Featuring The Global Network Navigator

# THE MOSAIC HANDBOOK



for the Macintosh

A NUTSHELL®

DALE DOUGHERTY & RICHARD KOMAN

O'REILLY & ASSOCIATES, INC.

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## The Mosaic Handbook for the Macintosh by Dale Dougherty and Richard Koman

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## FOREWORD

I always enjoy giving demos of Mosaic and showing people interesting places to go on the Internet. At tradeshows or in boardrooms, whether there's one person or many looking over my shoulder or watching it on a big screen, I watch to see when they "get" it. When do they really get the power of Mosaic? When do they really understand what the Internet makes possible? When do they realize that this is something they always wanted to do with a computer?

One thing I usually do when Mosaic appears on the screen is to distinguish between the Mosaic interface and the document that is displayed. I say, "When I use the scrollbar, which Mosaic provides, everything that moves is in the document window, where formatted documents containing text and graphics are displayed. The document itself contains any number of hypertext links, or connections to other documents anywhere on the Net. I move the mouse pointer over a link and click on it. Right away, Mosaic begins retrieving the document from a remote information server."

Then I stop and explain that the document I just retrieved came from Geneva, Switzerland. Usually, someone smiles. Next I get a document from a server in Australia and yet another from a university in Texas. At that point, someone usually asks a question, just to be sure. This gives me the chance to stop and emphasize to the audience that we are traveling great distances across the Internet. Sometimes there is a delay in making a long-distance connection, and then I have the opportunity to make the same point. But often enough the document pops up on the screen, just as if it were on my local system. "Did you see that?" I ask. "I just got that document from a World Wide Web server in Vancouver, B.C."

Mosaic makes it easy to navigate the Internet, and the connections that it makes are transparent to the user. I begin to worry that the audience might not grasp the power behind such a simple interface. So, I explain what the World Wide Web is.

While Mosaic manages the user interface and the display of documents—in other words, what is visible to the user—the World Wide Web (WWW) is invisible. The WWW is an information architecture, developed at CERN, a particle physics lab in Geneva, Switzerland. The WWW defines the components of a global information system and how they work together. I try to explain how clients like Mosaic are used to access information servers out on the network. How the clients and servers talk to each other is established by a WWW protocol specification known as HTTP (HyperText Transfer Protocol).

The World Wide Web specifications are public, and anyone can follow them to build a client; there is even code available that takes care of common functions. Indeed, that is how Mosaic was developed at the National Center for Supercomputing Applications (NCSA) at the University of Illinois. The virtue of public specifications is that from the outset, the World Wide Web recognized the need to have clients for all platforms. This was fully realized when NCSA came out with versions of Mosaic for the X Window System, Microsoft Windows, and the Macintosh.

As a graphical browser, Mosaic has managed to redefine what it means to be on the Internet. Instead of typing long command lines and having to remember a lot of arcane details, users can find the best the Net has to offer with a couple of mouse clicks. As if that isn't enough, when I show people that Mosaic can be used for multimedia, their reaction is one of disbelief, of seeing the future today. "Can you really find sound and video on the Net?" Yes, I answer, and although it may be impractical today for you to download digital sound bites or MPEG movie clips, the capability is there. The result can be stunning, and worth the wait. As the speed of network connections improve, so much more is possible.

The emergence of Mosaic and the WWW is the most exciting computing development in a decade, supplying the infrastructure needed to usher in the Age of Networked Information. Already, it is changing how people think and work, from elementary school children to CEOs. More and more people are discovering that they can move through the rich landscape of the Internet, find its wealth of resources, and contribute to its growth by becoming information publishers themselves.

It is also redefining what it means to be a publisher. With the *Global Network Navigator*, O'Reilly & Associates is exploring this new territory, and learning how to serve a new audience of online customers. Mosaic is also changing the way businesses and other organizations distribute information. Companies like Digital and Boeing, for instance, are setting up Web servers to distribute employee handbooks, sales sheets, and policies. Users are creating their own home pages and listing their hobbies or favorite places to visit on the Net.

All in all, the World Wide Web is becoming an incredible, enormous interconnected network of information, public and private, commercial and educational, free and for-pay. If you have an Internet connection, all you need is Mosaic to begin exploring these resources on your own.

Well, maybe, that's not all you need. Things are not as easy as they seem in a demo. Knowing where to go and what to do on your own can be a lot more challenging, especially given the size of the Internet. Learning how to navigate the Net and keeping up with all the new resources that are added every day is not easy. That's one reason we created *GNN*, so that you can find this information online and not have to spend your time gathering it. It is also why we developed *The Mosaic Handbook*. This book is more than a description of the Mosaic interface; it's a guide to navigating the Internet.

Dale Dougherty Publisher, *GNN* 

## PREFACE

What This Book Is About Enbanced NCSA Mosaic The Home Page Conventions Acknowledgments

Pelcome to Mosaic, the program that turns most folks' conception of the Internet on its ear. Forget about the Net being hard to use. Forget about command-line interfaces. Forget about UNIX commands.

You are about to enter the World Wide Web—a strange and fascinating land of hypertext, color graphics, digital video, interactive maps, and other cool stuff. Follow its strands and you'll wind a path through underground music archives, online newspapers and magazines, a warehouse of scientific knowledge, up-to-theminute weather maps and traffic reports, interactive services, and so much more.

But Mosaic is more than just a Web browser. In fact, it's an integrated interface for the entire Internet. Most services on the Net—including Gopher, WAIS, FTP, news-groups, and more—can be accessed through Mosaic.

How big is the Web? No one's really sure, since there's no central server registration point, but Matthew Gray, an MIT student who is the author of a program that travels the Internet seeking out new forms of Web life, sums it up pretty well: "Wow, it's big," he says.

But what exactly *is* the World Wide Web? It's a seemingly infinite system of servers on the Internet all tied together by hypertext links. Hypertext is a technology for linking collections of documents. On the Internet, these collections are distributed among a web of information servers. Using a mouse, you can click on a hypertext link in one document and retrieve the linked document from an information server out on the Internet. That server could be anywhere in the world.

The documents that you get can have a lot more than just text. Mosaic supports multimedia documents, and on the Web you can find graphics, video, audio, and other digital media.

#### The Best of the Net

What kind of information servers will you find on the Web? We'll cover that in some depth in this book, but to give you an idea of what's out there, here are some of the servers that in 1994 were named the "Best of the Net" by the *Global Network Navigator* (*GNN*), O'Reilly & Associates' online publications center and guide to Internet resources. In the images that accompany the descriptions of these servers, you'll see different documents displayed within the Mosaic interface. Mosaic displays documents within the area surrounded by the scroll bars.



#### International Teletimes

This general-interest magazine is published online from Vancouver, British Columbia, on a shareware model. According to its writer's guidelines, "Teletimes seeks to present informed opinion and observation drawn from the experience of living in a particular place." International Teletimes is a collaboration of many volunteers from around the world, but perhaps most notable is the fact that its editor-in-chief, Ian Wojtowicz, was 16 years old when he received the Best of the Net award.



#### New Zealand Information

Perhaps you are traveling to New Zealand, or teaching a class about it. A server at Carnegie-Mellon University will tell you more about New Zealand than you might want to know. Want to know about the climate, or locate Auckland on a map? Listen to a speech in the native Maori language? Want to know what a tuatara is? The most ancient of all living reptiles, and the sole survivor of the beak-heads family, the tuatara lives to be over 100 years old. What's more, while young the tuatara

has a third eye. You'll also find out that the main difference between Marmite and Vegemite, two types of yeast extract, is that the latter is Australian and tastes awful.



#### U.S. Bureau of the Census

The self-proclaimed "Factfinder for the Nation," the Census Bureau has created a model server for government agencies to follow. In short, it organizes information so that citizens can make their own use of it. You can get financial data on state and local governments as well as schools. The Bureau's statistical briefs are PostScript documents describing poverty in the U.S., analyzing housing changes from 1981–1991, or profiling people of Asian and Pacific Island heritage in the American

population. In the Census Bureau Art Gallery, there is a display of posters used to promote participation in the census.



#### Xerox PARC Map Viewer

From the famous research lab that gave birth to the technologies that would become the Apple Macintosh and Adobe PostScript (among others), here's one of the most interactive applications on the Net. MapViewer is an application that dynamically renders a map based on user input. Click on a region and MapViewer will zoom in on it. You can also use a geographic name server to locate a particular location by

name. Typing in "San Jose, California," we find that it is the county seat, and had a population of 62,000 in 1980. Its latitude and longitude are also given, and we can click on this information to display a map of the U.S. and a map of Northern California showing where San Jose is.

The Geographic Name Server happens to be located at the University of Buffalo, but that's how the Net works—one computer connects to another, just as one person's work connects to what other people are doing. A map of the world that is created dynamically seems the best way to think of our own new world, where the boundaries of nations and the limits of individuals can be overcome by making so many different connections possible.

Those are just four of the thousands of servers on the Web, with new ones coming online every day. Of course, not all of them are absolutely riveting. Helping you find the ones that interest you is what this book is really all about.

"Wherever you go, there you are," a line from the movie *The Adventures of Bucka*roo Bonzai Across the Eighth Dimension, sort of sums up what Mosaic and the Web are all about. The Web is made for browsing, for following trains of thought, for taking interesting detours whenever they crop up. Mosaic users have a sense of the explorer about them, an excitement about discovering new information, a lust for links.

#### What This Book Is About

*The Mosaic Handbook for the Macintosh* is aimed at everyone who uses Mosaic—or who wants to use Mosaic—to access the Internet. Whether you're a rank beginner or an experienced Net-surfer who wants a guide to Web sites or help with customizing Mosaic, we think you'll get something out of this book.

Chapter 1, *The Wide World of Internet Services*, provides an overview and history of the Internet, including the development of the World Wide Web and Mosaic.

Chapter 2, *Getting Started with Mosaic*, describes how to begin using Enhanced NCSA Mosaic and covers the most important aspects of the Mosaic interface.

Chapter 3, *Exploring the World Wide Web*, covers how to navigate through the World Wide Web. It includes a tour of *GNN* and provides pointers to some of the more fascinating places on the Web.

#### The Mosaic Handbook for the Macintosh

Chapter 4, *Exploring Other Internet Services*, describes how to use Mosaic as a browser for Gopher, FTP, WAIS, and News.

Chapter 5, *Customizing Mosaic*, explains how to make changes in Mosaic's default behavior.

Chapter 6, *Using Mosaic for Multimedia*, gives the lowdown on using other programs to play audio, video, and other multimedia files.

Chapter 7, *Creating HTML Documents*, gives a tutorial in how to write your own Web documents.

Chapter 8, *Future Directions*, discusses future development of the Web. It introduces the new World Wide Web Organization (W3O), which is a development consortium founded by MIT and CERN.

Appendix A, *Mosaic Reference Guide*, describes the user functions available from Mosaic's menus.

Appendix B, *HTML Reference Guide*, describes the HTML tags used to create World Wide Web documents.

#### Enhanced NCSA Mosaic

The Mosaic Handbook for the Macintosh includes Enhanced NCSA Mosaic on disk.

Enhanced NCSA Mosaic is based on the original Mosaic developed at the National Center for Supercomputing Applications (NCSA). However, it is not a public domain program, nor is it the same as the versions that can be downloaded from the Net.

Spyglass, Inc. was chosen by NCSA as the master licensee of NCSA Mosaic. They will license Enhanced NCSA Mosaic to other vendors, who will then distribute copies to end users. Spyglass is committed to maintaining a single code base for all three Mosaic platforms and keeping a consistent interface across all platforms. Thus, all three versions should be consistent in their reliability and functionality, which has not been true in the versions on the Net.

Enhanced NCSA Mosaic for the Macintosh features a number of improvements over the original NCSA version, including:

- Dramatically faster performance
- Reduced memory requirements—one-half to one-third the memory previously required
- Easier installation
- Support for printing
- Simplified interface for easier browsing

- Support for forms, allowing for two-way communication between users and Web servers
- Proxy gateway support for security in networked environments
- Online help system.

NCSA is now focusing on research into advanced features for the next generation of Mosaic, such as voice recognition, full-motion video, and intelligent agents for searching on the Internet. NCSA will continue to offer a public-with-copyright version of Mosaic over the Internet, which you can download for free. As part of the NCSA-Spyglass agreement, Spyglass will provide many of its improvements to NCSA, which will incorporate them into their version.

#### Support and Registration

This book includes version 1.0 of Enhanced NCSA Mosaic. New versions are expected to be available, and we can provide them online to registered users. Be sure to complete the online registration form accessible from the Mosaic Handbook Home Page. Check the Mosaic Handbook Support Center to learn about updates to the program.

If you have problems with the software, check the online Support Center. If you cannot solve your problem using the online resources, you can send email to *support@gnn.com*. We generally cannot deal with the specifics of your Internet connection beyond what we describe in Chapter 2. Be sure to ask your system administrator or your Internet service provider if you are having problems using Mosaic to access documents on the Internet.

### The Home Page

The disk that comes with this book also includes the Mosaic Handbook Home Page, which is the first document you see when you start this version of Mosaic.

During the installation process, the Mosaic Handbook Home Page will be copied to your computer's hard disk. The Home Page contains links to the *Global Network Navigator*, the *Mosaic Handbook Hotlist*, which provides online links to all the Internet resources mentioned in this book, and the Mosaic Handbook Support Center. It also has a link to a document that allows you to register your copy of Enhanced NCSA Mosaic. These resources are *not* on the disks shipped with this book; they are on the Internet. If you don't have an Internet connection up and running, you will not be able to access these resources.

The Home Page provides an easy way for you to start using the World Wide Web and the Internet. Later in the book, we will show you how to modify the Home Page and add links to your favorite resources.

Throughout the book, we'll refer to the Mosaic Handbook Home Page as your Home Page (with initial capital letters) to distinguish it from other home pages in

general. Most servers have a home page, which is the first document you come to when connecting to a server. We'll refer to these pages by their full names, such as the NCSA Home Page.

#### The Mosaic Handbook Hotlist

Because filenames and server locations change with great frequency, we have created the *Mosaic Handbook Hotlist*. This document will be maintained on the *GNN* server (rather than included on the disks) so that it can be updated if the network addresses of the resources described in this book change. Online access will also make it more convenient for you because you don't have to type the long addresses yourself.

#### **Conventions**

The following font conventions are used in this book:

Italic	is used for file and directory names, USENET news- groups, and to emphasize new terms.
Bold	is used for commands, command-line options, hypertext links, and Internet names and addresses.
Constant Width	is used for HTML tags and the contents of files or the out- put of commands in examples.
Constant Italic	is used within examples for variables that the reader will replace with an actual value.
Constant Bold	is used within examples for text that is literally typed by the user.

### Acknowledgments

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Clairemarie Fisher O'Leary steered the book through production, and caught a few errors of ours based on her own knowledge of HTML. Stephen Spainhour shared the production duties in getting the various versions of the book into print. Edie Freedman designed the cover art, capturing our navigation theme. Chris Reilley handled the illustrations throughout the book. Frank Willison, O'Reilly's Managing Editor, coordinated this effort and kept us on track. Chris Tong and Susan Reisler did the indexing. Frank Howard captured the screenshots for the Macintosh version. Valerie Quercia wrote the glossary. Lenny Muellner and Jessica Hekman provided technical support. Sheryl Avruch and Sue Willing also provided invaluable help with various production and administrative tasks.

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#### **CHAPTER ONE**

## THE WIDE WORLD OF INTERNET SERVICES

What Is the Internet? The Internet and Online Services The Client and the Server The Development of WWW and Mosaic Developing the Global Network Navigator

ithout the Internet, Mosaic wouldn't make much sense. Using Mosaic on a computer that's not connected to the Internet is like having a car that sits in the driveway. Before you go to visit the many services that the Internet has to offer, there are a few things you should know about this global network.

This chapter contains basic information about the Internet, which is useful for understanding how Mosaic works. It explains the client/server architecture behind most Internet information services. We also examine the development of the World Wide Web and how Mosaic came to be. If you find yourself itching to get started, please feel free to jump ahead to the next chapter. This chapter isn't "required reading" because it contains information that most people on the Internet already know.

#### What Is the Internet?

Not so long ago, if you asked "What is the Internet?" you'd get a technical answer. A longtime Internet user would usually make the following points:

- The Internet is a network of networks, with millions of computers connected to one another.
- The TCP/IP protocols at the core of the Internet describe how messages are addressed and sent as packets from one computer on the network to another. A packet may be routed through several computers to reach its destination.
- The Internet came into being as a U.S. Defense Department network, ARPAnet, that was designed to withstand a nuclear bomb attack. It is a distributed network without a vulnerable central hub.
- The National Science Foundation (NSF) built a network, NSFNET, on the same model as ARPAnet to connect research and educational institutions. Because of

the government funding, commercial traffic was restricted by an Acceptable Use Policy. In the early 1990's private, commercial networks joined the Internet, and restrictions on commercial activity were relaxed.

Today, the Internet has come to mean something much more than a physical network with historical ties to research, education, and national defense. It has become a cultural icon, emblazoned on the cover of *Time* magazine, and the subject of many stories in your hometown newspaper and *The Wall Street Journal*. The Internet has come to represent what the future looks like today, and to suggest what is possible when people can communicate with each other around the world.

The Internet has been variously characterized as the Information Superhighway, the Infobahn, and Cyberspace. It has been called the best reason to have a personal computer at home. John Markoff of *The New York Times* has written that the PC, not the set-top box, will rule the consumer market and that services such as those provided on the Internet will be available sooner and prove more valuable than video-on-demand and 500-channel cable systems.

So, what do people do on the Internet? They exchange email, follow newsgroups, and download files. They also find information and other people. These are things that many people have done for years on traditional online services such as CompuServe and America Online. What's so fascinating about the Internet? How does it differ from these online services?

#### The Internet Is Distributed

You could say that CompuServe is a big computer and hard disk in Columbus, Ohio. CompuServe users dial in via modems to access that computer and its data. It is a centralized network, completely owned and operated by CompuServe.

The Internet, in contrast, is completely distributed. Your computer connects to another computer that is connected to another computer. The TCP/IP protocol ties it all together invisibly, so you don't need to know exactly how your data gets from one computer to another halfway around the world. You are accessing not one computer, but many. You connect to your Internet service provider and from that point you can access any computer on the network.

#### The Internet Is International

Perhaps the most exciting thing about the Internet is its sheer size. While the Internet has its origins in America and most Internet traffic originates here, it is a global network. The fact that we can retrieve a document from Switzerland, Germany, Japan, or New Zealand demonstrates that we live in an interconnected global community.

#### The Internet Is Wide Open

Nobody really runs the Internet—at least not yet. Some have compared the Internet to the Wild West, with arguments escalating into flame wars instead of gunfights. There are few rules, at least written ones, but there is a culture that tends to support and enforce its wishes.

The Internet is wide open in a technical sense. Nobody owns the Internet, and there is little proprietary technology involved in its operation. This means that people have lots of choices.

#### The Internet and Online Services

One of the most interesting developments on the Internet is its potential to redefine how we obtain online services via a public network. The Internet effectively unbundles the services that a traditional online service provides; that is, the charge for network access is separated from the charge for content. For instance, a customer of Mead Data, which provides Lexis and Nexis online services, uses a private network, a software interface, and a delivery system, all built and maintained by Mead Data in order to supply the content to their users. Users pay high hourly rates for the amount of time they are on Lexis or Nexis accessing content.



Figure 1-1. Layers of the Internet

Figure 1-1 shows the layers of the Internet. Each layer may be supplied by a different vendor. At the bottom is the carrier, the wire over which the bits are transmitted. These are typically phone lines leased from the local and national phone companies, but the carrier can also be a cable company.

The next layer up from the bottom is the *IP* (*Internet Protocol*) layer. Each Internet service provider has a network of computers that it serves, and it routes Internet traffic to and from those machines. At the next layer, you have client and server software. In short, the server software distributes information on the Net, while users run client software to access and display that information.

A traditional online service often supplies a single interface program—usable only with that service. On the Internet, you have lots of tools to choose from, including programs to exchange email, participate in newsgroups, and search and gather information. In many cases, there are shareware or public domain versions of these programs as well as more fully featured, commercially supported programs. The point is that there are many sources that can supply you with an Internet connection and the kinds of tools that you use while connected.

Because the Internet is a general-purpose network that has many uses, a company might install an Internet connection just as it does a phone system. It allows users within the company to communicate with the rest of the world. The generalpurpose network serves those who want access to information as well as those who want to provide information to others. In fact, with this information infrastructure in place, it becomes easier and cheaper to become an information provider, so more people can do it. That has great potential for revolutionizing the business of online information services.

## The Client and the Server

A key to making Internet information services more accessible is making them easier to use. For many users, their first experience with the Internet was a UNIX command-line prompt:

unix%

At this prompt, the user would type in various commands such as "who am i" or "ftp" or "rlogin."

Until recently, UNIX was the interface of the Internet and you had to learn something about the UNIX command set to navigate successfully. UNIX is a very powerful operating system (and the Internet, as well as O'Reilly & Associates, owes a lot to UNIX), and networking is part of its basic design. From the very beginning UNIX computers were networked to each other, and programmers found useful ways to take advantage of the benefits. On UNIX systems, many programs were designed with a client/server architecture, which means that a program was divided into two parts that could run on different computers.

Take a word processing program as an example. Imagine that all the file handling routines are executed on a computer dedicated to that task. This software is the *server*. On your personal computer, meanwhile, a program controls the user interface and responds to your interactions. This is the *client*. When you ask for a file, the client program sends a message to the server to send that file. The server complies with the request, and the client then interprets and displays the file.

In other words, the server software on one computer manages the information and access to it, and the client program on another computer manages the user's interactions with the information. One exciting aspect of client/server design is that multiple clients can interact with a single server or with many different servers. In addition, clients can fit into the user's environment and assume the likeness of other locally run programs.

In short, this means that Macintosh users can run a Macintosh client that interacts with servers on powerful UNIX machines. As a user, you get the benefit of using a client that fits into your computing environment, while accessing a central file server that can handle lots of requests at once.

Mosaic is client software, and there are Mosaic clients for the Macintosh, Windows, and X Window System environments. All three programs receive the same information from the server, but they may display it differently. Mosaic is specifically designed to access World Wide Web servers, but it can also access other types of information servers.

#### Information Servers

An Internet-based information server is a computer that runs a program to handle incoming requests for information. There are actually many different types of information servers on the Internet. In this section, we will survey FTP, Gopher, and WAIS. Each provides a different way to access information, and user interactions range from the simple to the arcane. When we get to the World Wide Web in the next section, you will better understand how information access can be even easier.

#### FTP

If you run an *FTP* (*File Transfer Protocol*) server, you allow users on other computers to log on to your computer and retrieve files that you have put in a public area. Since giving each user an account would be a problem, an FTP server is set up to accept anonymous logins.

When O'Reilly & Associates first published our computer books, we made sample source code available on our FTP server. One server that we use for this is **ftp.ora.com**. We told our readers how to come in using the Internet to retrieve the files. Below you can see a sample FTP session, in which, after logging in, we change directory (cd) and then use the **get** command to retrieve the file named *bookcat.txt*.

dale % ftp ftp.ora.com Connected to ruby.ora.com. 220 ruby FTP server (Version wu-2.4(1) Fri Apr 15 14:14:30 EDT 1994) ready. Name (ftp.ora.com:dale): anonymous 331 Guest login ok, send your complete e-mail address as password. Password: 230-Welcome to O'Reilly & Associates, Inc. FTP Archive. 230-230-If your ftp client chokes on this message, log in with a '-' as the 230-first character of your password to disable it. 230-230-If you have problems with or questions about this service, send mail to 230-ftp-manager@ora.com; we'll try to fix the problem or answer the 230-question. 230-230-Current local time is Mon Aug 1 00:02:24 1994 230-230 Guest login ok, access restrictions apply. ftp> cd /pub 250-This directory includes... 250-250-book\_covers Image files of the covers of O'Reilly's books 250-book\* Book catalog in four different formats 250-errata/ Errata and updates for various O'Reilly titles 250-examples/ Example files and programs from O'Reilly publications 250-250-"Index" files in this directory and subdirectories have more information. 250-250-Please read the file Index 250- it was last modified on Thu Jul 21 08:44:06 1994 - 11 days ago 250 CWD command successful. ftp> get bookcat.txt 200 PORT command successful. 150 Opening ASCII mode data connection for bookcat.txt (124651 bytes). 226 Transfer complete. local: bookcat.txt remote: bookcat.txt 127533 bytes received in 31 seconds (4 Kbytes/s) ftp> guit

The advantage of FTP is that any kind of file can be made available, whether ASCII text, PostScript, or various graphics formats. Almost anyone on the Internet can access a file via FTP, although the commands make it feel like a lot of hard work. If you know what you want and where it is located, then FTP works reasonably well.

#### Gopber

Gopher originated at the University of Minnesota, where the varsity is known as the Golden Gophers. Gopher made things easy for users looking for information, as well as for organizations wanting to provide information. From the user's point of view, information on a Gopher server is organized as a series of hierarchical menus. Using a Gopher client, you choose a particular item on a menu and receive either a submenu or a text file.

Putting up a Gopher server requires not much more effort than running an FTP server. You arrange files in a set of directories, with each directory corresponding to a menu of choices presented to the user. At O'Reilly & Associates, we set up a Gopher server to provide information about our books. You can access this server

by running the Gopher client on your local machine. The UNIX command for this is:

unix% gopher gopher.ora.com

There are different Gopher clients available, including several commercial clients for Windows and the Macintosh. Here is the opening screen from our server:

```
Internet Gopher Information Client v2.0.12
Root gopher server: gopher.ora.com
--> 1. About O'Reilly & Associates
2. News Flash! -- New Products & Projects/
3. Detailed Product Descriptions/
4. Ordering Info/
5. Complete Listing of Titles
6. FTP Archive & Email Information/
7. Feature Articles/
8. Errata for "Learning Perl"/
9. Bibliographies/
Press ? for Help, q to Quit Page: 1/1
```

Gopher was responsible for the first big surge in Internet traffic as people began exploring what was available on servers throughout the world. Anyone can quickly understand how to move through the network of Gopher servers.

Unfortunately, what Gopher gained in ease of use, it lost in flexibility. Users felt as though they were always moving from one menu list to another, and when you finally got somewhere, you ended up with a ASCII document that wasn't very enjoyable to read.

#### WAIS

*WAIS* (*Wide Area Information Servers*) was developed by a consortium of four companies interested in designing an easy-to-use searching system. The consortium, consisting of Thinking Machines Corp., Apple Computer, Dow Jones, and KPMG Peat Marwick, was led by Brewster Kahle, then at Thinking Machines in Cambridge, Massachusetts. Brewster saw that there was so much information available on the Internet that anyone would have trouble locating the most relevant documents.

Each WAIS server contains a full-text index of all the documents on the server. A user of a WAIS client submits a simple query, such as a keyword or phrase, and the WAIS server returns a list of the documents that contain those words. If you select one of the documents from the list, it will be displayed on your computer.

Although WAIS was originally developed for use with a graphical client on the Apple Macintosh, in practice most people do not use a WAIS client. They access a WAIS server using either a Gopher client or a WWW client. Therefore, searching

for a document has become an alternative to browsing. For instance, on the O'Reilly Gopher server, you can access a WAIS server to perform a keyword search of the book descriptions online. This is what a WAIS query looks like:

```
+-----Keyword search on Descriptions-----+
| |
| Words to search for |
| ______ |
| _____ |
| |
| |
| [Help: ^_] [Cancel: ^G] |
```

+-----+

If we enter the keyword "Internet" in the search field, WAIS will return a list of books whose descriptions contain that word. The result looks like this:

Keyword search on Descriptions: Internet

--> 1. !%0:: A Directory of Electronic Mail Addressing & Networks

- 2. Computer Security Basics
- 3. Connecting to the Internet: An O'Reilly Buyer's Guide
- 4. DNS and BIND
- 5. European Networking
- 6. Global Network Operations
- 7. Learning the UNIX Operating System
- 8. Mobile IP Networking
- 9. Networked Information and Online Libraries
- 10. Notable Speeches of the Information Age, John Perry Barlow: USENIX
- Conference.
- 11. Security and Networks
- 12. TCP/IP Network Administration
- 13. The Future of the Internet Protocol
- 14. The Whole Internet User's Guide & Catalog
- 15. Volume 6A: Motif Programming Manual

Selecting any book by number will display the book's description. Note that WAIS tries to rank the list in order of importance, but you usually have to scan the list and select the most appropriate choice. For instance, the book that is most clearly about the Internet, *The Whole Internet User's Guide and Catalog*, shows up 14th on the list.

WAIS is a valuable tool for indexing large bodies of information and helping users locate specific documents in a collection. However, most users do not find searching alone to be an intuitive way to work. Therefore, WAIS servers typically run alongside other servers.

For more information about information servers and how to set them up, see *Managing Internet Information Services*, by Cricket Liu, Jerry Peek, Bryan Buus, Russ Jones, and Adrian Nye, published by O'Reilly & Associates.

### The Development of WWW and Mosaic

The World Wide Web is very similar in design to the Internet-based information servers we examined in the last section. However, WWW offers several advances, including a document-oriented view of computing that offers formatted text and graphics instead of menu lists.

#### The World Wide Web at CERN

The World Wide Web originated at the European Particle Physics Laboratory (CERN) in Geneva, Switzerland. Tim Berners-Lee, an Oxford University graduate who came to CERN with a background in text processing and real-time communications, wanted to create a new kind of information system in which researchers could collaborate and exchange information during the course of a project. For most scientists, a publication presents a record of what a project accomplished; that is, you read it after the project is long over. Tim saw the need for physicists to collaborate in real time, and not just on one project, but on many.

Tim used hypertext technology to link together a web of documents that could be traversed in any manner to seek out information. The web does not imply a hierarchical tree, the structure of most books, or a simple ordered list. In essence, it allows many possible relations between any individual document and others. Tim implemented hypertext as a navigational system, allowing users to move freely from one document to another on the Net, regardless of where the documents are located.

The term "hypertext" was coined in the 1960's by Ted Nelson, who defined it as "non-sequential writing." He wanted to emphasize that hypertext applied not only to locating and reading information, but also to creating it. Nelson popularized the idea in his books and his vision of a global hypertext system called Xanadu. This was a project designed to remain incomplete, rather like building a library to contain all the world's information. Surprisingly, the World Wide Web comes as close to realizing Xanadu as anything Nelson and his associates have achieved, although Nelson has argued that WWW lacks several key aspects of his system.

While the WWW does present a navigational model that is much easier for users, it also presents some problems for information providers. It requires authoring documents in a particular format defined by the system. Specifying a document format is necessary if hypertext links are to be embedded in the document.

There were many implementations of hypertext systems before the World Wide Web. What Tim did, in cooperation with others at CERN, such as Robert Caillau, was to define an Internet-based architecture using open, public specifications and free, sample implementations for both clients and servers. Because the specifications are public, anyone can build a client or a server. Because there are sample implementations and the code can be obtained for free, developers can choose to build or refine parts of the system. Both factors encourage other people to contribute to the project, and as is true of many things on the Internet, the WWW

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effort has turned into a collaborative project involving people and organizations from around the world.

#### WWW specifications

Let's look briefly at the WWW specifications. While this is not necessary for you to become a Mosaic user, it will help you understand how Mosaic works.

The World Wide Web is a set of public specifications and a library of code for building clients and servers. There are three key specifications:

- URL (Uniform Resource Locator)
- HTTP (HyperText Transfer Protocol)
- HTML (HyperText Markup Language)



Hypertext link contains URL of linked document.

Mosaic interprets HTML tags and renders document on the screen.

Figure 1-2. How Mosaic retrieves a document

Figure 1-2 illustrates how these specifications work together. A URL is the address of a document on a network server. If a user clicks on a link in a document that contains a URL, the client interprets the URL and then initiates a session with the specified server. HTTP is the protocol, a fixed set of messages and replies, that both the client and server understand. Thus, the client sends a message to the server requesting a document and the server returns it. The document itself is coded in HTML, and the browser interprets the HTML to identify the elements of the document and to render it. The use of HTML allows documents to be formatted for presentation using fonts and line justification appropriate for the system on which it is displayed.

The format of a URL is discussed in Chapter 2, *Getting Started with Mosaic*. The HTTP protocol is not discussed further in this book. The basics of HTML are covered in Chapter 7, *Creating HTML Documents*.

#### Early Browser Development

The team at CERN implemented a line-mode browser, which is the lowest common denominator among browsers, and can be used from almost any kind of terminal.

Welcome to the World-Wide Web THE WORLD-WIDE WEB

This is just one of many access points to the web, the universe of information available over networks. To follow references, just type the number then hit the return (enter) key.

The features you have by connecting to this telnet server are very primitive compared to the features you have when you run a W3 "client" program on your own computer. If you possibly can, please pick up a client for your platform to reduce the load on this service and experience the web in its full splendor.

For more information, select by number:

A list of available W3 client programs[1] Everything about the W3 project[2] Places to start exploring[3] The First International WWW Conference[4]

This telnet service is provided by the WWW team at the European Particle Physics Laboratory known as CERN[5] [End] 1-5, Up, Quit, or Help: q

The example above shows the initial login session with the line-mode browser, using TELNET to access the CERN server (info.cern.ch). As you can see, the screen is formatted ASCII text. Links are numbered and appear inside brackets. To follow a link, you enter the number of the link at the prompt at the bottom of the screen.

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Another browser with a better interface was developed for Steven Jobs' NeXT computer. However, it did not receive wide usage outside CERN. Lynx, a browser with a full-screen interface, was developed at the University of Kansas by Lou Montulli.

In some ways, when the first versions of Mosaic became available in the spring of 1993, WWW had reached proof-of-concept stage but it had not achieved widespread use. While multiple clients existed, none of them suggested the potential of combining text and graphics in a graphical Web client. With an easy-to-use interface that lets you click on a link to navigate the Web, as well as the ability to display graphics, Mosaic made the Internet accessible to a broader group of users.

#### The Development of Mosaic at NCSA

The National Center for Supercomputing Applications (NCSA), located at the University of Illinois at Urbana-Champaign (UIUC), was funded by the National Science Foundation to provide supercomputing resources to the research community. NCSA was part of a wider effort by Congress to fund a national infrastructure for high-performance computing and communications.

It would be nice to write that such government funding directly resulted in the development of Mosaic. However, Mosaic came about rather unexpectedly. Marc Andreessen was an undergraduate student at UIUC, who had a part-time job at NCSA, building tools for scientific visualization. He began working on Mosaic as one of those tools, but pretty soon he knew he was onto something bigger. From that point on, Marc was racking up far more hours than his part-time status required. Eventually, Eric Bina joined Marc in developing Mosaic.

To Marc's credit, when he started building Mosaic, he looked around on the Internet and discovered that he didn't have to start from scratch. He found the WWW and saw that it was intended to serve a community similar to the one served by NCSA. Having an existing code base available from CERN meant his work could progress very quickly, even if he had to re-write some of the code to make it usable.

It is hard to point out any single new feature that Mosaic introduced, either as a hypertext browser or a WWW client. Rather, Marc made available a solid program with the right number of features for users to feel amazed and empowered by their ability to navigate the riches of the Internet. Figure 1-3 shows Mosaic viewing the *GNN Home* page.

Marc was not only the developer of Mosaic, he was also its champion. He spent lots of time on the Web developer mailing list, talking about various development issues. He introduced minor improvements, and sometimes major changes, overnight, and sent out new versions for immediate distribution on the Net. While many people anxiously awaited the updates, NCSA wasn't sure what Marc had created, and where it fit inside their organization. Nonetheless, the excitement of government supporters, the press, and the Internet user community was

1	Global Network N N. http://gnn.com/GNNhome.html	avigator Home Page 🚞	
	GNN HO	ME PAGE	
	Global Ne	etwork Nav	igator
	Charti	ng the Interne	610
elcome to (N. If you	GNN, the Global Network Navigator. To fir /zenew to GNN and would like to knowmore wat to hence a chergiba (it is fool)	nd out what's new and cool in GNN about us, take a minute to check or	I, look at <u>What's Up in</u> ut <u>Welcome to GNN</u> .
11 100 110	What's Up in GNN	Welcome	Subscribe
avidal	ing the Net		
e GNN to formation	help you find your way through the Internet about Internet resources, if you're looking for	. GNN's <u>Whole Internet Catalog</u> businesses on the Net, check out G	is your best source of NN's <u>Business Pages</u> .
	The Whole Internet Catalog	The GNN Bus	siness Pages

Figure 1-3. Sample Mosaic screen

overwhelming. NCSA expanded its Mosaic development efforts, hiring students to develop Windows and Mac versions.

With the April 1993 release of Mosaic 1.0 for the X Window System, Mosaic began to drive the explosive growth of the World Wide Web. By that fall, Version 2.0 of Mosaic for X came out, and the first beta versions of WinMosaic and Mac Mosaic were released.

#### Commercialization and Future Developments

NCSA is not a commercial software development organization; it was chartered to create software for scientific researchers and place it in the public domain. NCSA made Mosaic freely available on the Internet "for academic, research, and internal business purposes only." No doubt these terms have helped make Mosaic popular. Anyone can get a copy, try it out, and realize how useful it is. Naturally, commercial software developers have taken notice of Mosaic. Many of them are interested in taking its development further.

Because Mosaic is copyrighted, anyone wanting to modify the source code or distribute binaries of Mosaic must obtain a license to do so from NCSA. Initially, NCSA handled the licensing of Mosaic. In August 1994, NCSA announced that it had reached an agreement with Spyglass, Inc., to have them serve as the licensing agent for Mosaic.

As a result of the various licensing deals by companies that will continue development of Mosaic, we may wind up with many different versions of Mosaic. *The Mosaic Handbook for the Macintosh* comes with Enhanced NCSA Mosaic, developed by Spyglass, which we chose because it is likely to define the core feature set for Mosaic.

In the long run, NCSA Mosaic may be viewed as the application that made the Internet important, just as Lotus 1-2-3 created a market for IBM personal computers. Others are at work on products that will compete with Mosaic, including Marc Andreessen himself. Marc left NCSA in December 1993 and eventually founded a company with James Clark, one of the founders of Silicon Graphics, Inc. Mosaic Communications Corp. has hired many of the original Mosaic developers from NCSA, and it will be interesting to see what they create in light of such high expectations.

## Developing the Global Network Navigator

At O'Reilly & Associates, we had been looking at various methods of publishing online. After all, we wrote books about computers, and it seemed to make sense to deliver books about computers on computers. We had developed a number of requirements for online publishing and as we began learning about the World Wide Web, we got very excited. At the time, we were just about to publish Ed Krol's *The Whole Internet User's Guide and Catalog*, which would become a bestseller.

We began to explore the Web and wonder what uses a publisher could make of it. One of our first efforts was an online demo of the resource catalog in the Krol book. It was so well received that we began to think of making it into a product, and that led to the development of the *Global Network Navigator*. Using a Web server to put the resource catalog online was the obvious part of it; we also saw the opportunity to create online magazines. The magazine format could be used to portray what people were doing on the Internet, what they were interested in.

As Mosaic became available in the summer of 1993, we began doing demos and showing people just what was possible with the new technology. In fact, we had to take great pains to make people understand where Mosaic ended and *GNN* began—that Mosaic was intended to retrieve documents from network servers and that we ran a network server ready to deliver our documents upon request to Mosaic users.

We launched GNN in August 1993 at the Interop tradeshow in San Francisco, and it officially went online October 1. We made GNN available for free, but asked that
users register and become subscribers. As of September 1, 1994, we have over 50,000 subscribers.

*GNN* introduced advertising in our online publications. We make it possible for advertisers to deliver a message in an editorial context that we have created for users. We also think, perhaps ambitiously, that we can change the nature of advertising by asking advertisers to take advantage of this new medium and provide users with only as much information as they are interested in receiving. We call it "content-driven" advertising.

That is all said to give you some flavor of *GNN* as a pioneering effort in online publishing, an ongoing experiment in creating online audiences. As it grows, *GNN* will continue to change, making it difficult to describe on paper, especially using black-and-white screenshots. The real thing is online and in living color. Online, *GNN* may differ some from what you see in this book, but it is a good way to show off the capabilities of Mosaic and to help you explore the World Wide Web.

### CHAPTER TWO

# GETTING STARTED WITH MOSAIC

The Right Kind of Internet Connection Installing and Starting Mosaic Connecting to GNN Mosaic's Navigation Tools Document-based Features When Things Go Wrong

Now that you understand something about how Mosaic, the World Wide Web, and the Internet all fit together, we can start using Mosaic to explore the Web. This chapter will show you how to navigate the Web using hypertext, Mosaic's controls, and Internet path names (called URLs). Once you understand the basic navigation techniques, you can traverse the Web to visit an incredibly wide variety of information sources all over the world.

We assume that you are familiar with the Macintosh environment, so we don't cover the basic Mac commands and operations. Before starting, however, we must make sure you are on the Internet and have the right kind of connection to use Mosaic. You can't get started without it.

## The Right Kind of Internet Connection

Perhaps the most difficult part of using Mosaic for the new user is understanding how to obtain the right kind of Internet connection. Fortunately, it is getting a lot easier to get an Internet connection these days, especially if you know which applications you want to use, such as email and Mosaic.

In this section, we give an overview of your options for getting on the Internet. If you want more detail, consult Susan Estrada's *Connecting to the Internet: A Buyer's Guide*, also from O'Reilly & Associates.

First of all, you need to find a local *Internet Service Provider (ISP)*. The ISP essentially maintains a computer network of customers who are connected to the Internet through their computer. There are two major lists of Internet service providers—the Public Dialup Internet Access List, or PDIAL, maintained by Peter Kaminski, and Susan Estrada's Internet Access Provider List, or DLIST. To get a copy of PDIAL, send an email message to info-deli-server@netcom.com with the text "Send PDIAL" in the body of the message. For information about getting the DLIST, send email to dlist@ora.com.

Before you contact an ISP, you should decide which type of connection is best for you. You need to make an assessment of your needs and what you can afford. (It is similar to buying a computer in that regard.)

There are basically three kinds of Internet connections: dialup shell, PPP/SLIP, and dedicated lines.

Dialup Shell Account

A dialup shell account is usually the cheapest and easiest type of connection you can get. Unfortunately, you can't use Mosaic over that connection. (You have to run a browser such as Lynx on your Internet host computer.)

PPP/SLIP Account

A PPP/SLIP account usually runs over a high-speed modem (14,400 or 28,000 bits per second, or bps) that connects to your ISP. The main difference between a shell account and a PPP/SLIP account is that the latter puts your computer on the network. Both operate over standard phone lines, and both require you to dial up and connect to an ISP. However, to use a shell account, you typically use a telecommunications program to dial the Internet host and log in. If you have PPP or SLIP, these programs establish the connection and you can then route Internet traffic to and from your machine.

PPP/SLIP also provides an important piece of the connection puzzle—TCP/IP, the protocols that allows data to traverse multiple networks on the way to its final destination. As part of your PPP/SLIP account, your ISP will provide MacTCP, an extension that lets your Mac communicate via TCP/IP. With PPP/SLIP or a dedicated line connection you will be able to use Mosaic just fine.

While PPP/SLIP connections over fast modems offer reasonable speed, they are still quite a bit slower than dedicated lines, so it's best to get as fast a modem as possible. While you can use a 9600 bps modem with Mosaic, it will seem rather slow. Anything less than 9600 baud is unacceptable.

Dedicated Line

Many organizations connect to the Internet via a dedicated line, which is a separate telecommunications line that connects you to your ISP. Both of you have a piece of equipment known as a router that routes the traffic between your local area network and the computer network maintained by your ISP. Dedicated lines come in various speeds; the slowest is a 56K line, which is four times faster than a 14.4K bps modem. If your office has a Macintosh server on the Internet and you have installed MacTCP on your Mac at home, you can also use AppleTalk Remote Access to access the Internet from home.

### Peak Performance

When you use Mosaic to retrieve a document from the Internet, there are a number of factors that affect performance. You may click on a link and not get an immediate result. If you understand that your computer is responsible for only a portion of the final result, then you may be more patient. Here are some of the factors affecting performance:

- The speed of your Internet connection
- The amount of traffic on the Internet, which includes all points between you and your destination
- The load on the server from which you are retrieving the document, perhaps along with thousands of other users at the same time
- The size of the document, which often depends on whether or not you are retrieving documents with graphics, or even larger data objects, such as sound or video files

Of these factors, only the first one is really within your control. You may be able to get a higher speed connection by obtaining a faster modem, using ISDN if available, or making arrangements for a dedicated phone line into your business.

## Installing and Starting Mosaic

If you have your connection worked out, you're ready to install Mosaic. To do so, insert the enclosed disk in your floppy drive and drag the Enhanced NCSA Mosaic folder to your hard drive. Be sure not to put the Mosaic folder inside of any other folders.

Now you're ready to use Mosaic to start navigating the Web. Launch Mosaic by double-clicking on its icon in the Finder. Mosaic starts by opening a home page, or start-up document. Your version of Mosaic comes with a special home page created just for this book. You copied this document, the Mosaic Handbook Home Page, from the floppy disk to your hard disk when you installed Mosaic. If you are not connected to the Internet, Mosaic will still display the Home Page, but not before displaying a message saying that the network did not initialize properly. If you are using a modem, make sure that PPP or SLIP is able to connect to your Internet Service Provider. PPP and SLIP can be difficult to configure correctly, so talk to your ISP if you're having a problem.

If your organization has an Internet connection and multiple local area networks (LANs) but you can't reach the Internet, you may be on a LAN that isn't configured for TCP/IP. If this is the case, you may need to gateway from your LAN to the

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TCP/IP LAN, so you can access the Internet. Talk to your network administrator about how to accomplish this.

If things are working correctly, you won't see the network error message. You will see the home page banner, some introductory text, and several graphics that provide links to Registration, *GNN*, the *Mosaic Handbook Hotlist*, and Mosaic Support. We'll begin our introduction to Mosaic by clicking on these links and exploring some of the resources on *GNN*.

### The Mosaic Interface

Before we get started, let's take a minute to get familiar with the Mosaic interface. Some of these will be discussed in more depth later in the chapter, so at this point we'll move quickly through the interface.

It is important to make a distinction between Mosaic itself and the document it is displaying. In Figure 2-1, Mosaic is displaying the Home Page in the document window, but the Home Page is not part of Mosaic. Mosaic displays the title of the



Figure 2-1. Mosaic Handbook Home Page

active document in the title bar. In this example, the title is "Mosaic Handbook Home Page."

Beneath the menu bar is the toolbar. The two arrows at the left let you navigate back and forth among recently viewed documents. The field labeled "URL" displays the Internet address of the current document. The S-shaped icon at the right activates when Mosaic is busy retrieving a file.

Below the **Back** and **Forward** buttons is the progress indicator bar, that shows (roughly) Mosaic's progress in downloading documents. Next to this bar is a status message area, that displays messages about what Mosaic is doing.

The uses of these elements will become clear as we start using the program.

## Connecting to GNN

To get started with Mosaic, let's visit GNN. You'll notice that the GNN icon on the Home Page is surrounded by a heavy border, as are the other icons. That tells you that it's a hypertext link. Click on it to go to GNN. Mosaic then goes out on the Internet and downloads the GNN Home page. When it's finished, it displays the formatted page—complete with graphics—on your screen, as shown in Figure 2-2. Each of the graphics on the GNN Home page is surrounded by a border, so you know that they're hypertext links. Try clicking on the What's Up in GNN bar near the top of the page. After a little while, the What's Up in GNN page will display.

## A Look at GNN

Congratulations, you've just mastered the most important navigation skill for using Mosaic and the World Wide Web. Clicking on hypertext links is also the easiest and most enjoyable way to navigate the Web. By just clicking on links, you can explore the Web by following subjects and ideas that interest you, discovering new areas of interest in the process. Hypertext links one document to another, which is linked to another, and so on, through literally thousands of documents. This system of links gives the World Wide Web its name; the links are like threads in a spider's web, connecting all the different servers together into a single system. Some servers, like the NCSA and CERN servers, have huge numbers of links pointing to them; others have relatively few.

Now that you have hypertext down, let's throw in one of Mosaic's navigation tools. From the *What's Up* page, click on the **Back** arrow (the one pointing to the left) to go back to the *GNN Home* page. Clicking on the **Back** arrow tells Mosaic to display the last document you were looking at.

Let's take a more in-depth look at the GNN Home page. Under the GNN banner are icons for centers—What's Up in GNN, The Whole Internet Catalog, GNN Business Pages, and NetNews—as well as GNN's special-interest publications, the Travelers' Center, the Personal Finance Center, and the Digital Drive-In.

	Document Title	iress
Forward	Document the	Activity Indicator
Back		
	Global Network Navigator Home Page	e
	URL http://gnn.com/gnn/GNNhome.htm Accessing UPL_http://gnn.com/gnn/wic/index.html	
Progress Indicator	GNN HOME PAGE	
Status Message Area 🧹	Global Network Na	vigator SGO
	Welcome to GNN, the Global Network Navigator. To find out what's look at <u>What's Up in GNN</u> . If you're new to GNN and would like to k a minute to check out <u>Welcome to GNN</u> . And don't forget to <u>become s</u>	new and cool in GNN, now more about us, take <u>a subscriber</u> (it's free!).
	What's Up in GNN Welcome	Subscribe
Document Window —		
	Navigating the Net	
	Use GNN to help you find your way through the Internet. GNN's <u>Wh</u> your best source of information about Internet resources; if you're look the Net, check out GNN's <u>Business Pages</u> .	<u>ole Internet Catalog</u> is .ing for businesses on
· · · · · ·	The Whole Internet Catalog The GNN	Business Pages
	Continue your exploration of Net resources with GNN's <u>Best of the N</u> . Internet sites, and <u>Netizens</u> , our compilation of personal home pages. I and need a little guidance, consult <u>The Internet Help Desk</u> .	et, our pick of the best If you're new to the Net
		- Martin
	News	
	Come to GNN for all the news about the Net. We provide in-depth rep GNN's <u>NetNews</u> .	porting on Net events in
	GNN NetNews	
		12

Figure 2–2. Elements of Mosaic's interface

At the top of the page is a graphic labeled **Subscribe to GNN**. You can click here to fill out a subscription form, which helps us learn who is using *GNN* and what parts of the service are most useful. Let's get started by going to *NetNews*, shown in Figure 2-3. Click on the **NetNews** graphic, and Mosaic gets and displays the *NetNews* home page.

Getting Started with Mosaic



Figure 2-3. GNN NetNews

### Multimedia in Mosaic

The *GNN* pages integrate text and graphics in one document. These graphics are called *inline graphics* because they are displayed in the document. You can also view full-size images and photographs, animations and video, and listen to sound files. Mosaic cannot display these files directly but relies on "viewer" programs to display them.

Often you'll see a postage stamp-size graphic that is also a link. This image may be linked to a full-size version of the image, which can be displayed in a graphics viewer program. Other links may take you to video, audio, PostScript files, and many other kinds of files. We'll discuss multimedia in more depth in Chapter 6, *Using Mosaic for Multimedia*.

## Getting Your Page

How does hypertext work? Basically, when you click on hypertext—whether it's text or graphics—you are telling Mosaic that you want to see the document that is linked to the hypertext. When you clicked on the NetNews graphic, you told Mosaic that you wanted to see the *NetNews* page.

But how does Mosaic know, of all the millions of documents on the Internet, which page is the *NetNews* home page, where it is, or how to get it? It knows because every hypertext link has embedded in it a URL that gives the name of the computer where the document is stored, the path and name of the document, and the protocol for transferring the document. Every computer on the Internet has a unique name and every document has a unique URL.

When you click on the NetNews graphic, for instance, a number of things happen:

- Mosaic looks up the URL for that link, in this case, *bttp://gnn.com/news* /index.btml.
- Mosaic opens an HTTP (the Web protocol) connection to the GNN server.
- Mosaic sends the URL to the server to request the *NetNews* home page.
- The GNN server sends the NetNews home page, which is an HTML (HyperText Markup Language) document. HTML is a simple tagging language that tells Mosaic how to format the document on your computer.
- Often, as with this page, the HTML document includes instructions for graphics files to be displayed at certain positions on the page. Mosaic contacts the server again to download the graphics files.
- When all the related files have been received, Mosaic interprets the HTML tags and displays the document on your computer.

If this all seems complicated, you can be grateful that Mosaic shields you from so much of it. As a Mosaic user, you don't need to know which document you're asking for, what computer it lives on, where that computer is, what the protocol is, or any of the many other things Internet users used to have to know. All you need to be able to do is click on a hypertext link and wait for the document to be delivered.

## Mosaic's Navigation Tools

As you link your way around the Web, you'll make the online equivalent of a wrong turn and you'll want to go back where you came from. Other times, you'll find some pages you really like and want to return to often. And you'll probably forget many of the places you've been, but you may want to revisit some of them.

Mosaic provides tools to deal with each of those situations, to give you more control over your Mosaic session than you could possibly have just by following links. The major tools are:

- Back and Forward buttons (found on the Toolbar)
- History (found in the Navigate menu)
- Hotlist (found in the Navigate menu)
- The GNN menu

Using Back and Forward is like walking around your neighborhood—it's the quickest way to get to your neighbor's house. History is like driving your car on the interstate—you have to start it up and pay attention to the exit signs, but it's the best way to cover distance. Finally, the Hotlist is like taking a plane to your destination—you have to make arrangements first but once you do, you'll get where you're going in a flash.

The GNN menu lets you quickly move to specific centers in GNN. To go to The Whole Internet Catalog, for instance, just select that option from the GNN menu.

## Back and Forward

To check out these tools, let's return to *NetNews*. You can get there by choosing *NetNews* from the GNN menu. At the top of the page are two news story headlines. (*NetNews* is a constantly changing section, so the version you see when you connect will be different than the version printed here.) Click on the second headline, **W3O** Initiative Update, to read that story. The article, which is reprinted in Chapter 8, *Future Directions*, is shown in Figure 2-4. After you read this article, you may want to go back to the *NetNews* page. To do so, click on the Back arrow in the top left corner of the toolbar. Now click on the second headline, Internet Movie of the Week, and Mosaic will display that article. Again, clicking on the Back button takes you to back to *NetNews*. But if you click on the Back button again, you'll return to the W3O article. That's because you're moving back in the order that you viewed different documents. You were looking at the pages in this order:

- 1. NetNews
- 2. W3O article
- 3. NetNews
- 4. Internet Movie of the Week

So, starting from "Internet Movie of the Week," clicking Back takes you to *NetNews*, then to the W3O article, then back to *NetNews* again, and then back to *GNN Home*.

The Forward button works in the same way. From GNN Home, clicking the Forward button takes you to *NetNews*, "W3O Initiative Update," *NetNews*, and "Internet Movie of the Week."



Figure 2-4. W3O Initiative Update

### Hotlist

A hotlist is Mosaic's way of letting you save a list of your favorite Web sites. Once you've added a page to your hotlist you can go right to it by selecting the entry in your hotlist. Let's take a look at how this works.

Using the Back and Forward buttons, return to the W3O article. This is a fairly long article, so you might want to return to read it later. To make it easily accessible, you can add the article to your hotlist. Under the Navigate menu, you'll see the option Add Current Document to Hotlist. Choosing this option adds the article to your hotlist.

Now let's take a look at the hotlist. As you can see in Figure 2-5, the only document in the hotlist is the one we just added. When you select that document, the URL appears at the bottom of the Hotlist dialog box. As you add more documents to your hotlist, they will appear in the list window. To go to a document on your hotlist, select the title and click on Go To.

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un,	httn://ann.com/news/fe	eature/mit.cern/dert	auzas html	
	Hotlist			
	dertouzos	to a minute		Add Current
	1 4 -			Delete
				Edit
	Deno rel			Scan Current
				Export
				Go To
				Done
mase	n (dc@cas.com,)	-		
ygiv	es the visiting reporter a sin Computer Science.	mple way to know who	m Michael L. Dertou	zos has arrived at MIT's
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🕷 File Edit Navigate GNN Windows

Figure 2-5. Hotlist

The Hotlist dialog also has several options for managing your hotlist. Add Current does the same thing as Add Current Document to Hotlist. Delete removes documents from the list.

Hotlist also has something unusual—a powerful command called Scan Current. When you click on this button, Mosaic takes all the URLs from your current document, finds their titles, and adds them to your hotlist. Then you can go right to any of those documents by double-clicking (or using the Go To button) on their titles. Since we're looking at the W3O article, clicking on Scan Current takes all the links within that page and adds them to the hotlist. Figure 2-6 shows what the hotlist looks like after doing this. This has two advantages. First of all, after you've moved on to another page, you won't have to go back to the original and click on the hypertext to get to the document; just go to Hotlist and choose it from the list. Secondly, you'll be able to see the title and URL of the document in the Hotlist window, which may give you more information than the hypertext does.

	dertouzos	
] UTel_	http://ann.com/news/feature/mit.cern/dertouzos.html	<i>\</i> {
nidere	Hotlist	
lichael	dertouzos MIT and CERN Join Forces to Develop the World Wide	(Add Current)
	MIT/CERN Plans Start to Take Shape	Delete
		Edit
		Scan Current
		Export
		Go To
		Done
1		
D.C. Denasc	n (dc@cas.com)	
secretary giv boratory for	res the visiting reporter a simple way to know when Michael L. Dertouzos ha Computer Science.	s arrived at MIT's
le's the bigg	est man who will walk through the door," she says, pointing to the main entr	ance.
		lc.

🕷 File Edit Navigate GNN Windows

Figure 2-6. Hotlist with Scan Current list

You can also edit the selected entry, using the Edit command. With W3O selected, click on the Edit button. Another dialog box will appear with fields for the Title and for the URL. If you want, you can change the title of the document here.

You could also edit the URL here. The only reason you would want to is if a document's URL changes. Usually the server will maintain a document at the old URL, which points to the new document. In this case, add the new document to your hotlist and delete the old one.

Next is the **Export** button. This lets you create a Web document on your computer that contains hypertext links to all the documents in your hotlist. **Export** lets you keep multiple hotlists. For instance, try this:

- 1. With W3O as your active document, choose Hotlist from the Navigate menu.
- 2. Choose Scan Current to add all the links from that page to the hotlist.
- 3. Now go back to Hotlist and export the hotlist to a document on your hard disk. Give the file a name with an *.btml* extension, such as *W3O.btml*.



Figure 2-7. Hotlist exported to document

- 4. Your new hotlist page will display, as shown in Figure 2-7.
- 5. Choose Add Current to Hotlist. You can now open your hotlist page from the Hotlist dialog.

## **History**

By the time you've read some of the articles in *NetNews* and visited some of *GNN*'s metacenters, you've been to quite a few places. You probably didn't add to your hotlist all of the documents you might want to look at again. But you don't have to retrace your steps from scratch in order to find those documents. You can use the History feature to revisit places you've been.

If you want to go back to the W3O article, for instance, just choose the History option from the Navigate menu. Select W3O and click on Go To. Mosaic displays that document. The History dialog box, shown in Figure 2-8, contains all the documents you've ever visited, not just the ones you visited in the current session. That makes it quite a powerful tool because you don't have to worry about how to get back to a document you saw a week ago.

On the other hand, it won't take long before your history list is quite unwieldy. To trim it down, use the **Delete** button to remove unwanted documents. All the other buttons in **History** are identical to the ones in **Hotlist**.



Figure 2-8. The History dialog box

### Entering URLs

When you know the URL of a document you want to see, you can enter it directly. For instance, to get to *GNN Home*, you can enter the URL *http://gnn.com* /*GNNhome.html*, as shown in Figure 2-9. This has the same effect as clicking on a link to that document or choosing it from a hotlist or history window. All the navigation techniques do essentially the same thing—use a URL to identify a document.

## Finding Text

If you're looking for some specific information in a long document, you can use Mosaic's Find command to search for a text string. Choose Find from the Edit menu, which brings up a window with a text field and two checkboxes, one to match case and one to search from the top of the page. To search, enter the text string in the field and click **OK**.

	HotList	
	file:///Mac HD/Enhanced NCSA Mosaic/W30.html	
HotList	Open URL	
dertouzos MIT and CER	URL Identifier:	
MIT/CERN E	http://gnn.com/GNNhome.html	
	Cancel OK	

Figure 2–9. Entering a URL

## Saving and Printing

Mosaic not only lets you navigate around the Net to view documents, it also lets you print documents and save them on your own computer. Both are simple operations.

If you want to print a Web document, just select Print from the File menu. Mosaic will print the page, with graphics in place. Regardless of the dimensions of the application window, Mosaic will print your page so that if fits neatly on letter-size paper. Mosaic is set to print with .75" margins on all sides, so it will print the page at a width of seven inches. For information about changing the margins, see Chapter 5, *Customizing Mosaic*.

If you're switching between printers or need to make other changes in your printing setup, use the Page Setup option under the File menu.

You can save a text version of the document by using the Save As option from the File menu. For instance, if you really like the "W3O Initiative" article, you can save it to your hard disk so you can read it offline. If you want plain text, select the Plain Text button. To save the HTML coding, click on the HTML button. You should save HTML documents with a file extension of *.html*. If you don't, Mosaic will display HTML files as text files. The Save As dialog box is shown in Figure 2-10.

You can also preview HTML documents by using the View Source option from the Edit menu. For more information about HTML, see Chapter 7, *Creating HTML Documents*.

There is no easy way of saving inline graphics on your Mac. If you are intent on doing so, you can write down the URL of the graphic as Mosaic downloaded it, then enter that URL using the **Open URL** command. You can then save the file to your disk. Another option would be to take a screenshot of your Mosaic window and cut and paste the graphics into separate documents.

#### The Mosaic Handbook for the Macintosh

The fact that you can download text and graphics brings up the subject of copyright. Remember that, even though this information is on the Net, it is someone's intellectual property and may be protected by copyright laws. If you're building your own Web documents and want to include someone else's work, it's a simple matter to include a hypertext link to the work, as described in Chapter 7.

In general, you should feel free to save or print a Web document for your own personal use. Copyright issues tend to arise when you distribute a copy of the document or make additional copies.

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Figure 2-10. The Save As dialog box

## **Document-based Features**

Many Web servers offer features beyond simply viewing text and graphics. Two common features are the ability to search a database and to fill out and send a form back to the server.

### Searching

As we discussed earlier, you can search an individual document using Mosaic's Find command. But some servers offer a much more sophisticated searching function that lets you search the full text of all documents on the server. These servers use the Wide Area Information Servers (WAIS) system to provide this searching capability.

*GNN* offers the ability to search all the documents in *GNN* using this system. On certain pages of *GNN*, you will see the message, "This is a searchable index. Enter keyword(s):" followed by a blank field. To search *GNN*, you type the words you are looking for in the field and press **Return**, as shown in Figure 2-11.



Figure 2-11. Searching the contents of GNN

Let's say you're searching for articles about insurance. Type "insurance" into the field and in a few seconds you'll receive a list of documents that have something to do with insurance. Each item in this "hitlist," shown in Figure 2-12, is a hypertext link that you can click on to retrieve the document. The server considers this list to be in descending order of relevance. Depending on the results you get, you may beg to differ. One important concept to remember about this kind of searching is that you are searching the full text of every document—not just descriptions of documents. Also remember that you are searching all of *GNN*, not just the center you are in at the time, and only the contents of *GNN*. For information about servers that search the Web, see Chapter 3, *Exploring the World Wide Web*.

	Search response for: PEL http://nearnet.gnn.com/gnn/whatsup.html?insurance
This is	a searchable index. Enter keyword(s):
Sear Numl	ch response for: per of records returned: 26
	1 Score 1000 lines 138 - Heller Ehrman White & McAuliffe: Insurance 2 Score: 333 lines 210 - Heller Ehrman White & McAuliffe: Lituation 3 Score: 278 lines 92 - Heller Ehrman White & McAuliffe: Curtis M. Caton Biography 4 Score: 222 lines 390 - ignn/data/meta/internet/mkt/ora/cataloc/softbiz.toc.html 5 Score: 222 lines 62 - Heller Ehrman White & McAuliffe: Nancy Sher Cohen Biography 6 Score: 222 lines 55 - Heller Ehrman White & McAuliffe: Services 7 Score: 194 lines 1674 - Clinton: Technology for America's Economic Growth 8 Score: 194 lines 1674 - Clinton: Technology for America's Economic Growth 9 Score: 194 lines 1674 - Clinton: Technology for America's Economic Growth

Figure 2–12. Search results are returned as a list of hypertext items

## Filling Out Forms

Some Web documents are actually forms that you can fill out and return to the server. The *GNN Registration Form* is one of these. As you go through it, you'll notice that sometimes there are blank fields for you to fill out and sometimes you're asked to pick one of several items. Filling out forms is a fairly intuitive process, as you can see from Figure 2-13. Using your mouse to move from one field to another, fill in the appropriate text. Before you go on to Chapter 3, take the time to register your copy of Mosaic and become a subscriber to *GNN*. To get to the registration page, go to your Home Page and click on the **Register** link.

## Understanding URLs

As we discussed earlier, Mosaic uses URLs to get the documents you ask for, whether you click on a link, enter a URL, or use Mosaic's tools like Hotlist and History. URLs are the *lingua franca* of the Web. When you find a great new server, you can tell your friends about it by passing along the URL. In fact, there are several mailing lists devoted to announcements about new services. When we talk about Web servers and documents, we talk about their URLs. Although you can

6NN Registration Form	
http://gnn.com/gnn/wel/register.html	
	<u> </u>
Registration Form	
HELP	
First name	
Primary email address	
Other email addresses you use ( <i>please separate by commas</i> )	
What is your age group?	
0-20 () 21-30 () 31-40 () 41-50 ()	
51-60 () 61-70 () 71-80 () 81+ ()	
Company	
Type of business	

Figure 2-13. GNN Registration Form

get to the servers mentioned in this book by clicking on the links in the *Mosaic Handbook Hotlist*, we also provide the URLs so you can enter them directly.

A URL consists of three main parts: the protocol, the hostname (which is not required in all URLs, although it is for HTTP), and the document's pathname. To use a driving metaphor, the protocol tells Mosaic what kind of road to take, the hostname tells it what exits to take, and the pathname gives directions for getting to a specific location. The URL for the *GNN Travelers' Center* is *http://gnn.com /meta/travel/index.html*. This follows the syntax for URLs:

```
protocol://server/directory/filename
```

Table 2-1 shows the parts of the URL and the corresponding parts of the GNN What's Up page.

Table 2-1: Anatomy of a URL

URL	http://gnn.com/meta/travel/index.html
Protocol	http:
Host Indicator	//
Server	gnn.com
Pathname	/meta/travel

You'll notice that this URL starts with *bttp*. This is the protocol for the World Wide Web. Whenever you contact a Web server, the URL will start with *bttp*. But Mosaic also works with other Internet applications, so sometimes you'll see a URL that starts with *gopher*, *wais*, or *ftp*. In those cases, Mosaic is contacting one of those non-Web services and presenting the results to you in Web format. (See Chapter 4, *Accessing Other Internet Services*, for more about these information services.)

A colon appears right after the protocol name. It signals the end of the protocol name. Next come two slashes, which indicate that a hostname will follow. (When sharing Web URLs in conversation, it's customary to spell out this part of the URL: "h-t-t-p-colon-slash-slash," unwieldy as that is. *GNN* writer D.C. Denison has suggested that this URL prefix should be abbreviated to "hittip" in conversation, but that shorthand doesn't appear to have caught on.)

The next part of the URL is the server name, in this case *gnn.com*. On the Internet, most computers end in *.com* for commercial sites, *.edu* for educational institutions, *.gov* for government agencies, or *.net* for network providers. By checking the server's extension, you can get an idea of what kind of server you're contacting.

The server name is followed by a directory path, which uses slashes to separate directories; in this case, the pathname is */meta/travel*.

Note that the URL ends with *.html*. This is the file extension for Web documents. It stands for HyperText Markup Language, a tagging scheme that lets authors create hypertext documents. When you see this file extension, you know you're receiving a Web page and not a directory or some other kind of file. Documents in other applications may have other file extensions.

## When Things Go Wrong

Sometimes when you try to open a connection, things don't go quite right. For instance, it might take a *really* long time to connect to the server. It may be that you're connecting to a distant server and it's just going to take a long time. Or you may be dealing with a slow or overburdened network. If the server is actually down, you'll eventually get an error message from Mosaic that the connection failed.

People often change the locations or names of their documents, which means, of course, that the URL has also changed. The more polite folks out there will leave a

document that points to the new URL. If not, however, you'll simply get an error message that the URL couldn't be found.

You'll also get an error message if you make a mistake when entering a URL in the **Open URL** field. If this happens, check the URL and try again. Remember you can use Macintosh's copy-and-paste functions to avoid typing out URLs. Then, if it still doesn't work, you can go back to the person who gave it to you and give him or her what-for.

The thing to remember about Mosaic and the Web is that when things don't work out, it's hardly ever your fault. Just accept the fact that you can't get access right now and try again later.

If you make a mistake, change your mind, or simply decide you don't want to wait for the page to download, you can cancel your request by pressing **Command-Period**. Mosaic will display a message that the request failed. Sometimes there are bugs on the server side that can cause Mosaic to freeze or crash. If it crashes, just restart the program. If it freezes, try the force-quit command, **Command-Escape**. If your computer is still frozen, you'll have to restart it. If you think you've encountered a bug in Mosaic, send email to *support@gnn.com*.

Now you know the basics of using Mosaic to navigate the Web. In the upcoming chapters, we'll talk more about customizing Mosaic, using other Internet services with Mosaic, and taking advantages of Mosaic's multimedia capabilities.

### **CHAPTER THREE**

# EXPLORING THE WORLD WIDE WEB

The Ages-old Problem of Navigation The Global Network Navigator Mosaic Handbook Hotlist Other Lists and Resource Guides Searching the Web

oming to the Internet for a new user is like arriving in a new country without a map or a guidebook. Mosaic makes it easy to get almost anywhere you want to go on the Net. However, the more difficult part is knowing what places are worth visiting and where they are located. This is especially true on the World Wide Web. Each information server has its own interface or navigational system. Some are highly structured, and others are very loosely organized. That there is such variety as you move from one server to another is one of the fascinating aspects of the Web. But navigation can be confusing and you can get lost.

To explore the Web, you have to know where to look, and the *Global Network Navigator* is a good place to start. *GNN* provides several useful navigational guides for Mosaic users, such as *The Whole Internet Catalog*. There's also the NCSA Mosaic *What's New* page. We will start by using these guides to discover public resources that are available.

In Chapter 2, *Getting Started with Mosaic*, we used *GNN* to demonstrate how the Mosaic interface works. In this chapter, we are going to demonstrate how to use *GNN* itself. We have also organized a tour of the Internet, using selections from *GNN's Best of the Net* award-winning sites to introduce different forms of servers. We will show examples of servers organized as online exhibits, magazines, and kiosks.

As you get more experience using Mosaic to explore the Internet, you will no doubt find your own ways to locate information sources, and you will discover how you best like to navigate from one server to another. As you get out on your own, you'll want to investigate the numerous search facilities described in this chapter that index information on the Web.

## The Ages-old Problem of Navigation

On the Internet, information is everywhere. Knowing where to look to find the right information is a challenge. There are thousands and thousands of servers worldwide, with hundreds being added every month. How do you find the servers that have the information you are most interested in? How do you learn more about them and where they are located? How do you know when a new server comes online that might interest you? These are the basic problems of Internet navigation.

Navigation is an ages-old challenge that people must face as they enter unfamiliar territory by land or water. The problem is one that can be solved if you have good information, and, throughout the ages, navigational guides for all kinds of people and every form of travel have been published. One of the first books published in the American West, when Pittsburgh was on the frontier, was called *The Navigator*, by Zadok Cramer. The first edition was published in 1802, and it described how to make the journey from Pittsburgh down the Ohio River. It pointed out significant features used to measure distances between places, explained how to avoid numerous hazards, and described what to look for when buying a boat.

*The Navigator* was written for immigrants and traders, people new to the frontier who had never made the journey down the Ohio River. *The Navigator* brought together the experiences of those who made their living on the river, and organized them in a compact form for use by newcomers.

Just as *The Navigator* helped settlers navigate the American frontier, *GNN* is helping people find their way across the terrain of the Internet. The writers and editors of *GNN* have spent a lot of time on the Internet, probably more time than you want to spend yourself. We know where to look and we try to keep up with the dynamic growth of information services on the Internet. *GNN* organizes access to the Internet by creating a variety of publications that will help you pursue your interests and spend your time more productively.

If you'd like to know more about significant trends and the interesting people on the Net, read *GNN NetNews*, which contains new feature stories and commentary each week. In Chapter 8, *Future Directions*, you can read a story from *GNN NetNews* that explains the new WWW organization, W3O, and has an interview with one of its organizers.

*GNN*'s special interest areas have publications aimed at specific audiences, those who enjoy travel or want to learn more about personal finance, for example. In the *GNN Travelers' Center*, you will find articles by real-world explorers who send in their dispatches to us.

The Internet is a new communications medium, which is one reason for all the excitement about it. What is so exciting to us, as creators of *GNN*, is that the information you need to navigate the Internet successfully can be effectively presented to you via the Internet.



Figure 3-1. The What's Up in GNN page

## The Global Network Navigator

Let's get started by going to GNN. As shown in Chapter 2, you can access GNN by any of the following methods:

- From the GNN menu, select GNN Home.
- From the Home Page, click on the link to GNN.
- From the File menu, choose Open URL and type in the URL for GNN.

#### http://gnn.com/GNNhome.html

You are retrieving the *GNN Home* page from one of *GNN*'s information servers on the Internet. (Just to be clear, this page is not on the disk shipped with this book, nor is it on your own hard disk. It is out on the network, and if you can't reach the network, you will get an error message.) The time that it takes to retrieve this page will vary depending on the speed of your connection and other factors.

#### The Mosaic Handbook for the Macintosh

When Mosaic retrieves the *GNN Home* page, you will have a document that serves as a directory to *GNN*'s publications and special-interest areas. When you choose any of the links on this page, you will download another document from the *GNN* information server. If you choose a publication, you will go to its front page.

#### NOTE

The figures that we use in this book may differ from what you actually see online in *GNN*. This is because *GNN* is dynamic, and there is always new information. We also restructure *GNN* periodically to accommodate new ideas or services.

One of the links on the *GNN Home* page is to the *What's Up in GNN* page. If you click on this link, you can find an itemized summary of new things that are happening in *GNN*. An example of that page is shown in Figure 3-1. On the *What's Up* page, each item describes a feature to be found somewhere in *GNN*. You can select any of the links and go directly to a publication, for instance, or to a document in any of the publications. For now, just scroll to the bottom of the page. On the bottom, you will see a colorful icon labeled "GNN Home," as shown in Figure 3-2. This is a navigational icon that will take you back to the *GNN Home* page, where we started. Click on it now to return to our directory of publications. (Of course, you could also use the **Back** button to return to the previous document.)





Navigational icons are but one example of how an information server can provide a system of navigation for its users. For instance, if you get lost in *GNN*, look for the navigational icons at the bottom of a page. They can take you to major sections of *GNN* or back to the home page. Similarly, if you don't see any of *GNN*s navigational icons, then it is probable that you have retrieved a document from another server. In *GNN*, we have explicitly labeled links that take you out of *GNN* to other servers. These are called "GO" links, and there is a GO button or label that you click on to traverse the link. When you link to a server outside of *GNN*, you go to another information space, and you have to figure out what the rules of navigation are for that server. You can always get back to *GNN* by using the Back button. You will see more examples of navigational choices as we explore *The Whole Internet Catalog*.

Before beginning the next section, click on the link for The Whole Internet on the *GNN Home* page and open this publication.

## The Whole Internet Catalog

*The Whole Internet Catalog* is organized by subject. It is selective rather than exhaustive in its listings of resources. We don't list absolutely every resource on the Net; instead we list the ones that we believe are the best. Our editors check out resources and evaluate them for inclusion in the *Catalog*. (We provide some pointers later in this chapter to listings that attempt to be exhaustive.)

*The Whole Internet Catalog* began as a sampler of Internet resources that appeared first in print in *The Whole Internet User's Guide and Catalog* by Ed Krol, published by O'Reilly & Associates. We put this catalog online and expanded it, keeping it more up-to-date than any print listing could be. Each entry in the *Catalog* describes an Internet resource, and provides a link to the resource that allows you to go there directly.



Figure 3-3. The Whole Internet Catalog

Let's look at a few examples. The front page of the *Catalog*, as shown in Figure 3-3, has a distinctive masthead followed by several links, which we'll discuss later, that gives you alternative views of the catalog. The main view is a listing of subject categories. You may need to scroll down the list to see all the subject categories. You can navigate from the main subject listings or more detailed, second-level

subject categories. If you are interested in Art, click on that link. You will go to a list of information servers that specialize in Art. Here is a sample list:

Art

Ansel Adams Photographs Architecture, etc. Art History in Australia ASCII Clipart Collection Black Artists at the National Museum of American Art Bodleian Library MSS The California Museum of Photography Computer Images & Art Japanese Art Kaleidospace Strange Interactions Krannert Art Museum The Ohio State University at Newark, Art Gallery OTIS A Roman Palace in ex-Yugoslavia Smithsonian Institution Vatican Library MSS Exhibit

Each name in this list is a link to a catalog entry that describes the server and what it offers. These entries are like cards in a library's card catalog system, describing an online information service. Now, we will select three different servers from the *Catalog* and visit them.

#### The Palace of Diocletian at Split

Each entry contains a description of the server, as well as links that take you to it. If you choose "A Roman Palace in ex-Yugoslavia," then you go to the entry for that server, as shown in Figure 3-4. The entry for the Palace at Split shows two links because the information is found on two different servers. Choose the second GO link (the first one is to a more experimental version) and you'll go to this server to retrieve the document shown in Figure 3-5. Let's make sure you understand what happened. You used *The Whole Internet Catalog* to choose an information service and traverse a link that takes you directly to that server. The document in Figure 3-5 is not part of *GNN*; it is a separate resource. This document contains lots of links to additional information, but it does not contain a link back to *GNN*.

-	File	Edit	Navigate	GNN	Windows
				A Rom	an Palace in ex-Yugoslavia
		IRL htt	p://gnn.com/\	/ic/visa	irt.09.html
A An Dej	Rom experim partmen	an Pa entinon tof Art I	alace in ex Ine art history History, Austral	-Yugo y present lian Nat	DSlavia tation technique, this exhibit was constructed by Michael Greenhalgh, tional University.
"Sp pal 305 sim mil	olitor lace whi i. On the nilar to t litary er	Spalato ch the E Dalmat hose stil operor) b	is one of the r imperor Diocleti ian coast, adjace Il to be seen on th out also, with it:	nost extr ian begar ent to the ne frontie s splendi	raordinary places of the later Roman world, being no less than the n building in A.D. 293 in readiness for his retirement from politics in e Roman city of Salonae, it takes the dual form of a legionary camp ers of Syria (appropriately so, for Diocletian was of necessity a id loggias, of an Italian house."
EX	PO also	offers a v	version of this m	aterial.	
L	GO	using	g the Web to ww	w.ncsa.u	uiuc.edu.
	GO	using	g the Web to sun	site.unc.e	edu (EXPO).
Ret	turn to A	rt			
۲ ۲	VIC OC	G N I	N 1784 1784 189		

Figure 3-4. The Whole Internet Catalog entry for the Palace of Diocletian at Split



Figure 3-5. The home page for the Palace exhibition

#### The Mosaic Handbook for the Macintosh

The Palace of Diocletian at Split is an online interactive exhibit. After you have read the introductory text in Figure 3-5, follow the link at the bottom of the page





to the palace. The document, shown in Figure 3-6, is the main navigational document for this exhibit. An image at the top of the page contains buttons that you can click on to visit different areas of the exhibition.

You may notice a difference between the buttons found on the graphic and other buttons that you find on a page. These buttons are mapped as specific hot regions on the graphic, and when you click on one of them, the Mosaic browser sends a message to the server giving the coordinates of the region in which you clicked. It then returns a document whose URL has been mapped to that region. You may also notice that when you move from one button to the next on this graphic, the destination URL that is displayed in the Status box does not change.

If you click on the button labeled **Introduction**, you can begin the exhibit. At the end of the page for each document in the exhibit, you will find the same graphic and you can use it to explore other topics.

When you are done, use the **Back** button to get back to *GNN*. Of course, if you have gone very far into the exhibit, you may find it easier to get back to *GNN* using the **GNN** menu.

If you do back up all the way to the last document you saw in *GNN*, you will return to the listing of Art resources. At this point, you can choose to visit other servers on the list. One that is very different, and definitely not classical, is OTIS, which stands for Operative Term Is Stimulate. See what today's artists are creating using all kinds of computer-based tools.

Or, if you want to choose a different subject, scroll to the bottom of the Art listings and find the navigational icon for *The Whole Internet Catalog*. If you click on it, you will go back to the *Catalog*'s front page, where the subject listings are found.

#### U.S. Department of Education

Let's choose another subject area—Government. Select the link for Government, then find the list for U.S. Government Agencies. On that list, you will find the U.S. Department of Education; click on that link.

As the description says, this is an information server that provides all kinds of documents generated by the U.S. Department of Education (ed.gov). This entry also includes GO links to their Web, Gopher, and FTP servers. We will explain how to use Gopher and FTP in Chapter 4, Accessing Other Internet Services; however, when given the choice among servers (presuming that you are using Mosaic), always choose the Web server. If you do so, you will go to this Web server's home page, as shown in Figure 3-7. This server is fairly straightforward; it contains a listing of its contents, most of which are presented on this same page. In other words, if you click on the link near the beginning of the Contents list, you will go to a location further down in the same document. (Mosaic doesn't retrieve the document again off the Net.) This is a form of "outlining" the contents of a document using links. In long documents, it is useful to have an outline with links to the various parts of the document below. Such a list is often labeled "Contents," but another way to identify one is that the links will be displayed as though you had visited them (typically, dashed underline instead of a solid underline) because their destinations appear in the same document.

Continue, if you wish, to explore the contents of this server. Otherwise, back up to *The Whole Internet Catalog*.

#### The Paleontology Server

Let's find one more resource in a different subject area—Science. Click on the link for Science and you will see a list of additional categories, one for each



Figure 3-7. Department of Education Web server

discipline. Use the scroll bar to move down through the list and find Paleontology. If you select this link, you will see a list of servers on Paleontology, such as:

Honolulu Community College Dinosaur Exhibit U.C. Berkeley Museum of Paleontology Gopher U.C. Berkeley Museum of Paleontology Public Exhibits Paleontological Society Gopher Palynology & Palaeoclimatology (ANU Bioinformatics Hypermedia Service)

Choosing the U.C. Berkeley Museum of Paleontology Public Exhibits link will take you to an entry for this server; select the GO link to visit it. This particular server has a well-defined but rather large graphic interface.

Once again, you have ventured to a new server and you can explore it as you wish. If you find the Paleontology server interesting, you may want to add it to your hotlist, so that you can go back to it easily. A good way to use the *Catalog* is to find servers and then compile your own list of those you'd like to visit on a regular basis.

### Alternative views of the Catalog

If you return to *The Whole Internet Catalog* front page, you will find several alternative ways to find information in the *Catalog*. You can look at the following:

Top 50 This document is a list of the entries most frequently accessed in *The Whole Internet Catalog.* It represents what users find most interesting in the *Catalog.* 

For instance, you might use the list to check out some of the most popular servers. One server that tends to stay high up on the charts is the Web server for Recipe Archives. You can search the recipe archives when you are at work and you can't consult *The Joy of Cooking*.

- What's New This document describes the most recent updates to the *Catalog*, listing new information servers or ones that have been removed for some reason.
- Searching As of this edition, the searching is somewhat limited. (We are working on improving it.) You can search using the search dialog box at the bottom of each document; however, that currently searches all of *GNN*, not just the *Catalog*. Searching does not currently work on all *GNN* servers.

An alternative is to browse a list of servers by name. Click on the link for All Catalog Entries and you will get an alphabetical listing of all the information servers indexed in the *Catalog*. If you select Find from the Edit menu, you can search this document, and perhaps find a server of interest.

## Mosaic Handbook Hotlist

We have created a special list of additional resources that you can use to explore the Net and organized them as the *Mosaic Handbook Hotlist*. This *Hotlist* is on the *GNN* server, and there is a link to it on the Home Page. Choose the link Chapter **3**, **Exploring the World Wide Web**, to get a list of pointers to the servers that we describe in the rest of this chapter. (This will save you having to type in the URLs to access them.) Many of the services can be found in *The Whole Internet Catalog* as well.

It is always possible that these URLs may change, so be sure to check the links on the *Mosaic Handbook Hotlist*.

## NCSA Mosaic What's New

The NCSA Mosaic *What's New* page is the best place on the Internet to find out about new information servers. This page is updated several times a week, and checking it regularly will help you keep up with developments on the Web. Its URL is *http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/Docs/whats-new.html*. A

sample entry from this page is shown below:

#### Labyrinth Electronic Publishing Project

#### Indiana University, Bloomington, Indiana

The Honors Division at Indiana University is proud to announce the unveiling of the Labyrinth Electronic Publishing Project, including: collections of poetry from IU faculty and students, and collections of visual art. Take a look and leave some comments on the art and poetry, or if you are feeling creative yourself, leave some noise on the Graffiti Wall.

What's New announcements are organized by date and presented as short descriptions of new resources or Net happenings. Each announcement contains links to the sites being described.

There is also a What's New archive going back to June 1993. Of course, some of this information can be dated and not as useful, but you can often use it to check for a particular site.

The What's New page is often good reading simply because of the variety in the announcements from educational, government, and commercial sites.

## FAQ Directory

Frequently Asked Questions (FAQs) are lists of questions that new users often ask, in particular, users of USENET newsgroups. As new users visit a newsgroup, they begin asking questions, and many of these questions have been asked by others before them. Eventually, someone realizes that he or she has answered "newbie" questions often enough and sets about creating a document that compiles these questions and their answers.

Don't get the idea that FAQs are simply answers to obvious questions; they represent the collective wisdom of the Net, and their authors take their work very seriously. You can almost regard the collection of FAQs as an online encyclopedia, they are that broad. By no means are they limited to computer or Internet-related topics. Are you interested in Games or Greek culture, Hockey or Hong Kong, Magic, Model Railroads, or Mexico? All have FAQs. There's another reason that the FAQ Directory is like an encyclopedia. You might go there looking for one thing and find yourself browsing any number of subjects that you may know nothing about. That's probably true of a lot of Web servers, which is what makes exploring the Web so enjoyable. Figure 3-8 shows the opening page for USENET FAQs, found on the Ohio State University server and compiled by Thomas Fine. Its URL is *http://www.cis.ohio-state.edu/hypertext/faq/usenet/FAQ-List.html*. You might use this directory of FAQs to find subjects that interest you and learn about a newsgroup where people discuss that subject.

The first thing you should do is scroll down the page, where you will begin to see the long alphabetical list of FAQ subjects. When you select an item on the list, you get one of the following:

List of USENET FAQs	
URL: http://www.cis.ohio-state.edu/hypertext/faq/usenet/FAQ-List.html	<u> </u>
USENET FAQs	4
This document contains a list of all USENET FAQs found in news.answers. The document is alphabetized by (more or less). Many of the FAQs in this list are presented in the same format as they appear in the newsgr while others have been further processed and split into additional documents. For more information on all of this project, see the <u>technical notes.</u>	7 topic oup, aspects
A few of the documents are provided in hypertext by the FAQ maintainers, rather than in converted plaint Those documents are shown with titles in italics.	text.
Please send comments and complaints to fine@cis.ohio-state.edu.	
New!	
There is now a very limited search capability. This is not a full text search; only the newsgroup names, arc names, subjects, and keywords are searched. Click <u>here</u> to try it. (If your browser doesn't support forms, it m support index searches. Click <u>here</u> to try that method.)	hive light
New!	
There is now a <u>listing by newsgroup</u> . If you tried it and it was broken, I think I've fixed it.	
A.B.C.D.E.F.G.H.L.I.K.L.M.N.O.E.Q.R.S.I.U.V.W.X.Z	
3	
<ul> <li><u>386b:d FAQ</u></li> <li><u>3b1FAQ</u></li> <li><u>3b2FAQ</u></li> </ul>	

Figure 3-8. USENET FAQs

- a full FAQ in ASCII text
- a list of questions, shown as hypertext links that you can follow to get the answer
- a list containing several FAQs on a subject, or parts of a single FAQ

For example, if you select "European Union" from the list, you will get a single ASCII document that explains the charter of the European Union and answers basic questions about its objectives.

If you select the Dogs FAQ, you get a list of FAQs on subjects ranging from obedience training to health. There are even more FAQs available on the next level, covering different breeds.

The FAQ server is beginning to offer different ways to access its documents. A new search facility is in the experimental stages so that you can search for an FAQ without knowing its main subject title.

### Netizens

Getting to know others like yourself who are exploring the Internet can be fun. You may know people from email or from their postings in newsgroups. However, the Web has encouraged new forms of expression and users are taking advantage of it by creating their own home pages and putting them on the Net.

*GNN* has a publication called *Netizens* in which users list their home pages for others to view. Visit *Netizens* and see who else is out there on the Internet. Its URL is *http://gnn.com/gnn/meta/internet/netizens/*. From the *Netizens* front page, shown in Figure 3-9, you can browse an alphabetical listing of names or a listing of the most recent additions.



Figure 3–9. Netizens page

For each user, you will find an email address, a location, and a mention of their interests. Most have supplied a link to a home page on their own server.

After you've read Chapter 7, *Creating HTML Documents*, which describes how to create your own home page in HTML, come back and add your name and become a Netizen.
## Commercial Sites on the Web

If you'd like to know if a particular business has information available on the World Wide Web, the Commercial Sites on the Web server at MIT is a good place to look. This student-run server offers an alphabetical listing of companies by name, which are linked directly to their sites. Its URL is *http://tns-www.lcs.mit.edu/commerce.html*. The current document lists over 300 commercial sites, which is one sign of the increasing business activity on the Net. For instance, if you'd like to find out if your favorite computer company is on the Net and offers support, look them up on this server. Remember that this server is essentially just a listing of links to other servers.

If you can't find a particular company, you may know its domain name by exchanging email with someone in that organization. The domain name for O'Reilly & Associates is ora.com; for IBM, it is ibm.com. If a company has a Web server, it often can be reached by composing an HTTP URL that prefixes "www" to the domain name. For instance, *http://www.ibm.com/*. It may also work without the "www" prefix. Either way, we are guessing at the URL based on conventional practice, but this syntax is not enforced by any software. It produces an error if the company does not have a server or if the server resides at a different address.

*GNN* also provides several ways for you to find companies that want to deliver information about products and services to Mosaic users. The *GNN Business Listings* are advertiser-paid listings that describe in brief what a company does and what information it provides online. This information is provided in a consistent format for users. You can search companies by product or service category as well as by name.

## **Discovering Information Services**

This section gives an overview of different kinds of Web-based information services. We look at online exhibits, magazines, international kiosks, and interactive media centers.

The servers listed in this section can be accessed directly from the *Mosaic Handbook Hotlist*, but their URLs are also listed here.

## Exhibits

An online exhibit organizes a collection of materials for easy access. Usually, an exhibit integrates text and graphics as a series of documents. Exhibits are usually created by universities or museums, and the number is increasing daily.

## Artserve http://rubens.anu.edu.au/

*Artserve* from Professor Michael Greenhalgh of Australian National University is a collection of digitized art organized as an art history database. Professor Greenhalgh is also responsible for the Palace at Split that we demonstrated earlier.

The Mosaic Handbook for the Macintosh



Figure 3-10. Home page for the Space Telescope Science Institute

#### Vatican Exhibit

#### http://sunsite.unc.edu/expo/vatican.exhibit/Vatican.exhibit.html

The *Vatican Library MSS Exhibit*, which can be found in the Art section of the *Cat-alog*, is a guided tour through the collections of the Vatican Library, as they were showcased at the Library of Congress. This exhibit includes some exceptionally beautiful illuminated manuscripts, which are presented as postage-stamp sized images that you can click on to retrieve an enlarged image in a separate window.

#### Dead Sea Scrolls http://sunsite.unc.edu/expo/deadsea.scrolls.exhibit/intro.html

Another interesting exhibition from the Library of Congress is the *Scrolls from the Dead Sea*. This exhibit can be found in Archaeology section of the *Catalog*.

# Hubble Space Telescope http://stsci.edu/top.html

A fascinating scientific exhibit is sponsored by the *Space Telescope Science Institute* at Johns Hopkins University in Baltimore, Maryland. This resource can be found in the Astronomy section of the *Catalog*. Its home page is shown in Figure 3-10. It includes information about the Hubble Space Telescope as well as a collection of images, including some from the Shoemaker-Levy comet that impacted Jupiter in July of 1994. There are a number of collections of interest to educators and the naturally curious, including a digitized sky survey.

## Magazines

When *GNN* premiered in the fall of 1993, we were the first to create a commercial Web-based magazine. Our first issue of *GNN Magazine* was about the U.S. Government's role in developing the Internet and its involvement in making more information available to the public. Our second issue was on education, and we showed many examples of how teachers are using the Internet in the classroom. Now, *GNN* has developed special-interest magazines on Travel and Personal Finance, with more to come soon.

Creating a magazine can involve more than putting the text of an article online (the most common approach used for a magazine that originates in print). Of particular interest are online magazines that utilize the medium most effectively to create and present content. The Web will be a fascinating place for large and small publishers to create all kinds of magazines, perhaps reaching even more specialized audiences. In a few years the Internet will have more magazines than your local newstand. Here are some examples you can find today.

#### International Teletimes

http://www.wimsey.com/teletimes.root/teletimes\_bome\_page.html

*International Teletimes* is published in Vancouver, British Columbia, as a generalinterest magazine. It is representative of many new magazines that are original to the Internet and have no print counterpart. Some are more sophisticated than others, and you'll also find that many of the online magazines or *'zines* are very personal in nature, and can be narrowly focused or broadly defined.

#### Zines

## http://www.ora.com:8080/johnl/e-zine-list/

*GNN* Technical Services Manager John Labovitz maintains a 'zines list. This is a reasonably comprehensive list of electronic magazines published on the Net. Many of the 'zines are text only, but there are a wide range of formats. Editorially, they are usually idiosyncratic, rather like fanzines and underground newspapers.

Wired

## http://www.wired.com/

*Wired* is a magazine oriented toward technology and culture, with an attitude. Its Web server contains sample articles and other information. If you enjoy *Wired*, but find its page layout distracting, reading it online can be a much more pleasant experience. They have announced plans to create a *HotWired* online service based on Web technology.

## Mother Jones

http://www.mojones.com/motherjones.html

*Mother Jones*, the mother of investigative reporting, has a Web server at mojones.com. You will find a cover image and articles for its bimonthly issues. A sample article from the July/August 1994 issue is "The Cry of the Ocean," by Peter Steinhart, which leads off a special report on how the world fish population is depleted and the consequences not only for the fishing industry but for all of us. The special report ends with an article, "Fishing in the Net," that suggests a few places on the Internet where you can find related information.

## International kiosks

International kiosks provide information about individual countries or states. The Regional and Cultural Interest section of *The Whole Internet Catalog* contains pointers to most countries. Some of these servers use only the native language of the country (i.e., the Norway server is in Norwegian), while others have materials in English as well. For more information on particular countries, check the listing of servers by country described later in this chapter.

#### New Zealand http://www.cs.cmu.edu:8001/Web/Peoble/mjw/NZ/MainPage.html

The *New Zealand Information* server, by Michael Witbrock, is a Best of the Net selection. This server is not located in New Zealand, though, but at Carnegie-Mellon University. Even so, it has a lot of depth in its information, and many unusual items.

Japan

## http://www.ntt.jp/japan/

You can learn more about Japan on a *Japanese Information* Web server sponsored by Nippon Telephone and Telegraph (NTT) and produced by Takada Toshihiro. You can find Japanese-language documents as well as a traveler's guide to speaking Japanese, which includes audio samples. You can hear the Japanese national anthem, *Kimigayo*, played on a recorder. You can also find a map of Japan, as well as a lot of political and cultural information.  Iceland http://www.rfisk.is/english/iceland/rest\_of\_iceland.html

You can take a tour of Iceland; if you click on a map of Iceland you'll get photographs from a specific city or region.

#### • Germany http://www.chemie.fu-berlin.de/adressen/brd.html

Get more familiar with Germany online. This server contains geopolitical information, as well as a map of Germany. It also provides access to a German language news service.

#### Interactive media centers

All Web servers can be considered interactive because of the nature of hypertext. You choose what interests you and go in that direction, almost instantly. However, a number of servers have created special interactive interfaces.

 Xerox PARC Map Viewer http://pubweb.parc.xerox.com/map

The Xerox PARC Map Viewer is a Best of the Net selection that allows you to generate maps of specific areas that you select.

 United States Map http://ageninfo.tamu.edu/apl-us/

The *Digital Relief Map of the United States* is a color relief map composed of cells. If you click on a cell, Mosaic retrieves a full-blown image of that cell. The map was created by Ray Sterner of the Applied Physics Laboratory at Johns Hopkins University, and distributed on the Web by Hal Mueller of Texas A&M University. This server can be accessed from the Geography section of the *Catalog*.

 The Geometry Center http://www.geom.umn.edu/welcome.html

The Geometry Center at the University of Minnesota, which is dedicated to "the computation and visualization of geometric structures," says that part of its mission is to help mathematicians reach the public. You will find an interesting picture archive, forums, and software, some of which only run on workstations. Be sure to check out "A Gallery of Interactive On-Line Geometry."

#### • Exploratorium http://www.exploratorium.edu/

San Francisco's innovative Exploratorium has a Web server called *ExploraNet* that is worth looking at. This hands-on science museum is taking advantage of the Net to create an interactive learning center for kids and adults.

# Other Lists and Resource Guides

In addition to *GNN*'s *The Whole Internet Catalog*, there are many subject-oriented lists and resource guides. These lists vary in completeness and timeliness. Some are organized well; others require you to scroll doggedly down a long screen (or screen after screen) of alphabetized entries.

In this section, we describe a sampling of lists and guides that you might find useful.

## CERN's General Overview of the Web

Overview: http://info.cern.cb/bypertext/WWW/LineMode/Defaults/default.html Virtual Library: http://info.cern.cb/bypertext/DataSources/bySubject/Overview.html Servers by Country: http://info.cern.cb/bypertext/DataSources/WWW/Geographical.html

The *General Overview of the Web* at CERN is a comprehensive, though less userfriendly, picture of what's available on the Web. On its "Overview" home page, it says that there is no "top" to the Web. This becomes immediately apparent when you link to the *Virtual Library*, which is a distributed subject catalog arranged alphabetically. There is no description of any of the resources in the list; instead, there is just a straight link out to the resource, so it's hard to know what to expect until you get there.

What this listing lacks in descriptiveness it makes up for in comprehensiveness. From Aeronautics and Aeronautical Engineering to Sports, pick a subject you're interested in and click on the link. What you'll get is another list of resources that relate to that subject. These lists are not arranged alphabetically; sometimes there's a brief description of the resource, sometimes there isn't.

If you're looking for information on a specific subject, you'll have to sift through a number of entries on this page before you find a link to what you're looking for—and you may *not* find such a link!

As with NCSA Mosaic's *What's New* page, the *Virtual Library* page gets a lot of its information on new resources from readers who submit pointers to these resources. The *Virtual Library* encourages readers to submit these pointers to maintainers, each of whom is responsible for a particular subject area. Updates appear to be fairly frequent.

Also available on the *General Overview of the Web* page is a list of servers, which lists all registered Web servers by country. When you click on this link, you'll see links to registered WWW servers organized by continent, country, and state. It is a long, exhaustive list, and it does contain some explanatory text for some of the entries. It's a great resource if you want to know more about a particular country, especially if you wish to find information in a foreign language.

Figure 3-11 shows the page that lists Web servers by country. Scroll down the list until you see South America (doing so will demonstrate that North America is most

HB-infaservers
W3 servers
This is a list of registered <u>VWWV</u> servers alphabetically by continent country and state. ( <u>About</u> <u>this list</u> )
New: A <u>summary of the list</u> is available
See also: data available b <u>y other protocols</u> , data by <u>subject, how to make a new server, test</u> <u>servers</u> , <u>automatically collected list</u> of Home Pages, <u>What's New</u> , and the <u>clickable world map</u> . If servers are marked "experimental", you should not expect anything. Please <u>see how to send</u> <u>announcements of new servers</u> (or modify your server's description).
Africa
South Africa
EMILY (Electronic Membrane-Information Library) EMILY was conceived to become the electronic repository of information on membranes and membrane processes. Essentially an flp site, it now has limited WWW capabilities. EMILY is maintained by Quentin Hurt (hurtq@aqua.ccwr.ac.za) as part of a Water Research Commission project. Poliution Research Croun
The Pollution Research Group (PRG) conducts research in a range of <i>environmental</i> engineering approaches, problems and processes. The PRG is based at the University of Natal, Durban. These pages are maintained by members of the PRG. <u>Rhodes University</u> Bhodes cookies information, as well as information relating to networking in Southern

Figure 3–11. Web servers listed by country

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heavily represented). Click on the link for **Peru**. You will go to a brief description of Red Cientifica Peruana, the Internet Network of Peru. You can follow a link to their server in Peru. Offered in Spanish and (some) English, this server gives basic information about the country, and links to Latin American and Caribbean Gopher servers.

Because this list is so extensive, you might want to use the Find feature in Mosaic to locate a particular country or state rather than scroll through the list.

To give you an example of how you can use this list as a point of departure for what can be a fascinating trip to almost anywhere in the world, follow the sequence of links below:

- 1. Find Malaysia on the list of Web servers by country and follow that link.
- 2. On the next document, follow the link to the University Sains Malaysia (USM) at Penang server.

3. On the USM server, follow the link to Penang Island.

This document is a tourist information guide, describing the geography, history, and climate of the area. It lists its contents as links at the top. If you select the **Local Food** link you can read about various local dishes, including murtabak: "An Indian styled pizza filled with all the goodness of minced meat and onions and fried over a hot plate. It is eaten with a vegetarian curry."

CERN's list of servers gives you an appreciation of how big the Web really is.

## Special Internet Connections

## http://info.cern.ch/bypertext/DataSources/Yanoff.html

Scott Yanoff offers a standard list of Internet services, which he began compiling in 1991. This exhaustive list, which is organized under broad categories such as Aviation, Law, and Travel (arranged alphabetically), contains entries and links to any kind of Internet service you can think of, from Gopher to TELNET, and everything in between. Though lengthy, the list is made up of terse entries that are not particularly descriptive of the resources they are pointing to. It is not updated on a regular schedule.

## CyberSight

## http://cybersight.com/cgi-bin/cs/s?main.gmml

Terse is not the word to describe CyberSight, however. Billed as the central online "jumping off" point for alternative information seekers, CyberSight offers links to off-beat resources in a lively format. Don't approach this server with any preconceptions; just go to "The What You Want List (nutritious too!)" and choose from a few of the eclectic categories (Hot Stuff, Kitsch, Cybversive). For example, if you go to the Funky category, you'll see pointers to such unusual resources as "Coke Machines," a site that helps you track the status of Coke and other vending machines around the world. Another site, "Roadkill R Us" ("a cornucopia of carcasses"), will give you access to more information on the truly tasteless than you ever dreamed of finding.

# Searching the Web

After you've used these lists, you might decide to set out on your own to find things on the Web. You'll find several useful databases (or automated indexes), with new ones appearing all the time. Not all the searching interfaces are easy to use, and some searches will result in dead-ends or direct you to more information than you want.

The first thing to know about searching on the Web is that you are not really searching the documents on the Web itself. Rather, you are searching databases of

information that have been collected from documents on the Web. These databases may include information for each document such as:

- Title
- Location (the URL)
- Documents that are linked to and from this document
- Keywords, abstracts, or brief descriptions of document contents

All this data is gathered off the Net and organized into a database, with links pointing back to the original documents. When you search for a word or phrase, you are really running a program on a remote computer that knows how to query and extract information from these databases. If your search is successful (i.e., your search words match up with words in the database), the program on the remote computer returns a Web document that contains links to the original documents.

Many of the searching databases are constructed and updated by programs called "robots" or "spiders" that continually "travel" the Net finding documents. As they encounter documents, they record information about each document, which is then used to update the database of documents.

Although robots sound like the perfect way to search the Web, there are a few problems. First, it takes a long time to search the Web, and so databases generated by robots may become out of date as documents are deleted or moved. Second, robots are generally indiscriminate about what databases they search, and a search in a robot-generated database may result in a huge number of "successful" searches, but a small number of really useful documents.

#### NOTE

For information on the general design of robots, and technical descriptions of robot programs on the Web, see "World Wide Web Wanderers, Spiders and Robots" (*http://web.nexor.co.uk/mak/doc/robots/robots.html*).

Most searching interfaces have a single text entry field for entering simple queries. Some interfaces are more complex, allowing you to reduce the scope of your search. Unless otherwise specified, most searchers will find any instance of a word, whether full or partial, upper- or lowercase. For example, entering "zine" will match "magazine" as well as "zine." Below we introduce a number of these search servers for the Web.

## The Wanderer

#### http://www.mit.edu:8001/people/mkgray/comprehensive.html

If at this point you're asking the question, "How big is the Web?" go to The World Wide Web Wanderer, a Perl script automaton created by Matthew Grey. The Wanderer travels the Web searching for Web sites. It does a breadth-first search of the Web, looking for and including in a queue all the URLs contained in every document it encounters. At last count (June 1994), the Wanderer had found more than 3000 sites on the Web. These are all listed (by numerical IP addresses, host sites, or by country); check out part or all of the list to see just how big your search can be when you search the Web.

## CUSI

#### http://web.nexor.co.uk/susi/cusi.html

CUSI, part of the Web at Nexor (a UK-based technology company) is a formsbased interface to many of the searchable indexes listed below, as well as other databases including catalogs, phone books, dictionaries, and technical documents. It's relatively easy to use, and you'll find it helpful to have so many of these searchers available in one document.

## ALIWEB

#### http://web.nexor.co.uk/aliweb/doc/aliweb.html

ALIWEB (Archie-Like Indexing for the Web) is a distributed indexing system. Because it is modeled after Archie, a program that maintains a database of software programs listed in public archives on the Net, you ask it where to find a particular program. ALIWEB's index database is generated from descriptions stored as files on the servers that contain the documents being indexed. This means that as long as publishers keep their own local descriptions up to date, ALIWEB has the potential to be of high quality. However, because it doesn't index every document on the Web, it's not a good place to look for instances of specific words or phrases.

## CUI W3 Catalog

#### http://cui\_www.unige.ch/w3catalog

The CUI searcher is a database of indexes to several popular lists and resource guides, including:

- NCSA's What's New
- NCSA's Starting Points
- CERN's W3 Virtual Library Subject Catalog and selected sub-lists
- Martijn Koster's ALIWEB—Archie-like Indexing for the Web
- Scott Yanoff's Internet Services List
- Simon Gibbs' list of Multimedia Information Sources

 John December's list of Computer-Mediated Communication Information Sources and Internet Tools Summary

Most of these resources are manually maintained subject-oriented lists (some of which are described earlier in this chapter), making the CUI catalog a good place to start if you know the topic of a search ("agriculture," for instance). Also, if a search is successful, it will return not just a list of documents, but the entry that contains the word or phrase.

## WebCrawler

#### http://www.biotech.washington.edu/WebCrawler/WebQuery.html

WebCrawler is a robot that keeps an index of the contents of all the documents it comes across. Its interface is surprisingly simple—you type the words you're looking for into a single text entry box and click Search. A checkbox controls whether the words you are looking for must all be present in a document being searched (logical "AND") or whether only a subset may be present (logical "OR").

## EINet Galaxy

#### http://www.einet.net/galaxy.html

EINet Galaxy is a combination hierarchical subject catalog and searchable database. This server, unlike the others, grabs all the documents it can find (not just HTML) and indexes them in a WAIS server. Thus you are searching the content of the Web and you get back as many hits as you ask for. It has a confusing interface, however, and searches often result in a large number of items returned.

## The World Wide Web Worm

#### http://www.cs.colorado.edu/home/mcbryan/WWWW.html

The World Wide Web Worm is a database of Web document titles, URLs, and cross-references. Its power lies in the detailed level of searching that can be done: in addition to searching for words or phrases in a document title, you can search for specific URLs or patterns within URLs. For instance, you can find documents at a particular host by searching for the hostname in the URL database. You can even search for particular types of files—searching for ".mpg" might find all the MPEG moving-image files in the database. Because WWWW keeps track of links between documents, you can supply a URL and find all the documents that link to that URL. The WWWW home page describes many such powerful search examples, although it doesn't say how often the Worm does its work.

Before concluding this tour of the Web, we should add that you are exploring an ever-expanding online universe. Things change every day, at every hour. This is especially important to remember if you can't find what you are looking for, or if the subject area of key interest does not have a strong set of resources on the Net.

Someone may notice the deficiency one day and begin putting up a lot of useful information the next day. You may even be the person who makes that contribution!

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## CHAPTER FOUR

# ACCESSING OTHER INTERNET SERVICES

Mosaic and Gopber WAIS Mosaic and FTP

So far, we have used Mosaic to access Web servers. However, Mosaic can also access other types of Internet servers, such as Gopher, WAIS, and FTP. In Chapter 1, *The Wide World of Internet Services*, we explained that these services were available on the Internet before Web servers existed. Each service has its own distinct way of providing information to users, just as the Web does. However, Mosaic can be used not only as a Web client, but also as a Gopher client. It can be used as a client to access WAIS servers and FTP archives. Because Mosaic is such a multipurpose browser, it has become the Swiss Army knife of the Internet.

In exploring the Internet, you may be surprised when you traverse a link and you don't end up in a Web document. Instead, you'll see a list of topics, each one appearing as a link, and, if you look at the URL, you will be able to identify it as a Gopher server. Similarly, you may see a list of filenames and directories. If you check the URL, you'll find that you have accessed an FTP server. In both cases, it is pretty obvious that you are not viewing a Web document.

In this chapter, we demonstrate how to use Mosaic to access these different types of servers. You don't have to learn too much about navigating to these servers. Rather, you will come to recognize the differences in the way they organize information. Knowing that a link points to a Gopher server tells you something about how the information will be presented.

Below is a list of the services covered in this chapter, along with a short description of each.

- Gopher Gopher is a menu-based information system that allows users to browse through a hierarchical organization and select items from menus. Each item on the menu represents either a file or a directory.
- WAIS WAIS, which stands for Wide Area Information Servers, is a search-and-retrieval system that lets users search a full-text index of all documents in a database.

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FTP

FTP, which stands for File Transfer Protocol, is an application that lets you download files from remote servers.

If you are interested in learning more about the Internet services discussed in this chapter and comparing other client interfaces, see *The Whole Internet User's Guide and Catalog* by Ed Krol.

## Mosaic and Gopher

Not too long ago there were a lot more Gopher servers on the Net than Web servers. There are still a lot of Gopher servers around because they are an easy way to provide information to a broad audience. What is distinctive about Gopher is that you navigate through menus, and each item on the menu is either a file or another menu with additional selections. In Mosaic, these choices are links, and you select the item you want by clicking on the link. Figure 4-1 shows the Library of Congress Gopher as viewed in Mosaic. We begin at the top-level menu of this Gopher. If you click on **Government Information**, Mosaic retrieves the contents of that menu, as shown in Figure 4-2. This menu contains four links, each of which takes you to another menu as you navigate to the next level of detail in the hierarchy. Clicking on **Federal Information Resources** takes you to a menu with more directories. On you go, tunneling through directories until you come to a menu that contains some files. Clicking on a filename displays the contents of the file. Most Gopher servers deliver ASCII files that Mosaic displays in a fixed font. An example of such a file is shown in Figure 4-3.



Figure 4-1. Library of Congress Gopher

Untitled	
URL: gopher://marvel.loc.gov/11/federal	्र
Select one of: <u>Federal Information Resources</u> <u>State and Local Government Information (U.S.)</u> <u>Foreign Government Information (Non-U.S.)</u> <u>International Government Information</u>	

Figure 4-2. Government Information menu

Untitled	
URL: gopher://wiretap.spies.com/00/Gov/US-History/decind.txt	<u> </u>
Declaration of Independence	8531
(Adopted in Congress 4 July 1776)	
The Unanimous Declaration of the Thirteen United States of America	
When, in the course of human events, it becomes necessary for one people to dissolve the political bonds which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the laws of nature and of nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.	
We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are life, liberty and the pursuit of happiness. That to secure these rights, governments are instituted among men, deriving their just powers form the consent of the governed. That whenever any form of government becomes destructive to these ends, it is the right of the people to alter or to abolish it, and to institute new government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes; and accordingly all experience hath shown that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train	<u>Ф</u>

Figure 4-3. Mosaic displays an ASCII file

Besides letting users browse through categories of information, Gopher can transparently access information from other Gopher servers. In addition, most Gopher servers contain pointers to all the other Gopher servers in the world, so it is truly a global system.

There are some disadvantages, however. In our example, we didn't go through all the layers of menus that it took to get to a text file, but there were more than a dozen. Sometimes Gopher seems like a case study in the limitations of hierarchical filing systems. The problem is that it becomes absurd (not to mention boring) to keep selecting menu items, only to be confronted by another menu list. After

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padding through a dozen or so of these menus, you may lose interest in whatever you were looking for.

Given the choice, most people would rather use a Web server than a Gopher server. However, you don't always have a choice, as some organizations may not yet be able to provide information in HTML on a Web server. You also see interesting Web/Gopher hybrids. For example, if a business already has a Gopher server, they might create a Web server with only a few original documents that serve as a high-level interface to the Gopher server. In other words, after the home page, their Web server points to information managed on the Gopher server.

That said, however, remember that lots of good information can be found in Gopher servers. *GNN's The Whole Internet Catalog* contains pointers to quite a few good Gopher servers, including:

- African National Congress Gopher
- The Bible
- Envirogopher
- CIA World Factbook
- Project Gutenberg
- The California Museum of Photography

## Using the Hotlist to Manage Gophers

Since the good stuff (the documents) may be buried several layers deep in a Gopher, you'll want to use all the tools at your disposal to manage them. You can use your hotlist to create bookmarks in the Gophers you use regularly. Each menu level in Gopher can be identified by a URL. Thus, when you get to the menu level that you want, you can just choose Add This Document from the Navigate menu to add that Gopher menu to your hotlist. Of course, you can still travel up and down the menus once you're in the Gopher.

## Getting Gophers with URLs

A Gopher URL is a lot like a Web URL, except that the service protocol is different, of course. Instead of *http*, you use the Gopher protocol. So to contact the Library of Congress Gopher, select Open URL from the File menu and type:

gopher://marvel.loc.gov

This takes you to the main menu of the server. As discussed above, it becomes pure drudgery to have to navigate through all those menus. Mosaic can help you avoid some of this awkwardness by allowing you to connect directly to a particular menu level. For instance, you can get directly to the Federal Information Resources menu in the Library of Congress Gopher by typing the URL:

gopher://marvel.loc.gov/11/federal/fedinfo

## Searching Through Gopherspace

Since tunneling through menus can be a time-consuming way to find information, especially if you're looking for specific information, there are several applications for searching "gopherspace." On a Gopher menu you may see an option for searching. If you select this option, you will go to another document where you are prompted to enter a search keyword. The Gopher server then returns a menu of items matching the search criteria. Many Gopher servers also have a gateway to a WAIS server that contains a full-text index of the contents of the Gopher. We'll talk more about WAIS servers in the next section.

There are also several tools that index all of gopherspace, not just a single server. You can specify a search string that will be matched against an index of words in Gopher titles or text files. Because they are modeled after an Internet search tool called Archie, these search tools were named after characters from the *Archie* comic books.

#### Veronica

Veronica searches all of the menu items on all Gopher servers for a string of words or characters that you enter. Follow these steps to use Veronica:

1. Log on to the Gopher server at the University of Texas at Austin by entering the following URL:

gopher://bongo.cc.utexas.edu

Figure 4-4 shows the top-level menu of this Gopher server.

2. Select Veronica: Search Gopher Menus Worldwide. This leads you to a menu where you can select a Veronica server, shown in Figure 4-5.



Figure 4-4. Top-level menu of the Gopher server at the UT-Austin



Figure 4-5. Choosing a Veronica server

As you can see, there are actually two types of Veronica searches—you can search the titles of all Gopher items, or you can search only for directories. If you do the first kind of search, you're likely to get a rather long list of results, so doing a directory search is usually more effective.

There are a number of different servers to choose from. As a general rule, try the server that's closest to you first. Veronica servers tend to be quite busy; you may not be able to access the first server you try. In fact, don't be surprised if you have to go to Europe before you find a server you can access. 3. Assuming you are able to connect, you will then be presented with a screen that contains a text field, shown in Figure 4-6. Simply enter the text you are searching for in the field and press **Return**.

gopher://info.psi.net:2347/7-t1%20%20	el .
URL: gopher://info.psi.net:2347/7-t1%20%20	- C
gopher://info.psi.net:2347/7-t1%20%20 index	
This is a searchable index. Enter keyword(s): Mosaic	
This is a searchable Gopher index. Please enter keywords to search for.	<del>र</del>

Figure 4-6. Searching Veronica for a string of text

4. The Veronica server will then search for that text and return a list of responses, as shown in Figure 4-7. Each response is a hypertext link, and clicking on one brings up either a menu or the contents of a file.



Figure 4-7. Veronica search response

Veronica searches accept "Boolean operators," words that specify conditions that must be met in order for Veronica to consider an item as matching the search. Boolean operators separate two or more strings. Veronica understands the following operators:

- AND tells Veronica that both parts of the query must be present. For instance, searching for "Apple AND Macintosh" tells Veronica that only items that contain both "Apple" and "Macintosh" are matches. If no Boolean operators are specified, Veronica assumes there to be an AND between words.
- OR tells Veronica that either part of the query is acceptable as a match. If the query is "Apple OR Macintosh," any items that contain either one of those words is considered a match.
- NOT tells Veronica to search for items containing the first string but not the second. For instance, searching for "Apple NOT Macintosh" searches for items containing "Apple" but excludes items that refer to "Macintosh."

You can combine Boolean operators. Veronica evaluates them from right to left, so "Apple AND Macintosh OR Newton" searches for items with "Newton" or "Apple Macintosh." Veronica also accepts an asterisk as a wildcard character, which represents any combination of characters to the end of the word. For example, "Mac\*" would match Mac, Macs, Macintosh, macadamia, and so on.

## Jughead

Sometimes you don't want to search the menus of every Gopher server in the world. If you are looking for regional or specialized information, you can use Jughead to search menu titles of Gophers at a single institution. Many colleges and universities use Gopher servers as campus-wide information systems, so students at the University of Texas at Austin can use Jughead to search for information about UTA. Or a medical researcher might use Jughead to search only the Gopher servers at Johns Hopkins University.

In most cases, you use Jughead without knowing it. While UTA's Gopher clearly identifies one menu item as Jughead: Search Gopher menus at UT Austin, most others simply say something like Search Gopher menus at ...

As with Veronica, Jughead lets you use the Boolean operators AND, OR, and NOT and the asterisk wildcard. Searches are not case-sensitive. However, Jughead only lets you search for two words at a time and doesn't support the ability to search for specific Gopher resource types.

# WAIS

There are approximately 600 WAIS servers on the Internet which let you search the full text of all the documents in a database. You can access WAIS servers through either the Web or Gopher.

To use WAIS within Gopher, you can pick a WAIS server and search for a string of words. Most WAIS servers aren't terribly sophisticated when it comes to advanced searching techniques, so Boolean operators probably won't work. One good thing about WAIS, however, is that you can ask it questions in plain English, like "What information is there about Silicon Graphics, Inc.?"

Here's how to try it out:

- 1. Connect to the University of Minnesota Gopher at gopher://gopher.micro. umn.edu
- 2. Choose Other Gopher and Information Servers.
- 3. Choose WAIS-Based Information.
- 4. Choose WAIS Databases by Letter.
- 5. At this point, you can either search the directory of WAIS servers or choose from an alphabetical list of servers. Since the names of WAIS databases can be a little strange, it's usually better to search the directory. To do that, choose **Directory of WAIS Databases** and enter your query in the search field. For our example, we'll use the query "health insurance," shown in Figure 4-8.

gopher://gopher-gw.micro.umn.edu/7waissrc%3a/WAISes/byletter/dire index This is a searchable index. Enter keyword(s): health insurance This is a searchable Gopher index. Flease enter keywords to search for.		URL: gopher://gopher-gw.micro.umn.edu/7waissrc%3a/WAISes/byletter/directory-of-sery
This is a searchable index. Enter keyword(s): health insurance This is a searchable Gopher index. Please enter keywords to search for.	gophe index	r://gopher-gw.micro.umn.edu/7waissrc%3a/WAISes/byletter/dire
his is a searchable Gopher index. Please enter keywords to search for.	'his is a se	earchable index. Enter keyword(s): health insurance
	'his is a se	earchable Gopher index. Please enter keywords to search for.

Figure 4-8. Searching the WAIS directory

- 6. After a little while, Mosaic will display a list of WAIS servers that say they have information about health or insurance, as shown in Figure 4-9.
- 7. At the top of the list is Health-Security-Act.src, which is a database of documents related to the health reform bill proposed by President Clinton in 1994. Click on that link to search the database. Enter your query in the search field, and the server will respond with a ranked list of headlines of documents that contain your search words.



Figure 4-9. Results of WAIS directory search

8. To see any of these documents, click on the headline, and Mosaic will display the document. If you want to save it, use the Save As command.

You can also use WAIS within certain Web servers. For instance, *The Whole Internet Catalog* includes a field for searching a WAIS index of all the documents in *GNN*. To find documents about insurance, you can simply enter "insurance" in the search field, and Mosaic will return a list of description files containing that word, as shown in Figure 4-10. Clicking on one of these files will display the page that contains the link. As of this writing, this feature is only available on *GNN*'s NEARnet server, *http://nearnet.gnn.com/gnn/wic/*.

## Mosaic and FTP

Some Web documents, such as *GNN's The Whole Internet Catalog*, will link you to FTP servers. FTP is the original Internet application protocol for moving files between computers.

FTP servers generally manage large collections of data—software source code, images, or other data—that is specifically made available for downloading rather than viewing. As a result, files are often stored or compressed in many different formats. This can make FTP a complicated program.

There are two transfer modes available in FTP—one for binary files and one for ASCII (text) files. Binary transfer mode preserves the bit sequence of the file, so that the copy is identical to the original. ASCII mode treats the file as sets of characters so that the document will be readable on the computer receiving the file.

Barren response IBC
Maintenance
This is a searchable index. Enter keyword(s)
Search response for:
Number Company and and an A OB
Number of records returned: 26
1. Score 1000 lines 188 - Heller Ehrman While & McAuliffe: Insurance
2: Score: 333. lines: 210 - Heller Ehrman White & McAulife: Litigation
3: Score: 278, lines: 92 - Heller Ehrman White & McAuliffe: Curtis M. Caton Biography
4. Score: 222, lines: 280 - Jannidata/meta/internet/mktiora/catalog/softbiz.toc.html
<u>5 Score 222 lines 62 Heller Ehrman White &amp; McAulifie Nancy Sher Conen Biography</u>
<u>6 Score 194 lines 35 - Heiler Enfant Wille &amp; McAullie Services</u> 7 Score 194 lines 1674 - Clipton Technology for Anarica's Economy Growth
8: Score: 194 lines: 1674 - Clinton: Technology for America's Economic Growth
<ul> <li>9: Score: 194, lines: 160 - The Benefits of Adding "Inc." to Your Company Name</li> </ul>
10: Score 194, lines 149 - Heller Ehrman White & McAuliffe: Bankruptcy
<u>11. Score. 166, lines. 19 - National Health Security Plan</u>
12: Score: 166, lines: 30 - Business Sources on the Net

Figure 4–10. Results of searching the WIC

So, using FTP you would have to specify whether you want a binary or an ASCII transfer.

In addition, files are compressed using many different programs, so it's important to identify which files you can decompress and use on your Mac. You can usually determine this by looking at file extensions.

Fortunately, using Mosaic to perform FTP transfers simplifies matters quite a bit. This is because Mosaic determines whether a file should be transferred using ASCII or binary transfer mode.

One important limitation of using Mosaic as an FTP client is that it only supports anonymous FTP, a service that lets you access a public directory via an anonymous login. If you want to transfer files from a computer on which you have an account, you'll need to use another FTP utility.

## Downloading Files with FTP

Now let's take a look at using Mosaic to transfer files from an FTP site. We'll start at *The Whole Internet Catalog.* In the Art category, the *WTC* has a link to the

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Smithsonian Institution's image server photo1.si.edu, shown in Figure 4-11. Clicking on the GO button will connect you via anonymous FTP to this server.

Smithsonian Institution	
URL: http://gnn.com/wic/visart.16.html	3
Smitheonion Institution	1
Sminsonian institution	
The Smithsonian Institution's Office of Frinting and Photographic Services in Washington, D.C., m available a selection of photographs from the Smithsonian's archives. The images cover topics ran and space to science, technology, history, and current events.	akes ging from air
<b>GO</b> using FTP to photo1.si.edu.	
Return to Art Return to History & Civilization	
Ketum to rhotography	
W.I.C. G.N.N T.O.C. HOME	
This is a searchable index. Enter keyword(s):	

Figure 4–11. WIC description of Smithsonian image server

When you click that button, Mosaic takes care of opening the connection to photo1.si.edu and logging you in as an anonymous user. Once connected, Mosaic displays the top-level directories of the server, as shown in Figure 4-12.

Now take a look at the URL for this server. The syntax should be familiar to you by now. It starts with the service protocol *ftp:*, followed by the separator // and the name of the server. Directories and filenames can be included in the URL, just as with other services. The URL for the Smithsonian image server, then, is *ftp://photo1.si.edu* Unlike in Gopher, FTP directory names are not particularly helpful. Remember that you are looking at a UNIX file server meant for transferring files, not browsing, so hints about content are few and far between. Since this is an image server, though, the *images* directory looks promising.

	Welcome directory	
URL: ftp://photo1.si.edu/		
Walaawa		K
weicome		
ALOT-Chapman.txt apps		
bin etc		
<u>images</u> More.Smithsonian.Stuff		
p <u>ub</u> shlib		
smithsonian.photo.info.txt		
<u>Shirmbownww.cels.txt</u>		L.
		5

Figure 4-12. Top-level directories of photo1.si.edu

As you can see, each directory is a hypertext link. Clicking on images will display the contents of that directory, as shown in Figure 4-13.

1	images directory
9	URL: ftp://photo1.si.edu/images
K	madee
	mages
200	<u>catalogs</u> electronic times ndf
	gi <u>189a</u> ifif.wencode
3.000	jpeg preview-text
T.	smithsonian, photo.info.txt
	mages Jp to / catalogs electronic.times.pdf git09a jfif.wwencode Jpes preview-text smithsonian.photo.info.txt

Figure 4-13. The images directory

Of the seven items here, two are files and five are subdirectories. The files are the ones with file extensions. Looking at file extensions is pretty much the only way to tell what format a file is in. In this directory, *electronic.times.pdf* is an Adobe Acrobat file, and *smithsonian.photo.info.txt* is a plain text file.

The other items are subdirectories. Three of these—gif89a, jfif-uuencode, and jpeg—look most promising as photo archives since their names contain image file formats.

Before we dive into the image directories, let's take a look at the text file *smithso-nian.pboto.info.txt* to see what it tells us. To read the file, click on the filename. The file is shown in Figure 4-14.



Figure 4–14. Clicking on a text file displays its contents

The information file explains the file and compression formats of the various files and tells us how to download appropriate software for viewing the images. To save this document for future reference, choose **Save As** from the **File** menu and choose a filename and location on your hard disk.

Now let's see what files are available. Click on the **Back** button to return to the directory listing and then click on **gif89a** to see the contents of that directory, as shown in Figure 4-15. The directory contains several subdirectories, which organize the images by category. Let's try the *air-space* directory, shown in Figure 4-16.

gif89a	directory	
URL: ftp://photo1.si.edu/images/gif89a		ୢ
		9
gif89a		<u>u</u>
<u>Up to images</u>		1.000
<u>air-space</u> art		
new-photo-uploads		
science-nature		
tech-history		Q.
		[2] [2] [2] [2] [2] [2] [2] [2] [2] [2]

Figure 4-15. Contents of gif89a

	air-space directory	
URL: ftp://photo1.si.	edu/images/gif89a/air-space	6
		9
air-space		
Up to gif89a		
A4C.GIF		
ALBTRS.GIF AFOLLO.GIF		
arecib.gif		
astrar.gif		
ATRANS.GIF		
<u>B17.GIF</u>		

Figure 4–16. Contents of the air-space directory

Finally, we've found the images. Notice that these files all end with the extension *.gif.* That tells us that they're images in the GIF format. Remember, now that you know where you're going, you can get right to this directory by entering the URL:

ftp://photol.si.edu/images/gif89a/air-space

Now we're ready to download a file. Let's try APOLLO.GIF. Clicking on the filename brings up the Save As dialog box, which, of course, lets you specify where to save the document.

Mosaic asks you to save the document, rather than just display it, because graphics files must be downloaded in binary mode. Mosaic automatically determines whether to transfer in binary or ASCII mode. Table 4-1 shows which mode is used for different file types.

File	Mode
Text file	ASCII, by definition
Spreadsheet	Probably binary
Database file	Probably binary, possibly ASCII
Word processor file	Probably binary, possibly ASCII
Program source code	ASCII
Electronic mail messages	ASCII
UNIX shell archive	ASCII
UNIX tar file	Binary
Backup file	Binary
Compressed file	Binary
Uuencoded or binhexed file	ASCII
Executable file	Binary
PostScript (laser printer) file	ASCII
Hypertext (HTML) document	ASCII
Picture files (GIF, JPEG, MPEG)	Binary

Table 4-1: Common File Types and Modes

## Downloading a Program via Hypertext

When the transfer is complete, you can view the image in any program that can display GIF files. (In Chapter 6, *Using Mosaic for Multimedia*, we'll show you how to view GIF and JPEG images with a program called JPEGView.) Mosaic is already configured to use JPEGView to display GIF and JPEG images. Let's download it now, so you can view the Apollo image. See Chapter 6 for a detailed discussion of using external viewers with Mosaic.

The program's author, Aaron Giles, maintains the JPEGView Page at Cornell University Medical College, where he works. You can get there by using the Mosaic Handbook Hotlist or by entering the URL http://www.med.cornell.edu /jpegview.html. As shown in Figure 4-17, the page has hypertext links for downloading 68K, PowerPC and "fat binary" (software that run on both 68K and PowerPC-based Macs) versions of the software. Notice that the description mentions that the files are "BinHexed." BinHex is a format that converts binary files to ASCII text. After you receive the file, you'll need to convert it back to binary format; we'll show you how to do that shortly. The file extension *.bqx* tells you that the file has been BinHexed. To download, just click on the link for the version you want. A Save As dialog box will then appear. Keep the filename and specify a location on your hard disk. At least it seems that the process is that simple. Clicking on that link actually starts an FTP session, in which you download the file from a remote FTP server. Here's what happens when you click on the link for JPEGView 3.3 for 680x0 Macs:

- 1. Mosaic connects to ftp.med.cornell.edu.
- 2. Mosaic logs you in as an anonymous user.

JPE6Iliew	20205
Mail http://www.med.cornell.edu/jpegview.html	St. 55 (5)
	0.000
DECUINT	0000000
EGVRW	
Welcome to the JPEGView page at the <u>Comell University Medical College</u> .	
JPEGView is a fast, powerful, easy-to-use image viewer for both 680x0 and PowerPC Macintoshes. The current incamation of JPEGView can read JPEG, PICT, GIF, TIFF, BMP, MacPaint, and Startup Screen files.	2000000
JPEGView was written by <u>Aaron Giles</u> . He is also involved in several <u>other projects</u> , in case you're interested. Amazing as it may seem, he works for the medical center, but is not a medical student by any stretch of the imagination.	
	000000
You can find three versions of the latest JPEGView release here:	North Color
JPEGView 3.3 for 680x0 Macintosher [540k, binhexed]	
The latest version of JPLG View that zuns on the "standard" bouxu Macintoshes, or slowly under emulation on the new PowerPC Macintoshes.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
IPEGView 3.3 for PowerPC Macintoshes [602k, binhexed]	200000
The latest version of JFEGView that zuns or should I say screams natively on the new PowerPC	
IMACINTOSNES, I NIS VEISION GOES NOT WOIK AT All ON COUND MALCINTOSNES.	
J <u>FEGView 3.3 tor bound and FowerFC Macintoshes</u> [774k, binhexed] A "fat binary" version of the latest JFEGView which runs at full throttle on both types of Macintoshes.	2000
	100000
(c)	3

Figure 4–17. JPEGView bome page

- 3. Mosaic sends an FTP request to transfer jpegview33.sit.hqx in binary mode.
- 4. The server downloads the requested file to your computer.
- 5. Mosaic closes the connection.

When the download is complete, the file will appear as a generic document. You'll need to convert the BinHexed file to a binary file. You can do this in any one of several freeware or shareware programs, such as StuffIt or Compactor Pro.

When the file is converted, it will appear as a StuffIt document. This is because the application was stuffed before it was BinHexed. Chances are you probably already have a copy of StuffIt on your computer. If so, just double-click on the icon to unstuff the file. It will then appear as the JPEGView application. If you don't have StuffIt, you can download it from the Net via the Macintosh Archive, a hypertext version of the Mac software archive at the University of Michigan. We'll work more with the Macintosh Archive in Chapter 6. To access the Mac Archive, click on the link in the Mosaic Handbook Hotlist or open the following URL: http://web.nexor.co.uk/mac-archive/welcome.html.

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As you explore the Internet, you'll encounter several different compression schemes. You'll want to make sure you have a program that can uncompress specific files. In the case of applications, you'll want to be sure you're downloading Mac files and not PC or UNIX files. The way to tell is by looking at file extensions. Table 4-2 gives information about common compression extensions and the associated programs.

#### Table 4-2: Common Compression Programs

Compression	Decompression	File	Typical	Platform
Program	Program	Suffix	Filename	
compress	uncompress	.Z	rfc1118.txt.Z	UNIX
gzip	gunzip	.z or .gz	textfile.gz	UNIX
Stuffit	unsit	.Sit	program.Sit	Macintosh
PackIt	unpit	.pit	report.pit	Macintosh
PKZIP	unzip41	.ZIP	package.ZIP	PC

Now that you've downloaded JPEGView, you can finally look at APOLLO.GIF. Just double-click on the icon or open it directly in JPEGView. Figure 4-18 shows what APOLLO.GIF looks like.



Figure 4-18. APOLLO.GIF

This version of Enhanced NCSA Mosaic does not support Network News, the system of bulletin board discussion groups. Future versions will include the ability to use Mosaic as a newsreader. Check the *Mosaic Support Center* on *GNN* for information about upgrades to Enhanced NCSA Mosaic.

## **CHAPTER FIVE**

# **CUSTOMIZING MOSAIC**

Changing Your Home Page Changing Preferences

Mosaic is a powerful tool that allows you to explore information and the connections between information in a multimedia environment. But, as we'll see in this chapter, Mosaic is also a flexible environment that can be customized and extended in many different ways. The combination is what makes Mosaic such an exciting tool: Mosaic not only lets you view information, but also gives you control over how the information will be presented.

The most obvious aspect that you can control is type formatting. As a Macintosh client, Mosaic can take advantage of the fonts loaded on your system to format many different elements of text in many different ways and to combine them within a document. You can customize several other parts of the interface as well.

In the current version of Enhanced NCSA Mosaic, only a few customization options are accessible through the **Preferences** dialog box. Future versions will include more customization options.

# Changing Your Home Page

The home page is a wonderful navigational device that does double duty as map and safe port. Your home page—the document Mosaic retrieves and displays when you launch the program—serves first as your personal navigational map of the Web.

When you're roaming the Net, freely following links and sailing from one server to another, it is not uncommon to find yourself someplace you don't particularly want to be and with no apparent means of getting back out again. When this happens, your home page is your safe haven, a return to your familiar map. When you get to a point where you'd like to start fresh, just return to your home page.

The Home Page that comes with this book has links to GNN and the Mosaic Handbook Hotlist. While this is an excellent starting point, after you've used Mosaic for a while, you may want to change your home page.

There are a number of reasons you may want to specify a different document as your home page. If you use, say, the *GNN Personal Finance Center* frequently, you may want to use the *Personal Finance Home Page* as your home page. If you have certain areas of specific interest, you may want to have a more narrowly focused home page. For example, if you're particularly interested in astrology and space, you may want to select "NASA Information Services Via the WWW" as your home page.

Or if you have discovered a number of servers you return to regularly, you may want to create your own custom map of the Web, which you can keep on your local system and update as needed. You might include URLs to your favorite sports, music, and travel servers, if those are your interests. On the other hand, you might prefer to use your hotlist to navigate to your favorite servers and keep a remote server as your home page.

## Using Another Document as Your Home Page

To change your home page, simply enter the URL of the new home page in the Home Page field of the Preferences dialog. But how do you find the URL? The best way is to go there—using your hotlist if you have saved it there; using History or hypertext links if you haven't. For instance, if you wanted to use *GNN*'s *The Whole Internet Catalog* as your home page, you would go to the *WTC*, select and copy the URL from the display in the toolbar, and paste it into the field in the Preferences dialog.

## Creating Your Own Home Page

Creating your own HTML document to use as your home page is a little more involved, but if you want to use your hotlist as your home page, Mosaic's **Export** command (found in the Hotlist and History dialogs) makes it a snap. **Export** creates an HTML page consisting of all the documents in your hotlist. Every document title is a hypertext link to the actual page on the Net. Here's how to use **Export** to create your own home page:

- 1. Choose Hotlist from the Navigate menu.
- 2. Add and delete items from your hotlist as desired.
- 3. Click on the Export button to export the hotlist to an HTML page.
- 4. Save this document as a file on your hard disk with the extension *.html* for example, *hotlist.html*. Mosaic then automatically displays this page. Figure 5-1 gives an example.
- 5. If you want to rearrange the list or add subject headers, open your home page file in a text editor. The file is coded in HTML and will look something like this:

```
<TITLE>HotList</TITLE>
<H1>HotList Page</H1>
<A HREF="http://www.spb.su/">
St. Petersburg Web
</A>
<A HREF="http://gnn.com/meta/travel/travelwatch2.html">
World Travel Watch
```

```
</A>
<A HREF="http://gnn.com/meta/travel/readingroom.html">
Travelers' Reading Room
</A>
<A HREF="http://hypatia.gsfc.nasa.gov/NASA_homepage.html">
NASA Information Services via World Wide Web
</A>
<A HREF="http://sd-www.jsc.nasa.gov/jscover.html">
Johnson Space Center
</A>
<A HREF="http://images.jsc.nasa.gov/html/home.htm">
Image Sciences Division
</A>
<A HREF="http://tommy.jsc.nasa.gov/">
Automation and Robotics Division
</A>
<A HREF="http://gnn.com/news/sports/strike/strike-intro.html">
Balance of Power
</A>
<A HREF="http://gnn.com/news/sports/draft/draft-94.html">
NBA Draft
</A>
<A HREF="http://gnn.com/news/sports/draft/index.html">
Usenet Mock NBA Draft
</A>
```

```
<A HREF="http://www.nando.net/baseball/bbserv.html">
The Nando X Baseball Server
```

```
</A>
```

#### 8 HotList

URL file:///Mac HD/my code/ho					а										
$\langle 1 \rangle$	10	PL:	file	://	1/1	1ac	HD	/my	1 000	ie/	hot	lis	t.h	tml	Ī
															2

#### **HotList Page**

St. Petersburg Web

World Travel Watch

Travelers' Reading Room

NASA Information Services via World Wide Web

Johnson Space Center

Image Sciences Division

Automation and Robotics Division

NBA Draft

Usenet Mock NBA Draft

The Nando X Baseball Server

Figure 5-1. Exported hotlist file viewed in Mosaic

- 6. Ignoring the coding for now, you should be able to see that each paragraph is the URL and name of a document in the hotlist. Using the cut and paste functions, you can rearrange the paragraphs to group documents by subject or by title. In this case, we might group the documents into *Sports, Travel, and Space.*
- 7. You can try a simple bit of tagging to change the title and main heading and add subject headings to the list:
  - Change the title by changing the first line to:

```
<TITLE>My Home Page</TITLE>
```

• Change the main heading by changing the second line to:

<H1>My Home Page</H1>

Insert subject headings by adding new paragraphs using this form:

```
<H2>Sports</H2>
```

Your edited file will look something like this:

```
<TITLE>My Home Page</TITLE>
<H1>My Home Page</H1>
<H2>Travel</H2>
<A HREF="http://www.spb.su/">
St. Petersburg Web
</A>
<A HREF="http://gnn.com/meta/travel/travelwatch2.html">
World Travel Watch
</A>
<A HREF="http://gnn.com/meta/travel/readingroom.html">
Travelers' Reading Room
</A>
<H2>Space</H2>
<A HREF="http://hypatia.gsfc.nasa.gov/NASA_homepage.html">
NASA Information Services via World Wide Web
</A>
<A HREF="http://sd-www.jsc.nasa.gov/jscover.html">
Johnson Space Center
</A>
<A HREF="http://images.jsc.nasa.gov/html/home.htm">
Image Sciences Division
</A>
<A HREF="http://tommy.jsc.nasa.gov/">
Automation and Robotics Division
</A>
<H2>Sports</H2>
<A HREF="http://cnn.com/news/sports/strike/strike-intro.html">
Balance of Power
</A>
<A HREF="http://gnn.com/news/sports/draft/draft-94.html">
NBA Draft
</A>
```

```
<A HREF="http://gnn.com/news/sports/draft/index.html">
Usenet Mock NBA Draft
</A>
<A HREF="http://www.nando.net/baseball/bbserv.html">
The Nando X Baseball Server
</A>
```

8. After you save your file, you can preview the results by using Mosaic's **Open Local** command and selecting the file. Figure 5-2 shows what our example file looks like in Mosaic.

My Home Page	
	T
/ly Home Page	Accessory of
	0000000
r. Fetersburg web world fravel Watch fravelers' Keading hoom	000000
Space	2000000
IASA Information Services via World Wide Web. Johnson Space Center, Image Sciences Division, Automation nd Robotics Division	000000000000000000000000000000000000000
Sports	10000000
VBA Draft_Usenet Mock NBA Draft_The Nando XBaseball Server	COLOR DE LA COLOR
[[]	

Figure 5-2. Edited home page file

9. Finally, choose Preferences from the Edit menu and type in the URL of your new home page file in the Home Page field. For local files, the URL starts with *File:///* followed by the pathname. The path includes the name of your hard disk, the relevant folders and the name of the file. For example, if your hard disk was named *HardDisk* and you saved your hotlist file as *botlist.html* in the *Enhanced NCSA Mosaic* folder, the URL would be *File:///HardDisk/Enhanced NCSA Mosaic/hotlist.html*.

Once you get into composing HTML, you can do quite a bit more with your home page, including adding graphics, writing lists, and incorporating multiple levels of headings. For instructions on writing HTML and a discussion of creating your own home page, see Chapter 7, *Creating HTML Documents*.

# **Changing Preferences**

The basic configuration options available in **Preferences** allow you to change style sheets, set your home page, and specify whether images will be downloaded automatically.
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The options available in Preferences are:

- Load Images
- Underline Anchors
- Set Home Page
- Proxy Server
- Style Sheets

## Load Images

If you connect to the Internet by dialing in over a SLIP or PPP connection, even with a fast modem, Mosaic may run slower than you would like. The bottleneck is in downloading graphics, especially large ones. By unchecking the Load Images checkbox, you can tell Mosaic not to automatically download images. Instead, Mosaic will draw generic picture icons, as shown in Figure 5-3.



Figure 5-3. Generic picture icons, displayed when Load Images is off

This speeds things up considerably, but, as you can see from the example, it really detracts from the design of the page. (If you're working from an office with a dedicated line, you won't need to worry too much about speed.)

Since a lot of the enjoyment of using Mosaic comes from looking at the images on Web pages, you'll want to avoid turning images off. Still, there may be some graphics-laden pages that you use mostly for navigation purposes. Since you know what these pages look like, you can save quite a bit of time by turning images off.

If you do turn the images off, you can get individual graphics by double-clicking on individual picture icons, or by choosing Load Missing Images from the Edit menu to load all the images on a page. Although it is more time consuming to download images this way, using this option gets you the text of the page fairly quickly, and you can then decide if you're even interested in the images.

Some servers, like *GNN*, specify alternate text for Mosaic to use when graphics can't be displayed. In these cases, Mosaic will display the alternate text. If the graphics serve as hypertext, the alternate text will have a bounding box, as shown in Figure 5-4.

Global Network Navigator Home Page	
K http://gnn.com/gnn/GNNhome.html	
	優
DOUBLE CLCK TO LOAD	
Welcome to GNN, the Global Network Navigator. To find out what's new and cool in GNN, look at <u>What's Up in GNN</u> . If you're new to GNN and would like to knowmore about us, take a minute to check out <u>Welcome to GNN</u> . And don't forget to <u>become a subscriber</u> (it's free!).	
What's Up in GNN Welcome Subscribe	
Navigating the Net	
Use GNN to help you find your way through the Internet. GNN's <u>Whole Internet Catalog</u> is your best source of information about Internet resources; if you're looking for businesses on the Net, check out GNN's <u>Business Pages</u> .	
The Whole Internet Catalog GNN Business Pages	
Continue your exploration of Net resources with GNN's <u>Best of the Net</u> , our pick of the best Internet sites, and <u>Netizens</u> , our compilation of personal home pages. If you're new to the Net and need a little guidance, consult <u>The</u> <u>Internet Help Desk</u> .	
¢ C	1

Figure 5-4. Alternate text, displayed when available

To reset Mosaic so that images load automatically, go back to Preferences and click on the Load Images checkbox. The next time you connect to a server, you'll get all the images.

### **Underline** Anchors

If you have a color monitor, Mosaic will display hypertext in color. If this option is checked in the **Preferences** dialog, links will also be underlined. You can turn off underlining by unchecking this option, which will improve performance slightly since it takes additional time to draw the underlines. If you have a black-and-white or grayscale monitor, however, you should leave **Anchor Underline** on, so you will be able to distinguish hypertext from regular text.

### Set Home Page

As described above, you can change your home page by entering a new URL in the Set Home Page field of the Preferences window.

### **Proxy Server**

If you work at a site with a security firewall, you won't be able to access the Internet directly. The workaround is a proxy server located outside of the firewall. Your computer connects to this server, which is on the Internet. The **Proxy Server** field in the **Preferences** dialog lets you specify the address of this proxy server. If you're in this situation, ask your network administrator for help.

### Style Sheets

Mosaic lets you control how documents will look by choosing a style sheet. Most word processing and page layout programs use "styles," which let you tag a paragraph of text with certain attributes. For instance, in Microsoft Word for Macintosh, you can select a paragraph of text, set up a style for it (for example, *beading 1*), and then define that style as, say, Times Roman, 36 points, single-spaced, no indent. In other words, you explicitly tell Word the values of the style and the program applies those values whenever you tag a paragraph with that style.

HTML operates very differently. There's nothing in an HTML document that specifies font or point size or spacing. All of these style issues are handled by Mosaic. All HTML says is: "This paragraph is heading 1." Mosaic then looks up the settings for the *heading 1* tag and displays the paragraph that way on your computer.

Since you can edit these settings, you can change the way Mosaic displays documents on your screen. Mosaic makes the process even easier by providing global



Figure 5-5. Notes From the Road formatted with Sans Serif Small style sheet

style sheets. Each style sheet has values for every HTML tag, and you can change the overall look of a document just by changing to a different style sheet. Here's how it works:

- 1. As an example, go to "Notes From the Road" in the *Travelers' Center*. Figure 5-5 shows this page formatted with the Sans Serif Small style sheet.
- 2. Then choose **Preferences** from the **Edit** menu and click on the **Style Sheets** pop-up menu. This lets you choose a different style sheet from a list of available choices. Choose **Mixed Large**.
- 3. Mosaic immediately updates the display using the new style sheet, as shown in Figure 5-6.



Figure 5-6. Notes From the Road formatted with Mixed Large style sheet

### CHAPTER SIX

# USING MOSAIC FOR MULTIMEDIA

What You'll Need Installing a Viewer Getting the Big Picture Digital Drive-In Sound Waves

Multimedia on the Internet can be one of the most exciting uses of Mosaic. You can play movies and music, look at full-color images of space or great artwork, run scientific animations and models, display 3D graphics, and more.

But Internet multimedia can sometimes be frustrating and is almost always timeconsuming. The problem is that these files can be quite large. For instance, a oneminute MPEG movie can be a megabyte or more, a three-minute song might be four or five megabytes, and large full-color graphics are typically half a megabyte or so.

How long it takes to download a file depends on the kind of network connection you have, how far away the server is, and how busy the network is. If you connect to the Internet over a modem, downloading large files will quietly drive you insane if you sit and stare at Mosaic's progress bar. So, when you start downloading movie and sound files, be prepared to take a break or work in another application.

Even so, using multimedia files on the Net can be worth the pain because the results can be stunning, perhaps even more so because it takes so long to get the files. When you bring up that full-screen version of the Mona Lisa, or sit back and play a four-minute track from an unsigned band, or fly through a computer-generated fractal environment... in short, when you sit back, stare at your screen, and say, "Wow!" that's when you'll appreciate the full power of Mosaic.

# What You'll Need

While you don't need a Power PC to run Mosaic, the faster your computer, the happier you'll be. Speed becomes even more of an issue when you're working with multimedia files, but processor speed is not the only issue. For instance, how smoothly video plays is affected by processor speed, available memory, and disk

speed.

Even with a fast machine and plenty of memory, you won't have much of a multimedia experience if you can't hear sounds or see color. So you'll need a color Mac capable of displaying 256 colors. There is no need for 24-bit color, since most images on the Internet are only 8-bit. (If you're buying a new monitor, be sure to get a low-radiation model.) Most Macs come with built-in sound speakers, of course, but if you're planning to kick out the jams with your Mac by downloading loads of grunge rock, you might want to invest in external speakers.

The hardware setup is just one part of the puzzle, though; you'll also need software programs capable of displaying various kinds of files. "Wait a minute," you may be saying, "I have Mosaic. What other software do I need?"

Mosaic cannot directly display all the types of files you might want to use. Instead it relies on other, smaller, programs that are designed to handle specific kinds of files. There are different programs for graphics files, audio files, video files, and so on. When you download a file that Mosaic can't display by itself (basically, anything except HTML and text), it launches one of these programs (referred to as "external viewers" because they are external to Mosaic), which then displays the file. These viewers give Mosaic its power as a multimedia application; they make it possible for Mosaic to display the diversity of digital media on the Internet.

In this chapter, we'll show you how to view full-color images, watch movies, and listen to sounds. We'll cover finding and downloading viewers, configuring Mosaic to use them properly, and getting and playing files.

# Installing a Viewer

There's nothing special about viewer applications; you can use any Mac program as a viewer for the kinds of files that program handles. Since the main purpose of external viewers is simply to display files, rather than to do a lot of editing, it's best to use small programs that launch quickly and don't require a lot of memory.

This version of Enhanced NCSA Mosaic is preconfigured to use specific programs as viewers for different types of files. Table 6-1 shows the viewer programs, appropriate file formats, and typical file extensions. Unfortunately, with the current version of Enhanced NCSA Mosaic, there is no easy way to configure other viewers. You can configure viewers by using ResEdit. Instructions for editing Mosaic with ResEdit are online in the Mosaic Support Center. Enhanced NCSA Mosaic 2.0 is expected to have interfaces for configuring viewers and other customization options.

<i>Table</i> 6–1:	External	Viewers ana	Extensions

Program	File Types	Extensions
GIF images JPEG image MPEG video	JPEGView JPEGView Sparkle	.gif .jpeg, .jpg .mpeg, .mpg
Sound files	Sound Machine	.qt, .moo, .mov .au, .snd, .aiff, .aifc

The best repository of Macintosh software is the Macintosh Archive at the University of Michigan. Because so many people access this server through FTP and Gopher, there are many mirror sites around the world. While Michigan does not offer a Web view of the archive, Martijn Koster of Nexor has created a Web server with pointers to all of the Michigan mirror sites. We'll use his *Macintosh Archive* to download the external viewers that work with Mosaic. You can get there by clicking on the link in the Mosaic Handbook Hotlist or by entering the URL *http://www.nexor.co.uk/mac-archive/welcome.html*. Figure 6-1 shows the Macintosh Archive home page.



Figure 6-1. Macintosh Archive home page

# Getting the Big Picture

Most of the files on the Web (aside from HTML files, of course) are graphics files. You may be thinking that Mosaic can already display graphics, since *GNN* contains graphics. In fact, as far as the Web is concerned, there are two kinds of graphics. Inline graphics are arranged on HTML pages, while linked graphics are standalone graphics files that require an external viewer like LView. There are several graphics formats, although GIF and JPEG are the most common on the Internet.

GIF is an 8-bit indexed color file format, while JPEG is a compression standard for 24-bit color. Quality depends on the level of compression, but JPEG images are generally better quality than GIF images.

After you download JPEGView, you can view some of the great graphics on the Net. To try this, go to the *Space Telescope Science Institute's* page of recent Hubble Space Telescope images. The URL is *bttp://marvel.stsci.edu/EPA/Recent.btml*. This page, shown in Figure 6-2, contains thumbnail images of photographs taken by the Hubble Space Telescope. Clicking on the image downloads a larger JPEG version of the image. There's an icon labeled GIF, which you can click on to see the GIF version of the image. There's also a caption icon, for seeing a text file about the photograph.

Let's go ahead and get the JPEG version of the Orion Nebula.

- 1. Click on the thumbnail photos.
- 2. When the Save As dialog box appears, save the file to your hard disk. Make sure you use a *.jpeg* extension.
- 3. When the download is complete, JPEGView will launch and display the file, as shown in Figure 6-3.

HST Images
SPACE
SCIENCE INSTITUTE
The following are digital versions of pictures distributed publicly as press releases. The images you see are thumbnails, small GIF versions of the (usually) larger images. Click on the image to see a full
size version in JPEG format. Click on the
describing the image. Click on the or the to see a full-size version of the image in that format.
Different <u>formats</u> are available because they provide various capabilities. Note that these are <i>presentation</i> pictures, not <i>raw data</i> appropriate for scientific analysis. They have been processed extensively, usually consist of composited multiple images and may have annotations superimposed.

Figure 6-2. Space Telescope Science Institute Recent Observations page

JPEGView is not a full-image editing program; it is primarily designed to let you view JPEG and GIF images. It does offer the ability to display images as a slide show, and a few other neat tricks.

# Digital Drive-In

Playing movies on your computer is one of the cooler ways to waste time at work. Actually, digital video has the potential to be quite useful, as well as fun. Imagine reading an entry from Nixon chief of staff H.R. Haldeman's diaries and being able to view a home movie he took on the day of the journal entry. Or learning a new software program and watching a movie that demonstrates a difficult function. Or reading an author's work and seeing an interview with him.

These are all great uses of video on the network. There aren't many cases where video and text are integrated very tightly, however. Most video clips on the Internet are random clips of a minute or less.



Figure 6-3. Orion Nebula (Photo: C.R. O'Dell (Rice University) and NASA)

In *Digital Drive-In*, a GNN special publication, D.C. Denison explains the state of digital video:

It's the Internet's final frontier: moving pictures. Every cyberspace news story, when they get to that inevitable 'future of the net' section, mentions the eventual delivery of digital video. So where is it?

*GNN* decided to find out. This involved short bursts of net surfing followed by long stretches of downloading. (A tip for prospective Internet movie downloaders: develop a time-consuming hobby, like rug weaving.) Fortunately all the searching, and waiting, led to a happy discovery: digital movies are already on the net in growing numbers. True, some of them look like animated postage stamps, but they have the spunky appeal of an embryonic art form.

### Installing Sparkle

To play movies you get from the Net, you'll need a program that can play MPEG movies. Sparkle is a shareware program that plays MPEG files and can save them to QuickTime format. It can't, however, play QuickTime movies. Mosaic is preconfigured to use Simple Player from Apple to play QuickTime movies. Simple Player is distributed with new Macintoshes and with most CD-ROMs. If you don't have it, you can download it from the Mac Archive, from NCSA's FTP site (ftp.ncsa.uiuc.edu) and from Apple's FTP site (ftp.apple.com).

To download Sparkle, go the Mac Archive. There are three main ways to find software in the archive: you can browse a list of the entire holdings (this takes a long time to download); do a single-word search; or do a multiple-word search. To find Sparkle, click on the link for single-word search and enter "sparkle." In a little while, Mosaic will present a page of items that contain "sparkle" in their names. Figure 6-4 shows this page.

Line http://www.nexor.co.uk/mac-archive-find/grep?sparkle	
Search Results for 'sparkle'	
Directory graphics/graphicsutil	
You can browse the graphics/graphicsutil directory for related files	
sparkle2.1	
View files in MPEG format and save them as Quicktime movies ( require Thread Manager, but works better if it is present; requires ( some memory problems and adds various other goodies.	er the reverse!); does not JuickTime 1.6. v2.1 fixes
310 K, BinHex4.0, StuffIt3.07 formats, archived on 7/19/94.	
Available from: <u>Michigan, src.doc</u> , <u>www.doc</u> , and <u>others</u> .	
Directory util/screensaver/afterdark	
You can <u>browse the util/screensaver/afterdark directory</u> for related	files.
sparkler1.0	
The screen erodes under the influence of a <b>sparkler</b> and its nume Includes Pascal source.	rous sparks. Neat effect.
5 K, BinHex4.0, Stufflt1 5.1 formats, archived on 12/6/92.	

Figure 6-4. Sparkle search results

You can download the program by clicking on one of the links to mirror sites of the Mac Archive. The first three are often busy, so click on the link for others, then choose the site that's physically closest to you. Under each site are three links: one the root directory of the FTP or Gopher site, one to the relevant directory, and one that directly downloads the file. In the case of Washington University in St. Louis, the links point to the FTP server **wuarchive.wustl.edu**, the directory *systems/mac/umicb.edu/graphics/graphicsutil*, and the file *sparkle2.1.sit.hqx*.

When you download the file, you'll have a generic text file in BinHex format. You'll have to convert it to binary format using a utility like StuffIt or Compact Pro. The binary is actually a self-extracting StuffIt archive. Double-clicking on the icon expands the file. You're not quite ready, however, because Sparkle requires the QuickTime extension to be present in your system. If you already have it, great; if not you can download the most recent version from Apple's FTP site, ftp.apple.com, by clicking on the appropriate link in the Mosaic Handbook Hotlist, or by entering this URL: ftp://ftp.apple.com/software/mac/sys.soft/quicktime.

As of this writing, the most recent version was QuickTime 1.6.1. The file is *quick-time-1-6-1.bqx*. You may also want to get the technical note, *quicktime-1-6-tecb-note.bqx*. QuickTime, like Sparkle, is BinHexed, so you'll have to convert the file when you receive it. Then put the QuickTime extension into your *System Folder's Extensions* folder, and you're finally ready to start checking out MPEG movies on the Net.

#### NOTE

Since so many Mac files on the Internet are BinHexed, you may prefer to use Fetch, an FTP client for the Mac that automatically converts BinHex files.

To visit the *Digital Drive-In*, click on the icon on the *GNN Home* page. Among the movies featured in the *Digital Drive-In* is some footage from the Raleigh, North Carolina, *News and Observer's* NandO.net, which integrates video with other information. The *News and Observer* runs a series of features called "Carolina Discoveries," which profile different spots around the state. A story on North Carolina's waterfalls includes two MPEG movies of waterfalls. To see these movies, click on the GO button.

This takes you to a page with links to the two movies. This page tells you the format, file size, and length of the clips. "Views of the cascading water" is a 640K MPEG movie that runs 28 seconds, while "The falling waters and the green forest create a tranquil scene" is a 480K MPEG movie that runs 24 seconds.

As Denison notes, getting movies from the Net involves a lot of waiting, so it's usually better to start with smaller clips since they take less time to download. In this example, we'll get the "tranquil scene" video.

When you click on the link, Mosaic asks you to save the movie on your hard disk. When you click OK, the download will start.

When the download is complete, Sparkle will launch and play the movie. Figure 6-5 shows Sparkle playing the waterfall movie. Sparkle features a very simple interface. MPEG movies—indeed, all movies—consist of a series of frames which give the illusion of motion when played quickly enough. A toolbar at the bottom of the window tells you how many frames are in the move and which frame you're currently viewing. You can start a movie by clicking on the **Play** icon at the left. The two icons on the right let you advance and go back one frame at a time. The slider in the middle gives a visual indication of the movie's progress.

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SIRL http	://www.nando.net/ncd/week8/vide	o.html	
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Figure 6-5. Waterfall movie displayed in Sparkle

Digital video is definitely not the big screen. In fact, it's the very small screen. The *News and Observer*'s Eric Harris says: "When it comes to digital video, we're sort of in the black-and-white TV age."

# Sound Waves

There are all kinds of sounds available on the Internet, from music servers like the Internet Underground Music Archive, the U2 server and the Elvis server, to sound bytes from Internet Talk Radio and *The Late Show with David Letterman*.

### Downloading SoundMachine

While there are many different sound file formats, the most common are Sun Ulaw files. Mosaic is preconfigured to use a shareware program called SoundMachine, which plays these files. SoundMachine 2.1 plays and records both Sun (*.snd* and *.au*) and Mac sound file formats (*.aiff* and *.aifc*).

To get it, return to the Mac Archive and do a keyword search for "soundmachine." Pick a nearby server and click on the appropriate link to download the file. When the Save As dialog box appears, choose a location on your hard disk for the file and click OK. This file is compressed in Compact Pro format, so you'll need Compact Pro to extract it. You can get Compact Pro from the Mac Archive.

### Listening to the Underground

One of the most popular music servers on the Internet is the Internet Underground Music Archive, which was awarded a Best of the Net award from *GNN*. "The Net's first free hi-fi music archive," the IUMA is dedicated to promoting unknown and unavailable artists over the Internet.

To use it, click on the Internet Underground Music Archive on the *Mosaic Hand*book Hotlist or enter the IUMA's URL:

```
http://sunsite.unc.edu/ianc/
```

When you get to the IUMA, you'll see one of the hippest home page designs on the Internet, with options to check out bands by artist, label, location, song title, and interactively. You can also select the **Fresh Catches** option to listen to new tracks. Figure 6-6 shows the IUMA home page.

The *Fresh Catches* page describes the music available and provides several links to various versions. There are stereo and mono versions of the whole cut, which typically weigh in at 4 to 5 megabytes, as well as much smaller 15-second samples, which are .au files.

Following the smaller-is-better rule of downloading, choose one of the smaller samples. Once again, Mosaic asks you to save the file and then starts the download.

When the file transfer is complete, SoundMachine launches and plays the sound file. Click on the **Play** button to play the sound. When it has finished, SoundMachine will quit and you can continue using Mosaic. There are other file formats that you may encounter on the Net that Mosaic is not configured to use. In these cases, you'll have to open the downloaded file directly in the application. Future versions of Mosaic will be easily configurable to launch various applications when you download files of different formats.



Figure 6-6. Internet Underground music Archive home page

#### CHAPTER SEVEN

# **CREATING HTML DOCUMENTS**

The Power of Hypertext The Hypertext Theory of Relativity Getting Started Writing HTML Creating Your Own Home Page Using HTML Editor to Create Documents Resources

So far in this book we've talked about viewing other people's World Wide Web pages. Now we're going to turn the tables and show you how to create your own Web pages. It's not something that requires programming experience or any special skills. All you need is access to a Web server on the Internet (one that uses the HTTP protocol) and the ability to tag text files according to the HTML specification.

Writing HTML documents is actually pretty easy. You can create them using any editor that can save files in plain ASCII text format. Most word processors can write ASCII files, and nearly every text editor writes ASCII files normally.

Unfortunately, there are relatively few tools that help in the process. One of them is Mosaic itself, which lets you preview HTML pages located on your local system. Another is HTML Editor, an editor for writing HTML. We'll discuss both of these programs in this chapter.

We'll also go through the standard HTML tags in some detail. While we won't cover every aspect of HTML, we will cover the most common and important tags. You may not be an expert by the time you finish with this chapter, but you will be able to write sophisticated documents for the Web.

# The Power of Hypertext

The Web adds a new dimension to writing documents—building hypertext links that connect one document or topic to another. Hypertext is a powerful way to help users navigate through information. To understand just how powerful, think about the way we navigate through printed books. There's a table of contents that describes the content of each chapter; an index that tells you where specific references are located; footnotes and annotations that refer to other sections of the book or to other works; and finally there's the body of the book itself, which (with the exception of mystery novels) people often flip through and scan for information that catches their eye.

Hypertext incorporates all these modes of navigating and adds the instant gratification of seeing a referenced work or section immediately. Within the pages of a hypertext server, an author can point to other pages of general content, point to specific information, let users jump to other works, and let them move through a collection of information in either a linear or nonlinear way.

In many cases, Web documents are multimedia documents with graphics, sound, and video files, as well as text. This presents the author with yet another question—how to combine and present all of these media in a unified document.

Almost all servers have a home page, a front door to the server that provides links to other documents. A home page is a place where you can assert your identity, explain the purpose and scope of your server, and set up links to other documents. Later in this chapter, we'll work on creating your own home page.

# The Hypertext Theory of Relativity

HTML is the markup language for World Wide Web documents. A subset of *SGML* (*Standard Generalized Markup Language*), HTML is a standardized language for creating formatted hypertext documents. It lets you perform two main tasks: defining hypertext anchors and links, and describing the format of the document.

Formatting is defined only in rather general, often relative terms. HTML does not tell Mosaic, for example, "Make this line 36 point Palatino." It simply identifies the text as a heading, and Mosaic uses that description to format and display the text.

The reason that HTML describes documents in general rather than specific terms is that there is no single World Wide Web browser that everyone uses. There are several different browsers, and more are likely to be developed in the future. What they have in common is that they are all able to display HTML documents. But they all do it differently.

The differences between browsers tend to reflect the limitations of different computing environments. For instance, Mosaic runs in a graphical user interface, so it can display graphics, type styles, and point sizes. Lynx is for character-based environments, so it makes do with more limited formatting capabilities. Some future computer platform might translate all text into spoken words, and a browser for that system might read plain text in a calm voice and headings in hearty yells.

In addition, not all users have the same set of fonts, so a document that specifies Palatino for headlines might use Courier on a system that doesn't include Palatino. That's a common problem when users try to share files, and it's one that HTML avoids by leaving the formatting to the browser. The basic philosophy of HTML is that authors need not be concerned with the way the document will look; that's the job of the browser. If the file is tagged correctly, each browser will display the document to the best of its abilities.

# **Getting Started**

You already have the most important tool for writing HTML—Mosaic itself. You can use Mosaic to preview documents on your local system by using the **Open** Local command. This works just like the **Open** command in any Windows program: it launches a dialog box that lets you open a file on your computer. Since you're working on local files, this is one time you don't have to be on the network to use Mosaic.

You can also access local files with the Open URL command. In this case, you need to use the following syntax:

```
File:///c:/dir/subdir/filename
```

Note that the URL uses slashes, not backslashes.

As we go through examples in this chapter, you can try writing your own HTML documents and previewing them in Mosaic. Remember to save your work as text files and to use the extension *.html.* 

Let's take a look at a real-world document. Here is the HTML document that describes the *What's Up in GNN* page:

```
<HTML><HEAD>
<TITLE>What's Up in GNN</TITLE>
</HEAD><BODY>
<A HREF="/gnn/wel/welcome.html">
<IMG ALT="Global Network Navigator--Charting the Internet"
SRC="/gnn/graphics/HOME.gif"></A>
<P>
<IMG ALT="What's Up?" SRC="/gnn/graphics/WU.xbm">
<UL>
<LI>The
<A HREF="/gnn/meta/finance/index.html">Personal Finance Center</A>
brings readers
<A HREF="/gnn/meta/finance/feat/foreclosure.html">>B>Real Estate
Foreclosures</B></A>,
a feature article from the Brookfield Economics Institute
discussing the "ins and outs" of foreclosure for buyers and sellers
alike.
< P>
</BODY></HTML>
```

If that looks discouraging, don't worry. It's really not that bad. In fact, once you get the vocabulary down, HTML is quite a simple beast to master. As you can see from the *GNN* example above, you can create highly sophisticated documents using HTML.

There are three basic conventions of the HTML language, and once you understand them, writing HTML is a breeze. These conventions are tags, attributes, and URLs.

### Tags

The most basic element in an HTML document is a tag, which is usually bracketed by the "less than" and "greater than" signs, < and >. Tags often come in pairs and surround text, much like quotation marks, with one tag starting the action and another tag ending it. Ending tags look just like starting tags except for a slash mark preceding the tag name within the brackets. For instance, <H1> is the starting tag for a top-level headline and </H1> is the ending tag. Here's a simple example of how tags are used in HTML:

```
<TITLE>This is the title</TITLE>
<H1>This is a headline</H1>
This is plain text.
```

Some tags work by themselves without ending tags. These tags usually identify special characters or tell the browser to insert something. For instance, the tag & represents the ampersand (&). Often tags are nested inside one another. Some tags accept nesting while others do not. Nesting is often used with lists to create an outline format.

Finally, tags are exclusive, not additive. Two tags can't be added together to create a hybrid effect. Each tag has its own formatting, completely independent of nearby tags. For instance, if you have a sentence in italic (using the <I> tag) and want to put a word or two in bold italic, you might think that just placing the bold tags (<B> and </B>) around the words would work:

```
<I>An italic sentence with <B>bold-italic </B>type.</I>
```

It doesn't. Each subsequent tag supersedes the previous tags, so you get regular bold, not bold-italic:

An italic sentence with bold-italic type.

Combining the tags (<BI>) doesn't work for the same reason. In fact, there really is no way to call out bold-italic type in HTML.

### Attributes

With some tags, you need to use attributes to define exactly how the action will work. These attributes vary from tag to tag. They are like multiple-choice questions; there are several possible answers, or values, for each attribute. The syntax for using attributes is:

```
<TAG ATTRIBUTE="VALUE">
```

In this chapter, we'll talk about the most important attributes for each of the tags, but we won't necessarily cover all of them. Refer to Appendix B, *HTML Reference Guide*, for more information about these attributes.

### URLs

Attributes are often used to specify files as links. To specify a file, use the document's URL as the value of an attribute. For example, IMG, the tag used to include a graphic or figure, takes the attribute SRC (for "source") to indicate which file to use. In this case, the document's URL is the value of SRC:

```
<IMG SRC="http://gnn.com/graphics/HOME.gif">
```

For a more detailed discussion of URLs, see Chapter 2, Getting Started with Mosaic.

# Writing HTML

There are two steps in creating a page for the Web—formatting the document and building links to other files. To get started, let's go through a simple HTML document. Below is the HTML document for the home page of a fictional server about the Marx Brothers comedy team. Figure 7-1 shows how the page appears in Mosaic.



Figure 7-1. Marx Brothers home page

```
<hr/>
```

```
<P><A HREF="groucho.html">GROUCHO</A>
<P><A HREF="harpo.html">HARPO</A>
<P><A HREF="chico.html">CHICO</A>
<P><A HREF="chico.html">ZEPPO</A>
<P><A HREF="zeppo.html">ZEPPO</A></P>
```

### Identification Tags

An HTML document consists of several tags that give information to the browser but don't actually affect the content. These tags give the title of the document and tell the browser when the header starts and ends, when the body starts and ends, and so on.

#### Document identifier tag

<HTML> and </HTML>

The Marx Brothers document opens with the <HTML> tag. <HTML> is the opening tag for all Web documents. It tells the Web browser that this is in fact an HTML document and not some other structured document. </HTML> marks the end of the document. Note that everything else in the document is nested inside these two tags. In fact, Mosaic and most other browsers do not insist on the use of these tags, but using them may prove to be more important in the future.

#### Header

<HEAD> and </HEAD>

While there are actually several elements that can be included in the header, the only important one is the title.

#### Title

<TITLE> and </TITLE>

The title is the name of the document as it appears in the browser's title window, history list, and hotlist. The title tag is part of the header, so it needs to be within the two header tags.

There are a few technical rules worth mentioning here:

- There may only be one title in any document.
- The title cannot contain anchors (explained later), paragraph marks, or text formatting.
- The title is not normally displayed in the text of a document itself, although the opening heading could consist of the same text as the title.

- While there is technically no limit to the length of a title, it's a good idea to keep it less than 64 characters. This is because some browsers may truncate it in window titles, menus, and hotlists.
- Each document within the collection of documents should have a unique title.
- The title should describe the page out of context. That is, it should refer to the whole collection of documents, not just a specific document. You can imagine how confusing it would be if you followed a hypertext link only to arrive at a page labeled merely "Home Page."

In the following example, the title is nested within the header tags, which in turn are nested within the document identifier tags. The ellipsis represents the body of the document, which is itself nested within the HTML tags.

```
<HTML>

<HEAD>

<TITLE>The Marx Brothers Home Page
</TITLE>
</HEAD>
...
</HEAD>
...
</HTML>
</Pre>
```

#### Body identifier

```
<BODY> and </BODY>
```

We're almost ready to start writing the document, but there is one more technical item. The <BODY> tag indicates that we're ready to start the actual document. Now, you might think that since we explicitly ended the header, the Web browser would be able to tell where the body starts, but HTML calls for an explicit tag to start the body. In fact, Mosaic and other browsers don't insist on the use of the body tag, but again, it's a good practice and may be important to future browsers.

### Crafting the Page: Formatting Text

HTML provides a number of ways to control the visual presentation of text on the screen. While it doesn't provide precise control over the placement of text and graphics, it does enable you to specify a great deal about the way your page is structured.

#### Headings

```
<H1> and </H1> ... <H6> and </H6>
```

There are six levels of headings, with <H1> having the most emphasis and <H6> having the least. Exactly how these headings are displayed is up to the different browsers. Mosaic displays <H1> in large bold text, while Lynx puts the header text in all caps and centers it. The other header elements, <H2> through <H6>, are of gradually reduced emphasis.

#### The Mosaic Handbook for the Macintosh

Don't use header elements below <H3>, because the display of these minor levels is notoriously inconsistent between browsers; a small but readable header in one browser may be indecipherable in another. More importantly, if you feel the need to have more than three levels of information, consider breaking the document up into several smaller documents and linking the documents to each other. Each document could then have its own <H1> element.

In the following example, we've added the body tag, an <H1> header, and some plain text. The text between the <H1> tags is the first thing the user will see. Viewed in Mosaic, it will be the biggest text on the page. <H1> indicates the start of the heading text and </H1> indicates the end of it. The next line of text has no formatting codes, so it is presented as regular text. Figure 7-2 is a screen shot of this page in Mosaic.



Figure 7-2. Document with an <H1> heading and plain text viewed in Mosaic

```
<HTML>
<HEAD>
<TITLE>The Marx Brothers Home Page
</TITLE>
</HEAD>
<BODY>
<H1>The Marx Brothers Web Server
</H1>
Welcome Marx Brothers fans!
```

#### Breaking paragraphs and lines

As far as HTML is concerned, the only thing you can do with a keyboard is type text. It does not respond to even rudimentary formatting techniques, such as entering carriage returns or extra spaces. To format text, even to indicate the beginning of a new paragraph, you must use tags. In this section, we'll discuss the tags that let you control the structure of text on the page. Note that these tags do not require ending tags.

#### Paragraphs <P>

The paragraph tag starts a new paragraph. Since carriage returns are ignored, you could simply place paragraph tags at the appropriate place in a block of text, like this:

Paragraph one.<P>Paragraph two.<P>Paragraph three.

or you could insert returns to make it easier for you to visualize the page, like this:

```
Paragraph one.
<P>
Paragraph two.
<P>
Paragraph three.
```

The result would be the same—three separate paragraphs. Exactly how those paragraphs would be displayed would, of course, be up to the individual browsers. Most browsers insert space after a paragraph, so there's no need for more than one paragraph tag. In fact you'll want to keep an eye out for redundant paragraph tags, as some browsers (Lynx, for instance) will insert space for every paragraph tag. Mosaic, on the other hand, ignores extra paragraph tags.

#### Line Breaks <BR>

What do you do if you want to break a line but you don't want to start a new paragraph? Simple. Use <BR> for a line break. This tag starts a new line but doesn't format a new paragraph. It is commonly used to format a block of text, such as an address:

Name<BR> Address<BR> Phone Number <P>

#### Rules <HR>

To make a horizontal rule, don't make the mistake of just typing a bunch of underline characters. Because various browsers may be set up for different line widths, this may create unattractive effects for some users. Instead, use <HR>. It causes a paragraph break and draws a horizontal rule across the screen.

In the following example, we've added paragraph tags, line break tags, and a horizontal rule to the Marx Brothers Home Page. Figure 7-3 shows the display of this document in Mosaic. There are three separate paragraphs on this page. Note that no paragraph tag is used before the horizontal rule because the <HR> tag automatically starts a new paragraph.

```
<HTML>
<HEAD>
<TITLE>The Marx Brothers Home Page</TITLE>
</HEAD>
<BODY>
<H1>The Marx Brothers Web Server</H1>
Welcome Marx Brothers fans!
```

<P>This server takes as its philosophy Groucho's opening song from "Horse Feathers": <P>"Whatever it is, I'm against it<BR> No matter whose it is or who commenced it,<BR> I'm against it!" <HR>



Figure 7-3. Document with paragraphs, line breaks, and borizontal rule viewed in Mosaic

#### Lists and glossaries

The list and glossary tags can be powerful because they allow for fairly sophisticated formatting through simple tags. Lists are a good illustration of the power of HTML because they let the author generally indicate the nature of the information, while the browsers take care of the exact format.

Lists are simply paragraphs, sentences, phrases, or single words presented in an itemized format. There are several kinds of lists. The most commonly used ones are ordered lists and unordered lists. Glossaries have a structure in which each item is a term followed by a definition. The terms are usually short items, while the definitions can be several paragraphs in length. Both glossaries and lists can be nested.

#### Lists

Entries in unordered lists are preceded by bullets. Entries in ordered lists are preceded by numbers in ascending order. Lists start with an opening tag (<UL> for unordered lists, <OL> for ordered lists) and end with a closing tag. Each item in the list is preceded by the <LI> tag, which does not require a closing tag. The syntax for an unordered list is:

<UL> <LI>Text <LI>Text </UL>

This example shows an unordered list in HTML, and Figure 7-4 shows the list displayed in Mosaic.

```
Here is a list of the Marx Brothers' Paramount films:

<UL>

<LI>The Coconuts (1929)

<LI>Animal Crackers (1930)

<LI>Monkey Business (1931)

<LI>Horse Feathers (1932)

<LI>Duck Soup (1933)

</UL>
```



Figure 7-4. An unordered list viewed in Mosaic

The syntax is very similar for ordered lists, with just the opening and closing tags changing:

```
<OL>
<LI>Text
<LI>Text
</OL>
```

Figure 7-5 shows what the previous example looks like in Mosaic if we use an ordered list instead of an unordered one.



Figure 7-5. An ordered list viewed in Mosaic

Both ordered and unordered lists can be nested to create an outline format, and both kinds of lists can be combined within a larger list. For instance, the following example gives a table of contents for a book about the Marx Brothers in which

#### The Mosaic Handbook for the Macintosh

unordered lists are nested within an ordered list. Figure 7-6 shows the list as viewed in Mosaic.

```
<H1>Table of Contents</H1>
<OL>
<LI>Vaudeville Days
        <UL>
        <LI>Fun in Hi Skule
        <LI>Mr. Green's Reception
        <LI>Home Again
        </UL>
<LI>On Broadway
        < 0.1.2
        <LI>I'll Say She Is (1924)
        <LI>The Coconuts (1925)
        <LI>Animal Crackers (1928)
        </UL>
<LI>The Paramount Films
        <UL>
        <LI>The Coconuts (1929)
        <LI>Animal Crackers (1930)
        <LI>Monkey Business (1931)
        <LI>Horse Feathers (1932)
        <LI>Duck Soup (1933)
        </لله>
</0L>
```



Figure 7-6. Table of Contents with nested lists, viewed in Mosaic

Creating HTML Documents

#### Glossaries

As mentioned earlier, glossaries consist of terms, which are usually short, and longer descriptions, which are indented in Mosaic. Glossaries use four tags:

- <DL> to start the glossary
- <DT> for the main entry or term
- <DD> for the descriptive paragraph, or definition
- </DL> to end the glossary

The syntax is:

```
<DL>
<DT>Term One
<DD>Definition of Term One.
<DT>Term Two
<DD>Definition of Term Two.
</DL>
```

The following example gives the HTML for a two-item glossary. Figure 7-7 shows how the glossary is presented in Mosaic.

```
<H2>Marx Brothers Film Summaries</H2>
<DL>
<DT>"The Coconuts" (1929)
<DD>Their first film, for Paramount, puts the brothers in Florida during
the land boom of the 1920s. It features the famous "Why a Duck?" routine
with Groucho and Chico.
<DT>"Animal Crackers" (1930)
<DD>Like "The Coconuts," based on a Broadway show of the same name,
"Animal Crackers" features Groucho as Captain Spaulding, the African explorer.
<P>It boasts the classic line: "One morning I shot an elephant in my pajamas.
How he got in my pajamas, I don't know."
</DL>
```



Figure 7-7. HTML glossary as viewed in Mosaic

Note that <P> can be used within definitions to create multiple paragraphs. Other formatting tags, except the heading tags, can also be used. You can nest ordered and unordered lists within a glossary. For example, you could include an outline (which could include many nested lists) within a glossary definition.

#### Text attributes

```
<EM> and </EM>
<STRONG> and </STRONG>
<B> and </B>
<I> and </I>
<U> and </U>
```

There are two kinds of tags for text attributes in HTML—physical styles (bold, italic, underline) and logical styles, which let the author format based on his intentions rather than having to specify the exact look of the text. The primary logical styles are <EM> (for emphasized text) and <STRONG> (for even more emphasized text). The idea is that emphasized text is visually louder than plain text and stronger text is louder still, as shown below:

This is very important: <EM>Always lock the door when you leave.</EM> <STRONG>Always.</STRONG>

Figure 7-8 shows how this is presented in Mosaic.



Figure 7-8. EM and STRONG types viewed in Mosaic

As a rule, you should use <EM> and <STRONG> instead of the physical styles (<B>, <I>, and <U>). This is because every browser understands these tags and interprets them in a relative, rather than absolute, way. That is, while different browsers display <EM> and <STRONG> differently, they will all display <EM> text as louder than plain text and <STRONG> text as louder than <EM> text.

In X Mosaic and Windows Mosaic, text tagged with <EM> displays in italic, and text tagged as <STRONG> displays in bold. Mac Mosaic underlines the emphasized text and puts strong text in bold. Lynx underlines emphasized text and does the same for strong text.

As for underlining—don't. Underlined text is too easily confused with hypertext links, which are often underlined.

#### Preformatted text

<PRE> and </PRE>

Sometimes you want to control exactly the way text will look. You can do that (within limitations) by using the <PRE> tag. Preformatted text always appears in a monospaced font like Courier, and unlike with other HTML text, carriage returns and extra spaces work. For these reasons, many people use preformatted text for tables, like this:

<pre><pre></pre></pre>	
Title	Date
A Night at the Opera	1937
A Day at the Races	1938
At the Circus	1939
Go West	1940
The Big Store	1941

You can use most other tags, including hypertext links, within preformatted text.

#### Address format

<ADDRESS> and </ADDRESS>

This tag was originally intended as a format for contact information at the bottom of a page, but you can use it whenever you want to set a paragraph such as a date apart from the rest of the page. Text appears in italics.

#### Special characters

What do you do when you want to use characters that have special meanings in HTML? There are four such characters:

- < (the left angle bracket)</li>
- > (the right angle bracket)
- & (ampersand)
- " (quote marks)

HTML includes character combinations, called escape sequences, to represent these characters in an HTML document. They are:

- < (the escape sequence for <)</li>
- > (the escape sequence for >)
- & (the escape sequence for &)
- " (the escape sequence for ")

It is important to note that escape sequences are case-sensitive, unlike all other HTML tags. There are many more escape sequences for non-ASCII characters. Some of the more common ones are:

- ö (the escape sequence for a lowercase o with an umlaut)
- ñ (the escape sequence for a lowercase n with a tilde)
- È (the escape sequence for an uppercase E with a grave accent)

### Weaving Threads: Anchor Links

#### <A> and </A>

Now for the fun part—creating anchors and hypertext links. As discussed earlier, links are the way that users are guided through a body of hypertext information. In the parlance of HTML, an anchor is the hypertext itself—the element that the user selects in order to go to the linked document. An anchor can be a word, a phrase, a picture, an icon, or anything that can be displayed on an HTML page. The linked item, that is, the place the user goes after clicking on the anchor, can be any file—not just another HTML document, but also a Gopher menu, a WAIS database, an FTP site, etc. For the sake of simplicity, however, we'll talk primarily about linking HTML documents together.

#### Linking to other documents

By now you're quite familiar with how to recognize and use hypertext links. In this section, you'll learn how to create them. We'll start by discussing how to link to other documents on your computer; then we'll move on to linking to other documents on the Internet.

You'll probably start out writing your documents on your Mac, but at some point, you'll need to move your files over to an HTTP server to make them available on the Web. For that reason, it's a good idea to use only filenames in your links, not directory names, since your files will have a different path on the server than they do on your Mac.

First, create an anchor using the anchor tag <A> and the HREF attribute. The anchor tag tells the browser, "Make the following text a hypertext anchor," and HREF tells it, "Link the anchor to this file." Here's the syntax:

```
<A HREF="filename">HYPERTEXT</A>
```

Consider the original Marx Brothers home page shown in Figure 7-9. The mouse is positioned over the word GROUCHO, which is displayed as a hypertext anchor. At the bottom of the screen Mosaic displays the name of the file that is linked to this anchor. Here is the HTML that causes Mosaic to display GROUCHO as a hypertext anchor.

<A HREF="groucho.html">Groucho</A>

SRL file:///Mac HD/marx/fig7-9.htm	
The Marx Brothers Web Server	
Welcome Max Brothers Fans!	
Get Information About The Brothers By Clicking On Their Names:	
ROUCHO	
LARPO T	
CHICO	
2EFFO	

Figure 7–9. Hypertext links displayed in status bar in Mosaic

This line says: Make the word GROUCHO an anchor that links to the file *grou-cho.html*. In this case, the file is on the same computer and in the same directory as the active page, so we only gave the filename. But we could link to a file in another directory on the same computer, or to another computer on the Internet.

Let's add to this page a hypertext anchor that links to a document on another server. To do this, we need to give the URL of the linked file. The hypertext will say, "Learn more about the 1930s," and will link to the home page of a collection of documents about the 1930s that exists on a computer called college.edu. Here's the HTML:

```
<A HREF="http://college.edu/USHistory/1930s/HomePage.html">Learn
more about the 1930s</a>
```

When users click on the anchor, they are connected to college.edu and the linked page is displayed.

When creating links, remember that you can link to any file, not just an HTML page. You can create links to video, audio, graphic, or CAD files. The only proviso is that users need to have external viewers to handle these files, so you'll probably want to stick to the common formats. See Chapter 6, *Using Mosaic for Multimedia* for more on file formats.

#### Naming anchors

Another feature of the anchor tag is the ability to name anchors. This is a helpful navigation technique for large documents. By linking to a named anchor, you can

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take the user right to a specific part of the page, as illustrated in Figure 7-10. While, in theory, you could link to a named anchor on another server, it's much more common to use names within your own server or within a single page.



Figure 7-10. Hypertext used to link to text within a document

Let's say you want to set up an anchor to link GROUCHO to an essay later in the same page. The first step is to set up a name for the linked text, using the NAME attribute with the <A> tag. The syntax is:

<A NAME="name">TEXT</A>

Here's how we would name the essay about Groucho:

<A NAME="grouchobio"><B>Groucho Marx: A Life</B></A><P> Groucho Marx was famous for quick wit, a greasepaint mustache and eyebrows, and a big cigar. He and his brothers were the preeminent comedians of film in the 1930s. While Harpo and Chico made a legendary slapstick duo, often quoting the vocabulary of vaudeville and burlesque in their routines, Groucho was without doubt the star of the show. The Marx Brothers started in burlesque and by the mid-20s were the toast of New York in the Broadway shows "The Coconuts" and "Animal Crackers." Those plays were brought to the screen as very early talkies in 1929 and 1930. Their film career was effectively over by the early '40s but Groucho managed a comeback as host of the game show "You Bet Your Life" in the 1950s. Note that we only named the title of the essay, but we could have named the entire essay, since it is fairly short. Since the hypertext anchor will take us to the beginning of the essay, there's really no point in naming the entire thing.

Now that we've named the paragraph, we can link to it from earlier in the page:

Welcome Marx Brothers fans!
<HR>
Get information about the brothers by clicking on their names:
<P><A HREF="#grouchobio"> Groucho</A>

The last line of the above code now says: Make GROUCHO an anchor and, when the user clicks on it, link to the text named "grouchobio."

Any text can be named, even another anchor. Remember that NAME is an attribute, just like HREF. Here's the syntax for naming text that is also a hypertext anchor:

<A HREF="linked file" NAME="#name">Hypertext anchor</A>

#### Inserting graphics

#### <11MG>

The combination of graphics and text is one of the things that make the World Wide Web so interesting. In our Marx Brothers server, we could include photos of the brothers, stills from their films, and so on.

There are two ways to present graphics in the World Wide Web—inline graphics (those that appear within the page) and linked graphics (stand-alone files reached by links). HTML only supports the XBM and GIF file formats for inline graphics; however, if you link to a graphics file, it can be in any format—provided that users have the external viewers with which to view them. The most common file formats are JPEG and GIF; it's probably a good idea to convert graphics to one of those formats. (Chapter 6 has more information about file formats and viewers.)

The tag for inserting an inline graphic is <IMG>. Since the tag doesn't refer to text, there's no end tag involved. This tag always requires a source attribute (SRC), which defines the name of the file to insert. The value for the SRC attribute can be any URL. The URL can point to a GIF or XBM file on any computer on the Internet, although it's probably safer to maintain inline graphics files locally, just in case the other computer is inaccessible.

There are two other attributes that can be included in the tag:

- ALIGN specifies how graphics and/or text should align. The values are TOP, MIDDLE, and BOTTOM. They tell the browser to align nearby text with the top, middle, or bottom of the graphic.
- ALT defines some alternate text to be used in case a browser cannot display graphics. This is important for users of non-graphical browsers such as Lynx. If the graphic is an integral part of your content, you'll want to be sure to specify some alternate text.

Let's say we want to insert a photo of Groucho before his name and have the accompanying text line up with the bottom of the image. For Lynx users, we'll display the phrase "[Photo of Groucho Marx]." Here's the tag:

```
<IMG SRC="groucho.gif" ALIGN=BOTTOM ALT="[Photo of Groucho Marx]">
```

#### Inserting graphics as anchors

We can also insert a graphic and make it an anchor for a hypertext link. Here the photo of Groucho is an anchor to the specified file:

```
<A HREF="marxbros.html">IMG SRC="groucho.gif" ALIGN=BOTTOM>/A>
```

One common use of graphics as anchors is for custom bullets. Instead of using an unordered list, which uses bullets, you can put postage-stamp size graphics in front of text and have them do double duty as custom bullets and hypertext links. It's a good way to give your page some personality. If you wanted to use a picture of Groucho as a linked bullet, for instance, you might write:

```
<P><A HREF="file1.html"><IMG SRC="groucho.gif" ALIGN=BOTTOM></A>Information
about Groucho's life
<P><A HREF="file2.html"><IMG SRC="groucho.gif" ALIGN=BOTTOM></A>Information
about Groucho's family
<P><A HREF="file3.html"><IMG SRC="groucho.gif" ALIGN=BOTTOM></A>Information
about Groucho's work
```

Figure 7-11 shows how this list looks in Mosaic.



Figure 7-11. Custom bullets used as hypertext anchors
# Creating Your Own Home Page

If first impressions really are the most important, you'll want to pay particular attention to your home page. The home page is the first document users come to when they contact your server. It introduces users to your service, tells them what kind of information they'll find, and provides links to documents on your server or others. Beyond that there really are no rules for home pages. Companies, colleges, publications, scientists, students... they all have Web servers on the Internet, with very different home pages. In this section, we'll take a look at some of the different home pages out there and discuss how you can make the right impression.

A personal home page occupies a unique niche on the World Wide Web: it represents the Web at its most basic and at its most eccentric. We can lay the blame for this multiple-personality disorder on evolution. From its simple text-based roots in CERN, the WWW home page has rapidly grown into a flexible self-publishing tool. It can now serve as anything from a conservative, professional-looking front door on the Net, to a medium of personal expression that intersects with autobiography, e-zines, and science fiction.

What should you put in your home page? Here are a few thoughts about different approaches (with the linked servers shown in brackets), taken from *GNN*'s *Netizens* feature, written by D.C. Denison:

Be Professional:

I graduated from <u>Utah State University</u> [USU] with a degree in <u>Music</u> [Internet Underground Music Archives], and now I work with the <u>Global</u> <u>Network Navigator</u> [GNN].

### Wax Literary:

It was a <u>dark and stormy night</u> [weather server]. Nancy Drew leaned back in her trusty <u>'62 T-bird</u> [rec.auto.classic] and turned the radio dial to <u>KKSF</u> [SF radio station Web site].

### Get Up Close and Personal:

I live with an amazing standard poodle named <u>Willie</u> [picture of Willie], and love to ponder <u>the meaning of life</u> [philosophy gopher] while watching <u>basketball</u> [GNN Sports Page].

### Be an Information Kiosk:

Here is a list of all the free <u>Mac software</u> on the Net [Internet Computer Index], all the online guides to <u>cyberspace</u> [GNN Gold Mine], and a list of all the Internet <u>bicycle information</u> [cycling gopher].

The attitude you decide on will tell you a lot about the other aspects of designing your page. If you're creating a professional page, you'll want your photograph to be professional and your links to be clearly identified. If you're being more personal, you can embed lots of links within text, make inside jokes, show off your homemade computer art, and so on. To help you get started with that first home page, here are a couple of templates. All you need to do is fill in the blanks, and you're off and running. This template is the HTML for a generic personal home page. It uses an inline image, unordered lists, and some links, as well as the <ADDRESS> tag.

```
<HTML><HEAD>
<TITLE>YourName's Home Page</TITLE></HEAD><BODY>
<H1>YourName's Home Page</H1>
<IMG SRC="YourPicture.gif"> picture title
<H2>Where I work/go to school</H2>
I work at <A HREF="URL here">company/school name</A>.
<H2>Hobbies</H2>
<UL>
<LI>description
<LI>description
<LI>description
</UL>
<H2>Personal Hot List</H2>
<111.5
<LI><A HREF="URL here">description</A>
<LI><A HREF="URL here">description</A>
<LI>A HREF="URL here">description</A>
</11.>
<ADDRESS>YourName (YourEmailAddress@host.domain) </ADDRESS>
</BODY></HTML>
```

You can fill this out and use it as your home page or customize it as you wish. Figure 7-12 shows a filled-out version of this page. The following template is a somewhat more complex form, featuring custom bullets in glossaries, as well as inline images and plenty of links. Try filling out this template and previewing the results in Mosaic.

```
<HTML><HEAD>
<TITLE>My Favorite Things</TITLE></HEAD>
<BODY>
<H1>These Are a Few of My Favorite Things</H1>
This page is all about the things I like.
<DL>
<DT>
<IMG ALIGN=BOTTOM SRC="picture.gif">
<A HREF="startrek.html">Star Trek: The Next Generation</A>
<DD>
<I>My all time favorite TV show</I>
<DT>
<IMG ALIGN=BOITOM SRC="picture.gif">
<A HREF="bogart.html">Casablanca</A>
<DD>
<I>My all time favorite movie</I>
<DT>
<IMG ALIGN=BOTTOM SRC="pics/whiteball.gif">
<A HREF="ulysses.html">Ulysses by James Joyce</A>
```

```
<DD>
<I>My all time favorite book</I>
</DL>
</BODY></HIML>
```



Figure 7-12. Personal home page

# Using HTML Editor to Create Documents

While HTML is a relatively simple tagging language, it is easy to make mistakes. If you miss an end tag somewhere, your whole document may be displayed in bold or as <H3> text. If the mistake occurs in a large document, it may be rather difficult to find and correct. At the very least, your fingers will get tired from typing out all those tags.

One solution is a shareware program called HTML Editor, written by Rick Giles of Acadia University in Canada. There is a \$25 shareware fee for this program, so if you wind up using it frequently, you should send the fee to Rick Giles, Box 207, Acadia University, Wolfville, N. S. BOP 1X0, CANADA.

There is a link for downloading HTML Editor on the *Mosaic Handbook Hotlist*, or you can download it yourself using the URL *http://dragon.acadiau.ca:1667/~giles /HTML\_Editor/Documentation.html*. HTML Editor gives you a Macintosh interface

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for creating HTML documents by offering pop-up menus, clickable icons, and dialog boxes for editing URLs. Figure 7-13 shows what HTML Editor looks like.



Figure 7–13. HTML Editor for the Macintosh

Let's take a look at how we created the Marx Brothers Home Page using HTML Editor. To get started, just click on the first icon, Title. It inserts the <TITLE> and </TITLE> tags and put the cursor in between. Enter the title of the document, move to the end of the line and press Return.

Next, enter the top-level heading. Click on the Heading pop-up menu and choose 1. This inserts the <H1> and </H1> tags. Enter the text of the heading and press H1.

To create the anchor tag for the word "Groucho," highlight the word and click on the Anchor icon. An anchor dialog box, shown in Figure 7-14, will appear, with three radio buttons and a text field for entering the name of the link. The three buttons let you determine whether the highlighted text will be a link target, or will link to another file, or to another anchor in the same file. In the text field, type in the pathname or URL of the linked file. There's also a button marked Construct. If you click on this you'll see another dialog box that lets you generate a pathname by selecting a file on your Mac through the standard point-and-click interface. The four pop-up menus contain the different kinds of tags—heading, style, list, and text. As described above, you can surround text with a pair of tags by highlighting the text and selecting a tag from the pop-up menu. But if you select several paragraphs and select a list tag, HTML Editor will automatically insert <LI> tags in front of each paragraph.

	Anchor	
Name or Reference:	groucho.html	<del>ن</del> ب
() Target		×
O Link in this file		
◉ Link to another fi	le	
(Construct)		(Cancel)

Figure 7-14. Anchor dialog box

For instance, if you enter the text from Figure 7-5 in HTML Editor, select it, and choose **Ordered** from the List pop-up menu, the whole list will be automatically formatted. You can nest additional lists by inserting text under one of the list entries and following the same procedure.

Besides the pop-up menus, HTML Editor has icon buttons on the toolbar, which let you insert tags for the title, text formatting and inserting pictures and anchors. There's also a button to automatically launch Mosaic and one to hide tags.

HTML Editor also boasts an Edit URLs dialog that shows all the links in your document and lets you edit their names and URLs without having to go into the file.

There are some drawbacks to the program, however. The pop-up menus don't show you the actual tags, so it's not always clear what tag you're using until you see it on the page. (Fortunately, there's always Undo.) Some common tags like <BR> and <HR> are not included in the interface. There is, however, a palette called User Tags, to which you can add any tags you want.

While you're still not an HTML expert, you're well on your way now. We haven't covered every single thing you can do with HTML, but you know enough now to create pages as sophisticated as most of what you see on the Web.

# Resources

A Beginners Guide to HTML http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html

A Beginners Guide to URLs http://www.ncsa.uiuc.edu/demoweb/url-primer.html

HTML Quick Reference http://kuhttp.cc.ukans.edu/lynx\_help/HTML\_quick.html

Hyper Text Markup Language (HTML) http://info.cern.cb/bypertext/WWW/MarkUp/MarkUp.html The Mosaic Handbook for the Macintosh

Style Guide http://info.cern.ch/bypertext/WWW/Provider/Style/Overview.html

WWW Names and Addresses http://info.cern.cb/bypertext/WWW/Addressing/Addressing.html

 $\hat{}$ 

World Wide Web Initiative http://info.cern.ch/hypertext/WWW/TheProject.html

ISO Latin characters http://info.cern.cb/bypertext/W/W/MarkUp/ISOlat1.html

## **CHAPTER EIGHT**

# **FUTURE DIRECTIONS**

W30

WWW Project Information VRML: Visualizing Web Space

The Mosaic interface and the World Wide Web information architecture will continue to evolve in new directions. In this chapter, we try to indicate what some of those directions might be and to describe how you can join in the discussions on the Net where the new developments are happening.

We begin with a story from *GNN NetNews* on the W3O the organization created by the Massachusetts Institute of Technology (MIT) and the European Laboratory for Particle Physics (CERN) to shape the future of the WWW. We also include a *GNN* interview by D.C. Denison with Professor Michael Dertouzos of MIT, a key player in creating this international organization. He talks about the goal of creating a Web that includes online entertainment, commerce, and education, and what needs to be done to make this happen.

Also in this chapter, we catalog the newsgroups, mailing lists, and Web servers where you can follow the most recent developments, such as the Virtual Reality Markup Language.

# W30

Almost from the beginning of the World Wide Web initiative at CERN, project leader Tim Berners-Lee recognized the need for a separate organization that could help to develop WWW standards, as well as much of the common code base. In the summer of 1994 that organization finally emerged, and it was named W3O. The organizing sponsors of W3O consortium are MIT and CERN. Berners-Lee will move from CERN to MIT to serve as the director of W3O.

At MIT, the Web initiative will be based at the Laboratory for Computer Science. Professor Michael L. Dertouzos is the director of the Lab. Dertouzos said that W3O aspires to "enhance the Web by developing the 'bulldozers and backhoes' of the information age, that will work for us—not the other way around, as is often the case today.

"We envision an information market where information and information services can be purchased, sold, or exchanged freely so as to improve the economic wellbeing and the quality of life of people throughout the world, and as a medium for education and the nurturing and integrating of different cultures."

W3O is expected to receive the enthusiastic support of the European Union. "It is of the utmost importance that these computer frameworks be worldwide frameworks," said Dr. Martin Bangemann, the Commissioner of the European Union in charge of industrial policy, information technologies and industries, and telecommunications. "The European Union intends to support this cooperative activity as an important step toward the Global Information Society," he said.

Dr. George Metakides, director of the European Strategic Program for Research and Development in Information Technologies (ESPRIT), which reports to Dr. Bangemann, commented, "Common information navigation tools will be essential for the development of the Global Information Infrastructure. This development of the World Wide Web provides a concrete example that will help us to understand better the transition to the information society."

At the time of the W3O announcement, Tim Berners-Lee commented, "The Web was conceived as a representation of mankind's knowledge, society, and commerce." It is becoming more secure, more interactive, and developing greater richness of meaning. An international base seemed essential to support its very rapid growth and its evolution, while also ensuring its stability.

"Throughout the world, information and communications technologies are generating a new industrial revolution already as significant and far-reaching as those of the past," according to the European Union's Bangemann. "A global information society is emerging which changes the way we work together and the way we live together. The engine driving the transition to the information society is the information infrastructure, which enables us to process, retrieve, and communicate information in whatever form it may take—oral, written, or visual—unconstrained by distance, time or volume."

As you might expect, you can follow the developments at W3O online. As of this writing, there are only a few pages on the Web about W3O, but that should change quickly.

The following URL will get you to the W3O server. (This server may be relocated to MIT.)

http://info.cern.ch/hypertext/WWW/Organization/Consortium/W3OSignature.html

## MIT's Michael L. Dertouzos on W30

To get a better sense of what W3O might do, as well as what interesting directions the Web might move in, we have an interview with MIT's Professor Dertouzos. This interview was conducted by D.C. Denison and originally appeared in *GNN NetNews* in August of 1994, several weeks after the formation of W3O had been announced.

A secretary gives the visiting reporter a simple way to know when Michael L. Dertouzos has arrived at MIT's Laboratory for Computer Science. "He's the biggest man who will walk through the door," she says, pointing to the main entrance.

Sure enough, Dertouzos, the director of the Lab and a professor of computer science and electrical engineering at MIT, is easy to spot. Tall and courtly, he sweeps into the office, gathers up a couple of mugs of coffee and some fresh faxes (from Vice President Albert Gore's office, it turns out), and settles down to discuss some big ideas. Like Dertouzos' idea of an "information marketplace," which he has been promoting for 15 years, and the W3O, the brand new international initiative to develop and standardize the World Wide Web.

### How did you get interested in the World Wide Web?

I was looking for a mechanism that would allow this Lab to concentrate its future research on the architecture of the global information infrastructure, with the emphasis on global. Second, I wanted something that already had millions of users, so it had the voice of reality, but was bendable. Then reality would bend us back, if we proposed stupid things, and we would bend it back, if we proposed clever or useful things.

I really want this lab to be an architect of tomorrow's information infrastructure. There are going to be so many people out there doing interfaces: Time/Warner will have a movie interface and a news interface; Bill Gates will have his own Microsoft interface, so that if you're in Excel you can hook up with somebody on the other side of the ocean who is also using Excel; the telcos will have an interface, each with its own look and feel; the publishers, the Murdochs, will have their own spin on an interface. Everyone wants to control that, because they see it as a very lucrative market. So there will be no shortage of me-toos, trying to plug you into the infrastructure. But no one's worried about the damn architecture. So I saw this as a fertile ground, for this Laboratory to focus on the architecture. And when I talk about architecture, I'm talking about how machines in one location will understand what the machines in another location want to do. Today, if you look at the Internet, they don't. It's human beings who have to understand. In fact the Web is human browsable.

### Is there a better way, in your opinion?

Back in the industrial era, we invented machines, and they replaced our muscles. That was a simple thing to understand. We've also come up with ways to produce food by using only three percent of the population, instead of 50 percent. So what are we replacing in the information revolution? What would you say?

# The work of finding and accessing information. The "legwork" it takes to locate sources of information. How's that?

The mundane mind work, if I may generalize from your words. You want to replace some of the mundane mind work. So in this lab, we're trying to work out schemes that will act as bulldozers and backhoes for the mind. That's a nice metaphor. The Web doesn't have bulldozers or backhoes; it has shovels. It welcomes you with lots of shovels that you have to operate. All it is now is a Web that links home pages and other pages all over the world: you click, you cross the

ocean or the street, and then your brain has to go to work: you have to figure out, "What do I want to do?" and "What do I have to do?" It's like electronic mail: it does some wonderful things, but it has some terrible disadvantages.

### What are its disadvantages?

It's another shovel in your hands. I can click my little finger and create a hundred copies of your message to me, and my response to you, and 100 minds have to at least read the message address to figure out what I'm telling them. Again, it's the human brain being overloaded. It is not evolution, in productivity terms, when you overload an ancient human brain. It's as if the Industrial Revolution came and you started telling people, "Now if you only start working harder with your muscles, we can offer you a lot of utopias." That's bull. It doesn't work. So viewed from that perspective, the current existing networks are nowhere near where we envision them. This is the vision that I have.

### So you want to make things simpler.

Correct. But not only simpler. I see it as the human quest to increase productivity, to have others do his work. Technology is there to serve us.

# What are the first things we can expect to see on future versions of the World Wide Web?

Recreation. There are 80 million households in the country, and a little over two TV sets in each household. That's more than 150 million TV sets. There are only 30 or 40 million PCs. There is also a well-known, \$14 billion market that views videos. So the first application is clearly that one.

### Do you think the Web can deliver that kind of entertainment?

Not in its current form. But the Web, suitably modified, could. But we're talking about the infrastructure of the future here, and that infrastructure clearly has to have the architecture to support recreation. So the first things you're going to see will probably be recreation. The Web today goes through slower lines, but there's nothing prohibiting people from running the Web through television's coaxial cable.

### And after recreation?

After recreation, I see shopping and mail-order coming right away, because that's natural, once people get used to browsing. Another thrust will come from the business sector, and commerce, by which I mean the whole set of transactions that start with looking for things, move on to negotiations, move on to contracting, and move on to delivery and post delivery. All these steps can be very important, depending on what you're buying or selling. Then there's education, which is the toughest, because although there's plenty of talk about education, there isn't much money. Whereas with entertainment and commerce, there's money and perceived need. So the possibilities for education are beautiful, but will it really happen? The whole area of travel will also be big. But the initial thrust will probably be recreation and commerce. Then I see health care coming in big. There's money there,

and the Web can help save both time and money. Financial services and group-work are other areas that show promise.

### This seems to be a long way from the current system.

Things always look that way. If you ask people what they want, they generally want 20 percent more than they have—a few more features, smoother operation, etc. But we want to go 150 percent ahead.

### How many people will be working on W3O?

I don't differentiate between W3O and the rest of the Lab. We have about 500 people working here, and about half of them will be working on the information infrastructure. But specific W3O people, working on the standard, and issuing new versions—probably around 12.

### Is part of W3's appeal its scalability?

W3 is very clean and unmolested by too many fixed ideas, so you can put some things on it. And it can expand. But our own idea, since day one, has been to build this information market. We're interested in a market, not a utility where someone has all the knowledge and sells it. We're not interested in any of these dictatorial models; we want a market where buyers and sellers come together and buy and sell information. It's decentralized.

### That's not what many corporations are building now.

No, this is not what's happening today. The scenarios you see today will make it possible for you to watch a movie, but if you want to then sell a service, you won't be able to. So we don't have a market. We don't have an equal place where you and I can transact. We have a broadcast medium, and that's what everybody's after: control, which means broadcast. Never mind if they give you some interaction back, so you can choose what you can buy, it's still broadcast. I've given a name to these models: I call them spiders, because they have a hub, and there's one way out, and they don't let you come back in. There are all sorts of spiders. The European telephone company is a spider: they think that they are going to offer every service you're going to need. That's another spider that prohibits an information market.

If you stop and think about it, it's not in the interest of any single capitalistic agency to promote a universal infrastructure. Any more than it's in the interest of any capitalistic agency to promote a highway system for cars. Who built the highway system in this country? The government. I'm not a socialist, I'm a capitalist, but there are some things that the government has to stimulate. This is one of them. People left to their own devices are going to build spiders, and it will take us 20 years before people will realize, which they will, that there's more money in converting spiders to highways. But by then there may be a lot of things already frozen in place.

### How will you head off all these spider-builders?

That's why we're the architects. That's one of our noble duties—to say to people, "Yes guys, these spiders are great for sending movies to the home, and it's even great to sell L.L. Bean products. But you won't be able to buy, from that homedweller, his ability to retouch photographs. You won't be able to buy, from that homedweller, his or her ability to work on insurance forms. The way you're going, all you'll be able to get from that homedweller are clicks that are going to say, 'Buy this, sell that, do this, do that.' He cannot put any of his own stuff on. That's fine. We'll offer you an architecture where you can do all that. But our architecture has hooks. So later, when you see the light, and you see that there's some revenue there, we can turn on that hook, and that person can sell." And that person can get on the highway system.

# Did you see W3 as a place where a market structure was already working, on a small scale?

W3 already has a great deal of this information market idea in it. It's got two beautiful things. The first is an obvious one, that anyone can produce something. You can create a home page that's as elaborate or as silly as you want. The second part of this is that there are 30 million of you doing this, and it is growing into a beautiful edifice. That's how it will continue to grow: if you do a great Web demo for a health center, then every health center and clinic is going to want to be Webbed. That's how it will work.

### It's already working like that.

Yes, but what we have now is a chaotic evolution of servers with no order. The Internet, really, has no order. It's a mud field, and every ten kilometers of mud, you find a little diamond. That's a situation we will be working to improve.

# What were the negotiations like, with CERN, when you were trying to put W3O together?

The elements of the deal are really quite obvious. Tim Berners-Lee invented the Web, at CERN, and they have a great understanding of the Web, and a great community of people using the Web. On our part, at MIT, we have the experience with the X Consortium, and our systems work for the last 30 years. And we have architectural research in progress, on the information infrastructure, that is second to none worldwide.

### What's going to attract corporations to the W3O Consortium?

Corporations are not stupid. They don't want to miss the next standard. So you offer them a reasonable entry, financially and otherwise, into a consortium, as we did with the X Consortium. You make sure they don't have any spider controls, but you be sure to listen to them, so that they evolve the standard with what they want to see changed, without constraining others from using it. If you get the right balance between openness and response to your users—that is one of the most accepted methods of evolving a standard. It's much faster than an international committee.

### Why?

Because you have a standard czar, in this case Tim Berners-Lee, who will be in charge of the consortium. And you have a team of elders, 12 people who will constitute his council. At least half of them will come from the consortium; the other half will be knowledgeable technologists and others whom he will consult. All year long people will be saying, "Gee, Tim, wouldn't it be nice if we had X or Y or Z in there?" Or they're saying, "Tim, that thing that you put in last year—that's a piece of junk." Or they're saying, "That feature you put in, that's fantastic." So he listens to all this, he talks to his elders, then come January 1 he drops the sword and he says, "The next version, number 9, of the W3 standard is this." And the minute he issues that, everybody—and I mean everybody—says "Thank God, we have one place where these decisions are made." That honeymoon lasts precisely one day. The very next day they're back bitching and saying, "Let's make this change, that change... "That's how the standard works.

So any company that knows about this process—and they all do—is going to say to themselves, "Hey look, there are some pretty good people at W3O, like the inventor, and CERN, and MIT. Maybe there's just a chance that they're going to do something. Can I afford not to be there?" And we need these people. Because without the manufacturers, who are going to build this stuff, and without the users, and without the technologists, who we represent, we don't have anything. You've got to have all three components: users, makers, and researchers.

### How much of a role are you going to play?

This subject happens to be a rather serious interest of mine, the information infrastructure. I'm writing a book on it. So I'll stop in and ask questions, but I'm not going to interfere. This is really better left to other people. But I'll be watching, making sure that we carve a path that is going to open the usage of these things to the world, and create an infrastructure, rather than create a spider.

### How will you roll out advances to WWW?

By a system of what I call protocol grafts. You know the way you graft a branch on a tree and it either takes or it doesn't? We are going to be declaring, in a given standard version, that "Here is the standard, and here is the graft region that has the six new things in it. They are not part of the standard; they are for people who want to play. But please send your comments." In the next version, based on the comments, two of these six grafts might make it into the standard, three might drop off, and one might stay for another year of observation. And three new grafts might be added. That's how I plan to resolve these tensions in an orderly way. Otherwise, the Web is going to remain a human-browsable network, which is not very useful. And my people's great ideas will remain unsorted, as to which ones are bull or great.

### What would be an example of a graft?

Let's say an automated vocabulary, with 100 nouns and 100 verbs, which every server on the Web that implements that standard can now understand. The verbs could be of the form, "Have you?" or be declarative, of the form, "I sent you," or "I

ask you to send me" or "I ask, do you have?" or "Can you show me how?" And there may be one hundred nouns, having to do with "a file named \_\_\_\_" or "a picture named \_\_\_\_" or statements of the form "I don't understand." So maybe we announce, "We're putting in this graft extension, a little language that augments the Web, and if you install this software, then you'll be able to not only fingerclick, but do some things automatically." So we'll try it as a graft. Nobody is compelled to use it. In fact, if you want simplicity, ask for the version without this. Then, whenever somebody hits you with it, they will get back the message, "Sorry, this node does not understand graft #16." But people being as adventurous as they are, they'll go for the grafts.

The Internet doesn't lack for adventurous people.

That's right. You have 15 million adventurous people. Even if half of them say "screw it," that still leaves enough for me to know if a given graft will take or not. And I'm not just talking about the techies. I want to get the regular human beings. So look for deals with some of the entertainment companies.

When will we see the first new version of WWW coming out of W3O?

I expect nothing before a year and a half. Tim Berners-Lee will start in September (1994). If we assume version 1.0 was what happened in Geneva, the very earliest you can expect to see version 2.0 will be January '96. Maybe.

# WWW Project Information

The largest repository of the information about the WWW is online, and organized at CERN. The URL for the WWW Project is:

```
http://info.cern.ch/hypertext/WWW/TheProject.html
```

You will find various lists of resources, as well as pointers to technical information about the Web. We have summarized the key information resources below.

## WWW Newsgroups

If you're interested in following, or taking part in, the development of the Web, you can participate in several newsgroups. Here is a list of Web-related newsgroups.

### comp.infosystems.www.users

This newsgroup is the best starting place for learning about using the Web. It is a forum for the discussion of Web browsers and their use with various Internet information sources. Among the topics covered in this group: new user questions, client setup questions, client bug reports, questions on how to locate information on the Web, and comparisons between various client packages.

### comp.infosystems.www.providers

This newsgroup is a forum for the discussion of Web server software and presenting information to users. Topics covered include: general server design, setup questions, server bug reports, security issues, HTML page design, and other concerns of information providers.

### comp.infosystems.www.misc

A forum for general discussion of Web-related topics that are not covered by the other newsgroups in the hierarchy. According to CERN, "This will likely include discussions of the Web's future, politicking regarding changes in the structure and protocols of the Web that affect both clients and servers, etc."

## Mailing Lists

To join any of the CERN mailing lists, send email to *listserv@info.cern.cb* with the following message:

### subscribe list-name your-name

in the body of the message. For example, I can subscribe to www-announce by sending mail with the following message:

subscribe www-announce "Dale Dougherty"

If you need more information about CERN's mailing lists, use the following URL:

http://info.cern.ch/hypertext/WWW/Administration/Mailing/Overview.html

The CERN mailing lists are described in the sections that follow. Many are available in archive form. If the archive is organized by a program called **Hypermail**, the messages can be viewed sorted by date, subject, or author.

### www-announce

A mailing list for anyone interested in WWW, its progress, new data sources, or new software releases. There is also an archive of the list, which is accessible through Mosaic. The URL for the archive is:

http://info.cern.ch/hypertext/WWW/Archive/www-announce

### www-html

Technical discussions of HTML and HTMLPlus. This is a technical mailing list consisting of design discussions only. This is not the place to ask basic questions about writing HTML, but if you're interested in following the nitty-gritty of the HTML language, you may want to subscribe to this list. There is also a hypertext-based archive for this mailing list at:

http://info.cern.ch/hypertext/WWW/Archive/www-html

### www-proxy

This mailing list is for a technical discussion about WWW proxies, caching, and future directions.

### www-talk

Technical discussion for those developing WWW software or with a deep interest in WWW. (Please keep this to WWW technical design only, *not* general questions from non-developers.) See the hypertext archive at:

http://gummo.stanford.edu/html/hypermail/archives.html

# VRML: Visualizing Web Space

The idea behind the Virtual Reality Markup Language (VRML) is to create a nonproprietary, platform-independent language, much like HTML, that would allow authors to create virtual reality "scenes." Users of virtual reality servers would be able to walk around a space and push open doors to other parts of the Web. While, as of this writing, VRML is still very much in the "talking about" phase, there is a working specification for VRML, developed by Mark Pesce and Anthony Parisi of the Labyrinth Group in San Francisco.

## VRML Resources

The VRML Web site contains papers, specifications, and links to other VR-related projects. The URL is:

http://www.wired.com/vrml/

You can subscribe to the www-vrml mailing list by sending email to:

majordomo@wired.com

with the following in the body of the message:

subscribe www-vrml your-email-address

## APPENDIX A

# **MOSAIC REFERENCE GUIDE**

The Toolbar The Menus

hile using Mosaic is a fairly intuitive experience, the program includes several features that are quite helpful in managing your Mosaic session. This appendix provides a comprehensive guide to Mosaic's toolbar and menu commands. The interface is described in Chapter 2, *Getting Started with Mosaic*.

# The Toolbar

The toolbar contains icons and displays information that helps you understand where you are and how to get to your next destination.

# Back and Forward Arrows

On the left side of the toolbar is the **Back** arrow, which points to the left. You use this button to display the page you were last viewing. Next to it, pointing to the right, is the **Forward** arrow. It works the same way, only in reverse. Normally the **Forward** arrow is dimmed; if you use the **Back** arrow, the Forward arrow becomes active, allowing you to return to your most recently downloaded page.

It's kind of like adding pages to a book. Every time you download a new page, you are adding that page to the back of your book; that page then becomes the last page of the book. Flipping back brings you to pages that were downloaded earlier; flipping forward takes you to pages added later.

This navigation process works well while moving through documents held in the cache. It gets a bit confusing, however, if you move too far back. When you move to a document that is not in the cache, Mosaic will download that document; that file will then become the most recent document. The solution is to use **Back** and **Forward** only to move in small increments; use **History** or **Hotlist** to take larger steps.

## URL Display

On the left side of the toolbar, you will see a field labeled URL. This field tells you the URL of your current document. For instance, when you're looking at the *GNN Home* page, this field reads *bttp://gnn.com/GNNhome.btml*. This text can be

copied to the clipboard with the CTRL-C command, just like any other text. This is a handy feature if you want to email a URL to your friends or just keep a list of favorite URLs handy.

# The Menus

There are five menus in Mosaic: File, Edit, Navigate, GNN, and Windows. These menus lets you manage files, change display characteristics, navigate the Web, manage windows, and display online help.

# The File Menu

The File menu has commands for file management operations like opening, saving, closing, and printing files.

### New Window

Mosaic lets you open numerous windows, so you can keep many different documents open on your screen at the same time. This can save quite a bit of time in going back and forth to your most frequently used documents. For instance, you could keep *GNN* open in one window and explore other Web offerings in another window. Then, instead of having to find your way back to *GNN*, just switch to the *GNN* window.

### Open URL

As described in Chapter 2, **Open URL** lets you enter a URL in this field. Mosaic will then contact the server and get the file for you. Because you have to enter the whole string by hand, it's quite easy to make a mistake. If you get an error message, such as "The program couldn't find the document" or "The program couldn't find the server," check to make sure you enter the URL correctly. Some directories and filenames are case-sensitive, so make sure you entered the URL exactly.

### **Open** Local

When you're writing HTML documents, it's quite helpful to preview them in Mosaic. To view HTML documents on your Mac, use the **Open Local** command. It opens a standard Macintosh dialog box showing disks and directories. **Open Local** is handy when writing HTML documents because mistakes are sometimes hard to catch when looking at ASCII text, but they become glaringly obvious when displayed in Mosaic. Remember, you must give your HTML documents a name with the extension *.html.* If you don't, Mosaic will display the file as plain text. You can also use **Open Local** to view non-HTML files on your hard disk.

### Save As

This command lets you save the current document to your hard disk as either an HTML document or as plain text with the HTML codes stripped out. This comes in handy if there's a long, particularly useful document that you want to read offline. Just save it as HTML and use the **Open Local** command to view it in Mosaic. Saving as text is better if you plan to put the document in a document of your own, for instance, a memo that you create in a word processing or page layout program.

### Close and Close All

These are used to close windows. Close only closes the active window, while Close All closes all open windows.

### Page Setup

**Page Setup** lets you set the margins and header and footer information for The default margins are .75-inch on all sides. The headers in the example are set to display the document title in the upper left, the page number in the upper right, the date in the lower left, and the time in the lower right.

### Print

Selecting the **Print** option prints all pages in the current document. When you print from Mosaic, it prints the document with the margins and header and footer information specified in the **Page Setup** dialog.

### Quit

Quit exits the program.

## The Edit menu

The Edit menu contains commands that deal with the text of a document.

### Cut, Copy, and Paste

You can copy text from documents in Mosaic by just clicking and dragging your mouse to select text. Then choose **Copy** or press Command-C. You can paste this text into other files like email messages or word processing documents, but you can't cut from or paste to the document in Mosaic. You can cut, copy and paste text into the URL field or into the **Open URL** field.

### Find and Find Again

The Find command lets you search the current document for a text string, which is highlighted in the document when found. The dialog box includes two checkboxes, one for matching case and one for starting from the top of the document. Find Again repeats the search without opening the Find dialog box. Find Again saves you the step of having to click OK within the dialog box.

### View Source

This command lets you see the HTML version of the document. It's useful for people who are previewing their HTML documents in Mosaic or who want to see how somebody else achieved a certain result. You cannot select, copy, cut, or paste from the View Source window, however; you can only view and save.

### Preferences

The **Preferences** dialog box lets you control certain aspects of the way Mosaic displays documents to you. **Preferences** is discussed in more detail in Chapter 5, *Customizing Mosaic*.

### Load Images Automatically

Checking this option sets Mosaic to download inline graphics when downloading an HTML document. Unchecking it downloads only the HTML page, with images replaced by generic picture icons or alternative text, if specified.

### **Underline Links**

When this option is checked, Mosaic underlines links.

### Proxy Server

If your organization uses a proxy server, you need to specify the server name in this field.

### Style Sheets

You can change the way Mosaic formats documents by selecting a different style sheet from this pop-up menu.

### Home Page

You can set your home page by entering the URL in this field.

## The Navigate Menu

The Navigate menu contains the options that you will use most often as you traverse the Web.

### Back and Forward

These menu items correspond to the Back and Forward buttons on the toolbar.

### History

The History window contains a list of all the documents you have visited since you first ran the program; it doesn't clear when you quit the program. History also contains several buttons that let you manage the list.

### Delete

To delete entries from the History list, select a document title and click Delete. Mosaic doesn't ask you to confirm the action.

### Edit

Selecting a document title and clicking on Edit opens a window that lets you change the title and URL of the document.

### Scan Current

Scan Current extracts all of the links in your current page and adds them to the list.

### Go To

Go To is the equivalent of OK in Macintosh dialog boxes. Selecting a document title and clicking Go To downloads that document.

### Close

Close exits the History window.

### Hotlist

When you find servers you want to be able to get to quickly, you can add them to your hotlist. The Hotlist window has several commands for managing your hotlist.

### Add Current

Clicking on this button adds the current document to your hotlist. When you add Web documents, their titles are displayed in the list. When you add non-Web documents, their URLs are displayed.

### Delete

To delete a document from your hotlist, select the document title and click on the **Delete** button.

### Edit

To change the document title displayed in the hotlist, select the title and click on Edit. This brings up a window that lets you change the title and URL of the selected document. This is especially handy for non-Web documents, for which Mosaic displays URLs as titles. You may want to change the URLs of documents that have changed location, but it's safer to go to the new location, add that document to your hotlist, and then delete the old one.

### Scan Current

Scan Current extracts all the URLs of the current document and adds them to your hotlist.

### Export

**Export** creates an HTML document consisting of all of the document titles and URLs in your hotlist. Each title in the document is an active link. When you click on **Export**, Mosaic asks you to name the document, which it then creates and immediately displays.

### Go To

Selecting a title and clicking on Go To downloads the selected document.

Close

Close closes the Hotlist window.

### Add Current to Hotlist

This option adds the current document to your hotlist, the same as the Add Current button in the Hotlist window.

### Load Missing Images

If you set Mosaic not to automatically download inline graphics, it will draw generic picture icons where the pictures would be. To download the images manually, you can double-click on each icon. If you want to see all the images on the page, however, just choose the Load Missing Images command and Mosaic will download them for you.

### Reload

This command simply downloads the same page over again. It is useful when Mosaic has a problem displaying an image on your screen. It is often used when writing HTML documents and previewing them in Mosaic. When you edit an HTML document, you can just choose **Reload** to preview the new version.

## The GNN Menu

The GNN menu lets you move directly to several centers and special-interest publications in *GNN*.

## Windows

The Windows menu lists all of your open windows. You can switch windows by selecting the appropriate document title from the window. This menu also contains two commands to organize windows—Tile and Cascade. Tile redraws your screen so each window takes up the same amount of space. Cascade arranges open windows so that the title bar of each window is visible.

## APPENDIX B

# HTML REFERENCE GUIDE

Table B-1: Tags

Tag	End Tag	Description
<html></html>		Starts/ends document
<head></head>		Starts/ends header
<title></title>		Starts/ends title
<body></body>		Starts/ends body
<h1>,<h2>,etc.</h2></h1>	,,etc.	Starts/ends headline text
<p></p>	N/A	Starts new paragraph
 	N/A	Inserts line break
<hr/>	N/A	Inserts horizontal rule
<em></em>		Surrounds emphasized text
<strong></strong>		Surrounds stronger text
<b></b>		Surrounds bold text
		Surrounds italic text
<u></u>		Surrounds underlined text
<address></address>		Surrounds text in "address" format
  BLOCKQUOTE>		Surrounds text in "blockquote" format
<pre></pre>		Surrounds preformatted text
<dl></dl>		Starts/ends glossary
<dt></dt>	N/A	Precedes term entry for glossary
<dd></dd>	N/A	Precedes term definition in glossary
<ul></ul>		Starts/ends unordered list
<ol></ol>		Starts/ends ordered list
<li></li>	N/A	Precedes paragraphs in list
<a></a>		Surrounds anchor; start tag requires
		attributes
<img/>	N/A	Inserts inline graphic

Table B–2:	Tag Attril	butes
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Tag	End Tag	Attribute	Description	Values
<a></a>	N/A	HREF NAME	Defines link destination Gives symbolic name to anchor Defines image source file	filename or anchor name any one-word name filename
		ALIGN	Specifies alignment Specifies alternate text	TOP,MIDDLE,BOTTOM any text

# GLOSSARY

### access provider

See "Internet Service Provider."

### anchor

The location of a hypertext link in a document; it can be used to describe the link as it appears in text or graphics as well as the place that the link references.

### Archie

A program used to locate files that are publicly available by anonymous FTP.

### ARPAnet

An experimental network established in the 1970's that served as a test environment for the software on which the Internet is based. No longer in existence.

### attributes

(a) SGML (and HTML) tags may accept attributes that further define their usage, much as parameters are used with command-line options. A tag may be followed by an attribute, which in turn is assigned a particular value.

(b) Configurable characteristics of Mosaic that determine how the program functions and how it displays elements on your screen.

### baud

When transmitting data, the number of times the medium's "state" changes per second. For example: a 14.4K baud modem changes the signal it sends on the phone line 14,400 times per second. Since each change in state can correspond to multiple bits of data, the actual bit rate of data transfer may exceed the baud rate. See also "bits per second."

### bits per second (bps)

The speed at which bits are transmitted over a communication medium.

### browser

A program that interprets and displays HTML documents.

cache

Generically speaking, a location in memory where data is stored for easy retrieval, or the process of storing them. Some versions of Mosaic cache the document previously viewed so you can return to it easily. You can configure Mosaic to hold an additional number of documents and images in the cache. If a document or image is not available in the cache, Mosaic has to return to the Internet to retrieve it.

CERN

The European Particle Physics Laboratory (CERN) in Geneva, Switzerland; hypertext technologies developed at CERN to allow physicists to share information provided the basis for the World Wide Web.

client

A software application that works on your behalf to extract some service from a server somewhere on the network.

dialup

(a) To connect to a computer by calling it up on the telephone. Often, "dialup" only refers to the kind of connection you make when using a terminal emulator and a regular modem. For the technoids: switched character-oriented asynchronous communication.

(b) A port that accepts dialup connections. ("How many dialup ports on your computer?")

dialup account

A type of Internet connection that operates over standard phone lines. Dialup accounts are of two types: shell accounts and PPP/SLIP accounts.

To use a shell account, you typically use a telecommunications program to dial the Internet host and log in. This is a cheap and easy method, but has many limitations; for example, you can't use Mosaic.

A PPP/SLIP account, which requires a high-speed modem, actually puts your computer on the network and allows you to use Mosaic.

See also "Mosaic," "shell," "PPP," "SLIP," and "dedicated line."

download

To transfer data from a remote server to your local system. The FTP program is often used to download files.

DNS

The Domain Name System; a distributed database system for translating computer names (like ruby.ora.com) into numeric Internet addresses (like 194.56.78.2), and vice-versa. DNS allows you to use the Internet without remembering long lists of numbers.

### dedicated line

A permanently connected private telephone line between two locations. Dedicated lines are typically used to connect a moderate-sized local network to an Internet service provider. If your Internet connection is provided by a dedicated line, you should be able to use Mosaic. See also "Mosaic" and "dialup account."

### Ethernet

A kind of "local area network" (or LAN). It's difficult to define an Ethernet because there are several different kinds of wiring, which support different communication speeds, ranging from 2 to 10 million bits per second. What makes an Ethernet an Ethernet is the way the computers on the network decide whose turn it is to talk. Computers using TCP/IP are frequently connected to the Internet over an Ethernet. (Say that three times fast.)

### FAQ

An acronym that generally refers to a list of frequently asked questions and their answers, or a question from the list. Many USENET newsgroups and some non-USENET mailing lists maintain FAQ lists (FAQs) so that participants don't spend a lot of time answering the same set of questions.

### firewall

See "security firewall."

### FTP

(a) The File Transfer Protocol; a protocol that defines how to transfer files from one computer to another.

(b) An application program that moves files using the File Transfer Protocol.

### gateway

A computer system that transfers data between normally incompatible applications or networks. It reformats the data so that it is acceptable for the new network (or application) before passing it on. A gateway may connect two dissimilar networks, like DECnet and the Internet; or it might allow two incompatible applications to communicate over the same network (like mail systems with different message formats).

### GIF

GIF refers to the Graphics Interchange Format, a graphics file format developed by CompuServe, Inc., which is used on a variety of platforms and systems. GIF is one of the most widely used formats for storing complex graphics, and one of only two formats in which inline images can appear in an HTML document. See also "XBM."

### Gopher

A menu-based system for exploring Internet resources; the items are arranged in a hierarchy and each item represents either a file or a directory.

### History

A function of the Mosaic browser that keeps track of all the documents you visit and allows you to call them up again.

### home page

(a) The graphical door to the information a server provides. The home page is generally a screen or window full of information in which links to related information are included.

(b) A document that you specify for Mosaic to display when you launch the program and that acts as a "safe port" as you navigate the Web.

host

(a) Generically, a computer.

(b) Sometimes, a computer that provides resources to the Internet; also called an Internet host computer.

Hotlist

A function of the Mosaic browser that allows you to keep a list of the documents you're most interested in and to call them up again.

HoTMetaL

A program from SoftQuad that assists you in formatting documents using HTML codes; available both as freeware and as a commercial product.

HTML

The HyperText Markup Language, a subset of SGML, provides codes used to format hypertext documents. Individual codes are used to define the hierarchy and nature of the various components of the document, as well as to specify hypertext links.

### HTTP

The HyperText Transfer Protocol, a fixed set of messages and replies whereby a client and server communicate during a hypertext link.

### hyperlink

See "link."

### hypermedia

See "hypertext."

### hypertext

Any document that contains links to other documents; selecting a link automatically displays the second document.

### IAB

See the "Internet Architecture Board."

IETF

See the "Internet Engineering Task Force."

ISP

See "Internet Service Provider."

### inline image

An inline image is a graphic image that appears within the current hypertext page. See also "linked image."

### Internet

(a) Generally (not capitalized), any collection of distinct networks working together as one.

(b) Specifically (capitalized), the world-wide "network of networks," which are connected to each other using the Internet protocol and other similar protocols. The Internet provides file transfer, remote login, electronic mail, news, and other services.

### Internet Architecture Board (IAB)

The group that makes decisions about standards and other important issues.

### Internet Engineering Task Force (IETF)

A volunteer group that investigates and solves technical problems and makes recommendations to the Internet Architecture Board (IAB).

### Internet resources

Public information available via the Internet.

### Internet Service Provider (ISP)

An organization that provides connections to a part of the Internet. If you want to connect your company's network, or even your personal computer, to the Internet, you have to talk to a "service provider."

### ISO

The International Standards Organization (or International Organization for Standardization); an organization that has defined a different set of network protocols, called the ISO/OSI protocols. In theory, the ISO/OSI protocols will eventually replace the Internet protocols. When and if this will actually happen is a hotly debated topic.

### JPEG

JPEG (pronounced "jay-peg"), which is an acronym for the Joint Photographic Experts Group, refers to a standards committee, a method of file compression, and a graphics file format. The committee originated from within the International Standards Organization (ISO) to research and develop standards for the transmission of image data over networks. The results were a highly successful method of data compression and several closely associated file formats to store the data. JPEG files typically contain photographs, video stills, or other complex images. Since Mosaic cannot display JPEG format files as "inline images," it launches a special viewer window in which the images are displayed.

### LAN

See "Local Area Network."

### leased line

See "dedicated line."

### link

In hypertext documents, the connection from one document to another. See also "anchor."

### linked image

A linked image is a graphic image that appears in a file separate from the current hypertext page; it is displayed by selecting a link. See also "inline image."

### Local Area Network (LAN)

A grouping of computers that are physically connected within a fairly limited location.

Lynx

A character-based browsing program developed at the University of Kansas.

MIME

The Multipurpose Internet Mail Extensions protocol (MIME), that defines a number of content types and subtypes, which allow programs like Mosaic to recognize different kinds of files and deal with them appropriately. The MIME type specifies what kind of file it is, such as image, audio, or video, and the subtype gives the precise file format.

### modem

A piece of equipment that connects a computer to a data transmission line (typically a telephone line). Most people use modems that transfer data at speeds ranging from 1200 bits per second (bps) to 19.2 Kbps. There are also modems providing higher speeds and supporting other media. These are used for special purposes—for example, to connect a large local network to its network provider over a leased line.

Mosaic

A graphical browser for the World Wide Web that supports hypermedia. Mosaic is often used incorrectly as a synonym for the World Wide Web.

### MPEG

An acronym (pronounced "em-peg") for the Motion Picture Experts Group. MPEG denotes a standards committee, a method of file compression, and a graphics file format. The main application for MPEG is the storage of audio and video data on CD-ROMs for use in multimedia systems. Since Mosaic cannot display MPEG format files as inline images, it launches a special viewer window in which the images are displayed.

### MUD/MOO

MUD refers to Multi-User Dungeon, a group of role-playing games modelled on the original "Dungeons and Dragons" games. MUDs have also been used as conferencing tools and educational aids. A MOO is an object-oriented MUD. Some experimental Web servers are set up with interactive MUD/MOO interfaces.

### multimedia

Documents that include different kinds of data, for example, text, audio, and video.

### NCSA

The National Center for Supercomputing Applications; NCSA produces a public domain version of the Mosaic browsing program and licenses the technology to developers.

NFS

The Network File System; a set of protocols that allows you to use files on other network machines as if they were local. So, rather than using FTP to transfer a file to your local computer, you can read it, write it, or edit it on the remote computer—using the same commands that you would use locally. NFS was originally developed by Sun Microsystems, Inc., and is widely used.

### NSFNET

The National Science Foundation Network; the NSFNET is *not* the Internet. It's just one of the networks that make up the Internet.

OSI

Open Systems Interconnect; another set of network protocols. See "ISO."

### packet

A bundle of data. On the Internet, data is broken up into small chunks, called "packets"; each packet traverses the network independently. Packet sizes can vary from roughly 40 to 32,000 bytes, depending on network hardware and media, but packets are normally less than 1500 bytes long.

### port

(a) A number that identifies a particular Internet application. When your computer sends a packet to another computer, that packet contains information about what protocol it's using (e.g., TCP), and what application it's trying to communicate with. The "port number" identifies the application.

(b) One of a computer's physical input/output channels (i.e., a plug on the back).

Unfortunately, these two meanings are completely unrelated. The first is more common when you're talking about the Internet (as in "telnet to port 1000"); the second is more common when you're talking about hardware ("connect your modem to the serial port on the back of your computer").

### PPP

Point-to-Point Protocol; a protocol that allows a computer to use the TCP/IP (Internet) protocols (and become a full-fledged Internet member) with a standard telephone line and a high-speed modem. Although PPP is less common than SLIP, it's quickly increasing in popularity.

### **PPP/SLIP** account

See "dialup account."

### protocol

Simply, a definition of how computers will act when talking to each other. Protocol definitions range from how bits are placed on a wire to the format of an electronic mail message. Standard protocols allow computers from different manufacturers to communicate; the computers can use completely different software, providing that the programs running on both ends agree on what the data means.

### proxy server

A server on the Internet that provides indirect Internet access to systems excluded from a direct connection by a security firewall.

### RFC

A Request For Comments; a set of papers in which the Internet's standards, proposed standards, and generally agreed-upon ideas are documented and published.

router

A system that transfers data between two networks that use the same protocols. The networks may differ in physical characteristics (e.g., a router may transfer data between an Ethernet and a leased telephone line).

### security firewall

A system that isolates an organization's computers from external access, as through the Internet. The organization sometimes provides some Internet access through use of a proxy system. The firewall is intended to protect other machines at the site from potential tampering from the Net.

### server

(a) Software that allows a computer to offer a service to another computer. Other computers contact the server program by means of matching client software.

(b) The computer on which the server software runs.

### service provider

See "Internet Service Provider."

### SGML

Standard Generalized Markup Language; a set of codes used to format documents. Individual codes are used to define the hierarchy and nature of the various components of a document; for example, as headers, options, variables, etc.

### shell

On a UNIX system, software that accepts and processes command lines from your terminal. UNIX has multiple shells available (e.g., C shell, Bourne shell, Korn shell), each with slightly different command formats and facilities.

### shell account

See "dialup account."

### SLIP

Serial Line IP (Internet Protocol); a protocol that allows a computer to use the Internet protocols (and become a full-fledged Internet member) with a standard telephone line and a high-speed modem. SLIP is being superseded by PPP, but still in common use.

### tags

In HTML, tags are the codes that determine both the structure of information within a document and its presentation.

### TCP/IP

Transmission Control Protocol/Internet Protocol; the most important of the protocols on which the Internet is based. TCP is a reliable connection-oriented

protocol; IP allows a packet to traverse multiple networks on the way to its final destination.

### TELNET

(a) A "terminal emulation" protocol that allows you to log in to other computer systems on the Internet.

(b) An application program that allows you to log in to another computer system using the TELNET protocol.

### TIFF

The Tag Image File Format, a graphics file format developed by Aldus Corporation, which has become a standard format found in most paint, imaging, and desktop publishing programs. TIFF is both powerful and flexible, and allows for storage of grayscale and color images.

### URL

Uniform Resource Locator; the address of a document on the World Wide Web. The address is contained in a link, which a client interprets in order to connect with the proper server.

### USENET

An informal, rather anarchic, group of systems that exchange "news." News is essentially similar to "bulletin boards" on other networks. USENET actually predates the Internet, but these days, the Internet is used to transfer much of the USENET's traffic.

### Veronica

A service that allows you to search all Gopher sites for menu items (files, directories, and other resources).

### viewer

A program Mosaic launches as needed to display a file in a format it cannot handle internally. For instance, Mosaic launches an MPEG player program to display an MPEG video file in a separate window because it cannot interpret this format.

### visit

You access a World Wide Web document via a hypertext link. The anchor of a document that has been visited has a different appearance than the anchor of a link you haven't accessed.

### W30

An organization created by the Massachusetts Institute of Technology (MIT) and CERN to direct the development of the World Wide Web.

#### WAIS

See "Wide-Area Information Servers."

#### WAN

See "Wide Area Network."

### Wide-Area Information Servers (WAIS)

A very powerful search-and-retrieval system for information in databases (or libraries) across the Internet. WAIS databases are gradually being adopted for general information storage and retrieval by the Internet community.

### Wide Area Network (WAN)

A grouping of computers that are connected over communication lines, usually in a wide geographic area such as a state, country, or continent.

### World Wide Web (WWW)

A hypertext-based system for finding and accessing Internet resources.

### www

See "World Wide Web."

### XBM

XBM refers to the X Bitmap graphics file format, which is the standard for bitmap image files in the X Window System. XBM files contain simple, twotone images. XBM is one of only two formats in which inline images can appear in an HTML document. See also "GIF."

### X Window System

A network-based windowing system, originally developed at the Massachusetts Institute of Technology (MIT); X is most frequently run in combination with the UNIX operating system.

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Richard Koman is an editor for the *Global Network Navigator*. He is also technology editor for *Communication Arts*, a national graphic design magazine, and former editor of *Online Design*, a California monthly covering electronic design, graphics, and multimedia. He has covered design, publishing, and printing technology for a variety of publications.

### Colopbon

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The sextant is an instrument used to determine latitude and longitude by measuring the angle between the horizon and the sun, or any other celestial body. Two people independently invented the sextant, in about 1730: John Hadley, an English mathematician, and Thomas Godfrey, an American inventor. Employing a telescope and two mirrors, the angle of the celestial object is measured on an arc of one-sixth of a circle. Measurement of angles up to 120 degrees are possible.

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Edie Freedman designed this cover. The cover image is adapted from a 19th-century engraving from the Bettman Archives. The cover layout was produced with Quark XPress 3.3 using the ITC Garamond font.

The inside formats were designed by Edie Freedman and implemented in sqtroff by Lenny Muellner. The text and heading fonts are ITC Garamond Light and Garamond Book. The illustrations that appear in the book were created in Aldus Freehand by Chris Reilley, and the screenshots were processed in Adobe PhotoShop using Photomatic. This colophon was written by Clairemarie Fisher O'Leary.



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By Cricket Liu, Jerry Peek, Russ Jones, Bryan Buus & Adrian Nye Ist Edition Winter 1994/95 (est.) 400 pages (est.), ISBN 1-56592-062-7



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Carl Malamud intervieus Brian Carpenter, Bernbard Stockman, Mike O'Dell & Geoff Huston Duration: 2 bours, ISBN 1-56592-993-4

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Brian Carpenter is the director for networking at CERN, the high-energy physics laboratory in Geneva, Switzerland. Physicists are some of the world's most active Internet users, and its global user base makes CERN one of the world's most network-intensive sites. Carpenter discusses how he deals with issues such as the OSI and DECnet Phase V protocols and his views on the future of the Internet.

Bernhard Stockman is one of the founders and the technical manager of the European Backbone (EBONE). EBONE has proven to be the first effective transit backbone for Europe and has been a leader in the deployment of CIDR, BGP-4, and other key technologies.

Mike O'Dell is vice president of research at UUNET Technologies. O'Dell has a long record of involvement in data communications, ranging from his service as a telco lab employee, an engineer on several key projects, and a member of the USENIX board to now helping define new services for one of the largest commercial IP service providers.

Geoff Huston is the director of the Australian Academic Research Network (AARNET). AARNET is known as one of the most progressive regional networks, rapidly adopting new services for its users. Huston talks about how networking in Australia has flourished despite astronomically high rates for long-distance lines.

#### The Future of the Internet Protocol

Carl Malamud interviews Steve Deering. Bob Braden, Cbristian Huttema, Bob Hinden, Peter Ford, Steve Casner, Bernbard Stockman & Noel Chiappa Duration: 4 bours, ISBN 1-56592-996-9

The explosion of interest in the Internet is stressing what was originally designed as a research and education network. The sheer number of users is requiring new strategies for Internet address allocation; multimedia applications are requiring greater bandwidth and strategies such as "resource reservation" to provide synchronous end-to-end service.

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- TUBA (TCP and UDP with Big Addresses)
- CLNP (Connectionless Network Protocol)
- CIDR (Classless Inter-Domain Routing)

or if you are just interested in getting to know more about the people who are shaping the future.

#### Mobile IP Networking

Carl Malamud intervieus Pbil Karn & Jun Murai Released Spring 1994 Duration: 1 bour, ISBN 1-56592-994-2

Phil Karn is the father of the KA9Q publicly available implementation of TCP/IP for DOS (which has also been used as the basis for the software in many commercial Internet routers). KA9Q was originally developed to allow "packet radio," that is, TCP/IP over ham radio bands. Phil's current research focus is on commercial applications of wireless data communications.

Jun Murai is one of the most distinguished researchers in the Internet community. Murai is a professor at Keio University and the founder of the Japanese WIDE Internet. Murai talks about his research projects, which range from satellite-based IP multicasting to a massive testbed for mobile computing at the Fujisawa campus of Keio University.

#### **Networked Information and Online Libraries**

Carl Malamud intervieus Peter Deutsch & Cliff Lynch Released September 1993 Duration: 1 bour, ISBN 1-56592-998-5

Peter Deutsch, president of Bunyip Information Services, was one of the co-developers of Archie. In this interview Peter talks about his philosophy for services and compares Archie to X.500. He also talks about what kind of standards we need for networked information retrieval.

Cliff Lynch is currently the director of library automation for the University of California. He discusses issues behind online publishing, such as SGML and the democratization of publishing on the Internet.

#### European Networking

Carl Malamud interviews Glenn Kowack & Rob Blokzijl Released September 1993 Duration: 1 bour, ISBN 1-56592-999-3

Glenn Kowack is chief executive of EUnet, the network that's bringing the Internet to the people of Europe. Glenn talks about EUnet's populist business model and the politics of European networking.

Rob Blokzijl is the network manager for NIKHEF, the Dutch Institute of High Energy Physics. Rob talks about RIPE, the IP user's group for Europe, and the nuts and bolts of European network coordination.

#### Security and Networks

Carl Malamud intervieus Jeff Schiller & John Romkey Released September 1993 Duration: 1 hour, ISBN 1-56592-997-7

Jeff Schiller is the manager of MIT's campus network and is one of the Internet's leading security experts. Here, he talks about Privacy Enhanced Mail (PEM), the difficulty of policing the Internet, and whether horses or computers are more useful to criminals.

John Romkey has been a long-time TCP/IP developer and was recently named to the Internet Architecture Board. In this wide-ranging interview, John talks about the famous "ToasterNet" demo at InterOp, what kind of Internet security he'd like to see put in place, and what Internet applications of the future might look like.

#### John Perry Barlow Notable Speeches of the Information Age

USENIX Conference Keynote Address San Francisco, CA; January 17, 1994 Duration: 1.5 bours, ISBN 1-56592-992-6

John Perry Barlow—retired Wyoming cattle rancher, a lyricist for the Grateful Dead since 1971— holds a degree in comparative religion from Wesleyan University. He also happens to be a recognized authority on computer security, virtual reality, digitized intellectual property, and the social and legal conditions arising in the global network of computers.

In 1990 Barlow co-founded the Electronic Frontier Foundation with Mitch Kapor and currently serves as chair of its executive committee. He writes and lectures on subjects relating to digital technology and society and is a contributing editor to *Communications of the ACM*, *NeXTWorld*, *Microtimes*, *Mondo 2000*, *Wired*, and other publications.

In his keynote address to the Winter 1994 USENIX Conference, Barlow talks of recent developments in the national information infrastructure, telecommunications regulation, cryptography, globalization of the Internet, intellectual property, and the settlement of Cyberspace. The talk explores the premise that "architecture is politics": that the technology adopted for the coming "information superhighway" will help to determine what is carried on it, and that if the electronic frontier of the Internet is not to be replaced by electronic strip malls, we need to make sure that our technological choices favor bi-directional communication and open platforms.

Side A contains the keynote; Side B contains a question and answer period.

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# ENHANCED NCSA MOSAIC

*The Mosaic Handbook for the Macintosh* includes Enhanced NCSA Mosaic, a commercial version of the NCSA Mosaic browser available on the Internet. Developed by Spyglass, Inc., under arrangement with NCSA, Enhanced NCSA Mosaic maintains a consistent feature set across Windows, Macintosh, and X Window System platforms, a first for the Mosaic world. As a commercial version, Enhanced NCSA Mosaic is more reliable and faster, the result of improvements made to the original NCSA Mosaic code. This version of Enhanced NCSA Mosaic has been customized with the addition of a *GNN* Menu that offers easy access to *GNN*'s publications.

Enhanced NCSA Mosaic for the Macintosh features a number of improvements over the original NCSA version, including:

- Much improved reliability
- Dramatically faster performance
- Reduced memory requirements—one-half to one-third the memory previously required
- Easier installation
- Support for printing
- · Simplified interface for easier browsing
- Support for forms, allowing two-way communication between users and Web servers
- · Proxy gateway support for security in networked environments
- Online help system

The Mosaic Handbook Home Page, also included on the accompanying disk, makes using Mosaic even easier. Just point and click to go to the *Global Network Navigator*, the Mosaic Handbook Hotlist (an online guide to all the servers mentioned in this book), and Mosaic Support (an online support center for technical support and software updates.)

The enclosed disk contains native Power Macintosh software, which also runs on 68K-based Macs. To install, insert the disk in your floppy drive and drag the Mosaic folder to your hard drive. Do not place the Mosaic folder inside any other folders. Internet

# THE MOSAIC HANDBOOK

### for the Macintosh

Mosaic is changing the face of the Internet. Forget about the Net being hard to use. Forget about command-line interfaces. Developed at the National Center for Supercomputing Applications (NCSA), Mosaic brings hypertext, graphics, formatted text, and multimedia together in one easy-to-use application.

Using Mosaic, you are about the enter the World Wide Web—a strange and fascinating land of hypertext, color graphics, digital video, interactive maps, and other cool stuff. Follow its strands and you'll wind a path through underground music archives, online art exhibits, online newspapers and magazines, movie servers, a warehouse of scientific knowledge, up-to-the-minute weather maps and traffic reports, interactive servers, and much more.

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The GNN Home Page

The Mosaic Handbook for the Macintosh is your guidebook to this world. We not only show you how to use Mosaic, we take you on a tour of some of the varied sites on the Web, focusing on the *Global Network Navigator*, O'Reilly & Associates' pioneering Internet publications center.

In addition, *The Mosaic Handbook* explains how to use Mosaic instead of traditional Internet tools and how to view multimedia documents, such as digital video, audio, and full-color graphics.

You'll learn how to compose HTML (the format for World Wide Web documents) and create a home page complete with links to other servers. We also show you a glimpse of the future of the World Wide Web.

Best of all, *The Mosaic Handbook* comes with Enhanced NCSA Mosaic on disk, a commercial version of NCSA Mosaic that improves upon what's available on the Internet. The disk also contains the Mosaic Handbook Home Page, with links to all of the servers mentioned in the book.







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