/network/pegasus

PKZIP/UnZIP and other software for DOS, Windows and SCO Unix

ftp://ftp.jriver.com/pub/incoming

ftp://ftp.usask.ca/pub/dos/archivers/pkz204g.exe

RealAudio
> From this site you can access information about *RealAudio*
> and download software.
> > http://www.realaudio.com

RSA Data Security Inc. (See Security)

TCP/IP related software for Macintosh, DOS, Windows, and
> Unix.
> Includes WWW clients and servers, Winsock applications,
> NCSA Telnet, Graphics viewing software, sound applications,
> WAIS and Archie clients software, and more.
> > ftp://ftp.ncsa.uiuc.edu
> > ftp://ftp.utas.edu.au

Usenet "How to become a USENET site"
> Details and procedures for retrieving the Usenet newsgroup
> software, and the basics of setting it up.
> > ftp://rtfm.mit.edu/pub/usenet/news.announce.newusers

Uuencoding/Uudecoding software for DOS
> > ftp://ftp.ftp.com/support/pub/dos/uucode.exe

WAIS client software for Macintosh, DOS and Unix.
> > ftp://think.com/wais

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Web Browsers

Internet Explorer
http://www.microsoft.com/ie/

Mariner
http://www.mariner.ncd.com/

Mosaic
http://www.spyglass.com/products/
mosaic_download.html

Navigator
http://www.netscape.com/mirror/client_download.html

Web Surfer
http://www.netmanage.com/netmanage.apps/
websurfer.html

Web Server Software

American Internet's SiteBuilder
http://www.american.com/sitebuilder.htm

Big Software's Big Business Web Server
http://www.bigsoftware.com

InterNotes Web Publisher
http://www.lotus.com/inotes/

Lotus Domino
http://domino.lotus.com

Microsoft's Internet Information Server
http://www.microsoft.com/infoserv/

Netscape's Enterprise Server
http://home.netscape.com/comprod/server_central/

Netscape's FastTrack
http://www.netscape.com/comprod/server_central/
product/fast_track/index.html

Novell Netware Web Server
http://corp.novell.com/market/apr96/mm000253.htm

Open Market Secure Web Server
http://www.openmarket.com/servers/

O'Reilly and Associates' WebSite
   http://website.ora.com/
Process Software's Purveyor Intraserver
   http://www.process.com/pintnet.htp
Process Software's Purveyor WebServer
   http://www.process.com/intranets/dynamic.htp
SuperWeb Server
   http://www.frontiertech.com/products/superweb.htm
WebStar
   http://www.starnine.com/webstar/

Winsock
Software for TCP/IP for MS *Windows,* and other Winsock
compatible Internet tools.
   ftp://ftp.ftp.com/support/pub/winsock

WinZIP and other software for *Windows.*
   http://www.winzip.com

World Wide Web Server software for Macintosh.
   ftp://mrcnext.cso.uiuc.edu/pub/info-mac

World Wide Web Server software for Windows and Unix.
   ftp://ftp.ncsa.uiuc.edu/Web

Taxes

1040.com

Features selected Federal and state tax forms. Federal forms are available from 1991, a feature that makes this Web site unique.

http://www.1040.com

ATax-L

Discussions of all aspects of taxes including accounting for taxes.

Subscribe through e-mail to LISTPROC@scu.edu.au with the message:SUBSCRIBE ATax-L yourname

Commerce Clearing House

Offers summaries of new Federal tax legislation.

http://www.cch.com

The Cyber-Accountant

This site features tax and financial Q&A, state and federal tax forms, and international and US directories of financial professionals.

http://www.cyber-cpa.com

Essential Links to Taxes

Hosted by Applied Research Technologies, this site provides links to forms and instructions, tax tips, software, state tax information, relevant news articles, mailing lists, commercial and international tax information, and the federal tax code.

http://www.el.com/ToTheWeb/Taxes

FAQs about changes in income tax laws (only for 1994)

http://www.best.com:80/~ftmexpat/faq1994/faq1994.html

Federal publications such as the *Congressional Record, Federal Register, Federal Regulation, Public Laws*, etc., (See Government and Governmental Accounting.)

Frank McNeil's TaxSites

Provides information about tax codes, as well as some regulations, rulings, procedures, and IRS notices. Complete listing of online foreign tax treaties and online information for expatriates.

http://www.best.com/~ftmexpat/html/taxsites.html

Internal Revenue Code

Keyword index of the Internal Revenue Code.

http://www.fourmilab.ch/ustax/ustax.html

Internal Revenue Service

Home Page

http://www.irs.ustreas.gov

Tax forms, instructions and new regulations

http//www.irs.ustreas.gov/prod/forms_pubs/

Newsgroup FAQ about miscellaneous tax issues
misc.taxes

Research Institute of America
Provides articles on Federal and state taxes, as well as
pension benefits and estate planning. Up-to-date news on
pending tax changes.
http://www.riatax.com

State Tax Information
Alaska

- Alaska Department of Revenue
  http://www.revenue.state.ak.us/index.htm
- Cases
  - Supreme Court Opinions and a second collection
    (recent only)
    http://touchngo.com/sp/sp.htm
    http://www.alaska.net/~akctlib/sp.htm
  - Court of Appeals Opinions (recent only)
    http://www.alaska.net/~adctlib/ap.htm
- Information on various state taxes from the Alaska
  Income and Excise Audit Division
  http://www.revenue.state.ak.us/forms/index.htm

Arkansas

- Income tax forms from Drake Software
  ftp://ftp.dnet.net/pub/Drake/state_taxforms/AK/
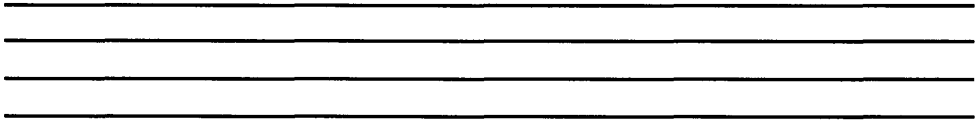
California

- Revenue and Taxation Code - keyword search
    http://leginfo.public.ca.gov/calaw.html
- Recent Opinions of the California Supreme Court and
    the California Court of Appeals
    http://www.callaw.com/welcome.html
- Forms and other information from the California
    Franchise Tax Board
    http://www.ftb.ca.gov

Colorado

- 1994-96 Forms and other information from the
    Colorado Department of Revenue
    http://www.state.co.us/gov_dir/revenue_dir/
    home_rev.html

Delaware

- Division of Revenue home page is under construction
    http://www.state.de.us/govern/agencies/revenue/
    revenue.htm

Florida

- Statutes
    http://www.scri.fsu.edu:80/fla-leg/statutes/
- Florida Department of Revenue Web site has general
    information
    http://fcn.state.fl.us/dor/revenue.html
    Dial-in access to Tax Law Library: (904) 488-3855
    Fax-on-demand forms and information:
    (904) 922-3676

Georgia

- Overview of corporate and individual taxes from the Chattanooga, Tennesse, DataBook
  http://www.chattanooga.net/rvrvally/Page8.html
- Income tax forms from Drake Software
  ftp://ftp.dnet.net/pub/Drake/state_taxforms/GA/

Hawaii

- Information, tax forms and instructions from the Department of Taxation
  http://www.state.hi.us/tax/tax.html

Idaho

- Cases
  - Supreme Court Opinions
    http://.www.state.id.us/judicial/scopins.html
  - Court of Appeals Opinions
    http://www./state.id.us/judicial/caopins.html
- Income tax forms from Drake Software
  ftp://ftp.dnet.net/pub/Drake/state_taxforms/ID/

Illinois

- Cases: Supreme Court Opinions (under construction)
  http://www.kentlaw.edu/isc/
- Illinois Department of Revenue has information and sales, income and other tax forms
  http://www.revenue.state.il.us

Indiana

- Code: Title 6 Article 8.1. Department of State Revenue; Tax
  http://www.law.indiana.edu/codes/in/6/art-6-8.1.html
- Cases: Opinions of the Supreme Court, Court of Appeals and Tax Court
  http://www.law.indiana.edu/law/incourts/incourts.html

Iowa

- Iowa Department of Revenue and Finance
  http://www.state.ia.us/government/drf

Kansas

- Income tax forms from Drake Software
  ftp://ftp.dnet.net/pub/Drake/state_forms/KS/

Kentucky

- Summaries of 1990-1996 Legislation
  http://www.lrc.state.ky.us/legisltn/legisltn.htm

Maryland
- Overview (under construction)
  http://mitc.org/MBINet/Taxes/taxes.html
- Income tax forms from Drake Software
  ftp://ftp.dnet.net/pub/Drake/state_forms/MD/
- Information from the Maryland Comptroller of the
  Treasury
  http://www.comp.state.md.us/main.htm

Massachusetts
- Massachusetts Department of Revenue - Income Tax
  Forms and Instructions, Publications, etc.
  http://www.magnet.state.ma.us/dor/

Michigan
- Income tax forms from Drake software
  ftp://ftp.dnet.net/pub/Drake/state_forms/MI/

Minnesota
- 1994 and 1995 Tax Forms and Instructions:
  Individual, Partnership, Property, Corporate,
  Withholding and Other
  http://www.state.mn.us/ebranch/mdor/
  taxforms.html
- Revenue Notices, Fact Sheets and other information
  from the Minnesota Department of Revenue
  http://www.state.mn.us/ebranch/mdor/

Missouri
- Income tax forms from Drake Software
  ftp://ftp.dnet.net/pub/Drake/state_forms/MO/

Nebraska

- Income tax forms from Drake Software
    ftp://ftp.dnet.net/pub/Drake/state_forms/NE/

New Hampshire

- Information on the Department of Revenue
    Administration Electronic Bulletin Board System
    http://www.state.nh.us/revenue/revenue.htm

New Jersey

- Income tax forms from Drake Software
    ftp://ftp.dnet.net/pub/Drake/state_forms/

New Mexico

- Income tax forms from Drake Software
    ftp://ftp.dnet.net/pub/Drake/state_forms/

New York

- Statutes
    telnet://assembly.state.ny.us/
- State Department of Taxation and Finance (quite
    limited information)
    gopher://unix2.nysed.gov:71/11/agencies/
    executive/tax
- Cases: Court of Appeals Opinions
    http://www.law.cornell.edu/ny/ctap/overview.html

North Carolina

- Cases: Supreme Court Opinions
    http://www.nando.net/insider/supreme/supco.html
- Information on state and local taxes
    http://www.commerce.state.nc.us/commerce/
    busiclim/taxindex.html

North Dakota
- Income tax forms from Drake Software
    ftp://ftp.dnet.net/pub/Drake/state_forms/ND/

Ohio
- Forms, publications and other information from the Ohio Department of Taxation
    http://www.state.ohous/tax/
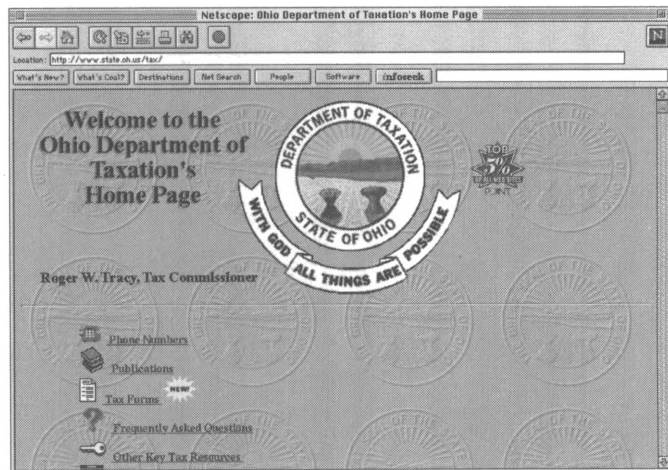
Oklahoma
- Court Decisions: Supreme Court Opinions (recent only)
    http://www.ou.edu/okgov/
- Information on the Oklahoma Tax Commission - no tax information
    http://www.oklaosf.state.ok.us/osfdocs/budget/bb96-695.html

Oregon

- Tax Forms and other information from the Oregon Department of Revenue
  http://www.dor.state.or.us/
- Publications on Personal Corporate and Other Taxes
  gopher://gopher.state.or.us:70/11/.d58.dir

Pennsylvania

- Department of Revenue
  http://www.revenue.state.pa.us
- Income tax forms from Drake Software
  ftp://ftp.dnet.net/pub/Drake/state_forms/PA/

South Carolina

- Information from the Department of Revenue
  http://www.state.sc.us:80/dor/
- Income tax forms from Drake Software
  ftp://ftp.dnet.net/pub/Drake/state_forms/SC/

South Dakota

- Administrative Tax Rules and Session Laws
  gopher://gopher.state.sd.us/1 1\files\legis
- Information from the Department of Revenue
  http://www.state.sd.us/state/executive/revenue/revenue.html

Tennessee

- Overview of corporate and individual taxes from the Chattanooga, Tennesse, DataBook
  http://www.chattanooga.net/rvrvally/Page8.html
- Department of Revenue
  http://www.state.tn.us/revenue/

<u>Texas</u>

- Tax Rules searchable by keyword (under construction)
  http://window.state.tx.us/taxinfo/rulenogo.html
- Information
  - Tax Forms
    http://www.window.texas.gov/taxinfo/taxforms/
    00-forms.html

<u>Utah</u>

- Utah State Code
  gopher://gopher.utah.edu/11/Off Campus
  Information/State of Utah/Utah State Code
- Package X
  http://txdtm01.tax.ex.state.ut.us:80/main/
  packxltr.htm
- General tax information from the Utah State Tax
  Commission
  http://txdm01.tax.ex.state.ut.us:80/

<u>Vermont</u>

- Bills Enacted
  gopher://dol.state.vt.us:70/
  11GOPHER_ROOT3:[PUBLAW95]
- Cases: Supreme Court Opinions
  gopher://dol.state.vt.us:70/
  11GOPHER_ROOT3:[SUPCT]

Washington
- Revised Code of Washington
    gopher://leginfo.leg.wa.gov:70/1/pub/rcw
- Revised Code of Washington (Excise taxes - Title 82,
    Estate taxes - Title 83 and Property taxes - Title 84).
    http://leginfo.leg.wa.gov/www/rcw.htm
- Overview of Department of Revenue
    http://www.wa.gov/DOR/wador.html

West Virginia
- Detailed state tax information from Simpson &
    Osborne, PC
    http://www.sandocpas.com/

Wisconsin
- Overview of Department of Revenue
    http://www.dor.state.wi.us/
    Fax-a-form automated forms retrieval system:
    (608) 261-6226

Wyoming
- Department of Revenue
    http://www.state.wy.us/~revenue/revenue.htm
- Information
    http://www.buffalo.com/wy_eds/Sec2.htm

Tax Analysts
    Sponsored by a non-profit organization, this site offers a
    customer support line, documents and directories, and "Tax
    Base," a daily news wire for subscribers. Visitors can also
    browse the archives of 27 discussion groups, which are
    moderated by members of the Tax Analysts' staff.
    http://www.tax.org/default.htm
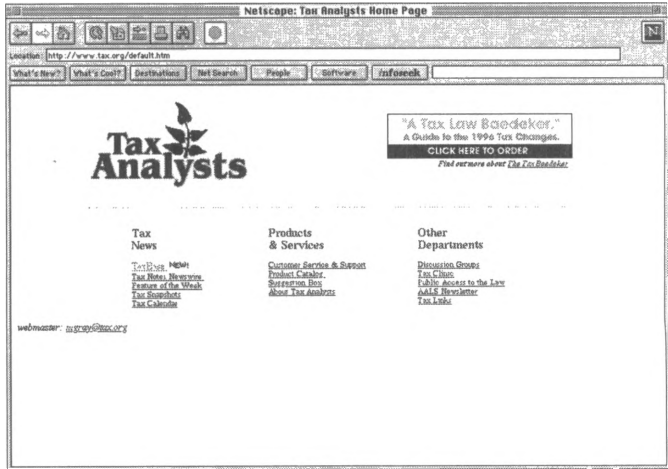
Tax and Accounting Sites

Dennis Schmidt, Associate Professor of Accounting at the
University of Northern Iowa, offers a comprehensive index of
Internet resources for academics, students, and professionals.
http://www.uni.edu/schmidt/bookmark.html

Tax Department Internet Site

Hosted by Harter, Secrest, & Emery, a Rochester, N.Y., law
firm, this site offers tax resources, attorney articles,
newsletters, and tax practitioner biographies.
http://www.hsetax.com

Tax Digest

An e-mail newsletter on current tax issues maintained by
Gary Hoskins, MBA, CPA. Subscribe by e-mail to
TaxDigest@aol.com or review online samples on WWW.
http://www.unf.edu/students/jmayer/taxdig.html
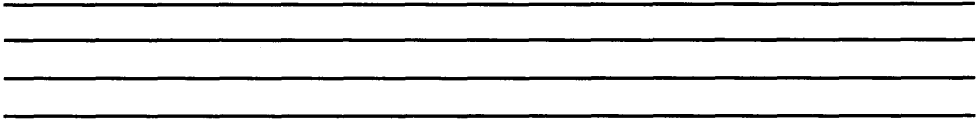
Tax Management

> Subsidiary of Bureau of National Affairs that offers Tax
> Highlights, BNA's Tax Practice Series Bulletin, Tax
> Management's Weekly Reports, and a column called "The
> Practitioner Speaks," where a roundtable of practitioners
> discuss a particular tax issue on an in-depth basis.
> > http://www.bna.com/

Tax Notes Mailing Lists

> Accounting (accounting.group@tax.com)
> Financial Institutions (banking.group@tax.com)
> Tax-Exempt Bonds (exemptbond.group@tax.com)
> Bankruptcy & Insolvency (bankruptcy.group@tax.com)
> Business Tax Issues (biztax.group@tax.com)
> Criminal and Civil Violations (criminal.group@tax.com)
> Employment Taxes (employment.group@tax.com)
> Estate, Gift, & Trust (estate.group@tax.com)
> Excise and User Fees (excise.group.tax.com)
> Exempt Organizations (exempt.group@tax.com)
> Farm and Ranch (farm.group@tax.com)
> Individual Income Taxes (individual.group@tax.com)
> International Taxation (international.group@tax.com)
> Legislative and Policy Issues (legpolicy.group@tax.com)
> Natural Resources (resource.group@tax.com)
> Partnership Taxation (partnership.group@tax.com)
> Pensions, Benefits, ERISA (pension.group@tax.com)
> IRS Practice and Procedure (practice.group@tax.com)
> Real Estate (realestate.group@tax.com)
> S Corporations (scorps.group@tax.com)
> State and Local Taxation (statetax.group@tax.com)

> > Subscribe through e-mail to the individual group address.
> > Type "Subscribe Me" and your e-mail address in the
> > subject line.

Tax Notes Today Database (See Databases)

tax-prct-issues
> Subscription controlled e-mail discussion group sponsored by
> Kent Information Services, Inc., and TAPNet that focuses on
> needs of tax professionals. Subscribe at either:
>> http://www.kentis.com
>> http://www.tapnet.com.

Tax Prophet
> Offers an interactive tax worksheet for determining whether a
> foreign taxpayer is a US resident for tax purposes as well as a
> number of diverse articles on taxes. Sponsor is attorney
> Robert L. Sommers. Plus tax FAQs.
>> http://www.taxprophet.com

Tax Research Services
> An information center staffed by CPAs and tax attorneys who
> can answer infrequently-asked questions and access hard-to-
> find forms dating back to the 1970s. The site is dedicated to
> helping tax professionals meet client needs. Call 1-800-333-
> TAXX.
>> http://www.netrex.com/taxresearch/

Tax Resources
> A comprehensive index of Internet resources maintained by
> the University of Iowa, College of Business Administration.
>> http://www.biz.uiowa.edu/misc/links/acct_tax.html
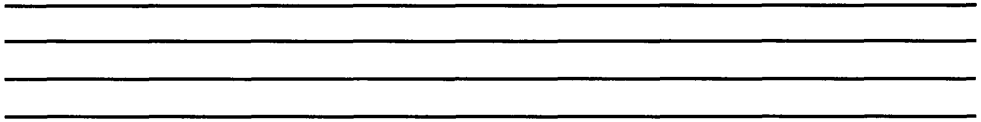
Tax Wizard

Provides a comprehensive tax organizer online, as well as a description of services, an agreement for services, a credit card payment mechanism, a schedule of fees, and menu connections to other useful tax-related Internet sources.
http://taxwizard.com

Tax World

Disseminates tax information as a public service and contains an index of tax information sites and other information of interest to students, academics and professionals. The site is the work of Thomas C. Omer, Associate Professor, Northeastern University.
http://omer.actg.uic.edu/home

Taxing Times

Maxwell Technologies, Inc., provides tax information, including tax forms available in TIFF, PostScript, and Adobe Portable Document Format.
http://www.scubed.com/tax/tax.html

TaxWeb

Tax site oriented to the taxpayer. Offers downloadable forms, general tax information, details of the IRS's enforcement record, and a list of phone numbers to call to check on the status of refunds.
http://www.taxweb.com

TimeValue Software's IRS Code and Subject Telephone Directory

This site provides more than 100 phone numbers and the names of the IRS contact for each IRS Code section.
http://www.timevalue.com/irsindex.htm

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Villanova Tax Law Compendium

>Student and faculty papers on various tax topics from the
>Villanova Center for Information Law and Policy at Villanova
>University School of Law
>>http://www.law.vill.edu/vill.tax.l.compen/

Yahoo Tax Page

>Provides links to tax information sources, including forms,
>FAQs, newsgroups, and software reviews.
>>http://www.yahoo.com/Economy/Taxes

Appendix 8-1:
Basic and Advanced HTML for Web Site Design

In Chapter 8, you learned how using Internet technologies can give your organization a competitive edge. We discussed the advantages Internet technologies can offer your clients and employees as well as how to choose content for a Web site or intranet page. To design Web documents, you will need to understand at least the basic features of Hyper Text Mark-up Language, a document-formatting language. Whether you choose to host a site on the World Wide Web or create a home page for an intranet, this Appendix will show you how to create HTML documents. The discussion is split into two main sections for easy reference: basic HTML and advanced HTML. Whether you want to learn how to use an HTML editor to create simple documents or incorporate advanced features such as tables and frames, this Appendix will provide you with a working knowledge of HTML that will allow you to create documents capable of supporting text, frames, graphics, and hyperlinks–giving your organization sophisticated, polished Internet presence.

Following the example of Chapter 8, which talked about using Internet technologies both externally (hosting a WWW site) and internally (designing an intranet), this Appendix will offer guidelines for creating both Web pages and intranet pages. Both

require the use of HTML. When putting these guidelines into practice, however, you will want to consider the differing uses of a Web site, which can be seen by millions of people—many of whom are unfamiliar with your organization—and an intranet page, which is accessed within an organization (or by customers and clients who are familiar with it). No matter what its use, any HTML document representing your organization should be designed to do so appropriately and professionally.

General Design Guidelines

In Chapter 8, we discussed various ways to develop content for your Web site or intranet. Before we get into the nitty-gritty of Hypertext Mark-up Language, we'd like you to consider a few general content issues that will help you create useful documents for your organization. These areas include the following:

- Establishing a corporate voice.
- Making use of non-linear documents.
- Controlling document size.
- Using graphics.

Corporate Voice

The ease-of-use and open systems power of Web documents can tempt content developers to forget that the Web site or intranet, like other corporate documents, must conform to the same voice and style conventions that characterize other organization publications. Establishing and enforcing guidelines
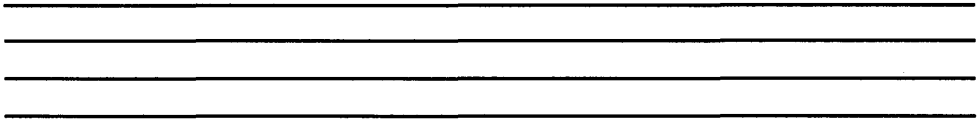
for corporate voice will enhance the usability of your site and reduce the learning curve faced by your staff members.

When planning content for a Web page or intranet, consult with marketing personnel to develop writing guidelines for content developers. You may wish to create a style guidelines page for content developers to refer to with links to sample documents, writing guidelines, and document templates. Keeping your HTML documents consistent and professional is especially important if you are designing a Web site that will introduce visitors to your organization, or if you plan to make some or all of your intranet available to clients and other business associates.

Create Non-Linear Documents

Hyperlinks have revolutionized the ways that we read documents. Traditionally, users read documents from top to bottom, from beginning to end. The job of the writer was to attempt to present the material in the order that would fit the needs of the largest group of readers. But hyperlinks allow for a non-linear reading experience in which readers can stop at any point and select a more focused topic by clicking on related words that have been anchored to other documents. The author of hyperlinked documents does not need to guess what order will best suit the needs of readers, since readers can select their own method for studying the available materials. Be certain that the documents you and others create make use of this intuitive research strategy.

Control Document Size

Breaking a large document into smaller hyperlinked documents can contribute to more efficient site performance. Information can be transmitted across a network more quickly and with less errors when large documents are broken into smaller units. Similarly, smaller documents require less packets and less download time for users, an important consideration whether you are creating presence on the World Wide Web or for an organizational intranet. For example, a user who must download the complete Employee Handbook from the intranet in order to review the organization's insurance coverage will need to wait longer (tying up crucial network and human resources) than the employee who can link directly to the insurance information she needs. Or, a Web surfer interested in the content at your site may grow impatient waiting for a long document to load and click to another site offering similar content. If resources allow, it's a good idea to control document size by dividing a large amount of content into several pages, rather than one long scrollable text.

Using Graphics

Graphics can add a lot of interest to a page. Carefully selected systems of icons can even facilitate fast and easy navigation through your Web site or intranet. Offering, for example, an easy-to-identify button that connects users to a section of your Web site that provides tax information can be a helpful feature. Just as with letterhead or company logos, graphics should help to develop a consistent organizational image. You might even consider including a set of coordinated navigation graphics that can be made available for all content developers to use when they are designing documents to post on the intranet or Web site.

However, you must consider the lengthy download times that are often required for sophisticated graphics. We have all experienced the initial thrill of watching a new colorful graphic display on our screens. But after one or two visits to a site, we are more likely to turn off the browser's image download feature to avoid the long wait for a graphic we've already seen. You may choose to offer any number of graphic displays, but make these decisions carefully. When deciding whether or not to use a particular graphic, examine what the graphic adds to the site and how long that value will last. If the graphic is only a flashy picture that does not contribute to the corporate voice, assist in navigation, or develop the value of the Web page content, you should probably eliminate it from your Web page.

Building Basic HTML Documents

Designing content for your Web page is only part of the challenge–getting it to appear on computer screens is the rest. When writing new HTML documents, you may take any of three basic approaches:

1. Use a word processor with an HTML conversion add-on.
2. Use a simple text editor and type in HTML tags.
3. Use an HTML editor.

Using a Word Processor with an HTML Conversion Add-On

When using a word processor with an add-on, simply create the document as you would any word-processed document, defining formatting and layout issues as you compose with your

word processor's formatting tools. Then, use the add-on utility to save the document as an HTML file. Typically, the add-on tool will interpret your formatting decisions as the HTML equivalents that have been defined in the software (in some software, you can pair specific HTML tags with word-processing codes). You should expect to refine these documents; unless you have customized it, the add-on's interpretation may not match your intentions. Some of these add-ons offer a WYSIWYG (what you see is what you get) mode that shows an approximation of the HTML display as you work. As you saw in Chapter 6, many browsers display features differently, so these documents may need to be refined after you have tested them in several browsers.

Using a Text Editor

You may also use any simple text editor or word processor as long as you can save your work in ASCII text format. (Word-processor file formats, such as the *.doc* format in Microsoft *Word*, save hidden characters that may interfere with the way a Web document displays.) Using a word processor allows you the benefit of using the word-processing features (like spell check) to refine the document content. After this refining process, you can type in the necessary HTML tags and save the document as an HTM or HTML document (depending on the number of letters you are permitted to have in an extension in the software you are using).

Using an HTML Editor

Many people prefer to use special HTML editors, such as *HTMLed* or *HoTMetaL*. Using an HTML editor works much like using a word processor, but editors also offer tools that

automatically insert HTML tags. These editors supply the benefit of limiting tags to ones that will work plausibly in the place indicated by the author's cursor. For new content developers, this can be an especially useful feature. In addition, HTML editors include a preview function, so with a click of your mouse you can view your document in a Web browser before posting it to the WWW or to your intranet.

Using an HTML editor is a little like using a calculator: although the machine does most of the work, it's still a good idea to know the multiplication tables. The same is true of understanding the underlying source code of your HTML document. Web pages often seem sophisticated and complex, but HTML is surprisingly easy to learn and implement. When looking at an HTML document outside a Web browser, the page appears as simple text with letters and words displayed inside greater-than and less-than brackets (< >). Everything inside brackets is an HTML tag and is left out of the display when the document is opened in a Web browser. Tags define and control specific areas of a document, so in most cases, there is a "start tag" and an "end tag," which is distinguished by a forward slash. (A few HTML tags do not require end tags, such as **<LI>**, the tag that indicates an item in a list. Since the next **<LI>** tag indicates a new list item, it also "ends" the previous **<LI>** tag.)

Typical HTML tags are common words, abbreviations, or notations, and their functions are usually easy to guess. For example, the HTML tag that indicates a group of words that will be represented in the title bar of a browser is, predictably, **<TITLE>**. (*Note: HTML tags are case-insensitive. That is, **<title>** is not treated any differently from its capitalized equivalent **<TITLE>** when interpreted by a Web browser.*) When using some tags, you can give more specific directions by using

"attributes," which define special features, such as the size of graphics or the type of border to use in a table.

All HTML documents have two basic parts—a head and a body. The head is reserved for giving the document a title and indicating any unusual parameters a browser may be using (such as Netscape-compliant special features). The body of an HTML document includes the text (and graphics) that are the meat of the document's content. The entire document is enclosed in tags that identify it as HTML. Thus, all HTML files have at least these basic tags:

<HTML>	Identifies the document as HTML.
<HEAD>	Identifies information about the document.
<TITLE>	Identifies the document title.
</TITLE>	Marks the end of the title.
</HEAD>	Marks the end of information about the document.
<BODY>	Identifies the main content of the document.
</BODY>	Marks the end of the document's content.
</HTML>	Marks the end of the HTML document.
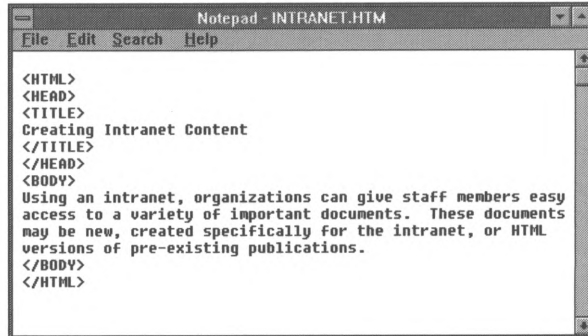
To display an electronic document immediately, you could simply save the file as text and copy the text into the document between the body tags of this basic frame. Although not pretty or integrated, the text will be available through a Web interface.

The simplest way to understand how HTML tags work in relation to Web documents is to look at the HTML instructions that appear in the document's source file, like the one displayed below. This document illustrates how HTML tags surrounding three distinct items of text define the placement and appearance of the document when it is displayed in a Web browser. First,

look at the source file created by typing the HTML tags and the text of the document in *Notepad*.
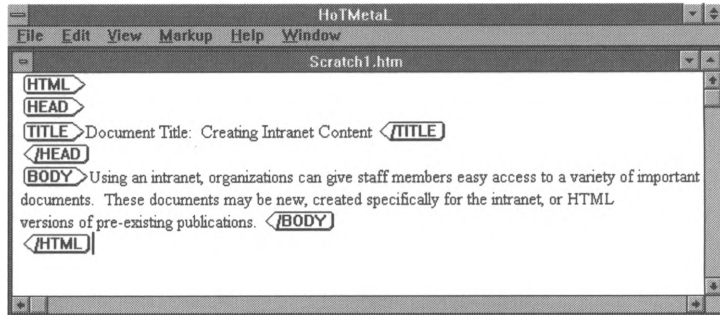
The same source document created with the simple HTML editor *HoTMetaL* looks like this:

Now compare the source files to the screen shot below that shows how this document appears when interpreted by the Microsoft *Internet Explorer* Web browser.

Figure A8-1.3
HTML source file displayed in Internet Explorer.
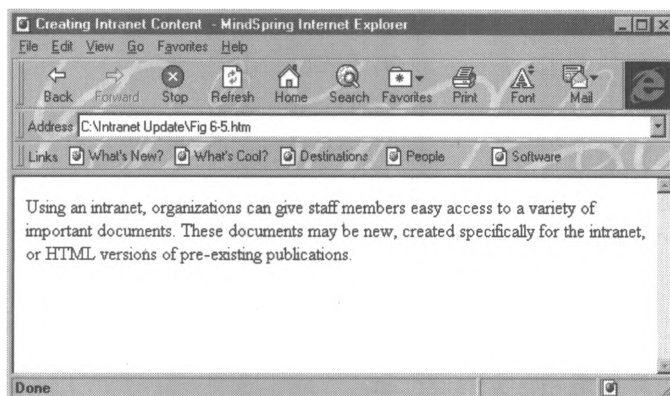
The tag sequence **<HTML></HTML>** tells the browser that all the text within the tags is to be treated as an HTML document. The tag sequence **<HEAD></HEAD>** in combination with the tag sequence **<BODY></BODY>** distinguish the two main parts of an HTML document–information about the document (head) and the document itself (body). The tag sequence **<TITLE></TITLE>** tells the browser to display the text between the tags in the top bar of the browser window. The actual body of the document is the text. (The end of the body text is marked by the second **</BODY>** tag.) Notice that the browser is displaying a file at a local computer (the function is **file:///**) instead of a file from a remote site like those URLs you see when browsing the WWW (**http://**). One of the conveniences of developing content for a Web page is that developers can create documents, save them in a local directory, and view them through Web browser software before making them available to others by uploading them to a Web server.

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Basic HTML Document Features

The content of Web pages, that is, the body of the documents, can be arranged and formatted in various ways. First, we will discuss basic document features including:

- Appearance of text.
- Content divisions.
- Lists.
- Hyperlinks.
- Images.
- Feedback mechanisms.

Appearance of Text

Text can be represented in many ways in an HTML document. The most common text effects are italics and bolding. Creating either of these effects is simply a matter of inserting the appropriate tags in a text document that is framed by the HTML codes we described above. Text can be formatted using either style tags that assign specific style attributes to the text, or content tags that attempt to adjust style based on the way the text is intended to be read. For example, if you want to emphasize text in relation to other text in a document, you might choose the content tag pair **<EM></EM>**. Most browsers will interpret these tags by italicizing the word(s) between the tags. On the other hand, style tags are more straightforward; if you want to italicize a group of words in a document, simply place the style tags for italics **<I></I>** around the word(s) you wish to be italicized. To represent text in boldface lettering, you could use the content tag **<STRONG></STRONG>** which tells the browser to represent the text more strongly in relation to
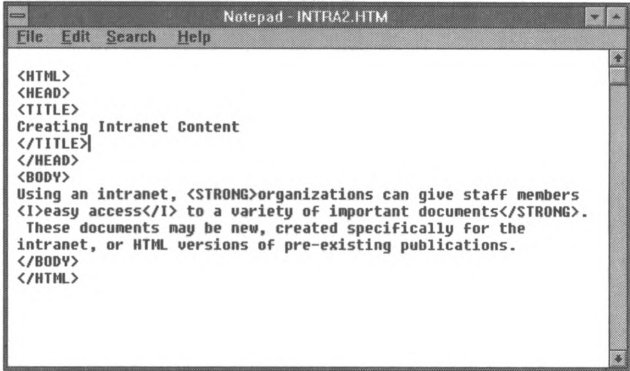
other text on the page, a direction that most browsers interpret as bolding. Or you could use the style tags **<B></B>**.

One interesting capability of HTML tags, which can be used to enhance these features, is tag nesting. By using HTML tags inside other tags, you can create multiple effects. For instance, in the HTML document below, the **<I></I>** tag pair is nested inside the **<STRONG></STRONG>** tag pair.

Figure A8-1.4
Nesting HTML
tags in Notepad.

The Web browser interprets these nested tags by bolding everything between the **<STRONG></STRONG>** tags, including the text between the **<I></I>** tags, which tell the browser to add the additional italicized treatment to the bolded words. The resulting Web display looks like this:

Figure A8-1.5
Nested tags displayed in Internet Explorer.
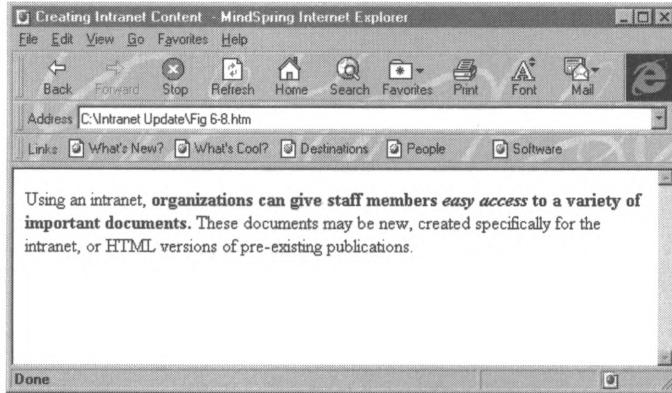
Content Divisions

In addition to adding special style features to your text, you will be creating larger divisions to help users understand the way documents are organized. The most common tool for organizing text is a paragraph. To represent a group of text as a paragraph, set apart spatially in relation to the rest of the body text, use the paired tags **<P></P>**. You may also need to break lines of text, and since Web browsers do not read hard returns in word-processed documents, these breaks must be artificially created using the tag **
. Sometimes you may want even stronger visual breaks, in which case you might choose to use a device called a "hard rule." A hard rule is simply a straight horizontal line that extends across a Web page. Using the tag **<HR> inserts a hard rule wherever you have placed the tag in your document.

Another common method of organizing text is through separating sections of the body with descriptive headings. Headings are typically distinguished from the body text through bolding and differently-sized type. Most Web browsers acknowledge six levels of headings that are indicated in HTML documents with the following paired tags: **<H1></H1>**,

<H2></H2>, <H3></H3>, <H4></H4>, <H5></H5>, <H6></H6>. Look at the browser display below to see how it interprets some of these features.

Figure A8-1.6
Content dividers displayed in Internet Explorer.
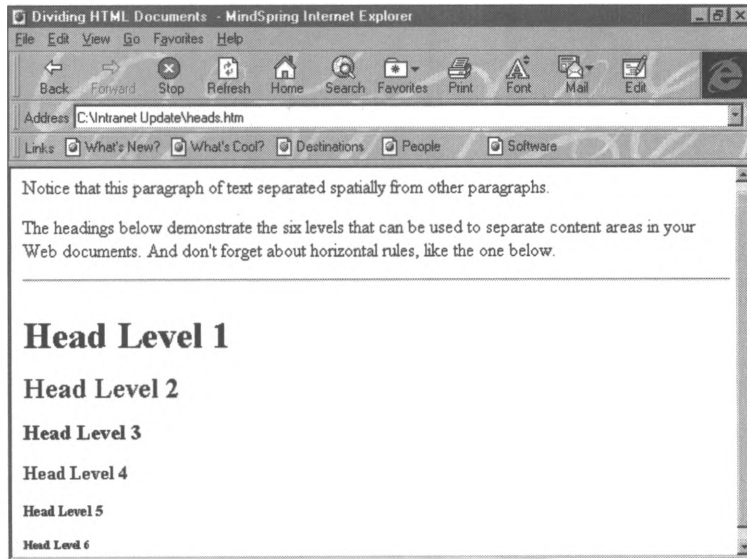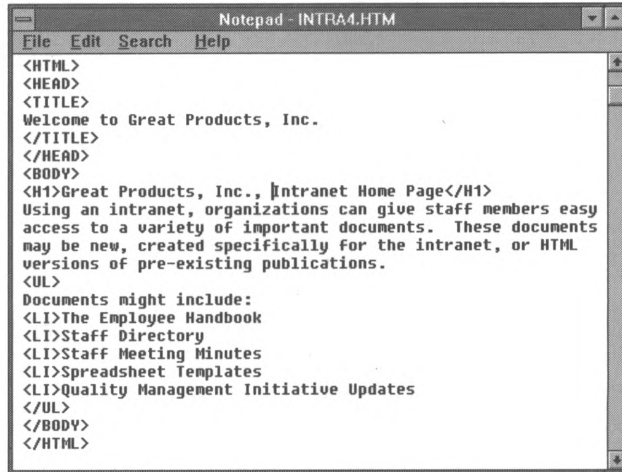
Lists

A list is one of the simplest and most common organizational effects you might want to create in an HTML document. For example, you may want to include a list of the documents available to staff members, or a list of departments with intranet sites as part of an intranet home page display. Lists can be either ordered (numbered) or unordered (bulleted). For example, let's create a simple Web document with a list of possible intranet documents. The HTML source document would look like this:

Figure A8-1.7
HTML source file for an unordered list.

The corresponding display on the browser would look like this:

Figure A8-1.8
An unordered list displayed in Navigator.
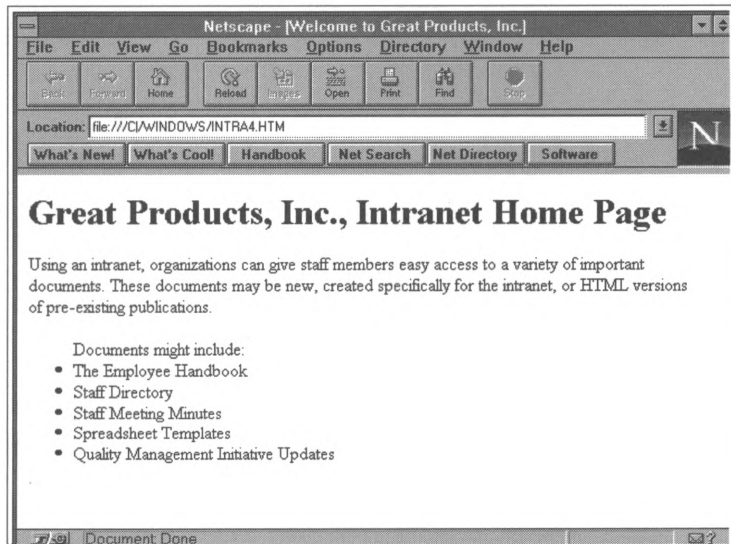
In this document, the HTML unordered list tag sequence
<UL></UL> tells the browser to treat all the text within the tags
as an unordered (bulleted) list. Each item in the list is indicated

by the list item tag **<LI>**. Notice that the **<LI>** tag does not require a partner since the next **<LI>** tag automatically indicates the next item in the list (although some HTML editors will automatically insert the unnecessary HTML partner tag **</LI>**). To create a list that uses numbers rather than bullets, the ordered list tag sequence **<OL></OL>** replaces **<UL></UL>** and the corresponding Web page looks like this:

Figure A8-1.9
An ordered list displayed in Navigator.
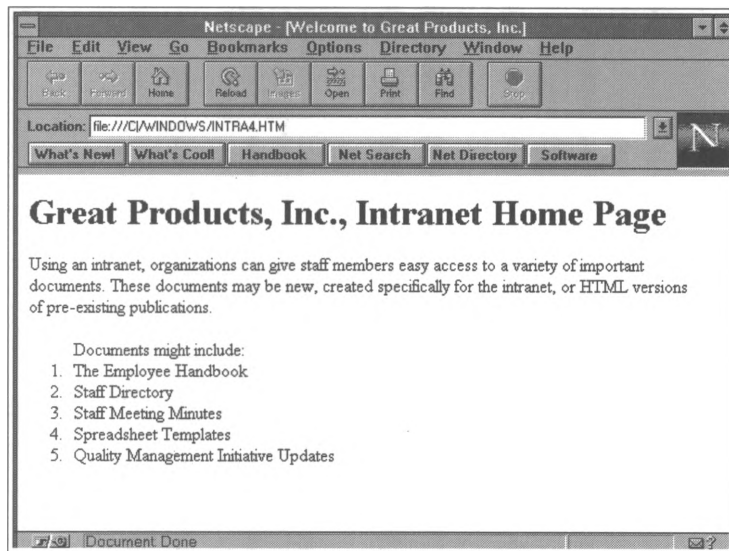
Hyperlinks

The single feature that has come to characterize Web pages (and the primary reason Web sites are so easy to use) is hyperlinks. Hyperlinks give users the ability to retrieve and display different resources simply by clicking on an associated word or phrase in an HTML document. To create a hyperlink to a document, you only need to know its location, called its URL (Uniform Resource Locator). In general, the address that corresponds to a URL will be something like **http://address/ directory/filename.html**. To create a hyperlink, you simply

"anchor" the URL of the new document to the related word or phrase in the original HTML document.

As you have probably guessed, anchoring your document to another document is simply a matter of typing in the appropriate HTML tags. The tag pair for creating anchors is **<A></A>**. Placed around the word or group of words that will act as the launching point, these tags will tell the browser to display the text inside as blue and/or underlined words. To anchor to a document, you must also include a reference to the URL in your tag, using the notation HREF and an equal sign (=), followed by the URL of the target page in quotation marks. So, for instance, to create a hyperlink from our sample page to a page containing the company's Employee Handbook, we might type **<A HREF="http://servername/HR/handbook.html">** before the trigger words "Employee Handbook" followed by the end tag **</A>** in our source document. The resulting Web display would look like this:

Figure A8-1.10
A hyperlink displayed in Navigator.

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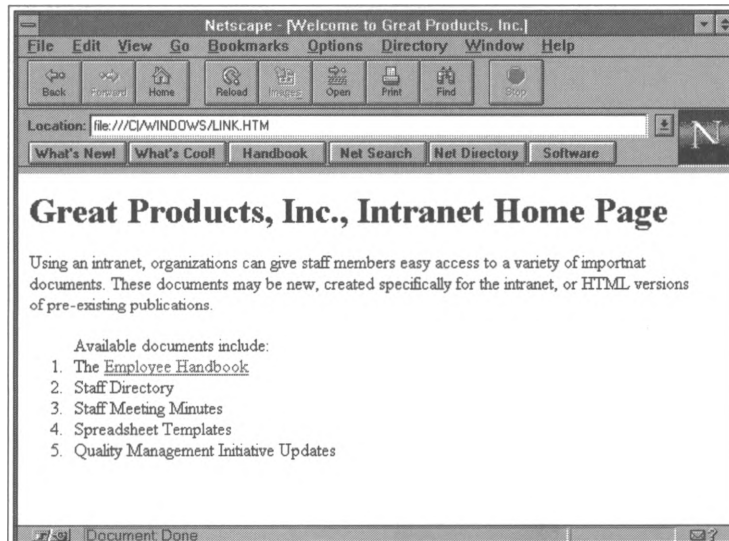
URLs that link to documents on the same server and in the same directory can be written in a shorthand version called "relative URLs." For instance, to link to a specific benefits document on an intranet, the HTML source document for _The Employee Handbook_ may include a tag sequence that looks like this:

<A HREF_"benefits.html">trigger words</A>

The Web browser will automatically fill in the missing portions of the URL using respective parts from the base document's URL (in this case **http://servername/HR/**).

Images

Another effect you can add to your Web pages are images, or graphics. Common graphics include the following:

- Icons (graphics with pictures that represent their functions, such as a picture of a house that links back to a home page or a picture of a printer that activates a print command).
- Bullets (enhanced bullets which replace simple bullets, often various shapes and colors, such as blue diamonds or gold balls).
- Buttons (graphics which appear as 3-D onscreen buttons with particular functions sometimes indicated by symbols or words, such as backward pointing arrows which retrieve previously viewed documents).
- Bars (lines that run horizontally across a Web page, often in various colors or patterns, such as rainbows and chains).

In addition to these simple graphics, which help users navigate through a Web page, you can also use other images, such as company logos, to customize your site and create corporate and brand recognition.

To add an image, use the tag **<IMG>** with a reference to the source (SRC) or location of the graphic file, as in **<IMG SRC= "http://address/images/hline.gif">**. In this HTML sequence, the Web browser is directed to look for the image in a special sub-directory of the Web server reserved for graphics. When the browser displays the HTML file, it will look for the referenced graphic and display it in the place marked by the tag. If we insert this code at the top of a document's body, the resulting Web display looks like this:

Figure A8-1.11
Rainbow bar displayed in Navigator.
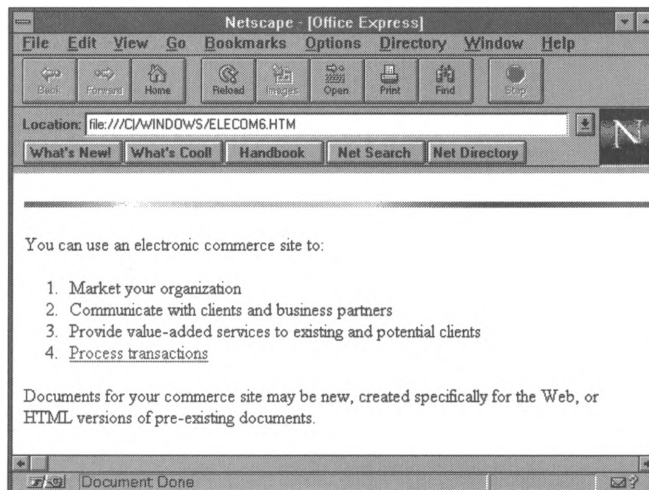
Feedback Mechanisms

One of the features that makes HTML documents unique is their ability to provide interactive tools. A common method of interaction on Web pages is the use of an automatic e-mail device. By including an automatic e-mail device for feedback,

you can encourage visitors to your site to send you comments,
suggestions, and requests for information. To use this "mailto"
device, anchor the piece of text that will serve as the trigger
(such as the word "e-mail") to an HTML "mailto" command.
The necessary HTML tag looks something like this:

<A HREF="mailto:e-mail address">trigger word</A>

The corresponding Web page displays the trigger words in blue.
When the user clicks on this link, the user's e-mail program
launches automatically and inserts the address included in the
anchor, as in the *Navigator* sample below.

Figure A8-1.12
Automatic e-mail
displayed in
Navigator.
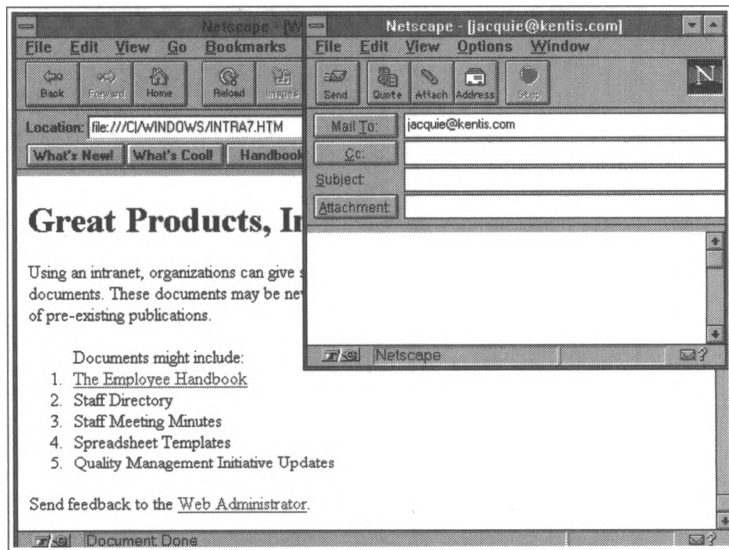
Today's business environment is increasingly competitive, and
moving online can make an enormous difference in an
organization's business processes, marketing reach, and
corporate image. Even if you use only the HTML features
described above, you can create a respectable presence on the
WWW. However, to keep the continuing interest of users, you

will probably want to use more sophisticated HTML features to enhance your site and improve the interface between your organization and your users. The next section of this Appendix will show you how to make use of other exciting HTML features that are used on many Web sites today.

Advanced HTML Features

In this section, we will explore the following advanced HTML features:

- Advanced Graphics.
- Image maps.
- Backgrounds.
- Forms.
- Tables.
- Frames.
- Searchable data.
- Multimedia.
- JavaScript.

Advanced Graphics

Graphics are a great way to add dynamic effects to your Web site and carry over corporate image through careful use of your organization's logo. But graphics are more than ornamentation. Since they require more space and processing time from your server, only graphics which play a valuable role in the site's usability are truly practical. We will demonstrate how to use advanced graphic features to enhance user enjoyment and how to add navigating power to your graphics.

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Hyperlinked Graphics

You already know how to "anchor" text within the body of your HTML document and how to add graphics to your site by using the tags **<A HREF="URL"></A>** and **<IMG SRC="URL">**, respectively. If you combine these two functions, you can "anchor" graphics to give them the same navigating power as hypertext links. For example, rather than having users click on the word "e-mail," to activate the automatic "mailto" function, you could use a graphic of a mailbox to accomplish the same effect.

The principles for creating an anchored graphic are the same as those used to anchor text; simply enclose the image in the anchor tags. To create this hyperlink in our sample page, we must first find a suitable graphic. If you have a communications or art department in your organization, you may solicit help from a staff member to create an original graphic. If you do not have staff members who can create these graphics for you, use your Web browser to visit and browse any of the vast number of online sites from which Web graphics are available for free downloading. When you have selected a graphic, your HTML string may look something like this:

> **<A HREF="mailto: e-mail address">**
> **<IMG SRC="http://address/images/mail.gif"></A>**

Images is a sub-directory of the Web server where graphics are stored, and *mail.gif* is the name of the mailbox graphic. As you can see in the Web display below, users may now click on the graphic of the mailbox to automatically launch their e-mail programs and send mail to a predetermined address.

Figure A8-1.13
*Hyperlinked
graphic in Internet
Explorer.*
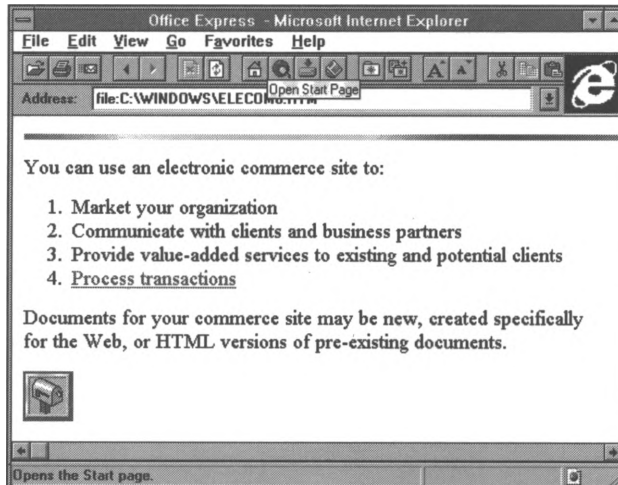
Image Maps

Image maps are increasingly popular tools for linking Web
pages and enhancing navigation between related documents.
Image maps, also called clickable image maps, are graphics that
are divided into distinct regions. Each of these regions is linked
to a specific location, either an area on a page or another Web
page. Clicking on a specific region of the image map retrieves
the associated page. An image map can be a good way to
simplify your site and provide a sense of continuity for users.
For example, an organization could use several small graphics
as a menu of selections that retrieve increasingly more specific
documents (such as an online catalog or a guestbook).
Converting these separate graphics into a single image map
graphic allows users to directly access specific areas from one
central graphic that suggests an overall plan for the organization
of documents at your site.

Although they may seem complicated, image maps are quite simple. They consist of three main parts:

- An image in GIF format.
- A map file based on the image.
- An image map program.

Choosing an Image

Of course, every image map begins with an image. The common file format for graphics on the Web is GIF (Graphics Interchange Format), and you can acquire graphics in GIF format at various Web sites or create your own image using any of the many available image-creation and editing programs, such as Adobe *Photoshop*.

Creating a Map File

The map file assigns specified regions of your graphic to the URLs of the Web documents to which you want the image to link. You will need a special image-mapping program to complete this step. As you might imagine, various image-mapping tools are available on the Internet—many for free. Two that we recommend are *MapEdit for Windows*, available at **http://www.boutell.com/mapedit**, and *WebMap* for *Macintosh*, available at **http://witiko.ifs.uni-linz.ac.at/~tom/HTML/tricks/Teaching/manuscript/1900-0002.html**. To design an image map with *WebMap*, for example, open the graphic in *WebMap*. First you will want to set a default link that will be activated if a user clicks on an area of the image map that is not assigned a particular URL. (For example, a typical default URL might link to background information on your organization.)

Now you're ready to begin assigning specific URLs to defined areas of your graphic (called "hot spots"). Defining hot spots is simple with *WebMap*'s floating palette (see Figure A8-1.14). The

floating palette allows you to choose and define hot spots by
clicking one of the shapes on the palette and then using your
mouse to define the size and location of the shape on your
image. For example, to define an irregular hot spot in the
example below, so that when users click on the computer they
are transferred to an Online Catalog, click on the irregular
shape on the floating palette and then click at one corner of the
hot spot, dragging each side across the graphic until the entire
hot spot is defined. After the hot spots are defined, assign links
to them.

Figure A8-1.14
*Using WebMap to
define a hot spot
on an image map.*
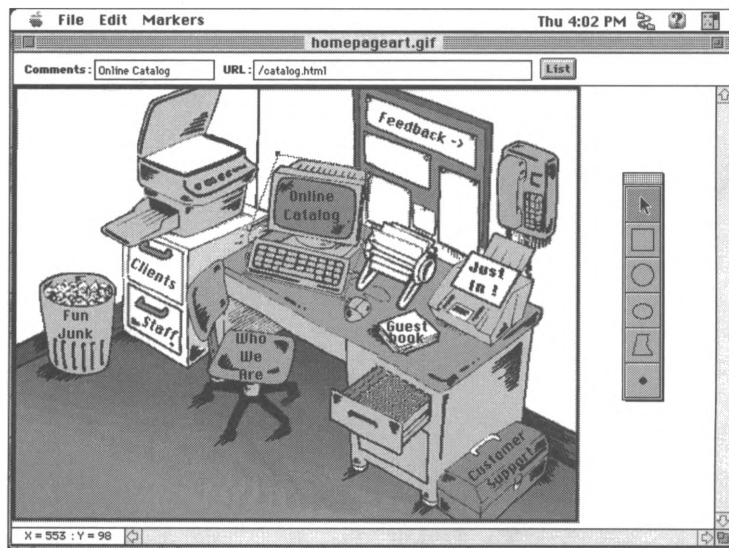
After you have defined all of the hot spots and assigned each a
URL, it's time to save the file (use the **Save** command under the
File menu). Although this file is not the map definition file you
will upload to your server, you can use this special *WebMap*
file for later editing. To make the map definition file, use the
Export as Text option in the **File** menu. In the menu that opens,
choose a location to store the map definition file and give this
file the same name as your graphic, replacing the *.gif* or *.jpg*

extension with *.map*. You must also save this map definition file
in either CERN or NCSA format. Saving a file in one of these
formats adds special documentation used by the Web server to
run the file. You should consult your server's documentation to
see what format has the embedded information your server
requires. For example, the Kent Information Services, Inc.,
server uses the NCSA format.

Finally, when saving your map definition file, you will want to
make sure that there are no extra, invisible characters that could
interrupt the reading of the file by the server program. These
extra characters, when left in the file, can result in error
messages on the user's browser screen. To avoid this
embarrassing problem, save the map definition file in UNIX
format. Unfortunately, some image map software is not capable
of saving text in this format, in which case you will need to use
a text editing program that does include this UNIX feature. Two
text editing programs you could download to complete this step
are: *TextPad* for *Windows* or *Bbedit* for *Macintosh*.

Referencing Your Image Map and Program

To make your image map work with your site, you must
construct references in your Web document's HTML file that
point to your new map when a user clicks on the image. In
addition, your server must have an appropriate software utility
(a gateway script) to handle the image map. Many servers come
with some software utility, typically located in a *cgi-bin/
imagemap* directory, and most ISPs store basic scripting
programs for subscribers to use on their sites. Check with your
Internet Service Provider or read your server documentation to
determine how to create and program an image map on your
system.

For example, if you created a *homepageart.map* file and used the image *homepageart.gif* for the map, including the following line of HTML would link the image to the map file you created and the program (stored in the server's cgi-bin) that will make the map work.

<A HREF="http://servername/cgi-bin/imagemap/ homepageart.map"> <IMG SRC="/homepageart.gif" ISMAP></A>

Finally, upload the graphic, the associated image map, and the HTML document with the necessary referencing codes, and you will be ready to try out your image map.

Figure A8-1.15
A sample image map on the intranet of Great Products, Inc.
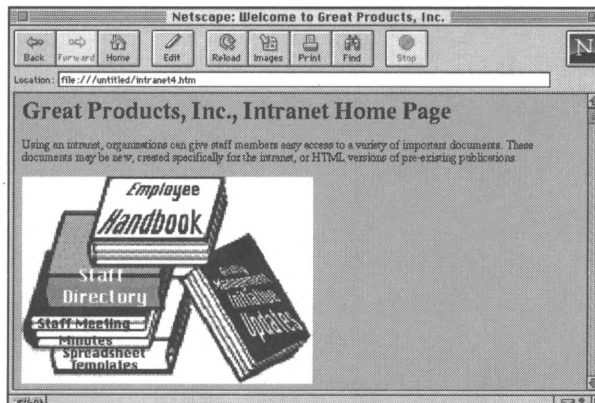
Backgrounds

As you have surfed the WWW, you've probably noticed that the default background color on most Web pages is gray. You can distinguish your site from the Web "crowd" by adjusting the background color that will appear on your site by:

1. Using the BGCOLOR attribute inside the **<BODY>** tag.

2. Tiling a graphic throughout the page.
3. Combining methods 1 and 2.

BGCOLOR

The first way to distinguish your Web site's background is to change the default gray color to a background that matches the tone you are trying to set for your site. In order to change the background color, you must change the BGCOLOR attribute within the **<BODY>** tag. (Remember, attributes are options available within a tag that give that particular tag more flexibility.) The tricky part of changing the background color is that you must know the hexadecimal red-green-blue format code for the color that you wish to use as your background. A few colors and their associated codes are listed below.

Figure A8-1.16

White	FFFFFF	Black	000000	Blue	0000FF
Cyan	00FFFF	Green	00FF00	Yellow	FFFF00
Gold	FFD700	Beige	F5F5DC	Tan	D2B48C
Brown	A52A2A	Purple	A020F0	Red	FF0000
Maroon	B03060	Violet	EE82EE	Plum	DDA0DD

Once you know the code, simply include it in the opening body tag, as in the following:

<BODY BGCOLOR="FFD700">

This creates a gold background for the Web display of the HTML document.

Tiling a Graphic

Another way to change the appearance of your background is to tile a small graphic throughout your page. This can be done with black and white, grayscale, or color graphics. However, be careful to use small graphics for this effect, since a large graphic

will take a long time to load, slowing the performance of your site. Using a graphic as a background is virtually the same as adding color using the codes we described above. Simply use the BACKGROUND attribute in your **<BODY>** tag. Using a graphic for your background is actually simpler than changing the color of your background, because you don't need to find any codes. Instead, you reference the image in the same way that you would if you were placing a graphic on the page:

<BODY BACKGROUND="http://address/images/image.gif">

Colors and Graphics

The final way to adjust the appearance of your site's background is to combine the colors and graphics. For example, if you want to add a graphic but are concerned about loading times, you can use a grayscale graphic (smaller than a color graphic) with a background color. The HTML tag with this combined attribute would look like this:

<BODY BGCOLOR= "FFFFFF" BACKGROUND= "http://address/images/image.gif">

Forms

One of the greatest benefits of a Web site is that it allows clients to order services and products right over the Internet, while acting as an information gathering resource for your organization. For instance, an Online Catalog might contain a form for customers to fill out that allows them to place orders for one or more items to be shipped directly to them and billed accordingly. Like the other HTML effects we've described, a form is created by surrounding text with special tags that tell the browser what functions to perform. The tags **<FORM></FORM>**

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indicate to the browser that the inside text and tags are to be treated as a form.

To make a form function, you must also define particular attributes. Forms require two attributes: an ACTION attribute and a METHOD attribute. The ACTION attribute tells the browser the URL of the program that receives and processes that data and is provided by simply typing **ACTION='URL'** inside the **<FORM>** tags. The METHOD attribute sets the method by which the browser sends the data to the server for processing, either GET or POST. If the data is sent using the POST method, the browser uses two steps:

1. The browser contacts the server specified in the action attribute.
2. The browser sends the data to the server in a separate transmission.

On the other hand, if the data is sent using the GET method, these two steps are completed as one, appending the data to the action URL, separated by a question mark character (?). Although most servers can now receive data by either method, be certain to check with your ISP or refer to server documentation before building your forms. To select the method you will use, type **METHOD=POST** or **METHOD=GET** inside the **<FORM>** tag.

As you've probably guessed, you need more than just the HTML shell tags described above to make the application work. The next tag in your form does not have an ending tag but only the beginning tag **<INPUT>**, because all of the information is within the tag itself. The **<INPUT>** tag can work in two very different ways. If used alone, **<INPUT>** creates the fill-in boxes where users type text. Typically, users require some type of

prompt to know what to type into a fill-in box, so you can use formatting tags to develop text that walks the user through the form, or type simple prompts followed by **<INPUT>** tags, as in:

Name: <INPUT>

If you have more than one fill-in box, you may want to use other divider tags to improve the presentation of your form. For example, to present several fill-in boxes in neat rows and columns, you would use the table tags described above to create a table within a form.

One of the main attributes used within the **<INPUT>** tag is the HIDDEN attribute. As the name suggests, the information within this tag is not displayed by the browser at all, but rather, it is used by the program that is running on the server to determine what to do with the information once it has been processed. In our example (Figure A8-1.17), you see that the input information is used to tell the program that it is to mail the information to the address in the VALUE field once it has processed the information in the form.

Another of the attributes used within the **<INPUT>** tag is the SIZE attribute. This attribute allows you to set the size by indicating the number of characters that each box should be able to accommodate. In addition, you use the **<INPUT>** tag and the attribute "TYPE=SUBMIT" to make a button with the words "Submit Query" on it. Clicking on the button sends the information that has just been filled in to the URL designated in the ACTION attribute. To adjust the notation on the button, simply use another attribute; in the **<INPUT>** tag type **VALUE=*"whatever text you want to appear on the button."***

But even these tags aren't enough to make a useful form. Forms require special software programs running on the server to process the information collected in the form and to perform other necessary functions, such as clearing the form. Fortunately, server vendors and ISPs usually supply sample forms applications with their servers. Talk to your ISP representative or look for a directory named *cgi-src* and you will probably find a number of examples you can copy and modify for your own forms.

The HTML source document for a fill-in form that collects information might look like this:

Figure A8-1.17
HTML source file
for a Web fill-in
form.


```
regform.htm
<HTML><HEAD>
<TITLE>Sample Commerce Site</TITLE></HEAD>
<BODY>
<CENTER>
<H1>Online Catalog Order Form</H1></CENTER>
<P>Below is a list of the products that you wish to order. To remove an item,
enter a quantity of zero.</P>
<FORM ACTION="http://servername/cgi-bin/order" METHOD="POST">
<INPUT TYPE="HIDDEN" NAME="Mailto" VALUE="who@where.com">
<TABLE>
<TR>
<TD>Qty</TD>
<TD>SKU</TD>
<TD>Description</TD>
<TD>Price per Unit</TD>
<TD>Total Price</TD></TR>
<TR>
<TD><INPUT SIZE="2"></TD>
<TD><INPUT SIZE="5"></TD>
<TD><INPUT NAME=""></TD>
<TD><INPUT SIZE="10"></TD>
<TD><INPUT SIZE="10"></TD></TR>
<TR>
<TD><INPUT SIZE="2"></TD>
<TD><INPUT SIZE="5"></TD>
<TD><INPUT NAME=""></TD>
<TD><INPUT SIZE="10"></TD>
<TD><INPUT SIZE="10"></TD></TR>
<TR>
<TD><INPUT SIZE="2"></TD>
<TD><INPUT SIZE="5"></TD>
<TD><INPUT NAME=""></TD>
<TD><INPUT SIZE="10"></TD>
<TD><INPUT SIZE="10"></TD></TR>
<TR>
<TD></TD>
<TD></TD>
<TD></TD>
<TD ALIGN="RIGHT">Total Price: </TD>
<TD><INPUT TYPE="TEXT" SIZE="10" VALUE="799.97"></TD></TR></TABLE>
<CENTER>
<P><INPUT TYPE="SUBMIT" VALUE="Continue Browsing"><INPUT
TYPE="RESET" VALUE="Clear Form"> **<INPUT TYPE="SUBMIT" VALUE="Place
Order">**</P></CENTER></FORM></BODY></HTML>
```

The corresponding Web display of the sample Online Catalog order form (with items selected by a customer) looks like this:

As you can see from the above example, a very simple form can be helpful in establishing a communicative link with visitors to your site. Sometimes, however, a more complex form may be needed to gather information. Some of the more valuable tags that extend the information gathering ability of a form include:

    <SELECT></SELECT>
    <OPTION>
    <TEXTAREA></TEXTAREA>
    <INPUT TYPE="radio">

The **<OPTION>** and **<SELECT></SELECT>** tags go together to form, as the tags imply, a list of options from which a user can select whatever function is needed. The **<TEXTAREA></TEXTAREA>** tags create a block of space that may be filled in with more than one line of text–great for soliciting comments from users! To adjust the size of the text area that is created on the screen, use the ROWS and COLS attributes to specify the number of rows and characters per row,
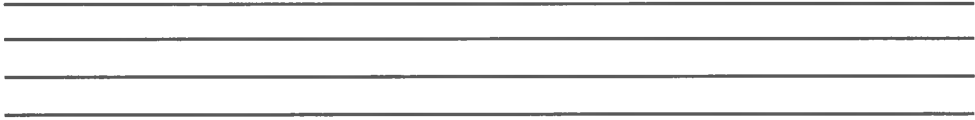
respectively. Another very useful feature is the radio button attribute of the **<INPUT>** tag. This feature allows you to provide a list from which the user may check only one of the selections. A radio button attribute may be checked as a default in the HTML source code to save the user time when filling out your form. The following source code demonstrates these tags and attributes.

Figure A8-1.19
Source code for more Web form elements.


```
form elements

<HTML>
<HEAD>
<TITLE>More form elements!</TITLE></HEAD>
<BODY>
<P>Here is a sample of some other form elements that are not in the first example.
<FORM>
<P>Comments:<p>
<TEXTAREA ROWS="7" COLS="35"></TEXTAREA>
<P>Sex: Male:<INPUT TYPE="RADIO" CHECKED> Female:<INPUT TYPE="RADIO">
<P>
<SELECT SIZE="1">
<OPTION>ITEM1
<OPTION>ITEM2
<OPTION>ITEM3
<OPTION>now</SELECT>
<P><INPUT TYPE="RESET"></FORM></BODY></HTML>
```

And the Web display would look like this:

Figure A8-1.20
More Web form elements displayed in Navigator.
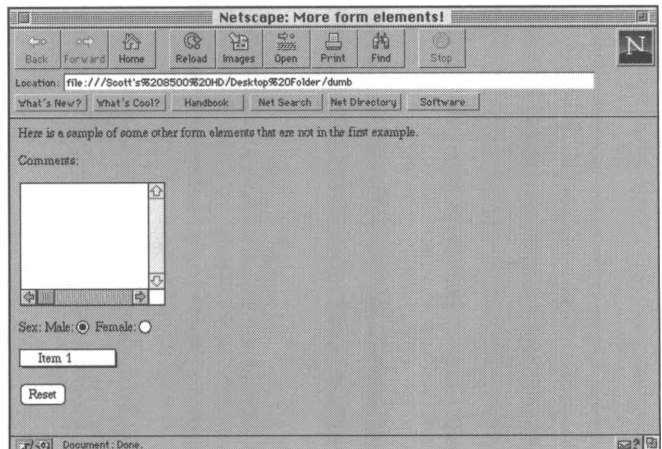
Tables

Tables are advanced Web publishing devices that display data in rows and columns. It is quite simple to create a table in which to display large amounts of information in an easy-to-read, appealing way. When dealing with tables, there are several functions that can enhance the appearance, some of which are supported by a limited number of browsers. In this discussion, we will describe only those properties supported by a majority of browsers.

Tables consist of four main tag sequences. The **<TABLE></TABLE>** tags tell the browser to format the text within the tags as a table. You would also define the table's alignment, border, and width, inside the opening tag, if you choose. The tags **<TR></TR>** are nested inside the **<TABLE>** tags and surround all the text and tags that will be used in that row. As we've seen, browsers often interpret tags differently (or ignore tags completely!) and **<TR></TR>** is a good example of this discrepancy. The default alignment of the text varies from browser to browser, so the default alignment of the rows of your table will vary as well. If you feel that your table looks better justified a particular way, you can change the default value within each row by using the "ALIGN=*left, right, or center*" attribute in the **<TR></TR>** tag pair. Inside the **<TR></TR>** tags, the tag sequences **<TH></TH>** and **<TD></TD>** are nested to define headers and data within a table. Although only a few browsers, such as *Navigator*, support the tag **<TH>**, using it will display headers in bold text in some browsers. Browsers that do not support this tag simply display the included text as regular information in the table. (Remember the **<B></B>** tags? You can create the same effect using this tag pair around the text you want to display as bold.) The **<TD></TD>** tags operate in the same way to display the text as information within a cell in your table. The data will be

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displayed in the order you present it, from left to right in your rows.

Frames

Frames extend the capabilities of a browser by breaking the main display window into separate smaller windows, each simultaneously displaying a different document. To use frames, you need the tags **<FRAMESET></FRAMESET>** in which you define the number and sizes of the frames. Typically these sizes are determined by pixels or screen space percentages, followed by an asterisk (*), which tells the browser to size columns or rows to whatever space is left over . Next, use the **<FRAME SRC="***URL***">** inside the **<FRAMESET></FRAMESET>** tags to direct the browser to the documents that will be displayed in the frames.

Because these tags are not recognized by all browsers, you should also use the **<NOFRAMES></NOFRAMES>** tags to supply an alternate navigation method for users who do not have frames capabilities. Browsers that are not frames compatible will read the tags and text inside these tags–something like this:

> **<BODY>***This document can only be viewed with a frames-capable browser.* **<A HREF="framealt.html">** *Use this link* **</A>** *to view the first HTML document in this set.***</BODY>**

Another good way to give alternate displays for those browsers that are not frames-enabled is to include the source code for one of the HTML pages in the frames display inside the **<NOFRAMES></NOFRAMES>** tags (as in the example below).

For example, we can combine a searching page, a product description page, and an order form page so that the customer may input a product, see it come up in a different window on the same page, and add it to his order form in yet another window on the same page. To create the Web page described above, you would create the following source code.

Figure A8-1.21
HTML source file for Web page using frames.


```
                                    hp2
<HTML>
<HEAD>
<TITLE>Sample Commerce Site</TITLE></HEAD>
<FRAMESET ROWS="18%,82%" COLS="46%,54%">
<FRAME SRC="./search.htm">
<FRAME SRC="./product.htm">
<FRAME SRC="./regform.htm">
<NOFRAMES>
<BODY>
<CENTER>
<H1>Searchable Online Catalog</H1></CENTER>
<ISINDEX
PROMPT="Enter a brief description or SKU of the product you want to search for: "
ACTION="http://servername/cgi-bin/catalog"></BODY></NOFRAMES></FRAMESET></HTML>
```

The corresponding Web page would look like this:

Figure A8-1.22
Frames displayed in Navigator.

Searchable Data

As you know, one of the biggest advantages of a WWW or intranet site over other forms of information distribution is that very large amounts of data can be updated and made available to customers quite easily. That information can be made electronically searchable with a few simple codes and programs.

The two tags needed to make your HTML data searchable are the **<ISINDEX>** and the **<BASE>** tags. The **<ISINDEX>** tag tells the browser that the data on the page is searchable and lets the users know this too by providing a prompt statement that reads, "This is a searchable index. Enter search keywords," followed by an input box where users can type their search words. If you want to customize the prompt statement, use the attribute PROMPT inside the **<ISINDEX>** tag followed by your customized statement, as in the following:

> **<ISINDEX PROMPT="Enter a brief description or SKU of the product you want to search for:">**

The corresponding Web page display is shown below.

Figure A8-1.23
A customized search prompt on a searchable Web page.

The other necessary tag, the one that actually makes the data searchable, is the **<BASE>** tag. This tag points the browser to the location of the data that will be searched and the

corresponding search program, as in **<BASE HREF=
"http://servername/cgi-bin/directory-query">**. Like image
maps, searchable documents require some type of support from
the server to work, because the way the server interprets and
processes the query is not defined by the HTML tags. Talk to
your ISP or read your server documentation to learn how your
server will process the query before creating the complete
<BASE> statement.

Multimedia

Another great advantage of publishing your organization's
documents on an intranet or on the World Wide Web is that
you can enhance them with sound and pictures. Keep in mind,
however, that these multimedia tools tend to use a lot of system
space and require special client software for your customers to
be able to use them. Use these features carefully and develop
clear guidelines for your content developers to follow when
they are deciding whether or not to incorporate multimedia
features in your site.

Audio
One type of multimedia enhancement available to developers is
audio. Many browsers treat audio files as separate documents
that are downloaded and displayed by helper applications (such
as Real Audio). Others, such as *Internet Explorer* and Netscape
Navigator offer built-in or plug-in applications that extend the
capabilities of the browsers to manipulate audio files.

Currently, sound can be used in two ways: (1) as background
music or (2) as descriptive *narration*. The use of background
music depends on the tag **<BGSOUND>**. This tag triggers the
download and playback of an audio file as soon as the host
HTML document is downloaded. More typically, Web

developers use sound to explain an idea or example, to enhance online training for audio learners, or to offer excerpts of speeches and presentations. To use an audio file in this way, you must first create the file with one of the many available audio programs. Then, create a link from your Web document to the sound file. As you do with any external file, you must reference the file using the **<A></A>** tags.

You can enhance your audio link with a hyperlinked graphic by "anchoring" your audio file to a graphic on your Web page. For example, rather than having users "click" on the words "Product Description" you could use a graphic of that product (like the desk graphic below) to link to an audio file that describes the product, maybe even in your voice!

Figure A8-1.24
A graphic hyperlinked to an audio file.

To create this audio hyperlink, create your audio file and then find a suitable graphic. Your HTML string may look something like this:

<A HREF="http://address/product.au">
<IMG SRC="http://address/images/desk.gif"></A>

where **product.au** is the associated audio file that gives a brief audio description of the pictured product, **images** is a sub-directory of the Web server where graphics are stored, and **desk.gif** is the name of the desk graphic. (Remember, images used on your Web site will be in either GIF or JPEG formats.)

Video

Video works much like a combination of both images and sounds. Like audio, video is an external file that you must create using special software; then, you reference it in your HTML document. Video is referenced like pictures are in HTML, using the tag **<IMG SRC="URL">**. Microsoft's *Internet Explorer* is the only browser that supports inline movies, which can be played by pressing a play button below a still image that is displayed in the browser. Movies are not limited to *Internet Explorer*, however; they can be referenced in other types of browsers by clicking on a link to load the video file that you have stored on your server.

Beyond Publishing

The World Wide Web was designed to use HTTP (Hyper Text Transfer Protocol) to publish but not to process information. In order to interact meaningfully with Web databases, perform searches, or do other forms of information manipulation, HTTP relies on programs called gateway scripts. There are two main types of programs that allow HTTP to interact with gateway scripts. These programs will be most helpful for gathering,

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processing, and distributing information on your Web site or intranet. These are (1) Common Gateway Interface (CGI), and (2) Server-Side Includes (SSI).

CGI is platform-independent programming supported by all HTTP servers that enables HTTP to accept processing requests from browsers, pass this information to gateway scripts for processing, and return readable results to the users. CGI scripts can be written in any programming language supported by a Web server. CGI is the preferred programming technique for most developers, because it is reasonably secure. And, since it is independent of the Web server, CGI is less likely to "crash" a server than server-side programming.

However, for developers who are familiar with HTML but who have little programming experience, Server-Side Includes (SSI) are easier to use than CGI. The coding for SSI is very similar to using the tag **<!–comment here–>** to make notes for your own use inside an HTML document. Comments can be added anywhere within your HTML file and do not appear in the final document. Similarly, if you want to run the SSI program that displays the current date on your home page, you can simply type the following code in your HTML document:

<!–#echo="DATE_LOCAL"–>

Although the simplicity of SSI seems to make it the programming language of choice, there is one rather large catch that makes SSI less accepted–security risks. Whenever you run a program that interacts with your server, you open your system to hackers who may be able to use the program to gain access to your system. SSI is the least secure programming language, and, therefore, many Web designers shy away from using it. Consider the risks as well as the benefits when deciding

whether or not to incorporate SSI programming on your Web site or intranet.

Client-Side Programming

With the booming interest in Internet technologies, new concepts to make the Web even more dynamic have begun to emerge, including client-side programming languages. One of the drawbacks of programming such as SSI or CGI is that the programs open server security risks and put additional processing demands on your Web server. Client-side programming, on the other hand, is written into HTML files and runs on the client software instead of the server.

JavaScript

One of the newest and most exciting client-side programming tools is JavaScript, a simplified version of Java, a programming language created by Sun Microsystems. JavaScript is an object-oriented, platform-independent, event-driven scripting language that is responsible for many of the exciting effects you see on the Internet–scrolling marquees, functioning clock faces, various simple animation effects, and much more. What this means to site developers is that you now have a scaled down programming language that allows you to create pages that can respond to user's selections or actions, making your Web site even more dynamic. Let's look at each aspect of JavaScript to give you a better understanding of what it does.

First, JavaScript is a scripting language, which means that you can create mini-applications to complete specialized tasks using

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JavaScript. These mini-applications aren't compiled like regular programs, but rather, they are interpreted line by line while the application is running and are incorporated into embedded HTML tags in Web documents to make the programming easy for Web designers to use.

JavaScript is object-oriented, which means that it deals with a program as a collection of individual parts (objects) that complete different tasks rather than as a sequence of statements that perform a specific task. This is helpful because the language has a number of objects already built in. For example, JavaScript already has a "date" object built in so that you don't have to build one.

JavaScript is also platform-independent, which means that it is not bound by the particular computer platform being used (*Macintosh*, *Windows*, or UNIX). Therefore, you may create the JavaScript application on a Macintosh computer and *Windows 95* and UNIX users will still be able to see and perform the same functions as those using Macintosh machines.

Finally, JavaScript is event-driven, which means that JavaScript can respond to any number of things that the user does. Whenever the user clicks a button, drags the mouse, loads a page, or even unloads a page, this is considered an event by the application. The JavaScript program can be written to offer alternative responses to various "events," allowing a great deal of flexibility to the Web page's level of interactivity.

For example, you can create a simple program to verify certain basic information typically input by users on a Web page. This allows the computer to let the user know if he has accidentally misinput the information before it takes the time to process the information. If, for instance, your organization uses visitor

identification numbers and passwords, you might have a form on your site in which clients input this information, such as the form below.

Figure A8-1.25
Sample identification page using JavaScript.

In a typical transaction, the visitor would input this information, complete the order form, and send all the information to the server for processing, at which point the server might find that the user's password does not match the ID number. The server would then send an error message to the user and request that he complete the information again. The JavaScript program below would work behind this input form and verify the information before the customer proceeds further in the ordering process. The source code that makes this process possible is shown below between the **<SCRIPT></SCRIPT>** tags that indicate to the browser that this is a JavaScript program:

Figure A8-1.26
Source code for sample identification page using JavaScript.

```
                              javapage
<HTML><HEAD><TITLE> Sample Commerce Site</TITLE>
<SCRIPT>
function isanumber(stuff)
{
  for(var i=0 ; i < stuff.length ; i++)
  {
    if (stuff.substring(i, i+1) < "0" ||
            stuff.substring(i, i+1) > "9")
    {
      return false;
    }
  }
  return true;
}
function checkSend(){
  if(document.tester.fivec.value.length != 5) {
    alert("Enter exactly five characters in the first field") ;
    return false
  }
    else if (isanumber(document.tester.numb.value) != true) {
  alert ("The entry in the second field must be an integer");
  return false}
  else if (document.tester.numb.value =="" ||
    document.tester.fivec.value=="")
  {
    alert("Both fields must contain data!")
  }
  else
  { alert("Click OK to confirm.");
    document.tester.submit();
    return true
  }
}
  </SCRIPT></HEAD><BODY>
<H1 ALIGN="CENTER">Online Catalog Customer Identification</H1>
<H3>Enter your personal five-digit customer identification number in the first
field and then your three-character password in the second field. Then press the
<B>&lt;RETURN&gt;</B> key on your keyboard to enter the Office Express Online
Catalog. </H3>
<FORM ACTION="/cgi-bin/id" NAME="tester">
<P>Enter your five-digit identification number:
<INPUT TYPE="TEXT" NAME="fivec" SIZE="7"></P>
<P>Enter your three-character password:
<INPUT TYPE="PASSWORD" SIZE="3"> </P></FORM></BODY></HTML>
```

As with server-side programming, you can find various JavaScript applets online or in print publications. Or, if you plan to include a lot of programming on your site, you may consider hiring a programmer or training a staff member to take on this role. Whichever method you choose, using these ever-developing programming innovations can offer you various opportunities for developing your site's usefulness.

As you can see, there are numerous ways to enhance your Web site and move beyond the simple content development that we described in Chapter 6. The level of complexity you decide to

implement will depend on your server capabilities, your staff members' training, and your organization's needs. Be sure to consider the type of content you will be creating and the level of sophistication that the documents require, as well as the hardware, software, and staff that you will need to create and maintain a site that uses these enhanced design effects.

Basic HTML Tags

Tags for the document frame:

<BODY></BODY> . . . . Marks the beginning and end of the document body.

<HEAD></HEAD> . . . . Marks the beginning and end of a document head.

<HTML></HTML> . . . . Marks the beginning and end of a hypertext document.

<TITLE></TITLE> . . . . Marks the beginning and end of a document title.

Tags for special treatments of text:

<B></B> . . . . Represents the enclosed text as boldfaced type.

<BIG></BIG> . . . . Represents the enclosed text in a bigger type.

<BLOCKQUOTE></BLOCKQUOTE> . . . . Treats the enclosed text as a block quote.

<CENTER></CENTER> . . . . Centers the enclosed text.

<EMP></EMP> . . . . Emphasizes the enclosed text by italicizing.

<I></I> . . . . Represents the enclosed text as italicized type.

<PRE></PRE> . . . . Represents enclosed text in its original preformatted style, including line breaks and spacing.

<STRIKE></STRIKE> . . . . Displays the enclosed text with a line struck through horizontally.

<STRONG></STRONG> . . . . Represents the enclosed text as boldfaced type.

<TT></TT> . . . . Represents the enclosed text as teletype.

Tags for major document divisions:

**\
** . . . . Breaks the text and starts a new line.

\<H*n*>\</H*n*> . . . . Treats enclosed text as a level *n* heading. (Numbers and treatments vary from 1-6.)

\<HR> . . . . Inserts a hard or horizontal rule in the document.

\<P>\</P> . . . . Marks the beginning and end of a paragraph.

Tags for lists:

\<DD>\</DD> . . . . Marks a definition in a definition list.

\<DL>\</DL> . . . . Marks the beginning and end of a definition list.

\<DT>\</DT> . . . . Marks a term in a definition list.

\<LI> . . . . Precedes an item in a list.

\<OL>\</OL> . . . . Marks the beginning and end of an ordered (numbered) list.

\<UL>\</UL> . . . . Marks the beginning and end of an unordered (bulleted) list.

Tags for links, images, and interaction:

\<A HREF="*URL*">\</A> . . . . Links to a Web document stored at the enclosed URL.

\<IMG SRC="*URL*"> . . . . Inserts an image stored at the enclosed URL.

\<A HREF="mailto:*e-mail address*">\</A> . . Launches an e-mail program and inserts an address.

Advanced HTML Tags

Tags for hyperlinked graphics:

<A HREF=*"link URL"*><IMG SRC=*"URL of graphic"*></A>

. . . . Anchors a graphic to a specific URL.

<A HREF=*"URL of map file"*><IMG SRC=*"URL of map GIF"*ISMAP></A>

. . . . Anchors a graphic to a Web map
file.

Tags for forms:

<FORM></FORM> . . . . Marks the beginning and end of a
form.

<INPUT> . . . . Creates a fill-in box for user input.

<INPUT TYPE="SUBMIT"> . . . . Creates an onscreen button that
reads "Submit Query."

Tags for tables:

<TABLE></TABLE> . . . . Marks the beginning and end of a
table.

<TR></TR>. . . . . Marks the beginning and end of a
row in a table.

<TH></TH> . . . . Displays the enclosed text as a
bolded table head.

<TD></TD> . . . . Displays the enclosed text as
information inside a row cell.

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_____

_____

_____
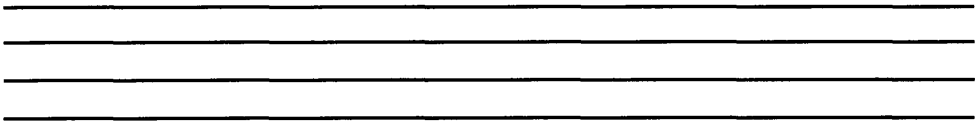
Tags for frames:

    <FRAMESET></FRAMESET> . . . . Marks the beginning and end of a frame display and allows for definition of frame sizes.

    <FRAMESRC="URL"> . . . . Identifies the location of the document that will be displayed in a frame.

    <NOFRAMES></NOFRAMES> . . . . Displays the enclosed text to browsers that do not read frames.

Tags for searchable data:

    <ISINDEX> . . . . Tells the browser that the page is searchable and displays an input box.

    <BASE HREF="URL"> . . . . Identifies the location of the search program and data.

Appendix 8-2
Installing Your Intranet on Your Existing LAN

In Chapter 8, we discussed some of the benefits organizations receive when they install intranets, benefits that include document publication and sharing, human resource management, and collaboration of workgroup applications, among others. If you are interested in creating an intranet and already have an existing local area network (LAN), this appendix is for you. With a LAN already in place, installing an intranet is not as difficult as it may seem because you have the necessary physical infrastructure in place. You can use the same wiring and the same network cards (the hardware "plug-ins" that make computers capable of transmitting and receiving data through the network cables) that support your LAN. No substantial new investment in physical assets is needed with the possible exception of an additional computer to host the intranet server.

Installation Steps

The main steps involved in the installation of an intranet are listed below:

- Select a computer to host the World Wide Web (WWW) server software.
- Select an operating system for your server and select the WWW server software.
- Identify the categories of users that may wish to access your server and what their rights and restrictions are.
- Install the operating system and the WWW server software.
- Install a network adapter card on the server's computer and connect it to the local area network.
- Decide whether to assign IP numbers to each workstation or to use a gateway from the LAN workstations to the intranet server and the Internet.
- If you decide to assign an IP number to each workstation, then you need to decide whether to use an internally generated numbering scheme or a TCP/IP numbering scheme, assigned by the InterNIC, so that those IP numbers can also be used to connect each workstation to the Internet.
- Assign IP numbers to workstations as appropriate.
- Install TCP/IP software on the server and configure it to work with the network adapter card.
- Select and install client software on each workstation.
- Select the method that will be used to convert alphabetic names to the numerical IP address of the server.
- Configure the WWW software to identify the directory where the initial Web home page resides.
- Decide on the file name for the initial home page and configure the WWW server to recognize that file as the initial home page.
- Develop a default home page that will answer inquiries from users.
- Build the rest of the pages.

In this appendix, we will describe these steps, the decisions that you will face when implementing these steps for your organization, and some of the online resources where you can learn more. The following material is not a substitute for an installation manual, but it should get you thinking about the kinds of decisions and concerns you may face when installing an intranet of your existing LAN.

Selecting Your System

In Chapter 8, we described briefly the various types of operating systems and WWW server software that are popular and available today. The choice of the computer and operating system software may reflect your organization's need for software which offers special features. But you must also consider the capabilities of the personnel that will be maintaining the system. If your computer personnel are well versed in *Windows* but are not familiar with UNIX, there is no need to force them to learn a new operating system just to install a UNIX intranet server. In fact, that would be counter-productive. Instead, you may wish to choose *Windows NT* as your server's operating system and one of the *Windows NT*-compatible servers, such as Microsoft's *Internet Information Server*. If you have a computer systems group with UNIX experience, they may prefer to install the intranet server on a UNIX platform because of the mature UNIX tools that are available for assisting in the management of a World Wide Web-type server. If your LAN is based on the Novell *NetWare* operating system, you must decide whether your organization can best face the future with additional Novell software or if you should spread your risk by using *Windows NT* as your intranet server's operating system. If your LAN's Novell server has excess capacity, you may want to add Novell's *Web Server for NetWare* to the same computer. In addition to avoiding the cost of a new computer, another advantage of that solution is that *Web Server*

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for NetWare authenticates users against NetWare Directory
Services (NDS) which simplifies the administration of security.

Configuring a Web Server

Configuring commercial WWW servers and commercial
operating systems for use as intranet servers is generally
explained in the system documentation. Because each system is
different, any global description of configuration steps we could
provide here would not be practical in your own configuration
process. Nevertheless, as an example, it may be useful to
describe some of the configuration issues that users of the
popular and freely distributed NCSA *HTTPd* server software face
when configuring the server software:

- After downloading and decompressing the software,
  users must first copy a small set of distribution
  configuration files from the configuration directory.
- Users must edit the *http.conf* file to indicate elements
  such as the following: (1) the type of server being used,
  (2) the port used by the server, (3) some user
  restrictions, (4) the mail address of the server
  administrator, (5) the root directory where executable,
  configuration, and log files are stored, and (6) the
  server's name.
- Users must configure the resource configuration file,
  srm.conf, to identify the document root, which
  identifies the directory in which files will be stored, and
  the ScriptAlias, which identifies the location where the
  CGI scripts that control your intranet's interactive
  features are stored.
- Users must configure the access configuration file,
  access.conf, which allows administrators to control
  access to specific server directories.
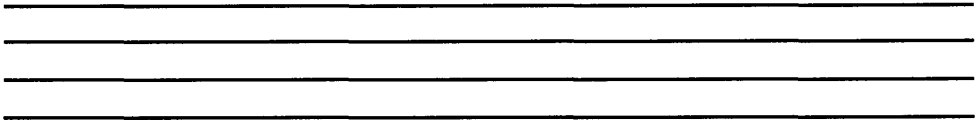
Depending on the type of software you select and the level of control you will need on your intranet, your configuration process may include more or less steps than those described above. When making these decisions, you can supplement system documentation with online resources devoted to Web server configuration and maintenance. For example, the newsgroups listed below are devoted to discussions of various types of Web server software. These newsgroups can be excellent sources of information, advice, and support:

- *comp.infosystems.www.servers.ms-windows*
- *comp.infosystems.www.servers.unix*
- *comp.infosystems.www.servers.mac*
- *comp.infosystems.www.servers.misc*

Server Security

An intranet server will probably have four basic categories of access. First, an administrator must have access to all executable programs including the system software. Second, the HTML files will probably be edited by various groups within the company. Those groups need access to the directories that contain the files they are responsible for maintaining, but not to the operating system software. Authorized users comprise the third group, and those that should not have access to the information on the server comprise the fourth group. A good rule of thumb is to limit server access to the first group (administrators) as much as possible.

While each system has its own method for administering these details (some of which were described above), the identification, classification, and rights of these groups must be identified and documented so that the system's security can be properly configured. Be certain that you address these issues with the appropriate decisionmakers and team members.

In addition, assure that groups accessing password protected areas choose difficult passwords. Since hackers use sophisticated dictionaries to break through password protected systems, assure that passwords are

- At least 8 characters long.
- Mixed-case alphanumeric.
- Not recognizable as a word.

See Chapter 7 for more information about Web server security and passwords.

TCP/IP Implementation

Since the intranet WWW server is based on TCP/IP protocols, you will need to decide how to implement TCP/IP addressing on your LAN. Your choices are to either assign a TCP/IP number to each workstation or to use a gateway product such as *NOV*IX for NetWare* from Firefox Communications, Inc. The *NOV*IX* gateway will convert packet formats and addresses so that workstations will not need to install new client software and may continue to use the Novell system. Assigning a TCP/IP number to each workstation reduces the processor intensive requirements of *NOV*IX*, but increases the burden on system administrators to configure each workstation.

If you decide that each workstation needs a TCP/IP number, you should decide whether or not your intranet will be connected to the Internet. If the intranet will be connected to the Internet, you should request a block of IP numbers from the Internet naming authority, the InterNIC (**http://rs.internic.net/rs-internic.html**).

Figure A8-2.1
The InterNIC
Registration
Services Web site.
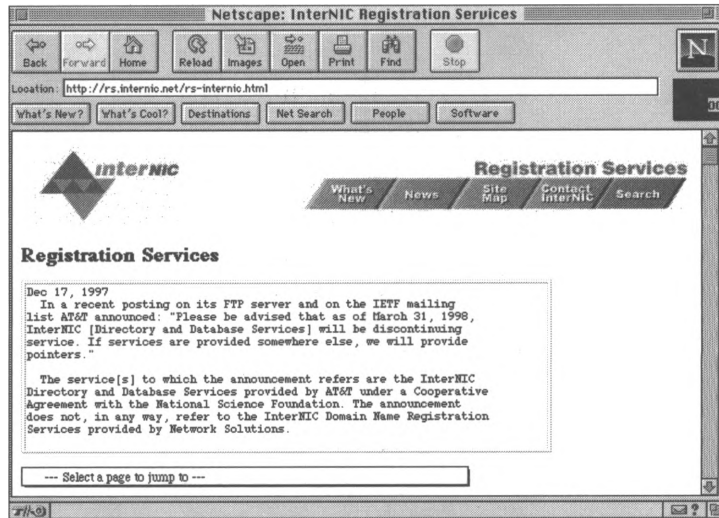
By doing this now, you will avoid the necessity of reconfiguring every workstation with a new set of IP numbers when your intranet is connected to the Internet. Your Internet access provider will help you obtain these numbers. If your intranet will never be connected to the Internet, you can use any set of discreet numbers as the IP numbers used to identify servers and workstations on the intranet.

Next TCP/IP software must be installed on the server and configured with an IP number. In addition, the server's network adapter card must be installed on the software and "bound" to the network adapter card.

Setting Up the Workstations

Each workstation that is added to your intranet and given its own IP address must have the same networking components described for the server: a network adapter card, the network driver (which tells the PC how to communicate with the adapter card), and TCP/IP software configured to work with each computer's
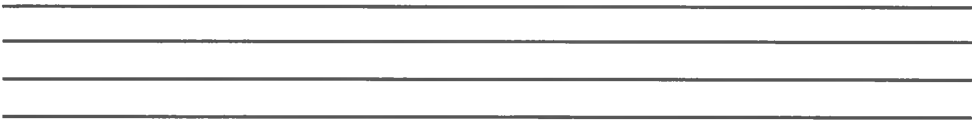
network adapter card. In *Windows* environments, an additional layer is required, called the *Windows* Sockets layer, or Winsock. The Winsock allows network-capable Windows programs to run with TCP/IP.

The workstation's client software, the Web browser, runs on top of this network base. Web browsers and any other application software your staff will be using must be installed on each workstation that is connected to the intranet.

As with Web server documentation, many online resources are available to support your installation of TCP/IP software. For example, one useful and widely distributed resource for installing TCP/IP software on a *Windows 95* computer is *The Windows95 TCP/IP Setup HOW-TO/FAQ* by Michael Rose and John Rafuse, available at many Internet sites including **http://www.four.net/ info/slp95faq.html**.

Figure A8-2.2
The Windows95 TCP/IP Setup HOW-TO/FAQ by Michael Rose and John Rafuse.

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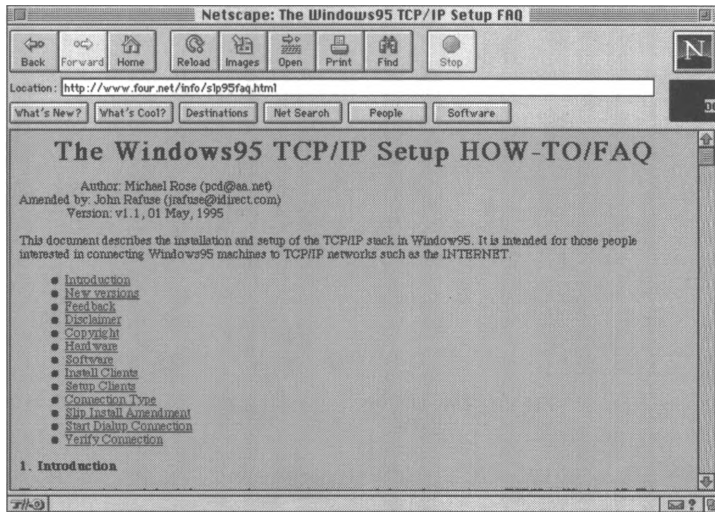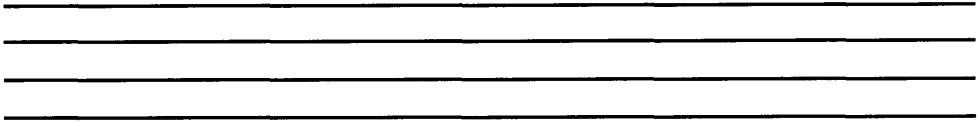
Name Resolution

The next decision will be to choose a method for converting the
IP numbers assigned to the intranet server or servers to commonly
understood names and vice versa. Otherwise, users would need
to address the intranet server with cryptic IP numbers. Requests
typed into the Web browser's **Address** or **Location** boxes would
look something like **http://38.115.11.90**, instead of more
understandable intranet addresses, like **http://corp**. The process
of changing a commonly understood name into an IP number is
called name resolution. You may have noticed a message that
appears at the bottom of your Web browser that says something
like "resolving www.kentis.com" when you type a new address
(such as **http://www.kentis.com**) into your Web browser. Your
computer is looking for the IP number related to the name you
input.

There are two methods of implementing name resolution. The
first method is to install the Domain Name System (DNS) service
or the equivalent Windows Internet Name Service (WINS) onto
one of the computers on your network. As an alternative you can
include a *hosts* file on each workstation. The *hosts* file is just a
text file with an IP number and the related name on each line of
the file. Using the *hosts* files method is only suitable for small
networks since each workstation must be updated every time
there is a change.

Installing Your Home Page

After you have installed your WWW server software onto your
intranet server, you must identify, in the initial configuration, the
name of the directory where the server looks to find the default
home page. For example, you may wish to create a directory
called "WWW" to house your default home page. Next, you

need to identify the file (called the default file or initial home page) that will be sent to inquiring client workstations when no particular file is specified in the client's request. In other words, what HTML page will the server send back to a client workstation that makes an inquiry when that inquiry does not identify the name of the file that it wants returned? For example, when you enter the address **http://www.kentis.com** into your Web browser, you have identified only where your browser should send the request for the file. In this case, you may be expecting the initial home page to be returned to you, but you have not specifically identified the file the server should send back to display in your browser. Instead, you are relying on the convention that directs the WWW server to send back the initial home page, also called the default file, when an inquiring client workstation sends a request to that server and doesn't specifically identify the file it wants returned. The convention of most server configurations is to use the file name *index.html* or *index.htm* as the default file name, but you can (and must) decide on the name you wish to use. The next time you surf the World Wide Web, type in the name of a WWW site, wait until you connect, and then look at the name of the file that is displayed in the **Address** or **Location** box in your browser. The file name at the end is the default file of that server.

Although the specific steps involved in configuring and implementing an intranet will be different for every organization, the steps described here are a good place to begin your planning. We've summarized these steps in the "Installation Checklist" that appears on the following page. You may want to use this sheet as you plan, or copy and distribute it among your team members.

Installation Checklist

ISSUE	RESOLUTION
Select a computer to host the World Wide Web (WWW) server software.	
Select an operating system for your server and select the WWW server software.	
Identify the categories of users that may wish to access your server and what their rights and restrictions are.	Administrator— HTML Editors— Authorized Users— Unauthorized Users—
Install the operating system.	
Install the WWW server software.	
Decide whether to assign IP numbers to each workstation or to use a gateway from the intranet workstations to the intranet server and the Internet.	
Contact Internet Access Provider to obtain TCP/IP blocks if also connecting intranet to the Internet. OR Decide upon a discreet block of TCP/IP numbers for an intranet that is not going to be connected to the Internet. OR Purchase and install an Internet gateway product like NOV*IX.	
Install TCP/IP software on the server and configure it to work with the network adapter card.	
Select and install client software on each workstation.	
Select the method that will be used to convert alphabetic names to the numerical IP address of the server.	DNS _____ WINS _____ hosts _____
Identify the directory on the server where the initial Web home page resides.	
Decide on the file name for the initial home page and configure the WWW server to recognize that file as the initial home page.	
Develop a default home page that will answer inquiries from users.	

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