Internet Starter Kit

for Macintosh Fourth Edition

Internet Starter Kit for Macintosh Fourth Edition

Adam C. Engst

Internet Starter Kit for Macintosh, Fourth Edition

Library of Congress Catalog Number: 96-75906
ISBN: 1-56830-294-0

Printed in the United States of America 1 2 3 4 5 6 7 8 9 0

Warning and Disclaimer

This book is sold as is, without warranty of any kind, either express or implied. While every precaution has been taken in the preparation of this book, the authors and Hayden Books assume no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information or instructions contained herein. It is further stated that the publisher and authors are not responsible for any damage or loss to your data or your equipment that results directly or indirectly from your use of this book.

Publisher
Lyn Blake

Publishing Manager
Laurie Petrycki

Managing Editor
Lisa Wilson

Development Editor
Steve Mulder

Copy/Production Editor
Kevin Laseau

Technical Editor
Tonya Engst

Publishing Coordinator
Rosemary Lewis

Cover Designer
Sandra Schroeder

Book Designer
Sandra Schroeder

Manufacturing Coordinator
Brook Farling

Production Team Supervisor
Laurie Casey

Production Team
Kim Cofer
Terrie Deemer
Tricia Flodder
Beth Rago
Erich Richter
Christy Wagner

Indexer
Tim Griffin

Dedication

As always, I dedicate this book to my lovely and talented wife, Tonya, to whom I continue to dedicate both this book and my life.

I'd also like to dedicate this book to the memory of my friend and business partner, Herb Effron, who passed away unexpectedly during the final weeks of writing. His enthusiasm for helping others will always remain infectious.

About the Author

Adam C. Engst is the editor and publisher of *TidBITS*, a free electronic newsletter distributed weekly on the Internet to over 150,000 readers. After graduating from Cornell University with a double major in Hypertextual Fiction and Classics, he worked as an independent consultant in Ithaca, New York, where he started *TidBITS* in April of 1990. He now lives in the Pacific Northwest with his wife, Tonya, and cats, Tasha and Cubbins, but seems to spend most of his time corresponding via electronic mail with friends and associates around the globe.

He has written or coauthored numerous Internet books and magazine articles, has collaborated on several Internet videos, and has appeared on a variety of local and national television and radio shows. On the Internet he continues to participate in a number of mailing lists, is the Assistant List Mom on the Apple Internet mailing lists, and is an InfoMac moderator. To people who ask how he manages to do so much (he wishes he knew), he generally replies that he's actually only a clever artificial intelligence.

Like anyone who attempts to condense the immensity of the Internet into a single book, he is certifiably crazy. His favorite quote (which reportedly comes from Apple Fellow Alan Kay) is, "The best way to predict the future is to invent it."

Trademark Acknowledgments

Acknowledgments

Many people have helped me throughout the writing of this edition and with previous editions of the book. I especially want to thank my wife Tonya, who not only helped out by working on several chapters and editing everything but also put up with me during the final few weeks of each edition, which is not a task for the faint of heart.

Thanks as well to my mother, who now runs her own Web server, and my father, who has become quite the late-night Internet denizen. I'd also like to thank all the readers of *TidBITS* because they have kept me going these last six years. Finally, thanks to the many readers and supporters of the previous editions of *Internet Starter Kit for Macintosh*. Word of mouth goes a long way, and the book wouldn't have lasted nearly this long without such support from so many individuals in the Internet community.

If I've forgotten anyone, my sincere apologies. Please accept my absent-minded thanks.

Surrogate Editors

Thanks are due to the many people who helped edit portions of this and previous editions of the book and those who either provided me with information or helped test the Internet Starter Kit Installer. I wish only that I had room to give everyone the full credit they deserve.

Alan Oppenheimer, Alwin Li, Amanda Walker, Andrew Green, Barbara Maxwell, Bill Cockayne, Bill Dickson, Bill Gram-Reefer, Bill Lipa, Brad Miser, Brian Hall, Cary Lu, Chad Magendanz, Chuck Shotton, Chuq Von Rospach, Cory Low, Dave Reiley, Dave Winer, David Rogelberg, David Thompson, Demitri Muna, Draper Kauffman, Drummond Reed, Erik Speckman, Geoff Duncan, Glenn Fleishman, Gordon Watts, Guy Kawasaki, Gwenne Lally, Herb Effron, Igor Livshits, Jason Snell, Jeff Needleman, Jeffrey Veen, Jennie Gilmore, Jim Matthews, John Baxter, John Hardin, John Norstad, John Werner, Jonathan Lundell, Jud Spencer, Kee Nethery, Ken Landau, Ken Stuart, Larry Blunk, Laurent Humbert, Laurie McGuire, Len MacDonell, Leonard Rosenthol, Mark H. Anbinder, Mark McCahill and the Gopher Team, Mark Williamson, Michael Tardiff, Michael Wellman, Mikael Hansen, Mike Simon, Paul Celestin, Pete Resnick, Peter Lewis, Quinn, Richard Ford, Rick Watson, Robin Littlefield, Roger Brown, Roger Jacobs, Ross Scott Rubin, Roy Wood, Roz Ault, Sandro Menzel, Scott Gruby, Scott Pinzon, Sky Dayton, Steve Dagley, Steve Dorner, Steve Mulder, Steve Worona, Tonya Engst, Werner Uhrig, Will Mayall, Marshall Clow, Galen Magendanz, and Andrew Nielsen.

Software Thanks To…

Although I don't have room to acknowledge individually the programmers of all the software I mention in the book, I do want to thank those who graciously allowed me to include their programs in the Internet Starter Kit Installer, including the following:

Leonard Rosenthol and all the folks at Aladdin Systems, for StuffIt Expander

Garry Hornbuckle, Richard Ford, and the MacTCP and Open Transport teams at Apple Computer, for MacTCP and making Open Transport possible

Steve Dagley, Rick Reynolds, and the rest of the FreePPP Group, for FreePPP

Peter Lewis, for Anarchie

Peter Lewis, again, and Quinn "The Eskimo!", for Internet Config

Steve Dorner and Qualcomm, for Eudora Light

Mr. Bill and Microsoft Corporation, for Microsoft Internet Explorer for the Macintosh

Other Invaluable Aid Provided by...

Ed Morin, Ralph Sims, and everyone else at Northwest Nexus for technical assistance above and beyond the call of duty and for providing my Internet connections

Paul Celestin, for creating and maintaining the Providers of Commercial Internet Access list

Geoff Duncan, for creating the *Internet Starter Kit for Macintosh* Web page

Mike Farr, for creating the Internet Starter Kit Installer

And finally, Tonya Engst, for writing Chapter 22, "Create Your Own Web Site," updating Chapter 4, "Step-by-Step Internet," and for just generally being wonderful

Hayden Books

The staff of Hayden Books is committed to bringing you the best computer books. What our readers think of Hayden is important to our ability to serve our customers. If you have any comments, no matter how great or how small, we'd appreciate your taking the time to send us a note.

You can reach Hayden Books at the following:

Hayden Books
201 West 103rd Street
Indianapolis, IN 46290
(800) 428-5331 voice
(800) 448-3804 fax

Email addresses:

America Online: Hayden Bks
Internet: `hayden@hayden.com`

Visit the Hayden Books Web site at `http://www.hayden.com/`

Contents at a Glance

Table of Contents

What's Inside

Before anything else, please believe me when I say that this book is not a manual to be ignored after you've ripped the CD-ROM from the back cover and stuffed it in your Macintosh. Using the Internet is not like using a word processor. There are some quirks and confusions that I explain, but they might frustrate you to no end if you don't bother to read the sections about using the different programs. Also, if you don't bother to read the instructions provided for, say, connecting to an Internet provider, and then you call the provider for help, you cannot expect the people there to be happy about explaining over the phone what I've already explained in the book.

That said, I want to tell you a little about how I designed *Internet Starter Kit for Macintosh*, because I think it will help you make the most of the book in the limited time that we all have. As with any broad subject, some parts of the Internet won't interest you in the slightest, and that's fine. However, I feel that it's important to cover many of these topics even if they won't interest all of my readers. So, let's look quickly at each of the five parts that make up this book, and I'll tell you what to expect.

Part I: Getting Connected

This part of the book is comprised of five chapters that help you install the software on the Internet Starter Kit CD-ROM and set up your Internet connection. Chapter 1, "The Right Stuff," looks at the hardware and software requirements necessary for connecting to the Internet. Chapter 2, "Choosing a Connection," helps you figure out which Internet service provider to use, especially if you have multiple choices in your area. Chapter 3, "Installing the Software," walks you through installing all the Internet software you need from the Internet Starter Kit CD-ROM, and Chapter 4, "Step-by-Step Internet," guides you through configuring and using the main Internet programs that I recommend.

I hope you never have to read Chapter 5, "Things that Go Bump in the Net," because it provides answers to the most common (and many uncommon) problems related to your Internet connection. However, the other chapters in this section are more important for everyone to read.

Part II: Internet Essentials

Once you've installed all the software and set up your Internet connection with a provider, you come to Part II, "Internet Essentials." Chapter 6, "What Is the Internet?" answers that difficult question, and Chapter 7, "What Can You Do on the Internet?," goes further by providing some real-life examples of how the Internet can work for you. Chapter 8,

"Internet Past, Present, and Future," takes a spin through the history of the Internet, looks at the major issues confronting the Internet and Internet users today, and peers into the crystal ball to make some predictions about what we'll see in the future.

As much as those three chapters provide useful information, Chapter 9, "Addressing and URLs," and Chapter 10, "File Formats," are required reading. You simply cannot get by on the Internet without knowing how all the addressing works, and similarly, you'll have major problems trying to download and upload files if you ignore the information about the many different file formats used on the Internet.

Part III: Using the Internet

This section of the book is the largest, but you don't need to read straight through it. Each chapter looks at a different way of using the Internet, first providing background information and then reviewing the software programs you can use to access those services.

Chapter 11, "Open Transport and MacTCP," walks you through the configuration and usage of both Open Transport and MacTCP, and Chapter 12, "PPP and SLIP," does the same for FreePPP. Chapter 13, "All About Email," is probably the most important of these chapters because it contains a wealth of information that will help you learn how to interact with others on the Internet. Plenty of technical information is present as well, as it is in the other chapters. Chapter 14, "All About Usenet News," covers the wide world of Usenet news; Chapter 15, "All About FTP," looks at the main way you transfer files on the Internet; and Chapter 16, "All About the World Wide Web," discusses the part of the Internet that sees the most action these days, the World Wide Web.

Along with those four important chapters come two that review less commonly used types of Internet software. Chapter 17, "Real-Time Communications," looks at the many different ways of interacting with other people in real time on the Internet, ranging from typing to one another to full telephone-like conversations and games. Chapter 18, "Utilities and Miscellany," as you might expect, reviews all the other random pieces of Internet software. These two chapters are worth reading, but aren't as necessary as the previous four.

Finally, Chapter 19, "Commercial Services," uses much the same format as the other chapters about software, but concentrates instead on the two main commercial services: America Online and CompuServe. If you don't use or plan to use either of these commercial services, feel free to ignore Chapter 19.

Part IV: Making More of the Net

Part III of the book is devoted to helping you use the various Internet services and the software that help you access them. In contrast, Part IV, "Making More of the Net," takes the next step. Chapter 20, "Finding Things on the Internet," provides techniques for finding almost anything on the Internet and reviews the main tools available for searching the Internet. I strongly recommend you read Chapter 20 and play the scavenger hunt at the end of the chapter. Chapter 21, "Macintosh Internet Resources," does for the Macintosh what you may wish to do on your own for other subjects. It reviews the best Macintosh Internet resources available, complete with pointers to the sites and discussion groups.

Chapter 22, "Create Your Own Web Site," could almost be its own book. It seems that everyone wants to make Web pages these days, and Chapter 22 tells you everything you need to know to create Web sites. It even reviews the main software you can use to make the task easier. If you're interested in making your own Web page, Chapter 22 is a must-read.

Chapter 23, "Set up Your Own Server," is even more rarefied, because it provides information about how to set up a Macintosh as an Internet server and reviews the main server software that's available. If you're not sure what a server is, why you might want one, or the like, don't worry about reading this chapter. After you've been on the Internet for a while, the topic may pique your curiosity more and you can come back to it.

Appendices

The final part of this book is a collection of appendices for browsing and skimming.

Appendix A, "Internet Starter Kit Providers," lists providers for whom we have included custom configurations on the Internet Starter Kit CD-ROM so that you can use the Internet Starter Kit Installer to configure your Macintosh to work with any of them. This is by far the easiest method of configuring a Mac for a specific provider!

Appendix B, "Providers of Commercial Internet Access," comes from the Celestin Company; it is a large list of Internet providers around the world—complete with telephone and email contact information. If none of the providers listed in Appendix A is appropriate for you, browse through this list (it's sorted by area code and country) to find another provider that might better meet your needs.

Appendix C, "Glossary," briefly explains some of the common terms and acronyms that you're guaranteed to run into on the Internet.

Last, but not least, comes the ever-popular index.

Special Formatting

There are a few special formats that I've used throughout the book. Email addresses, Usenet newsgroup names, machine names, and URLs all appear in a monospaced font, like `info@tidbits.com` and `<http://www.tidbits.com/>`. For the most part, ignore normal sentence punctuation that comes after anything in the monospaced font. Also, for URLs like the last one, ignore the angle brackets (< and >) around the address.

Commands that you type into a dialog box appear in **bold**, and if you should replace the example shown with your own information, it's shown in ***bold italic***.

Finally, I use two types of notes, FYI notes and BTW notes. FYI stands for "For Your Information," and BTW stands for "By The Way." Both are common abbreviations on the Internet, which is why I co-opted them for the book. They each have their own style, as you can see by the following examples.

FYI
FYI notes contain important information that you should be sure to read.

BTW
BTW notes contain asides, or comments about something that's not all that important. You might find useful information in a BTW, but it won't be essential.

Introductions

Before you launch into the Internet with the next few chapters, let's introduce ourselves.

Who Are You?

I haven't the foggiest idea who you are. That's not true, actually; I can make a couple of guesses. You are probably a Macintosh user, and you're probably also interested in the Internet; otherwise, I'm not quite sure why you've picked up this book—allow me to recommend anything by Italo Calvino over in the fiction section of the bookstore. Given those minor prerequisites, this book and the entrance to the Internet that it gives should provide hours of educational entertainment, just like Uncle Milton's Ant Farm. The major difference is that the Internet Ant Farm is worlds bigger than Uncle Milton's, and if you go away on vacation, all the Internet ants won't keel over—although you might be tempted to do so when you get back and see how much you have to catch up on. The Internet never stops.

I've written this book for the individual, the person behind that most personal of personal computers, the Macintosh. I'm aiming at ordinary people who have a Macintosh, a modem, and the desire to start using the Internet. After all, those three items—a Mac, a modem, and some desire—are all you really need, along with this book and the software that comes with it, to access the Internet.

Who Am I?

The more time I spend on the Internet and the older I get, the more I realize that people are interested in the lives of other people. I'll limit myself to a few autobiographical paragraphs, but I think it's only fair that you know a bit about the person who wrote the book you hold in your hands. I started using computers in grade school and had my first experience with a computer network while playing a game called Adventure over an acoustic modem (an old type of modem that required you to stuff the telephone receiver into the modem's rubber ears) on a computer that my uncle used in New York City. I used microcomputers throughout high school, but upon entering Cornell University I learned to access some of the precursors of the Internet, and toward the end of my four years at Cornell, the Internet itself.

After graduating from Cornell in 1989, I figured out how to set up my own Internet access using my Macintosh. In 1991, my wife and I moved from Ithaca, New York, to the Pacific Northwest. In the process, I learned even more about finding access to the Internet, a task that was far harder then than it is today. In many ways, the Internet kept me sane those first few months away from all of our friends and family. The ways I've used the Internet have changed numerous times over the years, both in terms of the ways that I connected and the activities in which I participated, but the Internet remains an extremely important part of my daily life.

Throughout this Internet odyssey, I've used the Internet for fun, socializing, and general elucidation. In the last six years, I've also written and edited a free weekly electronic newsletter called *TidBITS*. It focuses on two of my favorite subjects: the Macintosh and the Internet. *TidBITS* is both a product and a citizen of the Internet. It has grown from a 300-person mailing list that crashed a Navy computer running old mail software to an electronic behemoth that boasts an estimated 150,000 readers in almost 100 countries.

I've also spent the last three years researching, writing, and editing various versions and editions of *Internet Starter Kit for Macintosh*. The book has evolved and grown along with the Internet and is now in its fourth edition. The fourth edition differs a great deal from the previous editions, thanks in large part to the Internet, which has changed sufficiently in the last three years that I had to reorganize the book to accommodate the realities of today's Internet.

The various editions of *Internet Starter Kit for Macintosh* distinctly changed my life for the better. I've been asked to speak at conferences, interviewed through email and on the radio, filmed for TV, and fed food that was pre-chewed for my convenience by weasels on interminable cross-country airplane flights. But the reason I put up with all the hassle is that I truly love the Internet and believe that it's worth preserving, protecting, building, and explaining. If I can infect others with my enthusiasm for the Internet through this book, I think the world becomes a better place. And that's the goal in the end.

Enough about me—let's move on to Chapter 1, "The Right Stuff," and start the Internet adventure.

ADAM C. ENGST

June, 1996

PART I

Getting Connected

This part of the book is comprised of five chapters that help you install the software on the Internet Starter Kit CD-ROM and set up your Internet connection. The first four are important for most people to read, and the fifth provides useful information should you have trouble making an Internet connection.

- Chapter 1, "The Right Stuff," looks at the hardware and software requirements necessary for connecting to the Internet.
- Chapter 2, "Choosing a Connection," helps you figure out which Internet service provider to use, especially if you have multiple choices in your area.
- Chapter 3, "Installing the Software," walks you through installing all the Internet software you need from the Internet Starter Kit CD-ROM.
- Chapter 4, "Step-by-Step Internet," guides you through configuring and using the main Internet programs I recommend.
- Chapter 5, "Things that Go Bump in the Net," provides answers to the most common (and many uncommon) problems related to your Internet connection.

Chapter 1 The Right Stuff

Contents:

- Hardware
- Software
- Requirement Checklist

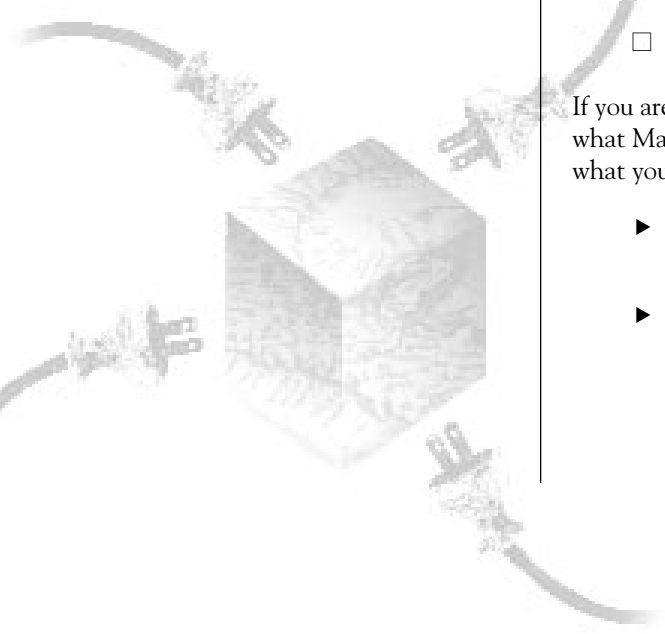
I know you're dying to get started and connect to the Internet, but I think the information that follows will significantly increase your chances of connecting quickly and without trouble. Quite simply, you need a few things to be able to connect to the Internet.

For those of you who are more technically savvy, run through the checklist below, and if your system meets the requirements, feel free to skip to the next chapter about choosing an Internet connection.

- ☐ Macintosh with a 68020 chip or later
- ☐ 8MB of RAM; preferably 12MB or more
- ☐ 15MB of free hard disk space or more
- ☐ CD-ROM drive
- ☐ Modem, ISDN connection, or network connection
- ☐ System 7.1; preferably System 7.5.3 or later

If you aren't sure what you have or don't know why it matters what Macintosh you have, read on for an explanation of what you need to access the Internet and why.

- First, you need this book, of course. But beyond that…
- You need a Macintosh. That's not absolutely true because you can use any sort of computer to access the Internet. (For those of you who may also use a PC, check out *Internet Starter Kit for Windows* or *Internet Starter Kit for Windows 95* from Hayden Books.) I talk about the details of the necessary Mac configuration later in this chapter.



- You need System 7.1 or, preferably, System 7.5.3 or later. If you need to upgrade, talk to your Mac dealer.
- You need some type of physical connection to the Internet, be it a modem, an ISDN modem, or a connection to a network at work or school that's connected to the Internet.
- You need an account with an Internet service provider. In Chapter 2, "Choosing a Connection," I discuss how to find an appropriate account for your needs.
- You need a certain level of computer experience. It's hard to quantify, but the Internet is not for the Macintosh novice. If you don't know the difference between a menu and a window or haven't figured out how to tell applications and documents apart, I recommend that you visit your local Macintosh user group and ask a lot of questions. A number of excellent books are also available. My favorites are *The Little Mac Book* by Robin Williams and *Macworld Mac and Power Mac Secrets, Third Edition* by David Pogue and Joseph Schorr.
- Finally, you may need to adjust your expectations. The Internet is not a commercial service such as America Online or CompuServe. Customer service representatives are not available through a toll-free call 24 hours a day. Most people on the Internet have taught themselves enough or have been shown enough by friends to connect to the Internet. The Internet is very much a learning experience; even with as much information and guidance as I provide in this book, there's no way to anticipate every question that might come up. The Internet is what you make it—so don't be shy. No one greets you on your first dip in, but at the same time, people on the Internet are some of the most helpful I've ever had the pleasure to know. If you are struggling, just ask and someone almost always comes to your aid. I wish that were true outside of the Internet as well.

Bear with me briefly then, as I cover the basic hardware and software requirements for installing the software and connecting.

Hardware

You need two pieces of hardware to make a connection to the Internet: a Macintosh and a modem or other communications device.

Macs

There are four parts of the Macintosh you should evaluate when deciding if your Macintosh can use the software in this book to connect to the Internet. First is the CPU chip, the central processing unit that is the heart of the computer. Second, you need

enough RAM to run the Internet software. Third, you need enough hard disk space to store these programs. Fourth, you need a CD-ROM drive to be able to load the software that comes with this book.

CPU

Although it's possible to use any system from the Macintosh Plus on up, the way software has grown dictates that you will be happiest if you have a Macintosh based on the 68030 CPU or anything later. Luckily, relatively few models of the Mac were based on chips before the 68030, so it's quite easy to tell if you have one (see Table 1.1).

Table 1.1 Macintosh Models with Chips Before the 68030

Mac Model	Chip Type
Macintosh 128	68000
Macintosh 512 (Fat Mac)	68000
Macintosh 512Ke	68000
Macintosh Plus	68000
Macintosh SE	68000
Macintosh Classic	68000
Macintosh Portable	68000
Macintosh PowerBook 100	68000
Macintosh II	68020
Macintosh LC	68020

For a few different reasons, these machines do not work well when accessing the Internet.

- Macs based on the 68000 chip are quite slow in comparison to more modern computers. Sometimes this performance problem is manageable, but with Internet software and modem communications, it may be more trouble than it's worth.
- Most of these machines can't accept much RAM (all the models in the list up to the Macintosh Portable are limited to 4MB or less). Modern Internet software requires a lot of RAM. In some cases, as with Netscape Navigator, the program requires more than twice as much RAM as can be installed in these computers.
- All Macs based on the 68000 chip lack something called Color QuickDraw (they also all lack color monitors). The lack of Color QuickDraw becomes a significant liability because most graphics that you run into on the Internet are color, and thus the programs used to view those graphics require Color QuickDraw. The end result is

that although you might be able to browse the Web using a Mac Plus, you won't be able to see graphics. The Macintosh II and Macintosh LC, which use the 68020 chip, include Color QuickDraw and support color monitors, so this liability doesn't apply to them.

- For the most part, these models of the Macintosh are running version 6.0.8 or earlier of the Macintosh System software. A lot of Internet software now requires at least System 7.1 and prefers System 7.5.3. Running any version of System 7 on some of these Macs can be disappointing.

If you were wondering, all Macs based on the PowerPC chips, which includes all the Power Macs and all the Performas with four-digit model numbers, will work fine. Those machines have more than enough power, and the only thing you should keep in mind is that you want to find software that's either PowerPC-native or "fat binary," which means that it contains code for both the PowerPC chip and for the 680x0 chips used in older Macs.

RAM

If you have a model of the Macintosh that's not in Table 1.1, you can run almost all Internet software, assuming you have enough RAM. RAM requirements vary widely among programs, so you might find one program that requires only a few hundred kilobytes of RAM, whereas Netscape Navigator, outfitted with all the whizzy enhancements you can download, might like 8MB or more for itself.

You can tell how much RAM you have installed in your computer by choosing About This Macintosh from the Apple menu when you're in the Finder. If your Mac is based on the 68030 chip and you're running System 7 or later, you can increase the amount of RAM available by using Virtual Memory (open the Memory control panel to turn on Virtual Memory, which uses hard disk space to simulate RAM). You can also purchase an inexpensive utility from Connectix called RAM Doubler that makes your Mac believe it has twice as much RAM. Both Virtual Memory and RAM Doubler merely simulate RAM using special techniques and by using hard disk space. Therefore, they aren't nearly as good as having real RAM, but can provide a welcome respite until you can add real RAM to your Mac.

How much RAM do you need? 4MB is the absolute minimum; any less than that and you won't have enough free RAM to launch any programs. Virtual Memory or RAM Doubler is essential with 4MB of RAM, but plan to buy more RAM when you can. 8MB is probably a realistic minimum, especially if you also use RAM Doubler or Virtual Memory. I personally recommend 12 or 16MB as a comfortable level, and having 20 or 24MB ensures that you will be able to run all the Internet programs you want at the same time without trouble.

> **FYI**
> Virtual Memory and RAM Doubler can cause problems, and although they work well for me, if you experience strange crashes, try turning them off.

Hard Disk

It's difficult to say exactly how much hard disk space you need for your Internet software, since it varies greatly depending on what you want to do and how much of a pack rat you are. I'd say that about 10MB of free space on your hard disk is the absolute minimum, so those of you with older Macs that came with 40MB or 80MB hard disks might consider purchasing a new hard disk.

On the upper end, though, any new Mac will be fine. If you assume that there aren't many people who keep more Internet software or email than I do, keep in mind that I currently have 160MB of stored email and 140MB of Internet software on my hard disk (hey, I have to test all the stuff I write about!). That's 300MB, which seems like a lot, but most Macs these days come with 500MB hard disks minimum. I doubt most people could use more than 100MB of hard disk space even if they tried. I'm a professional pack rat, and as long as I have the hard disk space, I'm going to use it.

CD-ROM

With this fourth edition of *Internet Starter Kit for Macintosh*, I decided to include all the software on CD-ROM rather than on a disk. The reason is simple. Because of the size of the software involved, it would have taken at least four disks to give you the basic software. Since a single CD-ROM is only slightly more expensive to produce than one disk, it made economic sense to include a CD-ROM instead. In addition, the extra space on the CD-ROM enabled me to provide many other Internet programs that I could never have put on disk.

The downside of putting the software on a CD-ROM is that not all Macintosh users have a CD-ROM drive. They're included with all new Macs, but not with PowerBooks or older Macs. If you don't have a CD-ROM drive in or attached to your Macintosh, you have several choices.

- Buy one. They're really quite useful these days, if only for installing software, since you put in one CD, double-click one installer icon, and walk away while it works, rather than sit and feed disks to your Mac for 20 minutes. CD-ROM drives cost somewhere between $150 and $400, depending on the model and the dealer.

> **FYI**
> I recommend Apple CD-ROM drives over third-party drives because the software that comes with third-party CD-ROM drives tends to cause trouble for Internet connections.

- Find a friend who has a CD-ROM drive and copy the disk installer files (for either 800K disks or 1.4MB disks) from the CD to disks, and then install the software on your Mac through the disks. Obviously, you won't easily be able to take advantage of the other software on the CD-ROM with this option.

- If you or a friend can download a very large file from the Internet (if, for instance, you have an America Online account and want to move to an Internet account), contact me through email at ace@tidbits.com.

Modems and Other Internet Connections

Enough about the Macintosh. The vast majority of Macs that are in use today will work fine, but you also need some method of connecting to the Internet. The most common piece of hardware that makes this possible is the modem, which is an acronym for modulator-demodulator (glad you asked?), and it enables your computer to monopolize your phone line, much like a teenager. There are two other possible ways that you might connect to the Internet. First, you can use a digital phone line service called an ISDN (Integrated Services Digital Network) along with specific ISDN hardware. Second, if you study or work at an institution that has already attached all of its computers to the Internet through a network, then that network provides your Internet connection.

Modems

It's beyond the scope of this book to tell you what sort of modem to buy, but most reputable modem manufacturers make fine modems with long or lifetime warranties. Some companies sell extremely cheap modems that work fine in most cases, but you may also get what you pay for.

The big names in the Macintosh modem world, including Global Village, Supra, and U.S. Robotics, all sell good modems. I've used modems from all of these companies, as well as modems from Telebit and Practical Peripherals, and for the most part they've performed well. Global Village's modems are notable for being the most Macintosh-specific, since most external modems work equally well on the Mac and on a PC. However, that doesn't mean that you don't want to buy a Macintosh-specific modem bundle, because Macs and PCs use different cables to connect the modem to the computer, and you must have the appropriate Macintosh cable.

FYI

If, for some reason, you've acquired a modem that was originally sold for a PC and you need a cable to hook it to your Macintosh, ask specifically for a "hardware handshaking modem cable" at the computer store. Do not ask simply for a modem cable, since you might get something that doesn't work at high speeds.

There are only two modem options about which I would warn you. Certain models of the Macintosh (the 660AV and the 840AV, and some Power Macintosh models) can use a piece of hardware called the GeoPort Telecom Adapter. This device, made only by Apple, is not actually a modem, but works with special software that enables the before-mentioned

Macintosh computers to emulate a modem using just software. The GeoPort Telecom Adapter has a few problems. It works only at 14,400 bits per second (bps), which is half the speed of today's fast modems. A software upgrade that enables 28,800 bps speed is coming. Also, because the Macintosh emulates a modem in software, using the GeoPort Telecom Adapter slows down other tasks on the Mac. Finally, although I have no hard data, anecdotal evidence suggests that the GeoPort Telecom Adapter makes for a somewhat flaky modem. If you have one, and it works well for you, great, but I don't recommend that you buy one in favor of a real modem.

The second modem I'd warn you to stay away from is Apple's Express Modem, which, like the GeoPort Telecom Adapter, uses the Mac's CPU to emulate modem functions. It can be a bit flaky at times, but it's one of only two choices for the PowerBook Duos. (Global Village makes the more expensive PowerPort/Mercury Duo.)

Suffice it to say that you want the fastest standard modem you can lay your hands on, and as of this writing, the fastest standard means that you want a modem with the magic words "28,800 bps" (or 28.8 Kbps) stamped prominently on its box.

FYI

Although 14.4 Kbps modems are still common, I strongly recommend that you buy a 28.8 Kbps modem, given the choice. The only variable other than speed and price that I feel is important is a decent display—I like modems that tell you exactly how fast your connection is, since it often varies per call. A corollary to this is that I recommend avoiding internal modems for desktop machines (they're fine in PowerBooks), because you can't see the modem lights.

Modem manufacturers often make claims about maximum throughput being 57,600 bps or higher, but real speeds vary based on variables such as phone line quality and the load on the server. Except in laboratory situations and near black holes, modems never reach the promised maximum speed.

The main point to keep in mind is that it takes two to tango: The modems on either end of a connection drop to the slowest common speed (usually 2,400 bps) if they don't speak the same protocols. Just think of this situation as my trying to dance with Ginger Rogers—there's no way she and I could move as quickly as she and Fred Astaire did.

Actually, there are more caveats to the modem question than I'd like to admit. Modems work by converting digital bits into analog waves that can travel over normal phone lines, and—on the other end—translating those waves back into bits. Translation of anything is an inherently error-prone process, as you know if you've ever managed to make a fool of yourself by trying to speak in a foreign language.

A large percentage of the problems that I've seen people have since the first edition of this book were related to their modems. Modem troubles are exacerbated by the fact that modem manuals are, without a doubt, the worst excuse for technical writing that I've ever seen. They're confusing, poorly written, poorly organized, and usually concentrate on the

commands that the modem understands without providing any information as to what might go wrong. So, as much as I'd like to pretend that modems are all compatible, and that setting one up to communicate with an Internet service provider is a simple process, it may not work right away. If you encounter problems after first checking all the settings to make sure you've done everything right, you should then check your settings against those in your modem manual. It's also worth asking your Internet provider for suggestions on settings for your modem.

I can't tell you how unhappy I am to have written that last paragraph, but it's just how the world is. You probably didn't get a driver's license without passing a written test, practicing with an adult, taking Driver's Ed., and finally passing a practical test. Perhaps more relevant, you probably weren't able to find anything in a school library until one of the teachers or librarians showed you around. If your modem works on the first try, great! If not, don't get depressed. Instead, turn to Chapter 5, "Things that Go Bump in the Net," which solves many common modem problems. Not everything in this life is as easy as it should be. If it were, we'd have world peace.

Anyway, modems connect to phone lines, of course. Not all telephone lines are created equal, and you may find that yours suffers from line noise, which is static on the line caused by any number of things. Modems employ error-correction schemes to help work around line noise, but if it's especially bad, you might notice your modem slowing down as it attempts to compensate for all the static. When it's really bad, or when someone induces line noise by picking up an extension phone, your modem may just throw up its little modem hands and hang up. You can complain to the phone company about line noise; as I understand it, telephone lines must conform to a certain level of quality for voice transmissions. Unfortunately, that level may not be quite good enough for modems, especially in outlying rural areas, but if you're persnickety enough, you can usually make the phone company clean up the lines sufficiently.

ISDN

Modems use analog telephone lines. By an analog line, I mean one that converts sound into waves and transmits those waves. On the other end, a telephone converts the waves back into sounds. Despite the fact that they're connected to digital computers, modems use analog lines just like people do. The sending modem screams (literally) down the phone line, and the receiving modem decodes those screams back into the data from the sending modem. If you've ever picked up a ringing telephone and heard a harsh, raspy screech come out of the receiver, that's what a modem sounds like.

It may seem inefficient to convert bits from the computer into sounds, convert those sounds into electrical waves, send them down the phone line, convert them back into sounds, and finally convert those sounds back into bits. It is inefficient and accounts for one of the reasons that modems don't run any faster than 28.8 Kbps.

There's a relatively new technology offered by most phone companies called ISDN, which stands for Integrated Services Digital Network and which normally runs at speeds ranging

from 56 Kbps to 128 Kbps, depending on your setup. As you might suspect, ISDN lines are digital all the way. That doesn't mean that you can just plug one into your computer, since the format for sending data down an ISDN line is different from the ways that computers can output data. Despite being digital, ISDN lines use only a single pair of copper wires that come into your house or office, just like a normal analog telephone line. The difference lies in the hardware that the telephone company uses in its central office—that's what enables the line to be a digital connection.

The speed of ISDN lines is incredibly attractive, but the effort of configuring both the ISDN connection itself and the hardware necessary to use the connection is nontrivial. In addition, although ISDN is inexpensive for the speed that you get, it's often quite a bit more expensive than a normal phone line and modem connection.

To use an ISDN line, you need a device between your computer and the ISDN line. These devices are sometimes called "terminal adapters" or "ISDN modems." They're somewhat more expensive than normal modems, and there are fewer choices on the market today because ISDN hasn't been available for long. I've listed a few of the ISDN modems that I'm aware of in Table 1.2.

Table 1.2 ISDN Modems

Manufacturer	Model Name
3Com	Impact ISDN External Digital Modem
Motorola	BitSURFR and BitSURFR Pro
U.S. Robotics	Sportster ISDN 128K
ZyXEL	Elite 2864I

For the most part, using an ISDN modem is much like using a normal modem. However, getting a working ISDN line from the telephone company is much different. Even figuring out who to call at your local phone company to order an ISDN line can take some time.

FYI

The best way to find the right person at the phone company is to ask a local Internet service provider for the name of their phone company representative. While you're at it, make sure your Internet provider supports ISDN and doesn't charge usurious rates for it.

After you figure out how expensive the ISDN line will be (it varies widely from different telephone companies) and get the phone company working on installing it, additional hurdles remain. For instance, after three months of inactivity, US West, my local telephone company, proved incapable of providing me with an ISDN line where I currently live.

It can take some time to work out all the bugs in how the line is configured after it's installed. Since telephone companies have little experience with ISDN, fixing the problems can take longer than would seem reasonable. Perhaps more telling, although ISDN modems are in theory standardized, it turns out that not all of them will talk to your Internet provider's ISDN hardware properly. Many Internet service providers have a list of ISDN hardware that they've tested for this very reason.

As I write this in the spring of 1996, I recommend that you do not attempt to set up an ISDN connection until you have a normal Internet connection set up and working and have a good technical contact at your Internet provider. The level of technical expertise required for ISDN is much higher than that required for modem use, and in my opinion, you shouldn't worry about ISDN until you're comfortable with the Internet and telecommunications in general.

For more information about ISDN, after you have your Internet connection up and running, check out Dan Kegel's information about ISDN on the Web at `http://www.alumni.caltech.edu/~dank/isdn/`.

Networks

The final way you can connect a Mac to the Internet is via a network already connected to the Internet. A local area network (LAN) is simply two or more computers connected together with appropriate cabling and software. Macs are by far the easiest computers to network, so if your Mac is connected to another Mac (or even to most types of LaserWriter printers), you're on a network.

Most people have only one computer, of course, so you're only likely to have a network connection at a business or school where there are a number of computers that all exist on the same network. If you have access to such a network at work or school, and if it's already connected to the Internet, then you're lucky because you won't have to install or use as much software, you won't have to mess with a modem or ISDN modem, and finally, your connection will be much faster (up to 10 times faster, depending on many variables) than people who use modems.

It's extremely likely that if you have access to such a network, there will be a person who takes care of the network, often called the network administrator. You'll need to find that person and ask her for help because only she can help you configure your software for use on your specific network. Since I don't know how your network is set up or connected to the Internet, I can't tell you exactly how to configure your software (you'll read more about configuring your software in coming chapters).

There are several different types of networks, and each of them requires slightly different connectors. If your computer isn't currently connected to the network at work or school, you'll need the proper connector to connect your Mac to the network. Again, your network administrator can tell you exactly what piece of hardware you need and, depending on your situation, might be able to just give you the right connector.

Software

For the most part, you don't need much software to access the Internet because I've provided almost all the necessary pieces on the Internet Starter Kit CD-ROM included with this book. There is one notable exception, and that's Apple's System software, which comes with every Macintosh.

You might wonder why I raise System software as an issue if it comes with every Macintosh. The problem is that Apple constantly updates the System software, adding new features and fixing bugs, but doesn't always make it easy for users to get the new versions. In addition, Apple doesn't distribute major versions of the System software for free, so you might need to visit your dealer to purchase a copy.

The minimum version of the System software that will work with most of the Internet software I provide is System 7.1. Since then, Apple has made significant changes, culminating with the last major release, System 7.5. The current version of the System software is System 7.5.3, which is available as a free update for System 7.5 users from the Internet and other places (although it's a very long download). Check out Apple's Web site at `http://www.apple.com`.

If possible, I recommend you upgrade to System 7.5.3 or some version of System 7.5. There are some features in System 7.5, such as drag-and-drop (which enables you to drag text from one application to another, rather than use the Copy and Paste commands, for instance), that don't exist in previous versions of System 7, and Internet software increasingly takes advantage of these recent feature additions. Some Internet programs won't even launch unless you have System 7.5 or later.

If you have System 7.1, though, you can get started without bothering to upgrade. However, keep what I've said here in mind, and think about upgrading to the latest version of System 7.5 as soon as it's practical.

Requirement Checklist

In this chapter, I've covered the basic requirements that your Macintosh must meet in order to access the Internet. If you need to add hardware to your Mac, such as a modem or CD-ROM drive, consider flipping ahead to Chapter 6, "Internet Introductions," and coming back to this chapter after you have all the parts you need. Otherwise, here's the requirements checklist again; if you have all the parts and pieces, head on to the next chapter, "Choosing a Connection," where I talk about how you go about finding an Internet service provider.

- ☐ Macintosh with a 68030 chip or later
- ☐ 8MB of RAM; preferably 12MB or more
- ☐ 10MB of hard disk space or more
- ☐ CD-ROM drive
- ☐ Modem, ISDN connection, or network connection
- ☐ System 7.1; preferably System 7.5.3 or later

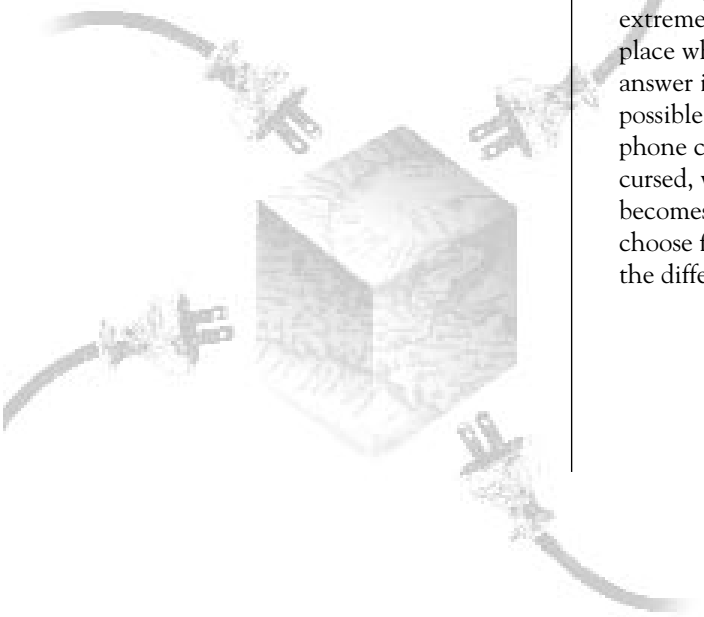
Chapter 2 Choosing a Connection

Contents:

When the time comes to start thinking about making your first connection to the Internet, the first question you must answer is, "Which Internet service provider should I work with?"

> FYI
> Just so I don't lose anyone, an Internet service provider, also called an Internet access provider or just an Internet provider, is a company you call with a modem to access the Internet. In the same way that you work with your local telephone company to access the worldwide telephone system, so too must you work with an Internet service provider to access the Internet. There is *no* way to access the Internet without an Internet provider—even Internet providers get their connections to the Internet from larger Internet providers.

Arriving at the proper answer to that question can be either extremely simple or somewhat difficult. If you live in a place where there is only one local Internet provider, the answer is quite easy—work with a local provider whenever possible because it's almost always cheaper to make a local phone call than to call long distance. If you're blessed, or cursed, with a multitude of Internet providers, the choice becomes more difficult. Although you may have more to choose from, you also have to spend more time figuring out the differences.



FYI
The easiest Internet service providers to use will be the providers listed in Appendix A, "Internet Starter Kit Providers," because the Internet Starter Kit Installer can automatically configure the connection software to work with those providers.

Connection Options

Many people are confused by the difference between accessing the Internet through a commercial information service such as America Online (AOL) or through a true Internet account from a local Internet service provider. Even more confusing, AOL and CompuServe now also offer true Internet connections. If you're considering using one of them for a true Internet connection, you should work through the variables in comparison to other local and national Internet service providers.

First, I explain what a true Internet connection is and why I think it's what you want. Then let's talk about the commercial information services that bombard you with disks containing their software (I currently have about 30 AOL disks and CDs). After that, I discuss how to choose among the many different Internet service providers.

In short, here are the advantages of a true Internet connection over the limited Internet connection you get with a commercial service such as CompuServe or AOL.

- Choice: With a true Internet connection, you can choose among literally hundreds of different programs. You can browse the Web using WebSurfer, Netscape Navigator, or Microsoft Internet Explorer, or, if you prefer, more than one of them at the same time. You can download files using Anarchie or Fetch, whichever you like better. With the commercial services, you're limited to the software they give you, which is generally lousy.

- Flexibility: Most new Internet technologies, such as those that provide real-time audio or video over the Internet, or that enable you to play multiplayer games over the Internet, work only over true Internet connections. You need a true Internet connection to be able to use the vast majority of Internet software. Future Internet technologies will also be available for true Internet connections first.

- Price: The commercial services generally offer several hours of use each month for free (actually for your monthly membership fee), and after that they charge you a certain amount per hour. For low usage, that's fine, but for high usage it gets expensive.

- Speed: The way that the commercial Internet services are set up, it often takes longer to download information through FTP or the Web. That's because they're serving many thousands of customers simultaneously and it's extremely difficult to throw

enough computing power and high-speed connections into the mix to make sure that everyone gets good performance.

True Internet Connections

In the next section, I compare, usually negatively, the commercial services to a true Internet connection. I don't think anything compares to a true Internet connection in terms of power, speed, flexibility, and often, cost. Here's the key thing to remember: With a true Internet connection, your Mac can speak the language of the Internet, TCP/IP, so you can access absolutely everything on the Internet. In contrast, the commercial services don't speak TCP/IP, so when you access the Internet through their software, what you can do on the Internet is limited.

First off, what is a "true Internet connection"? To explain this concept properly, I need to give you a little background. The Internet relies on certain standard protocols, which you can think of roughly as languages. Perhaps the most basic one is called TCP/IP (which stands for Transmission Control Protocol/Internet Protocol, but you need not worry about that). All standard Internet programs, including well-known programs such as Netscape Navigator, Eudora, Anarchie, NewsWatcher, and others, understand TCP/IP and can communicate over a TCP/IP-based connection.

You need certain pieces of low-level software on your Macintosh for it to be able to use TCP/IP connections. Originally a control panel called MacTCP made this possible, and older Macs with less memory should still use MacTCP. On newer, more powerful Macs, Apple has since replaced MacTCP with another piece of software called Open Transport. Don't worry, we'll cover all of this in more depth in Chapter 11, "Open Transport and MacTCP."

Roughly speaking, Open Transport and MacTCP are translators. They enable the Macintosh to speak TCP/IP. Normally, Macs use a protocol called AppleTalk over Macintosh networks. You must have either Open Transport or MacTCP installed and configured properly in order for programs such as Netscape Navigator and Eudora to work. Think of Open Transport or MacTCP as the Babel Fish from the *Hitchhiker's Guide to the Galaxy*. Pop one of them in your Mac's ear (parts of Open Transport and MacTCP live in various folders within the System Folder), and your Mac suddenly understands the Internet noise that flows in and out. The metaphor of speaking and languages isn't quite accurate because TCP/IP is actually a transport protocol, but the idea of Open Transport or MacTCP as a translator that translates Internet gibberish into a language the Mac can understand seems to be the best metaphor. Luckily, everything that these pieces of software do happens at such a low level that you never notice. In fact, after you set up Open Transport or MacTCP correctly, you should never notice that they're present.

Although you need Open Transport or MacTCP for your Mac to be able to use TCP/IP programs, neither of them actually create the connection to the Internet. For that you

need hardware: either a network directly connected to the Internet, or more commonly, a modem. If you have a modem, you also need software to help you interact with your modem. The software installed by the Internet Starter Kit Installer that configures and dials your modem is called FreePPP, and it uses another Internet protocol called PPP (Point to Point Protocol). There's another, older protocol, called SLIP (Serial Line Internet Protocol) for accomplishing much the same task. Few providers offer SLIP and not PPP, and PPP is the better choice. See Chapter 12, "PPP and SLIP," for more information.

The easiest way to understand PPP is to pretend that you don't have water service inside your house (see Figure 2.1). Every time you want to take a shower, you must run a garden hose out to the water hookup outside, take your shower, and then reel the hose back in. That's exactly what PPP does—it establishes a temporary, low-speed connection to the Internet. You must create that connection before you can run programs such as Anarchie and Netscape Navigator.

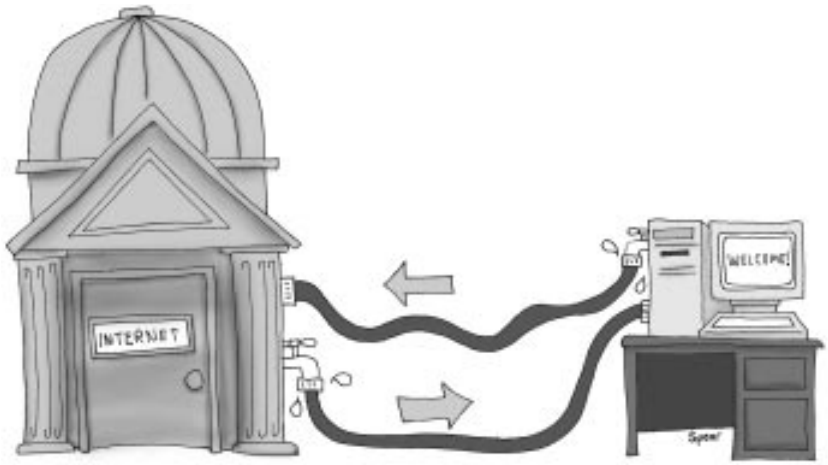


Figure 2.1 The Internet water pipe.

So, a true Internet connection is a connection that utilizes Open Transport or MacTCP and, if you're using a modem, a PPP program such as FreePPP to connect to another modem at your Internet provider's offices, and, through them, the Internet. I realize that I've gone into quite a bit of depth here, but it's important that you understand true Internet connections. After all, the vast majority of this book assumes you want a true Internet connection, provides the software to set one up, and helps you learn how to use some of the most popular pieces of software that require a true Internet connection.

Commercial Services

In my opinion, there are only a few reasons to choose a commercial online service such as America Online or CompuServe (there are a few others, such as Prodigy and MSN, but

only AOL and CompuServe are of any interest to Mac users) over a true Internet connection. First, if your area has a local number for the commercial service but doesn't yet have a local Internet provider, the costs of accessing the commercial online service might be lower than calling an Internet provider long distance. Read on to see what I say about how the costs work out, though, because the commercial online services charge by the hour after a certain number of free hours (they can also charge if you use certain services, and those costs aren't always as up front as they should be). It's easy to spend a lot of time on the Internet, and if you can make a local call to a commercial service, the per-hour fee that it charges after your free hours will probably be less than you would pay for a long-distance call anywhere.

The second reason for considering a commercial online service in favor of a real Internet connection is a bit hard for me to admit, given my Internet bias: It can be easier to set up an account with America Online than it is to configure the necessary software to communicate with a generic Internet provider, particularly one that isn't Mac-savvy. For instance, if for some reason you haven't received a disk from AOL in the mail, you can call an 800 number to get a copy of AOL's special software (see Chapter 19, "Commercial Services," for the details), and AOL offers tech support for its software. I feel that you pay for that initial ease of use (which isn't guaranteed—I've often had those automated signup processes fail in ways that would seriously confuse a beginner) with software that simply isn't up to snuff in comparison with what you can get for a true Internet connection. I receive quite a lot of email from people who have become frustrated by the limitations or costs of accessing the Internet through AOL or CompuServe and have opted for a true Internet account.

That's not to say that the commercial services don't meet a very real need. For instance, a few years ago, I gave my grandmother a Macintosh Classic for Christmas, and my sister gave her a modem. We set her up on America Online because it was a local call. She has some trouble using the AOL software, but she can usually manage to send and receive email from her many children and grandchildren (none of her great-grandchildren can type yet). America Online was the right choice for her, in large part because she's not interested in being on the Internet so much as being able to send and receive Internet email.

Finally, the commercial services all offer a great deal of information and files to download (although at this point there's far more information on the Internet, and the amount of information on the Internet increases far faster than on the commercial services). If you have no desire to explore beyond the walls of the commercial service, then by all means, don't bother! You shouldn't get on the Internet just because someone said you had to. You should want to get on because otherwise you'll probably convince yourself that the Internet is a waste of time. And, you'll be right—for you, the Internet will be a waste of time.

So, if you aren't particularly interested in the Internet and don't plan on spending much time online, you can't beat the commercial services for a combination of inexpensive access within your free hours each month and relative ease of use. Since you won't be using

the software much, the fact that it lacks important features and is hard to use isn't that important. For the most part, the software you use to access all the commercial services is at best mediocre (see Chapter 19, "Commercial Services," for details) and is more commonly lousy.

But enough about the differences between these two ways of connecting to the Internet. I assume from the fact that you bought this book over one that talks about the commercial services that you are indeed interested in using the Internet to its fullest, and from that, I can assume that you're going to want to find an Internet provider. I see two main variables in choosing an Internet provider—cost and service.

Cost

The first and, for most people, most important variable is cost. Unless you have more money than sense, it's not fun to throw money away unnecessarily. However, it can sometimes be difficult to determine the actual cost of your connection, especially if the provider has numerous little charges here and there and if you have to factor in telephone charges.

Flat-Rate Accounts

The first thing to look for is a flat-rate account, under which you pay a set fee every month, no matter how much time you spend connected. Some accounts aren't technically flat-rate, but have such a high upper limit, such as 120 hours each month, that they might as well be flat-rate. If you can get a flat-rate account, do it. They can't be beat for most people, and the lack of stress over how large your next bill will be is well worth it, in my opinion.

> **FYI**
> Some providers offer discounts if you pay for several months or even a year in advance—it's worth asking them if they have any such discount plans when you sign up. Of course, only sign up for such a discount plan if you think the provider will be in business that long.

Local Internet providers most commonly offer flat-rate accounts, since they operate in a more restricted market and can control their costs a bit more than a large national provider that provides access phone numbers in a number of cities around the U.S. Some national providers might also offer flat-rate access, and, if so, could be an excellent choice, especially if you travel a great deal and wish to access the Internet while away from home.

Restricted Flat-Rate Accounts

Some plans are flat-rate but come with some reasonable restrictions to prevent people from abusing the service. For instance, my provider, Northwest Nexus, has a two-hour-on, two-hour-off policy (you can spend two hours connected, after which you must disconnect for two hours before connecting again) that it enforces if necessary. Without such a policy, it would be easy for someone to connect and leave her modem connected all day, preventing anyone else from using the modem she is connected to at the provider's offices. Another restriction you may see is a policy of disconnecting connections that haven't had any traffic pass over them in a certain number of minutes. Sometimes this restriction can be a pain because, for instance, I can easily spend longer than ten minutes reading and then responding to a thoughtful message in Usenet news—all the time without sending any traffic.

FYI

If you have problems with your connection hanging up because of a too short timeout value, try setting Eudora to check your email every few minutes to force some traffic to go over the connection. This way, your connection won't quit, or timeout, because of a lack of activity.

I'd guess that most providers have some method of restricting their flat-rate accounts because otherwise it's too easy for people to abuse the service unnecessarily. If you're working for the entire time you're connected, that's fine, but leaving your modem connected because it's easier than dialing is plain rude.

Pseudo Flat-Rate Accounts

A number of providers don't offer straight flat-rate plans, but instead offer flat rates up to a certain number of hours. So, you might pay $30 for 60 hours of use, or something similar. After that hourly limit, the provider usually charges a few dollars per hour. Again, this rate system is designed to make sure that some people don't abuse the system to the detriment of other users. If the provider that you're considering uses such a system, you might want to ask if there's any way you can check to see if you're close to the time limit. In addition, I recommend asking what the policy is on isolated incidents in which, say, some emergency happens and you have to leave the computer suddenly while it's still connected, and it's still connected 12 hours later when you can get back. Most good providers will credit you with the time if it's a one-time occurrence.

FYI

You can set the software that actually makes the modem connection, FreePPP, to hang up the line after a certain amount of idle time. If you have a pseudo flat-rate account, I strongly recommend that you use this feature to prevent unnecessary charges.

Most national providers, including the true Internet accounts offered by the commercial services, fall into this category. If you decide that a national provider makes sense for you, especially if you travel a lot, then you should shop around to see which one has rates and policies that best fit your usage patterns. The number of flat-rate hours and the price per hour after that, combined with the locations throughout the country or world from which you can access the Internet, should all play a part in this.

Per-Hour Accounts

I seldom recommend accounts that charge by the hour because I personally find it stressful to continually worry about the clock ticking off dollars in the background while I work. However, per-hour accounts can make sense for people who don't use them often because the overall cost at that point comes out lower than a flat-rate account's monthly fee. For instance, CompuServe used to offer a pricing scheme of $2.50 per month and high hourly fees, and that's the sort of account I still have. Because I don't use CompuServe much, that pricing scheme is actually a lot cheaper for me than its current standard pricing plan, which costs $9.95 per month even if you don't use it. If you decide to go with a per-hour pricing plan, pay close attention to your bills so you can tell if it makes sense to switch to a different type of account, assuming that's an option.

Other Fees

The most common additional fee charged by Internet service providers is a startup fee that covers the costs of them adding you to their accounting systems, setting up your account, and so on. Startup fees also reduce the number of people who join for a month or two and then bail out. Most of the time, startup fees are in the $20 to $50 range. Since you pay only one startup fee, it's not a major way to differentiate between providers.

Although it's less common, some providers charge small amounts for file or email storage, such as $1 per megabyte per month. Since you wouldn't normally store files on the provider's machines, the main thing to watch out for is email, which is always stored on the provider's computers until you call in. The catch here is that it's possible to set some email programs to leave copies of the mail on the provider's computers after you've read them, thus wasting space and potentially racking up charges. Only leave mail on the provider's computer if you know you need to retrieve it again from another computer. I'll talk a bit about this in Chapter 13, "All About Email."

Another way you can be charged for storage space is if your provider enabless you to create your own Web page or anonymous FTP directory. If that's true, then you're getting some service for your money, so it should be easy to determine if the service is worth the charge. More on this later, since not all providers offer such services.

Phone Charges

Many people don't think about phone charges properly, which leads to some confusion. In addition to the fee charged by your Internet provider, you must also pay the phone company for the calls you make with your modem to the Internet provider.

Almost everyone who wants to make an Internet connection using the software with this book along with a Mac and modem has a telephone connection that can make local calls for free. This is less true in countries other than the U.S. and might not be true if your telephone line is a business line. Thus, a local telephone call won't add to your phone bill, or if it does, it won't be as much as a long-distance call. This is the main reason why I always recommend that people work with an Internet provider that offers a local number.

> FYI
> I'm assuming that you know the difference between a local call and a long-distance call. Long-distance calls by definition leave your local calling area—check your telephone book for a description of your local calling area and the numbers you can call for free.

Many people live where they can't call an Internet provider locally, nor can they call one of the national Internet providers with a local call. What to do? Well, there are two basic choices. First, break down and make that long-distance call to an Internet provider that otherwise has good rates and policies. Second, if you live in a country where 800 numbers are free, check out Internet providers that offer connections via 800 numbers. Let's look at these two options in detail.

Long Distance

Racking up huge long-distance bills goes against the grain for many of us, myself included, partly because when I was growing up it was long distance to call just about anyone we knew. However, now that there's plenty of competition in the long-distance market, you can choose a long-distance company that provides the best package for the way you call.

If you have a basic deal with a long-distance company, it might cost as much as 25¢ per minute, depending on the time of day that you call. However, if you sign up for one of the special calling plans, you can significantly reduce that per-minute charge. MCI, for instance, has offered a calling plan that gives a 20 percent discount on calls you make after 5:00 P.M. and on weekends, or something to that effect. If the number you're calling also is an MCI customer (many providers set up specific numbers for this purpose), then you get a 40 percent discount. In addition, I've heard of calling plans that give you a 40 percent discount on any one number. All the major telephone companies tend to have comparable plans, but because the details vary greatly and the plans tend to change frequently, you should call to find out what would be best for you. Also, many small long-distance companies have sprung up to offer creative and inexpensive packages. Check your Yellow Pages

for a list of the less well-known long-distance companies in your area and compare their prices along with those from the big guys. I've collected some phone numbers in Table 2.1.

Table 2.1 Long Distance Telephone Companies

Company	Customer Service Number
AT&T	800-222-0300
MCI	800-950-5555
Sprint	800-877-4000

In talking with the support people at my provider, I gather that some customers have found long-distance telephone rates as low as 7¢ per minute, or $4.20 per hour. It might not be possible for you to get exactly the same rates, so figure out what the best per-minute charge you can get is, and then multiply that by 60 to find the per-hour charge. Keep that charge in mind, since you'll want to compare it to calling an 800 number.

> BTW
> Because NewsWatcher supports Internet Config (see Chapter 18, "Utilities and Miscellany"), if you have already configured Internet Config completely (and it's included on the disk so you can do this), you won't have to fill in the basic settings discussed below—they'll already be present. Internet Config is a good thing.
>
> One advantage of calling long distance is that phone charges stay more or less the same no matter which Internet provider you choose; you can pick any provider in the country. That enables you to base your decision on variables other than cost, such as support, reliability, and other services.

800 Numbers

Numbers beginning with the prefix 800 deceive many people because, as we all know, calling an 800 number is free in the U.S., right? Well, no. When you call an 800 number, any 800 number, the phone company bills the company on the other end just as they would bill you for a long-distance charge. In other words, an 800 number is merely a way of reversing the charges.

If you're calling a tech support number or ordering something from a mail-order company, you probably never see that charge. The company in question absorbs it as a cost of doing business and adds it to its overall pricing structure. However, when you call an 800 number to connect to an Internet provider, the Internet provider passes the cost right back to you in the form of a per-hour charge.

There's nothing wrong with this mechanism, but you shouldn't pretend that there's anything different about it compared with a long-distance call. Either way, the telephone

company makes money for each minute you stay online. The only difference is that with a long-distance call, you pay the phone company directly; with an 800 number, you pay the Internet provider who then pays the phone company.

The problem comes in the rates. It's easy to get discount long-distance rates around 10¢ per minute ($6.00 per hour), and as I noted previously, some people pay as little as 7¢ per minute ($4.20 per hour). Most 800-number Internet providers charge between $8 and $12 per hour. The lowest 800 Internet provider price I've seen recently is EarthLink Network at $4.95 per hour.

Assemble as much comparative information as you can before you decide what is or is not the best deal for you. I cannot tell you what's cheapest because I don't know what the variables are for you—which long-distance company and calling plan you use, whether it's cheaper or more expensive to call long distance to relatively close areas, and so on.

Service

In some ways, making the decision of which provider to use based on cost alone is simple. You figure out the salient numbers, add them all up, and try to determine what your monthly bill will look like. End of story, assuming that one provider stands out over others. But what if cost isn't the deciding factor? What if you discover that three providers in your area all charge about the same amount (which wouldn't be surprising, given the demands of local competition). That's when you have to choose based on services. So what differentiates providers? Reliability (and its cohorts, accessibility and support) and special services such as personal Web pages and custom domain names.

Reliability, Accessibility, and Support

These three topics fit together quite closely and are inherently related to how important a given Internet provider thinks its customers are. If a provider wants to concentrate on doing the best possible job for the customer, none of these three should ever be a problem. But in the real world, trade-offs are made, and in my experience you sometimes get what you pay for in terms of reliability, accessibility, and support.

Just the other day I corresponded with someone experiencing all sorts of problems with his account. I couldn't see anything wrong in what he was doing, so I recommended he try another provider that might do things differently. He got an account with the other provider, and everything worked on the first try. I pass on this anecdote because I want you to realize that you don't have to put up with a lousy provider, for whatever reason. You can always switch to a different one (although of course, then you must go through the decision process of which one to pick again, but hey, you can't have everything!).

Reliability

Reliability is a simple issue, but it's hard to determine before signing up. Do the provider's machines crash often, and if they do crash, does the provider lose email? Can you almost always connect to the outside Internet (sometimes such connection problems aren't your provider's fault, but lie further downstream)? Can you post a message to Usenet news and be sure that it will make it out to the rest of the world?

These are just a few of the questions that you should periodically ask yourself. You can't know this information beforehand, except perhaps from talking to an existing customer, and a provider certainly won't tell you if its setup is unreliable. But problems happen, and if they aren't fixed promptly and properly, it's tremendously frustrating. The last thing you want to do is start using a provider in your home-based business, say, and then find out that because of a technical glitch all the email to your account was returned to the senders for a week while you were on vacation.

Accessibility

Although it might seem as though I covered accessibility previously, I'm thinking of a more specific issue here. This is a simple question. Can you connect to your provider's modems when you want to? There's nothing worse than getting a busy signal for hours on end, even with automatic redial. And it's even worse when your provider has bad modems that just ring and ring and ring and…

Busy signals are a fact of life with any provider. The reason is simple. No provider could possibly afford to have one modem and one phone line per customer without charging exorbitant rates. Every provider tries to maintain a balance between the number of customers and the number of modems and phone lines. This balance requires that you get busy signals occasionally when you call at the busiest times of night, such as after dinner. Otherwise, the provider would be paying for phone lines and modems that would sit unused for the rest of the day—an obvious waste of money.

As providers grow, they must continually add modems and phone lines, and sometimes it can take the phone company a week longer than expected to fill the order for more phone lines. Thus, it's acceptable for a provider to have even bad busy signal problems as long as it's for only a short period of time and those phone lines are on order. If busy signals are a chronic problem, especially at odd times of the day, get a different provider. You can't learn to live on the Internet if you have to spend 30 minutes waiting for a free modem.

Support

Finally, let's face it: The world is not a perfect place, and problems occur. Heck, they occur all the time. But what's important is that the provider goes out of its way to fix the problems promptly, help you when you send email or call, and generally be responsive and responsible.

Technical support is a tremendously hard and stressful job, and not all providers have equally good support staffs, but a provider that wants happy customers will make sure to hire quality support folks. Even more important for us Macintosh users is if the provider hires support folks who know the Mac cold. Unfortunately, many providers come from the Unix or Windows worlds and know next to nothing about the Mac or how Macs work. It's ironic, since the Mac is much easier to support than other platforms, but do check into the level of Macintosh knowledge when choosing a provider.

Another thing to check for is a provider that will inform its customers of known downtime through a mailing list or newsgroup. It's not a big deal to not use your account if you know in advance that you can't do so between 8:00 and 9:00 in the morning on a specific day.

Finally, if you're using a national provider, check on the hours it offers tech support, just in case you happen to be on the opposite coast and can't get support when you may need it. In my experience, local providers generally offer more accessible and better support, perhaps in part because they're not attempting to serve so many people from so many places. Large national providers are trying to break free of this support problem by offering 24-hour support, but I have serious doubts about their abilities to provide good Internet support at all hours of the day.

Special Services

It's hard for me to anticipate what sort of special services an Internet provider might offer, but here are a few that I've seen in the past. In my experience, a smaller, local provider is more likely to be flexible enough to offer these sorts of special services than a large national provider (although exceptions certainly exist in both directions).

Personal Web Pages

In this day and age of the World Wide Web, it seems that everyone wants to have his or her own Web page. It's not hard to create one (in fact, this book shows you how in Chapter 22, "Create Your Own Web Site"), but finding a server that will carry it can be more difficult. This is another area in which good Internet providers can distinguish themselves from the rest, since many Internet providers now offer free space on their Web servers for their customers. Some may charge an additional small monthly fee for such a service, but it may be well worth the cost, depending on how badly you want your own Web page.

Personal FTP Directory

As with personal Web pages, it can be handy to have a directory on an anonymous FTP server if you want to put files there for anyone to retrieve. Some providers offer this, and as with the Web pages, some charge extra.

Email Aliases

Although many providers would ask you to get two accounts if you want to let your spouse or children use the Internet on their own, some providers can set it up so you can have two email addresses without paying for two full accounts. Many couples appreciate this service so they don't have to share a single address even if they must share a single computer.

Full Set of Usenet Newsgroups

All Internet providers carry at least some of the 16,000-plus set of Usenet newsgroups (see Chapter 14, "All About Usenet News," for more information). However, many providers don't carry all the newsgroups (many of them aren't even in English), and if a newsgroup you want to read is in that group, you won't be happy. There are two main types of newsgroups that are popular with readers but not ubiquitous with providers. First is ClariNet, which carries the same news that appears in newspapers from the news wire services. Providers must pay for ClariNet, so some don't carry it. Second, many providers don't carry the more risqué newsgroups that contain sexually oriented discussions. There are a variety of legitimate reasons for a provider not to carry these newsgroups (fear of future liability, personal beliefs). Some people would prefer their provider carried this sort of newsgroups; others would prefer that they didn't.

Custom Domain Names

If you don't know what a domain name is yet, you can either skip this discussion for now or flip ahead in the book to Chapter 9, "Addressing and URLs," which explains domain names in detail.

Many people prefer to have a custom domain name instead of the name of the provider's domain, and some providers can help you get such a name. You can't just pick any name, such as `ibm.com`, because most of the obvious ones have already been taken, but some providers can search for free names from your list and apply for the name for you. Until you get your own permanent (also known as "dedicated") Internet connection or move to another provider, that domain name maps to your provider's computers. For instance, before I had a dedicated Internet connection, I could have had my email to `ace@tidbits.com` go to a normal dialup account at Northwest Nexus. After I got the dedicated connection, Northwest Nexus could start routing my mail directly to one of my computers.

It's often easier for providers to give out domain names under their domain. So, for instance, Northwest Nexus controls the `wa.com` domain and can provide domain names "under" that domain (which is merely an alias to another machine) quite easily. My friend

Bill got his domain name, `beer.wa.com`, that way. These subdomain names are easier to get because the provider doesn't have to ask the organization that controls domain names (at least in the U.S.) for them, but they also aren't portable to another provider.

> **BTW**
> In 1995, the InterNIC, which is the organization that gives out domain names, instituted a $100 charge for registering a domain name and a $50 per year charge for maintaining it. These charges are fair, but they do make getting your own custom domain name less attractive. If you still want your own domain, your provider can help you with the InterNIC's details.

New Connection Methods

ISDN is not as widespread as everyone would like, and in some areas it can be both hard to find and expensive when you do find it. But, if you can get an ISDN connection to your house for a reasonable rate, it would be good if your Internet provider supported it. The same goes for new modem standards, cable modems that work over your cable TV connection, and the like. Is your provider going to keep up with new technology so you can connect to the Internet at the fastest possible speed?

Similarly, although this isn't that important right away, if you decide to move up to a dedicated connection, for instance, can your provider help you? If so, that makes the move much easier than if you have to find a new provider for your dedicated connection.

Custom Information

Most Internet providers concentrate on providing access to the Internet rather than providing information on the Internet, but many of them also put together Web pages about events or issues of local interest. I don't consider this a major reason to go with one provider over another, since you can generally get to any such public site, but it might be worth supporting if you find the information truly useful.

Business Services

What if you want to set up a mailing list or big Web site, but you don't want to get your own dedicated connection? Some providers offer this sort of service, although with additional charges. If you're considering using the Internet as a business tool but aren't interested in running your own machine to do so, ask about what sorts of services your provider offers.

Taking the Plunge

I hope this discussion has provided the information you need to make an informed choice among the many different Internet service providers out there. Check out Appendix A, "Internet Starter Kit Providers," for a list of providers that you can easily use with the custom installation options included on the disk, and Appendix B, "Providers of Commercial Internet Access," for a much larger list of providers and their contact information.

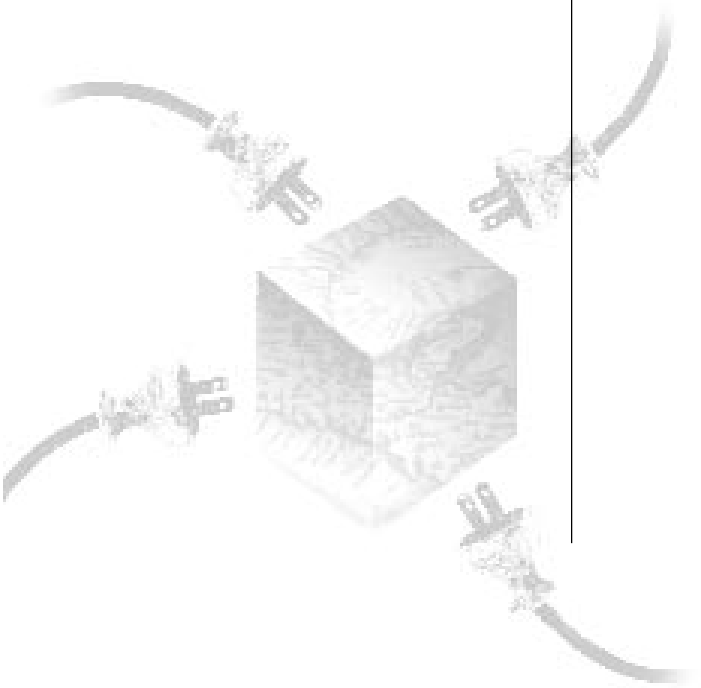
The providers listed in Appendix A will be easier to work with than the ones listed in Appendix B, if only because the Internet Starter Kit Installer can automatically configure your software to work with those providers listed in Appendix A.

Chapter 3 Installing the Software

Contents:

The CD-ROM that comes with *Internet Starter Kit for Macintosh* contains all the software you need to access the Internet! To install any or all of these programs, double-click the Internet Starter Kit Installer icon, and make sure to explore the rest of the CD-ROM as well. Read on for more details.

> **BTW**
> If you receive a damaged CD-ROM, call Hayden/Macmillan Computer Publishing, at 317-581-3833.



What If You Don't Have a CD-ROM Drive?

The only liability of putting all this great stuff on a CD-ROM is that not all Macs have CD-ROM drives. Almost all new ones do, but older Macs that can still run most Internet applications may not, and few people have external CD-ROM drives attached to PowerBooks. For those of you who fall into this category, my deepest apologies. Disks simply weren't possible, given the size of the programs I have to install.

That said, what options do you have, assuming that you bought the book anyway?

- I've placed versions of the Internet Starter Kit Installer on the CD-ROM that are split into 800K and 1.4MB chunks (the size of double-density and high-density disks). If you have another machine with a CD-ROM drive or a friend with one (you might also be able to go to an Apple dealer and ask to use one of its machines briefly), you can copy those files to disks and install from disks. Look for the folder called Floppy Installers.

- I've also uploaded a password-protected version of the Internet Starter Kit Installer to an FTP site. If you can send email and download files via FTP (such as via an America Online account), send me email at `ace@tidbits.com` and if I'm convinced that you've bought the book, I'll tell you how to get the online version. It will be big—about 4MB.

Either way, I can provide only the Internet Starter Kit Installer—the rest of the files on the CD-ROM take up about 330MB and there's simply no other way I can provide them to you. Almost everything on the Internet Starter Kit CD-ROM is available via the Internet, however, so you should be able to find any given item after you've made your connection to the Internet.

Internet Starter Kit Installer

I designed the Internet Starter Kit Installer to be as easy as possible to use. I tried to think of the different things you might want to do with the various files on the disk, which is why I created several different installer options.

Insert the Internet Starter Kit CD-ROM in your CD-ROM drive, and when the window comes up, double-click the file called Internet Starter Kit Installer. You should see the Internet Starter Kit Installer splash screen. Click the Continue button. Next, the Internet Starter Kit Installer presents you with some text that tells you to read this chapter. Click the Continue button. The Internet Starter Kit Installer then presents you with the Standard Install dialog box (see Figure 3.1).

Figure 3.1 Internet Starter Kit Installer Standard Install dialog box.

Here's where you must make your first decision.

- If you want to install the main applications that I recommend, just click Install to select Standard Install. If you've never installed Internet software before, select this option.
- If you want to install any one or more of the individual programs, click the Custom button and select the appropriate option (see Figure 3.2). You can select more than one at a time by Command-clicking them. If this is your first installation, installing individual programs won't provide all the pieces you need to access the Internet.

Figure 3.2 Internet Starter Kit Installer Custom Install dialog box.

I recommend that you choose Standard Install, and if so, just click the Install button. Next, you're presented with a Standard File dialog box that enables you to place the Internet Starter Kit Folder anywhere on your hard disk that you like. After you choose a location and click the Save button, the Internet Starter Kit Installer informs you that you must restart your computer after installing and asks if you would like to continue.

If you have any unsaved work open in other applications, click the No button and then the Quit button. Save your work, quit the other applications, and repeat the steps to this point. When you are ready to install, click the Yes button when the Internet Starter Kit Installer asks about restarting. The Internet Starter Kit Installer proceeds to install everything, and when it's done, it informs you that everything has been installed correctly and forces you to click a Restart button. Click it, and after your computer restarts, you're ready to configure the software that was installed for you.

> **BTW**
> Rather than overwrite existing files, the Internet Starter Kit Installer moves them to a folder on your desktop called ISKM4 Backed Up Items. Files that might appear in here if they were installed on your hard disk include Config PPP, PPP, PPP Preferences (all from MacPPP), MacTCP Prep, and TCP/IP Preferences.

That's all there is to using the Internet Starter Kit Installer—now we turn to the program that helps you choose a local Internet provider and configures much of your Internet software for you.

Internet Configurator

The Internet Configurator is a custom application that holds information about almost 400 Internet service providers around the world. It provides an easy step-by-step method of selecting a provider, entering the information that is specific to your Internet account (which you must get from the Internet provider first, of course), and configuring your Internet software. Although I recommend using the Internet Configurator because it's a bit easier than configuring all the software yourself, you do not have to use it. Instead, you can configure all the applications manually, as laid out in Chapter 4, "Step-by-Step Internet."

There are two possibilities at this point. First, if you're not working with one of the Internet Starter Kit Providers listed in Appendix A, contact your provider for the information you need to configure Open Transport or MacTCP and FreePPP. Read Chapter 11, "Open Transport and MacTCP," and Chapter 12, "PPP and SLIP," to find out what information you need from your Internet provider to set up your connection. Then, use the information in those chapters and Chapter 4, "Step-by-Step Internet," to configure your software. If you run into trouble, first read Chapter 5, "Things that Go Bump in the Net," and then turn to your provider's technical support folks for help. Don't run the Internet Configurator since it can't configure your software for a provider that's not in its database.

Second, if you *are* working with one of the Internet Starter Kit Providers listed in Appendix A, locate the Internet Configurator application on the Internet Starter Kit CD-ROM and double-click it (see Figure 3.3). The Internet Starter Kit Installer doesn't install the Internet Configurator on your hard disk because it's huge and there's no reason to waste space on something you use once.

Figure 3.3 Internet Configurator main screen.

If, for some reason, you haven't followed the steps outlined so far, you can click the Install the Software button to launch the Internet Starter Kit Installer. If you haven't yet run the Internet Starter Kit Installer, do so and come back to the Internet Configurator before reading further.

> **BTW**
> At any point, you can click a square button with an "i" on it for help or more information.

Click the Select an Internet Provider button. The Internet Configurator presents you with a screen of explanatory text; clicking the Continue button takes you to the Search screen (see Figure 3.4).

Figure 3.4 Search screen.

You can search by country, state, telephone area code, and city. However, the state and area code searches won't work if you're looking for a provider outside of North America. At that point, it's easier to search by country since most of the other countries listed in the Country pop-up menu don't have that many Internet providers represented. To perform the search, click the appropriate radio button and either select from the pop-up menu or enter the appropriate text in the field to the right of the radio button.

> **BTW**
> There's no way to search for two fields such as city and state simultaneously.

After you've entered your search criteria, click the Find button to see a list of providers that match (see Figure 3.5).

Figure 3.5 Selected Internet Providers screen.

To view detailed information about any of the providers listed in the Selected Internet Providers screen, click the name and click the View button (the selected Internet provider appears next to the View button as confirmation).

The Provider Information window gives you a ton of information (see Figure 3.6) about each provider, some of which is repeated in Appendix A, "Internet Starter Kit Providers." Pay special attention to the Rates, Access Numbers, and How to Sign Up fields, since they help you decide which provider is best for you. See Chapter 2, "Choosing a Connection," for information on how to evaluate different providers.

Figure 3.6 Internet Provider Information window.

While viewing the information for an Internet provider, you can click the Back button to go back to the list of providers to select and view another one. After you've decided on a provider, follow its instructions for signing up. In all likelihood, this won't be an instantaneous process and may even take a day or so if you have to call them during business hours. Sign-up procedures vary widely between providers.

After you have your account information from the provider (you need to know your username, your password, and if they're different, your email username and password), the time has come to configure your Macintosh. Make sure your provider is selected in the Selected Internet Providers screen and click the To Configure button. Alternately, navigate back to the main screen and click the Configure Your Macintosh button. The Internet Configurator provides some explanation of what to do, and clicking the Continue button takes you get to the Confirm Provider Choice screen (see Figure 3.7).

Figure 3.7 Confirm Provider Choice screen.

If the provider you've chosen isn't selected, click the Choose Another Provider button to jump directly to the Selected Internet Providers screen, where you can select the proper provider or click the Back button to do a new search. After you've gotten the proper provider showing in the Confirm Provider Choice screen, click the Continue button to bring up the Account Information screen (see Figure 3.8).

Figure 3.8 Account Information screen.

Enter the username and password that you've chosen or been assigned by your Internet provider in the fields provided. If your provider requires a different username for email, check the Different Email Username checkbox and enter your email username in that field. The same applies if your provider also requires a separate email password.

After you've entered your account information, click the Continue button to move on to the Telephone Information screen (see Figure 3.9).

Figure 3.9 Telephone Information screen.

For many of the providers in the Internet Configurator's database, phone numbers are provided in the scrolling field; if so, just select one that's a local call if possible. Some providers may not have provided their phone numbers, at which point they must tell you what the best number for you is when you sign up. If that's the case, enter that telephone number in the text field above the scrolling list.

The checkboxes below the scrolling list of telephone numbers enable you to set some of the more esoteric dialing options that FreePPP supports. To enable any of the items, select the checkbox and type the appropriate value in the text field to the left of the checkbox. For instance, turning off calling waiting generally involves sending the string &70, to the modem before dialing. Similarly, if you have to dial the area code, select that checkbox, and if it's a long-distance number that requires dialing 1 first, select that checkbox. The dialing prefix checkbox is probably most commonly used for accessing a different long-distance telephone company. All of these options depend on your specific location and situation; I can't tell you how to configure them for your connection.

After you've entered your telephone information, click the Continue button to move on to the Modem Information screen (see Figure 3.10).

Figure 3.10 Modem Information screen.

In the Modem Information screen, select your modem from the scrolling list of modem models. If your modem isn't listed, try selecting a different one from the same company. If nothing seems appropriate, you can rely instead on FreePPP's modem auto-detect feature. See Chapter 12, "PPP and SLIP," for instructions on how to turn on FreePPP's modem auto-detect feature in FreePPP Setup. You can do that after the Internet Configurator has finished configuring everything else. As a place holder, select the SupraFAXmodem 28.8 v.34 modem since it uses a generic modem initialization string that many other modems should support as well.

Next, select the port that your modem uses. In most cases, this is the Modem Port, but if you have your modem connected to your Printer port, select Printer Port from the pop-up menu. If you use a PowerBook Duo or 500-series with an internal modem, select Internal from the pop-up menu. If you use a 100-series PowerBook, select Modem Port even if you have an internal modem. If you have a 5300-series PowerBook and use a PC Card modem, you'll have to select it in FreePPP Setup's Modem Setup dialog manually. See Chapter 12, "PPP and SLIP," for instructions.

Finally, select the speed at which your Mac and your modem should communicate. For almost all Macs, there's no reason to select anything other than 57600 bits per second.

After you're done, click the Continue button to move on to the final screen in the Internet Configurator, which summarizes what it's going to do after you click the Configure Your Macintosh button. In short, the Internet Configurator configures either MacTCP or Open Transport (whichever is installed), FreePPP, Eudora, and Internet Config. Click the Configure Your Macintosh button, and a bit later you're done!

I strongly recommend that you read through Chapter 4, "Step-by-Step Internet," after running the Internet Configurator so you can check to make sure it has configured everything correctly. The simple fact of the matter is that this information was submitted by the hundreds of Internet providers themselves, and we couldn't verify all of it. Since the Internet Configurator merely attempts to simplify what you can do yourself manually, it's easy to check what it's done by following along as Chapter 4 walks you through much of the same setup.

Installation Details

Installers are good at putting files in specific places, but they seldom tell you exactly where the various files have ended up. Table 3.1 explains where the Internet Starter Kit Installer places everything on your hard disk, organized by installation option.

Table 3.1 Installation Locations

Item	Destination Folder	Comments
Standard Install		
MacTCP	Control Panels	
MacTCP Prep	Preferences	
FreePPP Setup	Internet Starter Kit Folder	
FreePPP	Extensions	
FreePPP Guide	Extensions	
PPP Preferences	Preferences	
PPPAutoDetectDB	Preferences	
Anarchie	Internet Starter Kit Folder	
Eudora Light	Internet Starter Kit Folder	
Eudora Folder	System Folder	
ObjectSupportLib	Extensions	Only if you use a Power Macintosh.
AppleScriptLib	Extensions	Only if you use a Power Macintosh.
AppleScript	Extensions	
Internet Config	Internet Starter Kit Folder	
Internet Config Extension	Extensions	
ICeTEe	Extensions	
Internet Preferences	Preferences	
Microsoft Internet Explorer	Internet Starter Kit Folder	
Indeo Video	Extensions	
Intel Raw Video	Extensions	
Dragging Enabler	Extensions	

Item	Destination Folder	Comments
Macintosh Drag and Drop	Extensions	
Thread Manager	Extensions	
Explorer folder	Preferences	
StuffIt Expander	Internet Starter Kit Folder	You may wish to move StuffIt Expander or an alias to it to your desktop for easy access.
MacTCP Only		
MacTCP	Control Panels	If you use this option to reinstall MacTCP after removing a corrupted version, make sure to restart after throwing out the old MacTCP, MacTCP DNR (in the System Folder), and MacTCP Prep (in the Preferences folder).
FreePPP Only		
FreePPP Setup	Internet Starter Kit Folder	
FreePPP	Extensions	
FreePPP Guide	Extensions	
PPPAutoDetectDB	Preferences	
Anarchie Only		
Anarchie	Internet Starter Kit Folder	
Eudora Light Only		
Eudora Light	Internet Starter Kit Folder	
Eudora Folder	System Folder	
ObjectSupportLib	Extensions	Only if you use a Power Macintosh.
AppleScriptLib	Extensions	Only if you use a Power Macintosh.
AppleScript	Extensions	

continues

Table 3.1 Continued

Item	Destination Folder	Comments
Internet Config Only		
Internet Config	Internet Starter Kit Folder	
Internet Config Extension	Extensions	
ICeTEe	Extensions	
Microsoft Internet Explorer Only		
Microsoft Internet Explorer	Internet Starter Kit Folder	
Indeo Video	Extensions	
Intel Raw Video	Extensions	
Dragging Enabler	Extensions	
Macintosh Drag and Drop	Extensions	
Thread Manager	Extensions	
ObjectSupportLib	Extensions	Only if you use a Power Macintosh.
AppleScriptLib	Extensions	Only if you use a Power Macintosh.
AppleScript	Extensions	
StuffIt Expander Only		
StuffIt Expander	Internet Starter Kit Folder	You may wish to move StuffIt Expander or an alias to it to your desktop for easy access.

What's on the CD-ROM

Previous editions of this book included floppies, and the vast amount of space provided by a CD-ROM is a welcome change. As a result, I've included a ton of stuff on the CD to aid in your Internet journeys.

Internet Starter Kit Installer

First off, there's the Internet Starter Kit Installer, which installs all the software that you need to access the Internet. There are many other programs you could use, but these are the ones I recommend and talk about at length in later chapters. Some configuration is done for you, and you can read more about configuring these applications in Chapter 4, "Step-by-Step Internet," as well as in Chapters 11 through 18. Software installed includes:

- MacTCP 2.0.6, which enables your Macintosh to run TCP-based Internet programs. (The Internet Configurator instead configures Open Transport if your Mac has Open Transport already installed.)
- FreePPP 2.5, which enables you to use a modem to connect to a PPP account at your Internet service provider.
- Anarchie 1.6, the best FTP program for any computer.
- Eudora 1.5.4, a powerful program that enables you to send and receive Internet email.
- Internet Config 1.2, which centralizes preferences such as your email address for a number of Internet programs.
- Internet Explorer 2.0.1, an excellent Web browser that takes you to the Internet Starter Kit for Macintosh Home Page by default.
- StuffIt Expander 4.0.1, which can debinhex and expand the files you download from the Internet.

Internet Configurator

The Internet Configurator application configures your Internet software to work with the Internet Starter Kit Provider you choose from Appendix A. Specifically, it configures the following programs either fully or partially, based on the information you enter:

- MacTCP 2.0.6, for use with FreePPP and with the proper domain name servers.
- Open Transport 1.1, for use with FreePPP and with the proper domain name servers.
- FreePPP 2.5, for use with the Internet Starter Kit Provider you selected.
- Eudora 1.5.4, with your POP account and SMTP server information.
- Internet Config 1.2, with your email address, Web home page, and a variety of other information.

Internet Applications

Most of the Internet Starter Kit CD-ROM is taken up by a folder of Internet freeware and shareware applications, utilities, and commercial demos. There are approximately 250 pieces of software included, and they consume about 300 MB of space on the CD-ROM. Within the Internet Applications folder are ten folders that contain software organized in a manner roughly equivalent to the book.

Although almost all the programs on the CD-ROM are mentioned in the book, there are a few that aren't, mostly because they were submitted after a chapter was finalized. So, if you find something on the CD-ROM that you can't find in the book, consider it a hidden surprise.

FYI
I strongly recommend that you copy programs that interest you to your hard disk before running them. Some programs work fine from CD-ROM; others do not and will crash.

- **Connectivity** contains software and utilities related to connecting to the Internet, so programs that work with MacTCP, Open Transport, and FreePPP all live here. See Chapters 11, "Open Transport and MacTCP," and 12, "PPP and SLIP."
- **Email** contains software and utilities related to sending and receiving email. Along with a variety of email utilities, I've included several email client programs. See Chapter 13, "All About Email."
- **Usenet News** contains a number of Usenet newsreaders so you can choose which you like the best. See Chapter 14, "All About Usenet News."
- **FTP** contains a few FTP client programs, including Anarchie (which is also installed by the Internet Starter Kit Installer). See Chapter 15, "All About FTP."
- **World Wide Web** contains a few Web browsers, but more importantly, it includes folders of helper applications, Web browser plug-ins, and a slew of independent bookmark management programs. See Chapter 16, "All About the World Wide Web."
- **Real-Time Communications** holds folders for Text communications, Audio communications, and Games. Each of those folders contains appropriate client software. See Chapter 17, "Real-Time Communications."
- **Miscellany** contains a wide variety of software that doesn't fit into one of the other categories. See Chapter 18, "Utilities and Miscellany."

- **Utilities** contains a number of programs mentioned throughout the book that are useful, but not actually Internet programs. See Chapters 10, "File Formats," 22, "Create Your Own Web Site," and 23, "Set up Your Own Server."
- **HTML** is divided into four different folders—Converters, Editors, Graphics, and Table Tools—each of which contains related pieces of software that you might use when creating Web pages. See Chapter 22, "Create Your Own Web Site."
- **Servers** contains three folders: Email Servers, Web & Combined Servers, and Other Servers. Email Servers contains email server and mailing list managers; Web & Combined Servers contains Web servers (including many that server other protocols as well) and a folder full of CGIs; and Other Servers holds a variety of different types of servers. See Chapter 23, "Set up Your Own Server."

FYI

Many of the programs on the Internet Starter Kit CD-ROM are shareware, which means that you can try them for free, but if you continue to use them, you're obligated to pay the author a small fee that's mentioned in the documentation for the program. *Please* support shareware authors—they provide us with an incredible amount of high-quality software and should be rewarded for their efforts.

Author's Bookmarks

In the process of writing this book, I've visited many hundreds of Web sites, some of which are listed within the text of the book. However, typing URLs is a pain, so I created bookmarks to almost every site I visited, about 650 all told. They're organized by chapter so you can easily retrace my steps without hassle.

Because you may want to use different Web browsers or bookmark managers, I've translated the entire collection from the original CyberFinder format that I used to several other formats. They all contain the same bookmarks. The formats include:

- CyberFinder (individual files that can go anywhere)
- CyberFinder Library (a single file that can go anywhere)
- Microsoft Internet Explorer Favorites (goes in your Explorer folder in your Preferences folder)
- Netscape Navigator Bookmarks (goes in your Netscape folder in your Preferences folder)
- URL Manager (a single file that can go anywhere)

Please note that as time passes, some of these bookmarks will stop working. There's nothing I can do about that, and I don't intend to attempt to keep them up-to-date. If a bookmark doesn't work, you can always use the techniques and sites mentioned in Chapter 20, "Finding Things on the Internet," to find the new pages.

Major Updates via FTP

Even though I have plenty of space to include a lot of programs on the Internet Starter Kit CD-ROM, I can't update the collection to reflect new releases. For the most part, you'll have to go to one of the major software archives or the home page of the program in question to download a new version (and I can help with that too—read on for information about `ftp.tidbits.com`). However, for some of the programs that I feel are the most important, I've included a set of Anarchie bookmarks that always point at the latest versions. A few important programs like Netscape Navigator aren't included here because they can't be freely redistributed.

To download a program using these Anarchie bookmarks, just make sure you're connected to the Internet and double-click the bookmark. The programs you can retrieve in this fashion include:

- Anarchie
- Disinfectant
- DropStuff
- Eudora Light
- Fetch
- FreePPP
- Homer
- Internet Config
- ircle
- NewsWatcher
- StuffIt Expander
- Updated Bookmarks

The Get Updated Bookmarks bookmark retrieves a new copy of the bookmarks in case I've added or removed a program from the set. If something new comes out, or if one of the programs listed goes away, I might have to make such a change. For the most part, you shouldn't have to worry about getting an updated set of the bookmarks.

TidBITS

In case you don't have enough to read in *Internet Starter Kit for Macintosh*, I've included all the current issues of *TidBITS*, the free electronic newsletter I publish each week. All the issues are text files that you can read in any word processor, but it's probably easiest to double-click the Index of TidBITS Issues icon to browse or search the issues in Easy View, which is also on the CD-ROM. To find out more about subscribing so you can read future issues, send email to `info@tidbits.com` or visit our Web site at `<http://www.tidbits.com/>`.

Cyberdog

Apple's recently released Power Mac-only Cyberdog supports a number of Internet services, including email, Usenet news, FTP, the Web, and more. I was able to include Cyberdog on the Internet Starter Kit CD-ROM at the last moment, and Apple graciously provided all the pieces of System software that Cyberdog requires. So, inside the Cyberdog 1.0 PPC folder you'll find the following items:

- System 7.5 Update 2.0: If you are running System 7.5, 7.5.1, or 7.5.2, you should use the installer in this folder to update to System 7.5.3, which includes Open Transport 1.1. The Internet Starter Kit Installer does not install Open Transport, so this is the only way to get it from the CD-ROM. This installer will not work with any System prior to System 7.5.
- QuickTime 2.1: If you don't have QuickTime 2.1, drag the files in this folder onto your System Folder to install it. Restart after copying the files into your System Folder.
- OpenDoc™ 1.0.4 Install: Cyberdog is built on top of Apple's OpenDoc technology, so you must install OpenDoc before you can install Cyberdog itself.
- Cyberdog™ 1.0 Install: Run the installer in this folder to install Cyberdog after you have installed the appropriate software from the list above.
- AppleVision Fix Install: If you have an AppleVision monitor, use the installer in this folder to install new software that should correct problems.

- System 7.5.3 Revision 2.0: Run the installer in this folder to update your copy of System 7.5.3 only if you use any PowerBook with a PowerPC chip; a Power Macintosh 7200, 7500, 7600, 8500, or 9500; or any PowerBook running Connectix RAM Doubler 1.6.1 or earlier.

Cyberdog requires a Power Macintosh, so don't bother trying to use it if you don't have a Power Macintosh. However, the System 7.5 Update 2.0 installer and the System 7.5.3 Revision 2.0 installer might still be useful, as might the AppleVision fix and QuickTime 2.1 if you have System 7.5 on a 68K Macintosh.

There's More…

But wait! Lest I sound too much like a late-night Ginsu knife commercial (has anyone *ever* bought one of those to cut beer cans?), I have in fact done even more.

ftp.tidbits.com

As I noted previously, I have bookmarks to the major Internet programs so you can download any one of them with merely a double-click of the mouse. But what if you want one of the less-popular programs that isn't on the Internet Starter Kit CD-ROM, or simply want to check out what else is available?

Many of these programs are available on an FTP site that I run with the able assistance of my Internet provider, Northwest Nexus. The site is available at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/>`. For more information on using Anarchie to connect to this FTP site, check out the "Anarchie" section in Chapter 4, "Step-by-Step Internet," and Chapter 15, "All About FTP."

Internet Starter Kit Home Page

The bookmarks and the FTP site are all fine and nice, but the more alert among my reading audience are no doubt asking themselves, "But how am I going to figure out that there's a new version of Internet Explorer, Eudora, or whatever?" Good question, alert readers, and the simple answer is that you'll use Microsoft Internet Explorer or another Web browser to connect to the Internet Starter Kit for Macintosh Home Page at `<http://www.tidbits.com/iskm/>`.

BTW

I've set the copy of Internet Explorer in the Internet Starter Kit Installer to connect to this page by default. However, if you've set a different home page previously, or wish to use another Web browser, you can still use the URL for the Internet Starter Kit for Macintosh Home Page as your default home page. All Web browsers have various ways, usually located in the Preferences, of setting a default home page.

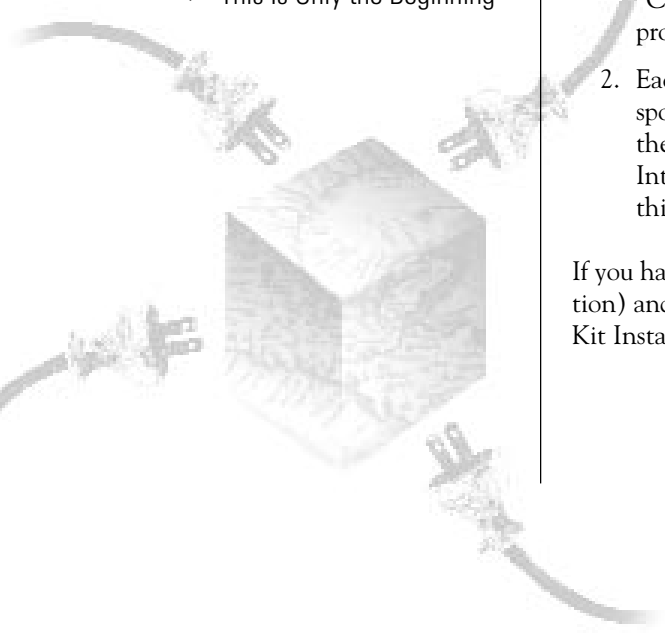
The Internet Starter Kit for Macintosh Home Page has a number of links to the most important sites on the Internet, catalogs of resources like Yahoo, search engines like WebCrawler, important FTP sites like Info-Mac and UMich, and even a few of the major companies in the Macintosh industry, such as Apple and Microsoft. These links should be your starting point for any exploration of the Internet, and rest assured that if I find additional sites that I consider equally as useful, I'll add them.

In addition, there's a link on the Internet Starter Kit for Macintosh Home Page called "Macintosh Internet Software Updates. " It points to another Web page that continually tracks the latest versions of all the main Internet applications for the Macintosh (so stop in every now and then and see what's changed).

These pages are a public Internet resource and anyone, whether or not they've bought the book, is welcome to use them. If you find them useful, I'm glad, and I hope they might inspire you to think what you could contribute to the Internet someday.

Chapter 4 Step-by-Step Internet

Contents:



This chapter gives steps for setting up and using a number of basic Internet programs, including the software you must use in order to connect to the Internet from your Macintosh. It also covers a useful suite of Internet software: Internet Config, Eudora, Anarchie, NewsWatcher, and Internet Explorer. With the exception of Open Transport and NewsWatcher, all these programs come on the Internet Starter Kit CD-ROM.

If you follow all the steps in this chapter, you should end up with some hands-on experience setting up and using an excellent collection of Internet software.

This chapter makes two assumptions:

1. For these directions to work, you must have a PPP account or a direct Internet connection. Chapter 2, "Choosing a Connection," explains how to choose a provider and establish an account.
2. Each set of steps assumes you've installed the corresponding software. If you've read Chapter 3, "Installing the Software," and run the installation software on the Internet Starter Kit CD-ROM, you should have everything installed that you need.

If you have a PPP account (or a dedicated Internet connection) and installed the software through the Internet Starter Kit Installer, it's time to jump into the world of the Internet.

FYI
Depending on the options you chose when running the Installer and the Internet Configurator, much of your Internet software might already be set up. If you're not sure, you can run through the setup sections of this chapter to verify that everything is set up correctly. I made these directions complete (they take you from not being connected to the Internet to connected) because you may need to duplicate these configurations without the aid of the Internet Starter Kit Installer, perhaps when the software is updated, or for a friend. For instructions covering more advanced functions of these Internet applications, refer to Part III of the book.

Open Transport 1.1

Quick description: Open Transport is a collection of software that enables Macintosh computers to connect to TCP/IP-based networks such as the Internet.

Where it comes from: Open Transport is part of System 7.5.3 (check About This Macintosh on the Apple menu in the Finder). If Open Transport is installed, the Internet Configurator configures it, but it does not install Open Transport. If Open Transport is not installed, the Installer installs MacTCP (see the next section, "MacTCP 2.0.6"). MacTCP and Open Transport provide the same functionality; you use one or the other, but not both.

Tasks:

1. Check if Open Transport is installed.
2. Configure Open Transport for use with your provider and FreePPP.

Check if Open Transport Is Installed

Before you worry about configuring Open Transport, check to make sure it's installed. If you own a relatively new Macintosh or if you just purchased a Macintosh, Open Transport is probably installed. To find out, run the following tests. If your Mac passes *either* test, you have Open Transport installed.

- Choose Control Panels from the Apple menu. Look for two control panels: AppleTalk and TCP/IP. If you have these two control panels, Open Transport is installed, and you can skip the next bullet point.
- If your Mac failed the above test, choose Control Panels from the Apple menu. See if you have a control panel called MacTCP. If you do, look in your Apple Extras folder for an application called Network Software Selector. If your Macintosh is set up this way, Open Transport is installed.

If your Mac doesn't have Open Transport installed, chances are that you can use MacTCP instead of Open Transport. To find out more about Open Transport, see Chapter 11, "Open Transport and MacTCP." To configure MacTCP, skip ahead to the section "Configure MacTCP" later in this chapter.

Configure Open Transport

1. If you have a Network Software Selector but don't see the TCP/IP control panel in your Control Panels folder, double-click the Network Software Selector to launch it, and select the Use Open Transport Networking radio button (see Figure 4.1).
2. Restart your Mac.

Figure 4.1 Network Software Selector.

FYI

If you ran the Internet Configurator while Open Transport was installed and chose to work with an Internet Starter Kit Provider, it has completely configured Open Transport for you. You do not need to perform any of the following steps, although you may want to go through them to see what's been done for you.

3. Make sure you have FreePPP installed (look for a FreePPP extension in your Extensions folder). You must have FreePPP installed before you can configure Open Transport for FreePPP.
4. Open the Control Panels folder and double-click the TCP/IP icon.

   The TCP/IP window opens (see Figure 4.2).

Figure 4.2 TCP/IP control panel window.

5. From the Connect via pop-up menu, choose FreePPP.
6. From the Configure pop-up menu, choose Using PPP Server.

> **FYI**
> These directions show you how to configure Open Transport specifically for my provider, Northwest Nexus; I'll explain when you should use your provider's information instead.

7. In the Name Server address area, type the address of your primary domain name server, such as **198.137.231.1**, and press Return. (Don't actually enter this information unless your provider is Northwest Nexus; enter the information given to you by your Internet provider.)
8. Type the address of your secondary domain name server, such as **192.135.191.1.** (Again, enter the information given to you by your Internet provider.)

Your configuration dialog should look like Figure 4.2, although yours should have different numbers in the Name server address area in the lower-left corner.

If your provider gives you a static-addressed account with an assigned IP number, you might have to choose Manually from the Configure menu and enter your IP number in the IP address field that appears. Your Internet provider will tell you if this is necessary.

9. From the File menu, choose Close (or press Command-W or click the close box) to close the TCP/IP control panel window.

   Open Transport prompts you to save your configuration (see Figure 4.3).

Figure 4.3 TCP/IP control panel window.

10. Click the Save button to save your configuration changes.

If you followed these directions without customizing them for a different provider, you've now configured Open Transport for use with FreePPP and Northwest Nexus.

MacTCP 2.0.6

Quick description: MacTCP is a control panel that enables Macintosh computers to connect to TCP/IP-based networks such as the Internet.

Where it comes from: If MacTCP is installed already (it comes with some versions of the System software from Apple and with other Internet products), the Internet Configurator configures it if you use an Internet Starter Kit Provider. If neither MacTCP nor Open Transport is installed, the Installer installs MacTCP and, if you use an Internet Starter Kit Provider, the Internet Configurator configures MacTCP. If Open Transport is installed and you use an Internet Starter Kit Provider, the Internet Configurator instead configures Open Transport (see the previous section, "Open Transport 1.1"). MacTCP and Open Transport provide the same functionality; you do not use both.

Tasks:

1. Check if MacTCP is installed.
2. Configure MacTCP for use with your provider and FreePPP.

Check if MacTCP Is Installed

Before you worry about installing MacTCP, check to see if it's installed. If you own a relatively new Macintosh, if you just purchased a Macintosh, or if you ran the Internet Starter Kit Installer, MacTCP is probably installed. To find out, choose Control Panels from the Apple menu. See if you have a control panel called MacTCP. If your Macintosh is set up in this way, MacTCP is installed. If you don't see the MacTCP control panel, but you do see one called TCP/IP, then you have Open Transport installed instead of MacTCP. Skip back to "Open Transport 1.1" for information on configuring Open Transport.

Configure MacTCP

FYI
If you ran the Internet Configurator and chose to work with an Internet Starter Kit Provider, the Configurator configured MacTCP for you. You do not need to perform any of the following steps, although you might wish to go through them to see what's been done for you.

1. Make sure you have FreePPP installed (look for a FreePPP extension in your Extensions folder). You must have FreePPP installed before you can configure MacTCP for FreePPP.
2. Open the Control Panels folder and double-click the MacTCP icon.

   The MacTCP window opens (see Figure 4.4).

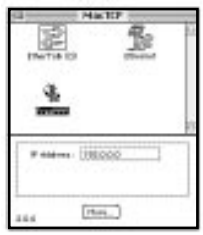


Figure 4.4 MacTCP control panel window.

3. In the MacTCP window, select the FreePPP icon.
4. Click the More button.

   MacTCP presents you with its configuration dialog box (see Figure 4.5).

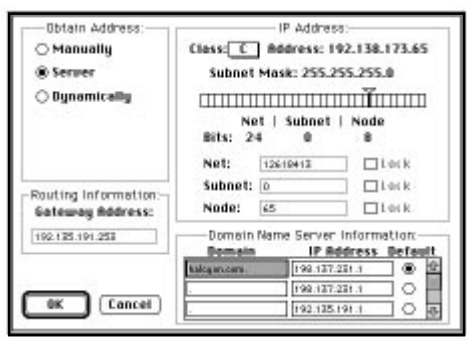


Figure 4.5 MacTCP configuration dialog box.

> **BTW**
> These directions show you how to specifically configure MacTCP for Northwest Nexus; I'll explain when you should use your provider's information instead.

5. In the Obtain Address area at the upper-left of the configuration dialog box, select Server.

6. In the Domain Name Server Information area, click the first field under the Domain column. Type **halcyon.com.**, making sure to include the trailing period. Press Tab or click the first field under IP Address. Type **198.137.231.1** and select the Default radio button. (Don't actually type this information unless your provider is Northwest Nexus; instead type the information given to you by your Internet provider.)
7. Press Tab or click the second field under Domain. Type a period. Press Tab or click the second field under IP Address. Type **198.137.231.1** again. (I won't remind you again in this set of steps, but do remember, you *must* type the information from your provider.)
8. Press Tab or click the third field under Domain. Type a period. Press Tab or click the third field under IP Address. Type **192.135.191.1** this time.

   Your configuration dialog should now look similar to my screen shot, although yours probably has `0.0.0.0` in the Gateway Address field and something different in the IP Address area at the upper-right. Don't worry about those differences.
9. Click the OK button to save your changes and close the configuration dialog.
10. Close the MacTCP window by clicking the close box in the upper-left corner.

    MacTCP may or may not tell you that you must restart for your changes to take effect.
11. Restart your Macintosh.

If you followed these directions without customizing them for a different provider, you've now configured MacTCP for use with FreePPP and Northwest Nexus.

FreePPP 2.5

Quick description: FreePPP consists of an application called FreePPP Setup and an extension called FreePPP. FreePPP uses your modem to establish a connection to a PPP account over which Internet programs can work.

Where it comes from: The Internet Starter Kit Installer installs FreePPP, and, if you use an Internet Starter Kit Provider, the Internet Configurator configures FreePPP for you. You can also download updated copies of FreePPP from the Internet at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/conn/>`.

Tasks:

1. Configure FreePPP for your provider.
2. Establish an Internet connection.
3. Close the Internet connection.

Configure FreePPP

1. Double-click the FreePPP Setup icon.

   The FreePPP Setup window appears (see Figure 4.6).

Figure 4.6 FreePPP Setup window.

2. Click the triangle in the lower-left corner to expand the window and display the configuration panel (see Figure 4.7). You don't have to change any of the settings in the General settings panel.

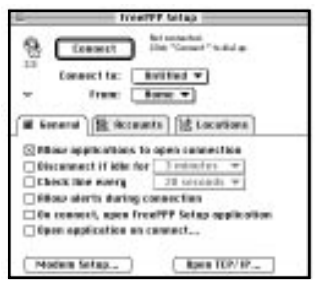


Figure 4.7 Configuring FreePPP Setup.

> **FYI**
> These directions include specific information for Northwest Nexus, but if Northwest Nexus is not your provider, use the information from your provider.

3. Click the Accounts tab (see Figure 4.8).

Figure 4.8 Creating a new account in FreePPP Setup.

4. Click the New button to create a new account (see Figure 4.9). In the Server name field, type **Northwest Nexus** (or whatever you want to call it—it doesn't matter).
5. In the Phone number field, type the phone number for your provider, just as I've entered the phone number for Northwest Nexus, **(206) 455-8455**, in Figure 4.9. Make sure to enclose the area in parentheses. If you must dial the area code, check the "Dial area code" box (if it's just a local number and you don't have to dial the area code, enter it anyway, but leave the "Dial area code" box unchecked). If the number is long distance and requires that you dial a 1 first, check the "Dial as long distance" box.

> **BTW**
> Read Chapter 12, "PPP and SLIP," for more details on setting up FreePPP's powerful dialing options.

6. Enter your user name, such as **Ptidbits**, in the User name field.
7. Enter your password, which won't appear in clear text, in the Password field.
8. If your Internet provider supports PAP or CHAP (they should tell you), select Directly from the Connect pop-up menu. If you must use a connection script with your provider, select Using Connection Script. This is the most common configuration at the moment. Your dialog should look somewhat like Figure 4.9 now, although the details should be different.

   If your Internet provider supports PAP or CHAP, skip to step 15.

Figure 4.9 Configuring a new account in FreePPP Setup.

9. Click the Edit connection script button to bring up the connection script dialog box (see Figure 4.10). Your provider may use a slightly different login script.
10. In the first row of controls, select Send from the pop-up menu on the left side. FreePPP automatically checks the Return box to the right.
11. In the second row of controls, enter **ogin:** to wait for the login prompt. Make sure FreePPP selects Wait for from the pop-up menu for that line.
12. In the third row of controls, enter your userid. Make sure FreePPP selects Send from the pop-up menu and checks the Return box to the right.

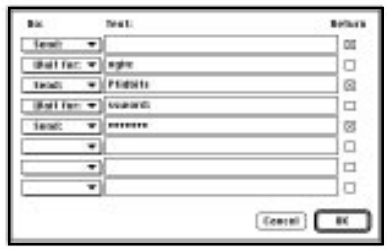


Figure 4.10 Entering a connection script.

13. In the fourth set of fields, enter **ssword:** in the field to wait for the password prompt. Make sure FreePPP selects Wait for from the pop-up menu for that line.
14. In the fifth set of fields, enter your password, which will show up as clear text. Make sure FreePPP selects Send from the pop-up menu and checks the Return box to the right. Finally, in the sixth set of fields, enter **ppp** and make sure FreePPP selects Send and checks the Return box. Ignore the rest of the rows of controls.

> **BTW**
> Read Chapter 12, "PPP and SLIP," for information on hiding your password in the connection script.

15. Click the OK button to save your changes.
16. Back in the account configuration dialog box, click the Connection tab to configure your connection (see Figure 4.11).

Figure 4.11 Configuring the Connection panel.

17. From the Port Speed pop-up menu, choose 57,600 bps. If you experience trouble with that speed, choose a lower speed, first 38,400 bps, then 19,200 bps.
18. From the Flow Control pop-up menu, choose CTS & RTS (DTR). If you have trouble with your connection, try choosing CTS Only instead.
19. Click the OK button to save your changes.
20. Back in the main FreePPP Setup window again, click the Locations tab so you can tell FreePPP where "Home" is.

21. Select Home in the list of locations and click the Edit button to bring up the Locations dialog box.
22. Type your area code in the area code box, making sure to enclose it in parentheses.
23. Click the OK button to save your changes, and you're done!

There are many other options you can set in FreePPP Setup that may or may not be necessary for your situation, most notably the Modem Setup options available in the General tab. I've described the bare minimum that should be necessary for most people. However, I strongly recommend that you read Chapter 12, "PPP and SLIP," for much more detailed information about what all of the different options in FreePPP Setup can do for you.

Establish an Internet Connection

1. Once you finish setting up FreePPP, you can use FreePPP Setup to connect to the Internet! If it's not already open, double-click the FreePPP Setup icon.

   FreePPP Setup opens. Note that it says that it's not connected and that you should click Connect to create an Internet connection (see Figure 4.12).

Figure 4.12 FreePPP Setup before connection.

2. Click the Connect button.

   FreePPP auto-detects what kind of modem you have (see Figure 4.13) and configures your modem according to its database.

> **FYI**
> If FreePPP fails to correctly detect what sort of modem you have, read Chapter 12, "PPP and SLIP," for information on how to enter a modem initialization string manually.

Figure 4.13 FreePPP looking for the modem.

Once PPP has found and initialized the modem, it dials the number you provided (see Figure 4.14).

Figure 4.14 FreePPP dialing dialog.

After the modems connect, FreePPP sends your userid and password to log you in if you use a connection script (see Figure 4.15) and then establishes the connection (see Figure 4.16). You will see other messages as well, but they flash by quickly.

Figure 4.15 FreePPP running the connection script.

Figure 4.16 FreePPP establishment phase.

Notice that the globe is spinning (it's hard to show this in a book), the Connect button has changed to Disconnect, the label now says Connected and is keeping a timer on your connection, and FreePPP instructions say "Click 'Disconnect' to hang up" (see Figure 4.17).

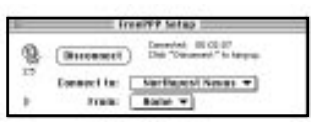


Figure 4.17 FreePPP connected.

You should now be able to run Internet applications such as Eudora, Anarchie, and Internet Explorer. If the connection didn't work, it might have been something as simple as a busy signal (at which point FreePPP automatically redials), or it might have been some different problem. If you have trouble and you think your configuration may not be right, first read through Chapter 12, "PPP and SLIP," to make sure you've configured FreePPP properly. If changing the configuration still fails to help, read Chapter 5, "Things that Go Bump in the Net," for detailed troubleshooting information about connections.

Close the Internet Connection

1. Quit any Internet applications other than Eudora that you may have launched.
2. If the FreePPP Setup window is closed, double-click the FreePPP icon.
3. Click the Disconnect button.

   FreePPP disconnects from the Internet and hangs up your modem (see Figure 4.18).

Figure 4.18 FreePPP Setup after connection.

Congratulations! You've successfully configured FreePPP, established a connection to the Internet, and closed that connection. If anything went wrong during this process, read the section on FreePPP in Chapter 12, "PPP and SLIP," and Chapter 5, "Things that Go Bump in the Net."

There are easier ways of connecting and disconnecting using the FreePPP Menu or the FreePPP Control Strip. For more information on those, read Chapter 12, which also provides far more detailed information about FreePPP.

Internet Config 1.2

Quick description: Internet Config is a program that helps you configure MacTCP applications. You enter configuration information in Internet Config once, and then any MacTCP application that knows about Internet Config automatically uses the information in Internet Config. Of the programs mentioned in this chapter, Internet Config works with Anarchie, NewsWatcher, and Internet Explorer.

Where it comes from: The Internet Starter Kit Installer installs Internet Config for you. It also comes with Anarchie and a lot of other Internet applications. You can download

updates to Internet Config from the Internet at <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>.

Tasks:

1. Configure Internet Config.

Configure Internet Config

1. Double-click the Internet Config icon.

   Internet Config launches. If this is the first time you have launched Internet Config, you are prompted to install the Internet Config extension. Click the OK button to install it.

   Next, Internet Config shows the Internet Preferences window (see Figure 4.19). If for some reason you don't see the Internet Preferences window, choose Open Internet Preferences from the File menu.

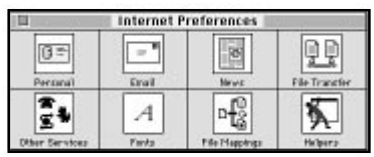


Figure 4.19 Internet Preferences window.

2. In the Internet Preferences window, click the Personal button.

   The Personal window opens (see Figure 4.20).

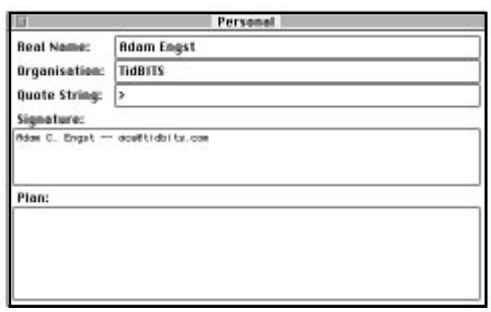


Figure 4.20 Setting personal preferences.

3. In the Personal window, fill in your name and organization. Leave the > character in the Quote String field. When you finish, click the close box in the upper-left corner of the window.

> **BTW**
> For more help with any Internet Config dialog box, turn on Balloon Help (from the Help menu at the upper-right corner of the menu bar) and point at the item you need help with.

4. Back in the Internet Preferences dialog box, click the Email button.

   The Email window opens (see Figure 4.21).

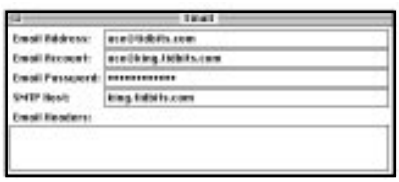


Figure 4.21 Setting email preferences.

5. Fill in the Email Address field with the email address given to you by your provider. Be careful to use all lowercase.
6. Press Tab or click the Email Account field. Type your email account using information your provider gave you. If you have a POP account, use your POP account in the Email Account field. Be certain to use all lowercase unless your provider explicitly gave you a mixed-case username.
7. Press Tab or click the Email Password field. Enter your password, being careful to enter it exactly as your provider gave it to you.
8. Press Tab or click the SMTP Host field. Type your SMTP host, using the name your provider gave you. (If your provider gave you information about an SMTP server, note that an SMTP server is the same thing as an SMTP host.)

> **FYI**
> Figure 4.21 shows my information, and yours is definitely different. Also, some providers provide different passwords for different things; be sure to put your email password in the Mail Password field.

9. When you finish filling in the first four fields in the Email window, click the close box in the upper-left corner of the window.
10. You should be back at the Internet Preferences window. Click the News button.

    As you probably expect, the News window opens (see Figure 4.22).

Figure 4.22 Setting news preferences.

11. In the News window, fill in the NNTP Host field using information from your provider. If your provider is Northwest Nexus, enter **news.halcyon.com**, as I did in Figure 4.22.
12. Press Tab or click the News Username field. Enter your news username, which is usually the same as your email username.
13. Press Tab or click the News Password field. Enter your news password, which is probably the same as your email password.
14. Click the close box in the upper-left corner of the window.

    You've now set up Internet Config's News settings, and it's time to save your work.
15. From the File menu, choose Save.

    A Save dialog box appears, and it shows that if you click the Save button, you will save a file called Internet Preferences in your Preferences folder.
16. Do not change the default name or folder. Click the Save button.
17. From the File menu, choose Quit.

You have finished the basics of setting up Internet Config. When you launched Internet Config back in step one, the program installed an Internet Config extension and an Internet Preferences file. You can also customize the settings in the remaining Internet Config areas, but it's not necessary at this time. To learn more about Internet Config, flip ahead to the Internet Config section in Chapter 18, "Utilities and Miscellany."

Eudora Light 1.5.4

Quick description: Eudora is an email program. See Chapter 13, "All About Email," for more details on email.

Where it comes from: The Internet Starter Kit Installer installs Eudora Light 1.5.4 for you. You can download updates to Eudora from the Internet at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/mail/>`.

Tasks:

1. Configure Eudora.
2. Compose and send an email message to the President.
3. Subscribe to the SCOUT-REPORT mailing list.
4. Read, reply to, and delete an email message.

Configure Eudora

1. Double-click the Eudora icon.

   Eudora launches.

2. From the Special menu, choose Settings.

   Eudora presents you with the Settings dialog box. Notice that the dialog box has icons running down the left side, and clicking an icon brings up controls for that icon's options (see Figure 4.23).

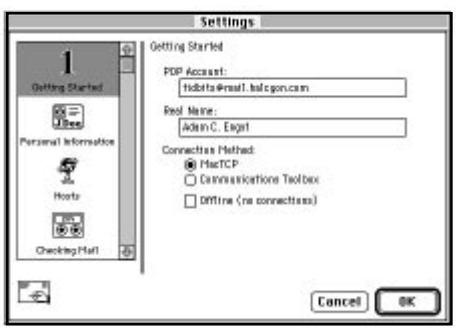


Figure 4.23 Getting started in the Eudora Settings dialog box.

3. With the Getting Started icon selected, you should see the settings for Getting Started, as shown in Figure 4.23. In the POP Account field, enter your POP account (get this information from your provider) and be certain to enter it in exactly the same case your provider used, usually lowercase.
4. Press Tab or click the Real Name field. Enter your real name as you want it to appear in your email messages.
5. In the Connection Method area, turn on the MacTCP radio button.

   You have now completed filling in the Getting Started portion of the Eudora Settings dialog box. We are going to skip the Personal Information option and move on to Hosts.

6. Click the Hosts icon.

   The Settings dialog box shows the controls for Hosts (see Figure 4.24).

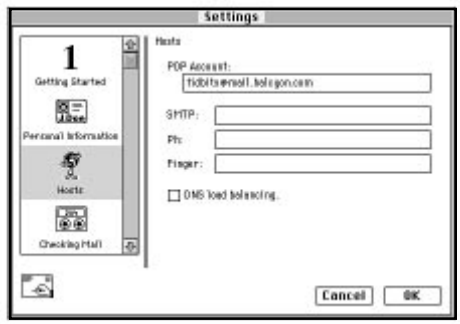


Figure 4.24 Setting Hosts options.

7. The only field you need to worry about in Hosts is the SMTP field. If your provider explicitly gave you an SMTP server (or host) that is different from the machine name in your POP account, enter its name in the SMTP field. Otherwise, leave the field blank, as I've done in Figure 4.24.

   That's it for the Hosts controls. Let's move on to the Sending Mail controls.

8. Click the Sending Mail icon (you may need to scroll down to see it).

   The Sending Mail controls appear (see Figure 4.25).

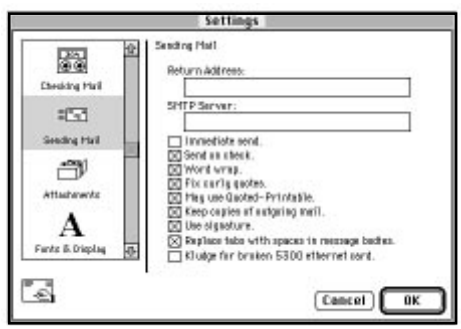


Figure 4.25 Setting Sending Mail options.

9. Turn off the Immediate send checkbox. This ensures that you can compose mail and queue it for sending without being connected to the Internet the entire time.

10. Make sure the Send on check checkbox is turned on. This ensures that Eudora sends waiting mail when it checks for new mail.

11. Click the OK button.

You have now performed the minimum configuration to use Eudora. There are many other options in the Settings dialog that you may wish to explore further. I recommend that you turn on Balloon Help from the Help menu (at the right end of the menu bar) and point at any fields or checkboxes with which you need help.

Compose and Send an Email Message to the President

1. Make sure Eudora is running. From the Message menu, choose New Message.

   Eudora presents you with a new message window, with the From line filled with your email address and name (see Figure 4.26).

2. Make sure your insertion point is in the To line (it should be unless you've clicked elsewhere in the window) and type your recipient's email address. In this case, enter **president@whitehouse.gov**.

Figure 4.26 Sending email to the President.

3. Press Tab or click the Subject line to move the insertion point to the Subject field. Enter your subject, something such as **Communicating with the President**.

4. Click the large area of the window for typing the body of your message, or press Tab three times to move the insertion point. Type your message.

   Since this example sends email to an address that replies automatically, the body of the message isn't that important for the time being, although you can use this method to express your opinions to the president of the United States. At minimum, type something like **I strongly support the concept of a national information infrastructure.** It's considered polite to type your name at the bottom.

5. When you finish typing and signing your message, click the Queue button in the upper-right corner of the window. (If that button is labeled Send, choose Settings from the Special menu, scroll down to select the Sending Mail icon, turn off the Immediate send checkbox, and click the OK button. The Send button should turn into a Queue button.)

6. Now connect to the Internet, using FreePPP if necessary. Do not quit Eudora; simply switch to FreePPP Setup to connect.

7. Switch back to Eudora, if necessary.

8. From the File menu, choose Check Mail.

   Eudora immediately presents you with a dialog box asking for your password. Enter it, making sure to capitalize it as you did when you originally created it (or as it was given to you). The characters will not be displayed.

9. Click the OK button to enter the password you just typed.

   Eudora contacts your POP server and looks for new mail, transferring it back to your Macintosh if you have any. After retrieving new mail, Eudora contacts the SMTP server and sends the mail that you just queued for delivery. After it finishes sending, Eudora displays a dialog box telling you whether or not you have new mail.

10. If you're paying for your Internet connection by the hour, or if you're paying for a long-distance call, switch out of Eudora and disconnect from the Internet to save money. Otherwise, go ahead and stay connected as we work through the next few tasks.

Assuming everything was set up correctly on your Macintosh and on your host machine, you've just sent an email message using Eudora. Even better, you've just sent it to the President of the United States (whoever that may be when you read this book)! You can expect a reply, although I must confess that it's not a personal reply.

Subscribe to the SCOUT-REPORT Mailing List

The SCOUT-REPORT mailing list is an email distribution list that once per week automatically sends you a message that contains a short list of new and interesting Internet resources. You can read more about mailing lists in Chapter 13.

1. Make sure Eudora is open, and from the Message menu choose New Message.

   Eudora presents you with a new message window, with the From line filled in with your email address and name and with the insertion point in the To line.

2. In the To line, type **listserv@lists.internic.net**.

3. Press Tab four times or click the message section of the window. Type **SUBSCRIBE SCOUT-REPORT your full name** (not your email address) and nothing else (see Figure 4.27).

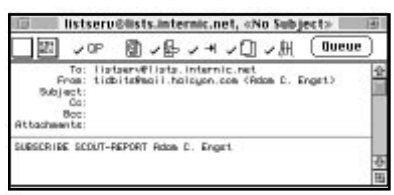


Figure 4.27 Subscribing to SCOUT-REPORT.

4. Click the Queue button in the upper-right corner of the window to queue the message to be sent.
5. Make sure you are connected to the Internet.
6. From Eudora's File menu, choose Check Mail.
7. As before, Eudora first connects to your POP server and checks for new mail. Depending on how long it has taken you to create this message, you might have received mail back from the White House (if you sent a message in the previous set of steps). Either way, after checking for new mail, Eudora contacts your SMTP server and sends your subscription message to the LISTSERV program.
8. If you pay for your connection by the hour, feel free to close the connection to save money.

You've just subscribed to a mailing list so you will receive the SCOUT-REPORT's weekly messages! Although other mailing lists may be slightly different, mostly in terms of the mailing list manager's address and the list name, the basics are the same. If you wish to unsubscribe so you stop getting the SCOUT-REPORT messages, read Chapter 13's discussion of working with mailing lists.

BTW

In previous editions of this book, I used these steps to explain how to subscribe to *TidBITS,* a free electronic magazine that I publish about Macintosh- and Internet-related topics. Because I am about to change the mailing list software that runs *TidBITS*, I can't give you good directions here. Even so, if you are interested in learning how to subscribe to *TidBITS,* send an email message to `info@tidbits.com`. You may enter a subject in the Subject line and type text in the body of the message, but the auto-reply software will ignore them.

Read, Reply to, and Delete an Email Message

1. Make sure Eudora is running.

   If you received a reply from the White House when you sent the subscription message to the SCOUT-REPORT list, Eudora opened your In box for you.

2. Make sure you're connected to the Internet, and from the File menu choose Check Mail.

   Eudora opens your In box after receiving new mail. (You can also open your In box by going to the Mailbox menu and choosing In.) Eudora then displays the In box and marks unread messages with a bullet (•) character (see Figure 4.28).

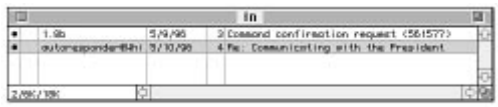


Figure 4.28 Eudora In box.

If don't receive a reply from the White House or regarding your SCOUT-REPORT subscription, wait for a while and try this step again (there's no way to know how long it could take; you might get a reply back within minutes, or it might take as long as 24 hours, or even longer).

3. Double-click the reply from the White House, which probably looks as though it came from **autoresponder@WhiteHouse.Gov**, the program that automatically replies to email sent to the President.

   Eudora opens the message and displays it, along with the first four lines of the header (see Figure 4.29).

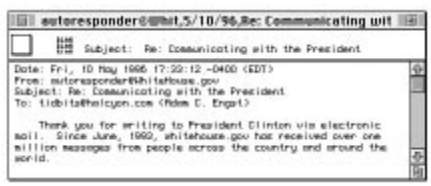


Figure 4.29 Email from the White House.

4. Read the message, scrolling with the scrollbar or the Page Up and Page Down keys.

   You've finished reading an email message!

5. To delete the message from the White House, make sure its window is open or make sure it is selected in the In box; then, from the Message menu choose Delete.

   Eudora moves the deleted message to the Trash mailbox.

   Now we'll look at the message from the SCOUT-REPORT and reply to it.

6. Double-click the message that came back as a result of your request to join the SCOUT-REPORT. Most likely, the message will have "Command confirmation request" as part of its subject.

   Eudora opens the message, which asks you to confirm that you really want to join the SCOUT-REPORT mailing list.

7. After reading the message, go to the Message menu and choose Reply.

   Eudora creates a new message window, entering the original sender's address in the To line and the subject of your original message, prefixed with Re:, in the Subject line. The entire body of the original message is quoted in the body of the message (by

"quoted" I mean that each line is prefixed with a ">" character), and Eudora automatically selects the quoted text .

8. Although it's possible that the SCOUT-REPORT's directions will have changed by the time you follow these directions, the directions currently call for you to send a reply containing just the word "ok." To delete all the selected text in your reply, press the Delete key. (If for some reason the text is no longer selected, select it and then press the Delete key.)

   Eudora deletes all the quoted text, leaving you with a blank message body.

9. In the body of the message, type **ok** (see Figure 4.30).

Figure 4.30 Replying to a message.

10. If you do want to join the SCOUT-REPORT, click the Queue button to queue the message for delivery. If not, choose Delete from the Message menu to delete the message.

> **FYI**
> The SCOUT-REPORT isn't a discussion-based mailing list (see Chapter 7, "What Can You Do on the Internet?"). However, if you join, you will receive weekly mailings that offer "a selection of new and newly discovered Internet resources of interest to researchers and educators." Every SCOUT-REPORT issue has information at the bottom detailing how to sign off and on the list.

11. To send any messages that you might have queued, choose either Check Mail or Send Queued Messages from the File menu.

12. Once you finish sending any messages, if you have a modem connection, disconnect from the Internet, especially if you're being charged.

That's about all you need to know to get started reading and writing email with Eudora. As you explore the program or read about Eudora in Chapter 13, "All About Email," you will find many other options and shortcuts that make using Eudora even easier.

Anarchie 1.6

Quick description: Anarchie is a shareware FTP program that you use to retrieve files. You can also upload files using Anarchie. See Chapter 15, "All About FTP," for more details on FTP.

Where it comes from: The Internet Starter Kit Installer installs Anarchie 1.6 for you. You can download updates to Anarchie from the Internet at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>`.

Tasks:

1. Configure Anarchie.
2. Connect to a site and retrieve a file.
3. Use a bookmark to retrieve a file.
4. Connect to a site and upload a file.

Configure Anarchie

1. Anarchie uses Internet Config for its basic configuration, so if you haven't already gone through the steps earlier in this chapter for setting up Internet Config, go back and follow them. If for some reason you don't know all the information required by those steps, the minimum that you must do in Internet Config to use Anarchie is use the Email button to open the Email dialog, where you must fill in the Email Address field.
2. Anarchie's job, of course, is to download files, but because Anarchie also tries to be a fairly helpful application, it passes downloaded files off to other programs, most notably StuffIt Expander, for post-processing—making the files proper, uncompressed Macintosh files. (The Internet Starter Kit Installer installs StuffIt Expander for you as well. See Chapter 10, "File Formats," for more information on StuffIt and other means of compression.)
3. Double-click the Anarchie icon.

   You may see a dialog box asking if you want to enable SIVC (Simple Internet Version Control, which notifies you of updates to Anarchie). If this dialog box appears and you don't object, click the Allow SIVC button (if you do object, Anarchie will work just fine if you click the Disable SIVC button).

   Anarchie launches.

That's it. You're done configuring and launching Anarchie and ready to use it to connect to a site and retrieve a file.

Connect to a Site and Retrieve a File

1. Make sure that you are connected to the Internet and that Anarchie is running.
2. From the FTP menu, choose Get.

   Anarchie brings up the Get via FTP window (see Figure 4.31).

Figure 4.31 Anarchie Get via FTP window.

3. In the Machine field, enter the name of the remote computer to which you wish to connect, such as **ftp.tidbits.com**.
4. In the Path field, enter the location of the file on the remote computer, separating directories with slashes, such as **/pub/tidbits/select/newswatcher.hqx**.
5. Select the Get File radio button.
6. Click the Get button to retrieve the file.

   Anarchie displays a progress window as it downloads the file (see Figure 4.32). When the download is complete, Anarchie passes the file to StuffIt Expander for post-processing. StuffIt Expander debinhexes and expands the file, turning it into a NewsWatcher folder that appears on your desktop unless you've used Internet Config to change the location of your download folder. (You change the download folder using the File Transfer button.)

Figure 4.32 Anarchie progress window.

Use a Bookmark to Retrieve a File

1. Make sure Anarchie is running and that you are connected to the Internet.
2. If the Bookmarks window is not showing, choose List Bookmarks from the File menu (see Figure 4.33).

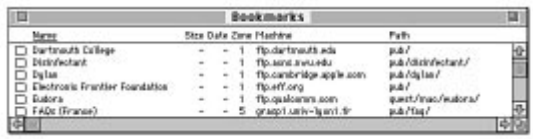


Figure 4.33 Anarchie Bookmarks window.

3. Double-click the Disinfectant item in the Name column (you might have to scroll down to see it).

   Anarchie connects to `ftp.acns.nwu.edu` and puts you in the `/pub/disinfectant` directory (see Figure 4.34).

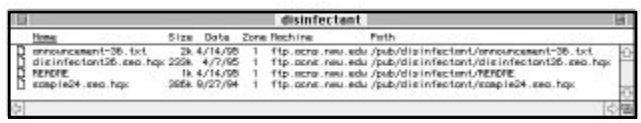


Figure 4.34 Anarchie at `ftp.acns.nwu.edu`.

4. Double-click the disinfectant36.sea.hqx item. (The name may not exactly match, since Disinfectant may be at a later version when you try these steps.)

   Anarchie downloads Disinfectant, which is a free program that helps you find and remove computer viruses on your Macintosh. When the download is complete, Anarchie passes the file to StuffIt Expander. StuffIt Expander debinhexes and expands the file, thus turning it into a Disinfectant icon, which will appear on your desktop unless you've used Internet Config to change the location of your download folder.

Congratulations! You've just performed many of the basic tasks in Anarchie you're likely to do in real life. You should be able to extrapolate from these instructions how to retrieve other files using Anarchie's Bookmarks and Get via FTP dialog box. However, if you plan to create Web pages, chances are good that you'll use Anarchie to upload Web page files from your Macintosh to a Web server on the Internet. In the next set of steps, we'll look at how to use Anarchie for uploading files.

Connect to a Site and Upload a File

I'm including these directions for people using Anarchie to upload files relating to their Web sites. If you don't have a space on a Web server set up for your files, don't worry about this section; instead, skip ahead in the chapter to the steps for setting up NewsWatcher.

1. Make sure Anarchie is running and that you are connected to the Internet.
2. In Anarchie, choose Get from the FTP menu.

The Get via FTP dialog box appears (see Figure 4.35).

Figure 4.35 Use Anarchie to connect to your directory.

3. In the Machine field, type the name of the server to which you upload. It may not be the same as the Web server, so ask your provider for details. In Figure 4.35, I'm using the server given to me by my provider, Northwest Nexus.
4. Type the path to your Web files. It's likely to be your default directory, at which point you can leave this field blank, as I've done.
5. Type your username and password in the appropriate fields. If you don't know what to type, ask your provider.

   The characters in the password field appear as bullets.
6. Make sure the Get Listing radio button is selected, and click the List button.

   Anarchie logs you into the server and displays a window listing the contents of your directory.
7. Arrange your windows so you can see the Anarchie directory window and the icon for the file that you want to upload.
8. Drag the icon for the file that you want to upload into the Anarchie window. (If your Macintosh doesn't support drag-and-drop, you can also upload files using the Put command on the FTP menu.)

   Anarchie copies the file to the directory.
9. To verify that the file copied successfully, make sure the directory window is the frontmost window on-screen, and then choose Retry from the File menu.

   Anarchie reloads the directory window, which should now show the file that you just uploaded.

Congratulations! You've successfully uploaded a file using FTP. To find out more about FTP and Anarchie, read Chapter 15, "All About FTP."

FYI
As you become more experienced with Anarchie, notice that you can Shift-click multiple files in a folder on your Macintosh and then drag the files as a group to an Anarchie directory window. Also, once you start one file (or group of files) copying, you can start additional files copying by dragging them to the appropriate Anarchie window. Finally, if you need to create a subdirectory within your main directory, you can do so with the New Directory command on the FTP menu. Choose Retry from the File menu to reload the current directory and see the new directory.

NewsWatcher 2.1.2

Quick description: NewsWatcher is a newsreader; a program for Usenet news (see Chapter 14, "All About Usenet News," for more details). NewsWatcher requires access to an NNTP news server on an Internet host.

Where it comes from: Unfortunately, we were unable to include NewsWatcher on the Internet Starter Kit CD-ROM because of Northwestern University's licensing fees. The directions earlier in this chapter for Anarchie give specific steps for using Anarchie to download a copy of NewsWatcher for free. You can also download updates to NewsWatcher on the Internet at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>`.

Tasks:

1. Configure NewsWatcher.
2. Create a personalized subscription list and subscribe to several newsgroups.
3. Read articles in a subscribed newsgroup.
4. Post an article.

Configure NewsWatcher

1. Make sure you are connected to the Internet—connect with FreePPP if necessary.
2. Double-click the NewsWatcher icon.

   If you haven't previously configured NewsWatcher, the program launches and presents a Welcome to NewsWatcher dialog box (see Figure 4.36).

Figure 4.36 Choosing how you use NewsWatcher.

3. Click the Private button.

   The Server Addresses dialog box appears. If you configured Internet Config, the fields will already be filled in (see Figure 4.37).

Figure 4.37 Configuring NewsWatcher.

4. If they are not already filled in, fill in the News Server and Mail Server fields using information obtained from your provider.
5. Click the OK button.

   The Personal Information dialog box appears.
6. Enter correct information in the Full name, Organization, and Email address fields. Be certain to type your email address with all lowercase letters.
7. Click the OK button.

   NewsWatcher connects to your news server and retrieves the full group list from the server. This can take some time, especially over a slow modem. Once NewsWatcher sorts the list, it displays it in a scrollable window, along with a smaller window labeled untitled.

You've now successfully completed the minimum steps necessary to configure and use NewsWatcher. Do not quit NewsWatcher now, but go on to the next task in which you learn how to create a personalized subscription list and subscribe to newsgroups that might interest you.

Create a Personalized Subscription List and Subscribe to Several Newsgroups

1. Arrange the untitled and Full Group List windows so they don't overlap.
2. Making sure that the untitled window is the frontmost window, go to the File menu and choose Save. Give the file an appropriate name, such as **My Newsgroups**, and save it in a location where you will be able to easily find it later.

   The window, also known as the "subscription window," takes on the name that you gave it.

   You may wish to move the file later, perhaps to your Apple Menu Items folder so that it shows up in your Apple menu.
3. Scroll down in the Full Group List window until you find the newsgroup called `news.announce.newusers`. Groups are sorted alphabetically, so it should be roughly halfway down.
4. Drag the `news.announce.newusers` item into the subscription window and drop it.

   NewsWatcher may show the spinning beach ball cursor briefly, and `news.announce.newusers` should appear in your subscription window. The number next to its name indicates the number of unread articles in that group.
5. Repeat the process with `comp.sys.mac.announce`, `comp.sys.mac.comm`, and `misc.test`. As you drag each name over the subscription window, you should see a dark black line appear in the window, indicating where the newsgroup will appear once you drop it. For some fun, you might also drag over `rec.humor.funny`. You can also add any other groups that you think might be interesting. When you finish, your subscription window should resemble the one in Figure 4.38.

Figure 4.38 NewsWatcher subscription window.

Announcements important to the entire Mac community appear in `comp.sys.mac.announce`. Discussions about Macintosh communications software appear in `comp.sys.mac.comm`, which is also a good place to ask about things that you cannot otherwise figure out. I'll use `misc.test` later, when providing instructions on posting.

6. Make sure your subscription window is frontmost, and choose Save from the File menu to save your subscription list.

7. Close the Full Group List window by clicking the close box in the upper-left corner. (You can open it again by choosing Show Full Group List from the Windows menu.)
8. Quit NewsWatcher by choosing Quit from the File menu.

   The previous isn't absolutely necessary, but bear with me. I want you to start the next task, reading articles, as you would normally, and that includes launching NewsWatcher.

You've successfully created a personalized subscription list and saved it for future use. You can add newsgroups to this list at any time and remove newsgroups that no longer interest you (to remove a newsgroup, select it in the subscription window and then choose Unsubscribe from the Special menu). NewsWatcher starts up slightly faster with a small subscription list, so it works best to subscribe to only newsgroups that you read.

Read Articles in a Subscribed Newsgroup

1. If you are not connected to the Internet, establish a connection.
2. Launch NewsWatcher, not by double-clicking the NewsWatcher icon, but by double-clicking the subscription list icon you created in the previous task.

   NewsWatcher launches, connects to the news server, checks for new groups and new articles, and then displays your subscription list window.
3. Double-click `news.announce.newusers`.

   NewsWatcher retrieves the subjects and authors of the articles contained in that newsgroup and presents you with a window displaying a list of those articles (see Figure 4.39).

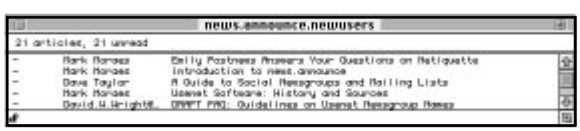


Figure 4.39 Articles in `news.announce.newusers`.

4. Double-click the first article in the newsgroup.

   Since articles in `news.announce.newusers` are often large, it might take a bit to download. NewsWatcher displays the article once it is downloaded.
5. Read the article, if you wish. I recommend that you browse the articles in this group early on, since they're designed to answer many questions that new users have.
6. To read the next article, you can close the article window and double-click the next article in the newsgroup. An easier method is to go to the News menu and choose Next Article or press Command-I.

You've now successfully opened a newsgroup and read several articles. You can close the window listing articles in `news.announce.newusers` and double-click `comp.sys.mac.announce` to see the list of articles in that group and read them if you wish.

Post an Article

1. In your subscription window, double-click the `misc.test` newsgroup. You could double-click any newsgroup that you wanted to post to, but since this is your first attempt at posting from NewsWatcher, we'll try a newsgroup for tests. You will receive a number of email messages from various sites letting you know that your test posting made it there.

   The `misc.test` window opens.

2. From the News menu, choose New Message.

   NewsWatcher brings up the New Message window with the Newsgroups line already filled in and the insertion point in the Subject line (see Figure 4.40).

Figure 4.40 NewsWatcher new message window.

3. Type a subject in the Subject line.
4. Press Tab or click the message area. Type your article.
5. Click the Send button.
6. NewsWatcher might display a warning dialog box asking if you are sure you want to send the message. Click the OK button to send the message.

   NewsWatcher posts your article to `misc.test`. Now that you've posted your article, feel free to read other articles, post more articles (but it's a good idea to read for a while before becoming a prolific poster), and subscribe to additional newsgroups. You won't see your post in `misc.test` unless you quit NewsWatcher and launch it again.

7. When you're finished, choose Quit from the File menu and save your subscription list when NewsWatcher prompts you to do so.

Congratulations! You've successfully performed all the basic tasks you can perform with NewsWatcher. I won't pretend that there aren't many more subtleties in using

NewsWatcher, but you can learn about those in Chapter 14, "All About Usenet News," and by reading NewsWatcher's documentation files.

Internet Explorer 2.0

Quick description: Internet Explorer is an application for the World Wide Web, the most graphical and flexible of the Internet services. See Chapter 16, "All About the World Wide Web," for more information on the Web.

Where it comes from: The Internet Starter Kit Installer installs Internet Explorer for you. You can also download updates from the Internet from Microsoft's Web site at `<http://www.microsoft.com/>`.

Tasks:

1. Configure Internet Explorer.
2. Visit a specific Web site.
3. Browse the Web.
4. Use the History list.
5. Use the Favorites list.

Configure Internet Explorer

1. If you skipped the directions earlier in this chapter for configuring Internet Config, go back to those directions and configure Internet Config.
2. Make sure you are connected to the Internet—connect with FreePPP if necessary.
3. Double-click the Internet Explorer icon.

   Internet Explorer launches, potentially asking you if it should pick up settings from Netscape Navigator (if you've used that) or Internet Config (if you've installed it). I recommend you avoid using Netscape settings but that you do use the Internet Config settings. After that, Internet Explorer loads its default home page, which will be the Internet Starter Kit home page if you've installed Internet Explorer from the Internet Starter Kit CD-ROM.
4. From the Edit menu, choose Options.

   Internet Explorer displays the Options dialog box, which has tabs along its left side that you click to access different settings (see Figure 4.41).

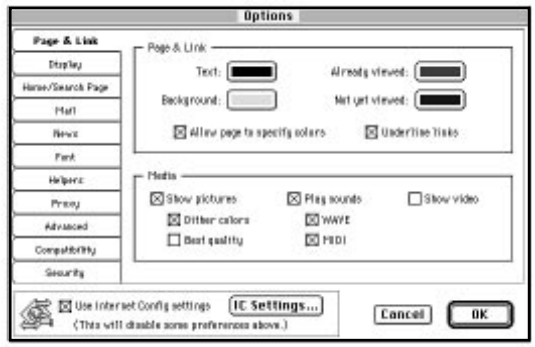


Figure 4.41 Internet Explorer Options dialog box.

5. If it's not already checked, check the Use Internet Config settings checkbox at the lower left of the dialog box.

   Internet Explorer will now use the settings created in Internet Config.

6. Click the OK button.

That's all there is to it. You now have Internet Explorer configured and ready to go. There are, as you can see, many other settings that you might want to use, but they aren't necessary for basic operation. Read Chapter 16, "All About the World Wide Web," for more information about Internet Explorer.

Next, we use Internet Explorer to go to a known URL (Uniform Resource Locator—it's the address of an Internet resource), such as you might see in a magazine or on television.

Visit a Specific Web Site

1. Make sure Internet Explorer is running and that you are connected to the Internet.
2. In the Address field, type **www.yahoo.com** and press Return.

   Internet Explorer displays the contents of the Yahoo! home page (see Figure 4.42). Yahoo is a catalog of Web sites (much like a card catalog in a library) that you can browse to find interesting sites.

That's all there is to going to a particular URL. If you see URLs in publications, on business cards, or wherever, you can type them into the Address field or you can also paste them from other programs. You can type or paste in the `http://` at the beginning of a URL as well, but it's not necessary in Internet Explorer.

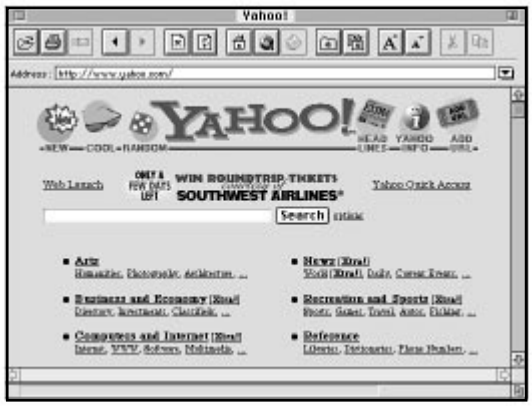


Figure 4.42 Internet Explorer at Yahoo!

Browse the Web

1. Make sure you are still connected to the Internet and at the Yahoo! home page, which you should be at if you just followed the steps in the previous section.
2. In the Arts topic, click the underlined word `Arts`.

   Internet Explorer takes you to the Arts page on the Yahoo! (see Figure 4.43).

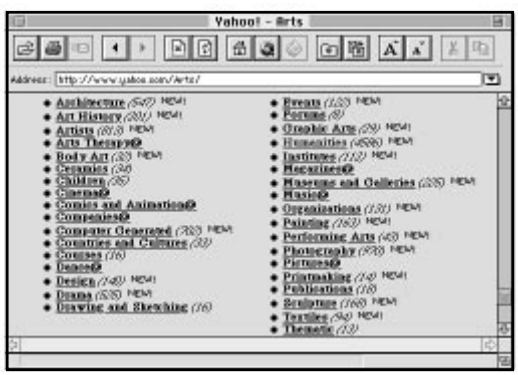


Figure 4.43 Internet Explorer at the Arts page.

3. Notice the triangle-shaped Back and Forward buttons on Internet Explorer's toolbar. Click the left-pointing triangle.

   Internet Explorer returns to the previous page, the Yahoo! home page. Notice that the underline for the Arts link has changed color, indicating that you have already visited that link.

4. Click the right pointing triangle.

   Internet Explorer moves ahead in the sequence of pages you've visited and takes you to the Yahoo! Arts page.

I hope you're feeling comfortable with clicking underlined text to move around in the Web, because if so, you know the basics of browsing the Web. Feel free to continue clicking underlined words (which are called "links") to move to other parts of the Web.

Although you can always use the Back and Next buttons on the toolbar (or the Back and Forward commands on the Go menu), you might also wish to use Internet Explorer's History list to get around more efficiently.

Use the History List

1. If Internet Explorer isn't launched, make sure you are connected to the Internet and launch Internet Explorer.
2. Choose an option in the Go menu. (If nothing shows in the Go menu, that's because you haven't yet used Internet Explorer to go anywhere; the steps earlier in this section explain how to do this.)

   Internet Explorer takes you to the page you chose.
3. From the bottom of the Go menu, choose More History.

   Internet Explorer brings up the History dialog box (see Figure 4.44). Your dialog box might not look exactly like the one in Figure 4.44, but you should see all the Web pages listed in the Go menu, and—if you've visited enough Web pages—additional pages that didn't fit in the Go menu.

Figure 4.44 Internet Explorer's History dialog box.

4. Double-click one of the entries in the History list.

   Internet Explorer loads the page you double-clicked. If you have enough screen space, you can keep the History window open while you use Internet Explorer.

You now know the basics of using the History list, which includes all pages that you've visited. You can also set up a Favorites list, which is for Web pages you want to return to frequently. We'll look at the Favorites list next.

> **BTW**
> You can also use the History pop-up menu (accessed by pressing the down-pointing triangle to the right of the Address field in the Internet Explorer window) to see Web pages you've visited since you last launched Internet Explorer. Unlike the Go menu, this menu doesn't list every page you've visited; instead, it lists only domains you've visited, such as `tidbits.com` or `yahoo.com`.

Use the Favorites List

1. Check to be sure that you are connected to the Internet and that Internet Explorer is launched.
2. In Internet Explorer, browse to the Yahoo! home page. (You might be able to double-click it in your History window, as explained in the previous set of directions, or you can type **www.yahoo.com** in the Address field and press Return.)

   Internet Explorer takes you to the Yahoo! home page.
3. From the Favorites menu, choose Open Favorites.

   Internet Explorer opens the Favorites window (see Figure 4.45).

Figure 4.45 Internet Explorer's Favorites window.

4. From the Favorites menu, choose Add Page to Favorites.

   An item for Yahoo! appears in the Favorites window.
5. Keep the Favorites window open, but switch back to the Internet Explorer window. In the Address field, type **www.tidbits.com** and press Return.
6. The TidBITS home page displays.
7. Choose Add Page to Favorites from the Favorites menu.

   A listing for TidBITS appears in the Favorites window.
8. In the Favorites window, double-click Yahoo!

   Internet Explorer takes you to the Yahoo! home page.

These instructions should give you an idea of how to add items to the Favorites list and how to browse to those items quickly on the Web. Like the History window, you can keep the Favorites window open while you browse the Web, or you can select items from the Favorites menu.

Those are the basics of using Internet Explorer, though exploring even a portion of the Web could take a lifetime. When you finish looking around, quit Internet Explorer by choosing Quit from the File menu. You might wish to disconnect from the Internet after you quit. To learn more about the Web and using Internet Explorer, read Chapter 16, "All About the World Wide Web."

This Is Only the Beginning

If you've followed some or all of the previous tasks, you've done quite a bit on the Internet. Here is what you've learned to do:

1. Configure Open Transport or MacTCP.
2. Configure FreePPP.
3. Configure Internet Config.
4. Write, send, read, and delete email with Eudora.
5. Retrieve and upload files via FTP with Anarchie.
6. Read, write, and post articles with NewsWatcher.
7. Browse the World Wide Web with Internet Explorer.

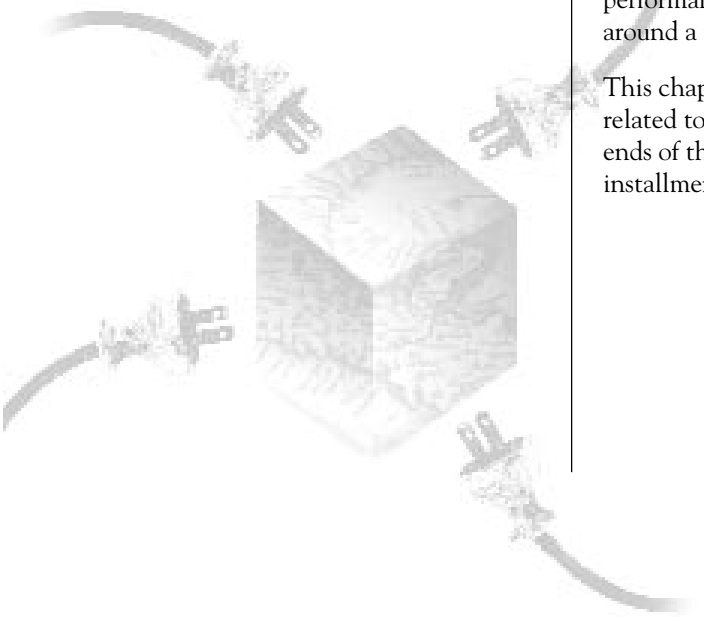
I hope this chapter has conveyed the information you need to get over the hump of using these programs. If something changed such that the instructions don't work quite right, don't lose heart. The Internet changes rapidly, and you must be flexible enough to deal with that change. Keep trying and you're bound to get the hang of it soon.

Also, as you might have noticed, this book has layers. The outer layers, represented by the earlier chapters, such as this one, provide the basic information you need in order to connect to and use the Internet. These earlier chapters paint in broad strokes and avoid many details that aren't critical early on. Later on, after you've had a chance to absorb some of these early layers of information, you'll find a good deal more detail about using the software mentioned in this chapter.

Chapter 5 Things that Go Bump in the Net

Contents:

- Initial Troubleshooting
- Reporting Problems
- Open Transport Q&A
- MacTCP Q&A
- Domain Name Server Errors
- FreePPP and MacPPP Q&A
- InterSLIP Q&A
- Tune in Next Week…



If you have used the Internet Starter Kit Installer and walked through the step-by-step instructions in the last chapter and everything works, congratulations! Skip this chapter entirely, because it can get a bit technical in places, and if everything works, there's no need to dwell on what might not work. Most people don't have much trouble setting up an Internet connection, but there are some pitfalls to avoid and some tricks and tips I've learned over the years. I'd like to share some of the problems and solutions with you here, and although I hope you don't need to read this section, if you do, I hope it helps. I've formatted the section along the lines of an Internet FAQ, or Frequently Asked Questions, list. Within each section, I've tried to organize the questions and answers roughly as you might experience them. There's no point, for example, in giving suggestions about improving performance before giving suggestions about how to get around a modem problem and connected in the first place.

This chapter covers only connection problems—for problems related to email, Usenet news, FTP, or the Web, check the ends of those chapters later in the book for additional installments of "Things that Go Bump in the Net."

Initial Troubleshooting

When you've determined that you have a connection problem, there are a couple of standard procedures for eliminating it that I give next. If those don't work, read through the rest of this chapter for instructions on how to report problems as well as solutions to specific problems.

First though, do the following: Start over completely from scratch, removing from the System Folder all files related to MacTCP (if you use it; there's been no indication of Open Transport's files becoming corrupted) and FreePPP, including preferences files.

> **BTW**
> One quick way to find all these files for quick removal is to use the Find command in the Finder's File menu to search for "TCP" and "PPP." I recommend not deleting these files until you're up and running again, just in case, but that's why Apple created a Trash that doesn't delete files until you choose Empty Trash.

After you've removed the old files, reinstall from your original source of the files (probably the Internet Starter Kit Installer) and carefully follow each step in the step-by-step instructions in the last chapter, noting anything that doesn't seem to mesh between your setup and what the instructions say. If you deviate from the instructions, note that, too. In many cases, following this procedure will either solve the problem or reveal where it lies. Taking something apart and putting it back together often fixes problems for no apparent reason. Don't think of this process as an unpleasant chore, because then you're likely to become careless and miss an important clue. Troubleshooting can be a lot of fun, because you learn a lot more about the topic at hand, and you get to solve a real-life mystery in which no one dies.

If that basic process doesn't work, try this one, which is more work, but is more likely to eliminate all possible problems. Again, these instructions are for people using MacTCP; if you use Open Transport, leave it alone and ignore the steps and references to MacTCP below, following the rest of the steps.

1. Write down all the settings that you've entered into MacTCP and FreePPP.
2. Throw out MacTCP from the Control Panels folder, throw out FreePPP from the Extensions folder, throw out MacTCP DNR from the System Folder, and throw out MacTCP Prep and FreePPP Preferences from the Preferences folder. If you use Open Transport instead of MacTCP, throw out the TCP/IP Preferences from the Preferences folder as well. Don't throw out the TCP/IP control panel or other files related to Open Transport.
3. Restart with the Shift key down so that extensions don't load.

4. Reinstall MacTCP and FreePPP from clean originals. If you're using the Internet Starter Kit Installer, the copies it installs count as clean originals.
5. If you're using the Internet Starter Kit Installer, hold down the Shift key when it makes you restart. Otherwise, restart the Mac manually, making sure to hold the Shift key down to prevent extensions from loading. This is important, because it enables you to work with clean copies of the various control panels.
6. Open MacTCP and select FreePPP. Then click the More button and configure MacTCP as you had it previously configured. The Internet Starter Kit Installer might have configured it properly for you, depending on your installation choices.
7. Open FreePPP Setup and configure it as you did before.
8. Now, using an extension manager such as Conflict Catcher or Apple's Extensions Manager (which you can find in the Control Panels folder), turn off all extensions and control panels other than MacTCP and, if they show up in your list, FreePPP and MacTCP DNR. Especially make sure that all anti-virus software such as SAM and Virex is off.
9. To be ultra-safe, make copies of your MacTCP Prep and FreePPP Preferences files in the Preferences folder. They're the most likely to be corrupted, and you can replace bad versions with these copies later on if necessary.
10. Restart the Mac, letting extensions load. The only things that should load are the extensions and control panels that you left on with the help of the extension manager in Step 8.
11. Try to establish a connection. If you experienced a grayed-out Connect button in FreePPP, it should be available now, and if you had problems with other crashes or errors, they should be gone now.
12. If your problems are gone when you start up with all extensions off except those necessary to use the Internet, then it's likely that one of your extensions is conflicting with your Internet connection. To find the conflict, turn on all of your normal extensions and control panels one by one using the extension manager. Test your Internet connection after each change, and make sure things still work. If they stop working, you might have found the conflicting extension. Please let me know what it is so I can warn others.

Reporting Problems

Before I give specific solutions to specific problems, I want to say a few words about how you can best go about isolating problems and reporting them on the net or to technical support. If you ask for help on `comp.sys.mac.comm` by posting a note that says something such as, "I'm connecting to the net via PPP and it doesn't work. What am I doing wrong?" you won't get any helpful responses. You probably won't get any responses at all, helpful or

not, because people will have no clue what your problem is other than the fact that you don't know how to ask for help.

Some mysteries confound amateur sleuths, and when they're unable to find the solution to a problem, they must consult others who are more knowledgeable or who have a different way of looking at the problem. If you are having trouble with a commercial program, the first experts to turn to should be the technical support staff at the company that produced your program. I've heard good things about most of the technical support staffs of companies that make Internet applications, although quality tech support is never guaranteed.

When dealing with telephone technical support people, keep in mind that they probably know a lot more about the program in question than you do, they answer a huge number of calls every day, and the job has a high burnout rate because it's so stressful. You're most likely to get the best help if you're polite and cooperate with what they ask you to do. If you call and announce that you're a power user and why doesn't this stupid program work anyway, you're unlikely to get decent help. If, on the other hand, you call, say that you're having troubles, and give the information the technical support person asks for, she can do a much better job. It never pays to alienate the person whom you're asking for help—whatever is wrong is not her fault.

If you are using a freeware or shareware application, it usually says whether or not the author is willing to help using email. If not, there are several places where you can ask for help from other users, many of whom are true experts. Also, the developers of many of the freeware and shareware utilities tend to hang out in the same places and help their users, even if they prefer not to be continually asked for help in personal email. The best place to ask for help with Internet stuff is on the Usenet newsgroup `comp.sys.mac.comm`. There also are many knowledgeable people who hang out in the Mac Communications and Apple Internet Users mailing lists, which you can subscribe to by sending email to `listproc@solutions.apple.com` with the commands **subscribe mac-communications *Your Name*** and **subscribe apple-internet-users *Your Name*** in the body of the message (put them on separate lines). Check Chapter 21, "Macintosh Internet Resources," for more information about these mailing lists. If you can post to a newsgroup, there are often newsgroups specific to your provider where local folks hang out and answer questions, such as the `halcyon.slip` newsgroup at Northwest Nexus.

> **BTW**
> If you don't read a newsgroup regularly, you should explicitly ask for replies by email so you don't miss anything.

No matter what, if you want any of these people to help you, you must help them first by sending a complete report. In that report, you should include the following:

- List exactly what you're trying to accomplish. This should be specific, because telling someone that you want to read Usenet news with NewsWatcher isn't salient to the problem of not being able to get FreePPP to connect. Take each goal a step at a time.

- Mention the fact that you have carefully followed the directions. This fact tells people (a) that you're not a complete idiot and can read directions, (b) that you have gone through a certain set of procedures already, and (c) that you are capable of following any suggestions they make. If you haven't followed the directions carefully, don't bother posting until you do so.
- List the salient facts of your software and hardware setup. Include things such as what Mac you have, what modem you use, what version of the System software you're running, and any weird stuff that you can't eliminate from the testing. Unless asked, don't bother listing every extension and control panel on your hard disk. You should have already eliminated them in the process of testing by turning off all unnecessary extensions and control panels. Also, an unusually long report will turn many people off.
- Talk a bit about what you have already tried, whether or not it worked, and whether you noticed anything strange happening at any time during the process. If you encounter error dialogs at any time, report exactly what they say.
- Be nice. The last thing you want to do is insult an expert's favorite program, since he or she is less likely to help you at that point. When you're in trouble, it doesn't help to alienate anyone.

Open Transport Q&A

Open Transport 1.1 has been out for only a short while as I write this, and it's proven to be a great success. Open Transport solves the problems related to MacTCP's interface and is compatible with almost every Internet application I tried. Because of that, there aren't that many problems and solutions I can provide here, which is good, I suppose.

Q: I don't have a TCP/IP control panel in my Control Panels folder. Where is it?

A: Assuming that you've installed Open Transport (which is almost certain if you installed the System 7.5 Update 2.0 or have a Mac that contains System 7.5.3), look for a program called Network Software Selector in your Apple Extras folder. Run it, and turn Open Transport on.

Another possibility is that you've turned that control panel off in an extension manager program.

Q: I can make an Internet connection with FreePPP, but when I launch any Internet application, it crashes. Could I have configured something wrong?

A: In all likelihood, you didn't configure anything at all. In certain cases, if you install Open Transport over an existing MacTCP installation that uses PPP, the installer will erroneously select Using BootP Server from the Configure pop-up menu. Change that to Using PPP Server and everything should work.

Q: I can make a connection and launch Internet applications, but they all complain about not being able to find a DNS server. How can I fix this?

A: It's likely that you have incorrect information in the Name server address field in the TCP/IP control panel. Check that and enter the correct IP numbers for your domain name servers. One great feature of Open Transport is that you don't have to restart your Mac after doing this, as you would with MacTCP, and you don't even have to disconnect.

If this problem just started occurring for a connection that used to work properly, it's likely that you have only a single domain name server in the Name server address field, and it's down. Enter the IP number for another domain name server, making sure to put it above your current one so it's used first (making your current entry the secondary domain name server). You don't have to restart or even reconnect.

Finally, check the section "Domain Name Server Errors" later in this chapter for some additional ideas.

Q: My Mac's memory seems to fragment as I use it, preventing me from loading programs that require a lot of RAM, even though I know I have enough. Could Open Transport be the problem?

A: Yes. Open Transport has a feature that enables it to load into memory when necessary, which is a good idea, but it can fragment memory by using bits of memory in the middle of large free chunks. To avoid this problem, open the TCP/IP control panel, choose User Mode from the Edit menu, and switch into Advanced mode. Click the Options button and make sure Load only when needed is turned off.

Q: Can I double-click settings exported from the TCP/IP control panel to open them?

A: Unfortunately, no, even though the TCP/IP control panel is really an application that just masquerades as a control panel.

Q: Is the TCP/IP control panel scriptable?

A: As far as I know, not currently, although it's one of the most requested feature additions.

MacTCP Q&A

Before anything else, let me emphasize that you may need to reinstall a clean copy of MacTCP at various times to solve problems. Thus, you must keep a clean copy that you have never opened on a locked disk. The copy that comes on the Internet Starter Kit CD-ROM qualifies as a clean copy of MacTCP.

Q: I don't see an icon for FreePPP in my MacTCP control panel.

A: Try reinstalling FreePPP.

Q: I get a weird -23004 error from MacTCP, and it complains about its drivers not being installed.

A: Make sure that you select FreePPP and not LocalTalk in the MacTCP control panel.

Q: What about that weird slider bar in the upper right of the MacTCP configuration dialog?

A: Ignore it unless you're on a subnet, which means you'll have a network administrator who can tell you what to do there.

Q: Should I type anything in the IP number box in the MacTCP control panel if I'm using server addressing?

A: No. Only enter a number there if you use a manually addressed account.

Q: Why can't I type anything in the Gateway box in the MacTCP configuration dialog box when I'm using server addressing?

A: Your gateway address is determined by your server when you use server addressing.

One reader found that in using VersaTerm SLIP, the first time you log in you must enter a Gateway address and your IP address into VersaTerm SLIP, using either the fields in the upper right of the configuration window or a small pop-up menu in VersaTerm AdminSLIP's terminal window. With Northwest Nexus, the Gateway address is the first of the two IP numbers that the machine provides after you enter your login name and password, something such as 198.137.231.150. Your IP address for that session is the second of the two numbers. Other providers might be similar.

Q: What are the MacTCP DNR and MacTCP Prep files?

A: MacTCP creates them when you restart to store various settings and preferences. You can throw them out at any time with impunity because MacTCP recreates them with the same settings when you restart. You must restart after throwing them out because MacTCP applications require MacTCP DNR to work properly.

If you reinstall MacTCP without throwing out these files, MacTCP retains the settings it had before you reinstalled. This can be useful for moving copies of MacTCP around, but they also tend to retain any corruption.

Q: My Mac crashed the first time I restarted after reinstalling MacTCP. Should I be worried, even though it doesn't crash now?

A: I would completely reinstall MacTCP (throwing out MacTCP DNR and MacTCP Prep as well) and reconfigure to be safe, but I don't think you should worry too much. Anti-virus software such as SAM can sometimes get persnickety about MacTCP creating the MacTCP DNR file, which could cause the problem.

In fact, I hear that if the MacTCP DNR file becomes corrupted, some anti-virus software, such as Gatekeeper, could possibly prevent MacTCP from updating it, which is a bad thing. If you use sensitive anti-virus software that tries to prevent unknown actions (Disinfectant is fine), to be very sure it isn't causing problems, turn it off, delete MacTCP, MacTCP DNR, and MacTCP Prep, reinstall a clean copy of MacTCP, restart, turn the anti-virus software back on, and restart again.

Q: Hmm, I don't seem to have a MacTCP DNR file. Why not?

A: That's really weird, but one reader reported a reproducible conflict with a control panel from Apple called CPU Energy Saver. Try removing it and restarting. MacTCP should create a new MacTCP DNR file on restart if it's not present.

Q: I also don't have a MacTCP Prep file.

A: First, try opening MacTCP, changing something, and then closing it. That should force the creation of a MacTCP Prep file in the Preferences folder. If that doesn't work, restart without extensions, particularly anti-virus programs, and try reconfiguring MacTCP again.

Q: I crashed while using Fetch or some other TCP-based program. Should I reinstall MacTCP?

A: That's probably not necessary. First, connect again to see if Fetch works. If it does, you're fine. If it doesn't, throw out the MacTCP DNR file and restart. Try Fetch again. If it still doesn't work, completely reinstall MacTCP from scratch.

Q: I'm getting the impression that reinstalling MacTCP is a common occurrence. Is that true?

A: Yes and no. I seldom do it, but frankly, if anything goes wrong, reinstalling MacTCP is worth trying. Make sure to throw out MacTCP DNR and MacTCP Prep, too, because they can harbor the corruption that caused MacTCP to have problems in the first place. Always keep a copy of MacTCP on a locked disk (or keep your Internet Starter Kit CD-ROM handy) to facilitate reinstalling.

Q: I'm running MacTCP 2.0.2 or 2.0.4. Should I update to 2.0.6?

A: Sure, why not? I personally haven't seen any problems in 2.0.2 or 2.0.4 that were fixed in 2.0.6, but others have, and it's a free update at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/conn/mactcp-206-updt.hqx>`.

Besides, MacTCP 2.0.6 is on this book's CD-ROM, so you can install it from there if you want, first removing the old MacTCP, MacTCP DNR, and MacTCP Prep.

Q: When I went to update my copy of MacTCP to 2.0.6, I got some sort of error about a DRVR 22. What's that all about?

A: The MacTCP updater works only on a clean copy of MacTCP that has never been opened before. Get a new copy from your master disk, update it, and the updater will work fine. Then, keep a clean copy of 2.0.6 on a locked disk somewhere for use when reinstalling.

Q: Where can I find a list of error message numbers that MacTCP passes to other programs?

A: Apple's Tech Info Library has such a list at <http://www.info.apple.com/cgi-bin/read.wais.doc.pl?/wais/TIL/Macintosh!Software/Neting!File!Prntr!Sharing/MacTCP/MacTCP!!Error!Codes!Defined>. Bear in mind that it doesn't apply to Open Transport. Just knowing what an error message means doesn't necessarily help, but it can on occasion.

Domain Name Server Errors

I've noticed many people running into a problem in which SLIP or PPP (any implementation) connects properly, but trouble arises with the domain name server when they attempt to run any of the other TCP programs. Sometimes they crash or hang, but the behavior is usually completely reproducible (although I have seen the occasional exception, where it will work fine after reinstalling MacTCP but fail on subsequent connections). Other ways a domain name server error might become apparent is if an Internet program puts up an error message saying that it can't find a domain name server or a domain name. It's hard to pinpoint precisely how domain name server errors might manifest themselves, but suffice it to say that the error messages should be relatively clear.

There appear to be a number of causes for this problem, and as a result, I can offer only some things to try. The easiest way to test this situation is with Peter Lewis's free MacTCP Watcher, which shows an IP number but no Mac name. It also complains about a "No answer error" or a "Cache fault error" when it is unable to find the domain name server. If you use Fetch, you can tell quickly that you are seeing a domain name server problem if when you connect, the dog cursor is frozen. If the dog cursor runs, you're generally better off. If the cursor is frozen, immediately press Command-. (period) to try canceling the connection before Fetch hangs. NCSA Telnet can prove useful as well, because in some cases you might be able to telnet to a machine using its IP number, but using the domain name fails. This indicates that the connection works, but that there is a problem resolving domain names.

Note that the problem is generally not with your account. Each time someone has had this problem and asked me to check his account, it has worked fine if he did indeed have a SLIP or PPP account, although trying to connect through SLIP or PPP to a Unix shell account can cause the problem. That said, here are some things to try, in this approximate order:

- Disconnect, restart, and reconnect. Sometimes that's all it takes.
- Throw out your MacTCP DNR file and restart. Sometimes this file becomes corrupted, and MacTCP creates a new one on restart if necessary.
- If you have a Hosts file in your System Folder, move it to the desktop, restart, and try again. If that works, throw out the Hosts file.
- Check your domain name server configuration in Open Transport or MacTCP carefully to make sure you typed the correct IP numbers. I've made this mistake before.
- If you are using a manually addressed account with MacTCP, make sure you have typed the correct number into the Gateway address box in MacTCP's configuration dialog box. Only your provider can tell you what your Gateway address is—you cannot guess it.
- If you use InterSLIP, make sure you use the appropriate gateway script for your provider. Without this, your Mac may be unable to get an IP number properly. A number of people try to use the Simple Unix/Telebit script that's built into InterSLIP when they should use a custom gateway script. The Simple Unix/Telebit script simply won't work with a server-addressed account such as those that Northwest Nexus provides. This is because gateway scripts for providers such as Northwest Nexus are designed to find your IP number from the login message each time you log in. If you use the Simple Unix/Telebit script instead, it completes successfully after sending your userid and password and ignores the IP address that appears next.
- Connect with a terminal emulator to make sure your account is set up for SLIP or PPP. If after providing your username and password and sending any necessary commands to start SLIP or PPP (ask your provider if any are necessary) you don't see garbage or something such as "SL/IP session beginning..." and you get to a Unix prompt that lets you type Unix commands, then your account has not been set up for SLIP or PPP. Ask your provider to fix it. This is a common mistake for overworked providers.
- Reinstall MacTCP from scratch. Hey, it's easy, but you'd be surprised how much it helps.
- Make sure your domain name server information in the TCP/IP control panel or in MacTCP configuration dialog box is correct—refer to Chapter 11, "Open Transport and MacTCP," for details.
- Try turning off Virtual Memory or disabling RAM Doubler, if you're using either. One person reported success without Virtual Memory enabled.
- Ask your provider if other people are experiencing this problem as well, because it might be related to an overloaded domain name server. They might be able to use a different machine for DNS services and solve the problem that way.

- Try using a different telephone cord to connect to the modem. In one case, a slightly bad telephone cord caused line noise that messed up InterSLIP in such a way as to cause this error.
- Okay, here's a major realization I've made (thanks to Michael Tardiff for tremendous help in figuring this out). If nothing so far has worked, check to make absolutely sure that you are using hardware handshaking with your modem, and more importantly, make sure XOn/XOff is turned off in your modem initialization string. It seems that if XOn/XOff is on, the SLIP or PPP program might appear to log in properly but will fail to find the Gateway address properly, which can cause domain name server errors.

> **BTW**
> A modem initialization string is a set of commands that is sent to your modem before it dials to configure it properly for the connection.

- Make sure your modem cable is indeed a hardware handshaking cable. Most high-speed modems purchased in "Macintosh kits" within the last few years include proper hardware handshaking cables, but if you bought a modem without a cable, or you bought a new cable separately from a computer store, your cable might not be a proper hardware handshaking cable. You might need to call your modem vendor to confirm this. Modern hardware handshaking cables should have the configuration shown in Table 5.1.

  If you're sufficiently technical (otherwise, just show this to a technical friend or buy a known good cable—see the next point), you can test these pinouts in an existing cable if you have the proper electronic testing equipment, or you can construct an electric testing device that turns on a light or makes a noise when a circuit is closed by touching leads to the proper pins (I once used an empty battery-powered squirt gun to indicate when a circuit was completed).

Table 5.1 Hardware Handshaking Cable Pinout

Mac Function	RS-232 Function	Mac Pin	DB-25 Pin
RxD (receive)	Receive Data	5	3
TxD (transmit)	Transmit Data	3	2
Ground	Ground	4 & 8	7
HSKi	CTS	2	5
HSKo	RTS & DTR	1	4 & 20
GPi	CD	7	8

- If you do not have a hardware handshaking cable, you can purchase one from numerous sources, but insist on a hardware handshaking cable, not just a modem cable. Jump up and down, yell, and scream, if necessary, but the two terms are not necessarily interchangeable. I've ordered high-quality, properly wired cables for about $15 from the Celestin Company, 800/835-5514, 360/385-3767, 360/385-3586 (fax), `celestin@celestin.com`, or `<http://www.celestin.com/compunite/index.html>`.

- After you determine that your modem cable is indeed a hardware handshaking cable, ensure that hardware handshaking is turned on in your SLIP or PPP program. You may see a checkbox labeled Hardware Handshaking, as in InterSLIP, or a pop-up menu listing choices such as XOn/XOff, CTS, RTS, and CTS/RTS (in FreePPP, it's in the Account Connection panel). Choose CTS or CTS/RTS for hardware handshaking. Hardware handshaking is usually easy to check and set.

- Unfortunately, simply turning on hardware handshaking in your PPP or SLIP program may not solve your problem. It seems that some modems set XOn/XOff, or software handshaking, in their default settings. Thus, when you initialize the modem with the factory default initialization string, you actually turn software handshaking back on. This is bad. I ran into this with a Telebit QBlazer, which defaults to software handshaking with the setting S58=3. By my changing that to S58=2 in the initialization string, the domain name server errors disappeared immediately because InterSLIP could then complete the negotiation for the Gateway address and the reverse name mapping that goes on right after the login process.

  VersaTerm AdminSLIP might not always suffer from the same problem as InterSLIP. Merely setting hardware handshaking in the configuration window enabled the QBlazer to work, whereas checking the hardware handshaking box in InterSLIP made no difference. Nonetheless, consult the fine print in your modem's manual for the settings to ensure that hardware handshaking is enabled. Look for settings called DTE Flow Control. In Telebit modems, those settings are controlled by the S58 register, although other modems undoubtedly differ.

- Try using another modem. This worked for one user who switched from a Zoom 2400 bps modem to a QuickTel v.32bis modem. This might well have been related to the hardware handshaking issue.

- Try booting from another hard disk, if you have one.

- Try installing your Internet software on another Macintosh, if you have access to one.

- Try rebuilding your desktop. I have no idea why this would make a difference, but it's worth a try. You can rebuild your desktop by pressing Command-Option during startup until the Macintosh asks you if you want to rebuild the desktop.

- Try zapping (meaning "revert to default settings") your PRAM (Parameter RAM—it stores various low-level settings). I have no idea whether this makes any difference, but anything is worth a try at this point. To zap your PRAM in System 7, hold down Command-Option-P-R while restarting the Mac. Press the keys until the Mac has made the restart sound several times. You will lose certain settings such as the time and the mouse speed setting, but you can reset those later.
- Try reinstalling your System. First, make sure you have a full set of System disks, since you must disable the System on the hard drive before installing to ensure a completely clean install. Then, drag your System file to your desktop and restart with the Install disk. Install the System and then restart with your hard disk again. Throw out the System file sitting on your desktop. If any updates from Apple exist for the version of the System you use, reinstall them as well. Then, try again. At least one user solved the problem this way.
- Consider switching to a commercial PPP or SLIP program. This might just work, and if not, you've obtained another method of getting help (from the tech support folks at that company).
- Try a different provider.
- If none of these suggestions help, I don't know what to say, except that some problems are never solved. Otherwise, we'd have world peace.

FreePPP and MacPPP Q&A

FreePPP 2.5 has been out for only a short while as I write this, so there hasn't been much time for problems to appear. However, FreePPP 2.5 is based on previous versions of FreePPP and on MacPPP 2.0.1, so there are some known issues.

If I say MacPPP in the following questions or answers, I mean MacPPP 2.0.1 and not FreePPP. Enough copies of MacPPP are still in use that I don't want to eliminate the troubleshooting information that appeared in previous editions of this book.

Some of the problems and solutions that apply to MacPPP may also apply to FreePPP; I simply don't yet have enough data.

Q: I'm using MacTCP and I want to switch from InterSLIP to FreePPP. What should I watch out for?

A: First, you need a new account. Second, I don't recommend leaving the InterSLIP extension installed at the same time as the PPP extension. Third, reinstall MacTCP from scratch before trying to connect with FreePPP. Frankly, if everything works fine with InterSLIP, I don't recommend bothering to switch.

Q: After I installed MacPPP or FreePPP, my Mac hangs.

A: This definitely points to an extension conflict. Readers have reported conflicts with the Pro DOS File System extension and the FWB CD-ROM Toolkit, but the only way to tell on your system is to remove all extensions other than stuff from Open Transport or MacTCP and MacPPP or FreePPP and see if your Mac starts properly. Then turn the other extensions and control panels on, one or two at a time, until you find the culprit.

Q: Why am I getting an error message that tells me "The control panel ^0 is damaged" when I open FreePPP?

A: You're probably using a version of MacTCP earlier than 2.0—FreePPP requires MacTCP 2.0.6 or Open Transport.

Q: I have an internal modem in my PowerBook, but there's no choice in the Port Name pop-up menu for Internal Modem. What should I select?

A: Select the Modem port. Nonbus internal modems in some PowerBooks (typically the 100 series) connect to an internal modem port connector. Bus modems, such as the Apple Express Modem and the Global Village PowerPort/Mercury for the PowerBook 500 series and the PowerBook Duo, should be set to Internal Modem.

Q: I have an internal modem in my PowerBook 520, but I want to use an external one on the Printer-Modem port. Why doesn't that selection show up in the Port Name pop-up menu?

A: In the PowerBook Setup control panel, there's a setting on how the modem should be treated. If it's set to Compatible, your Printer-Modem port won't appear in the Port Name menu. Set the PowerBook Setup control panel's Modem setting to Normal and all will be well.

Q: I use a PowerBook 5300 with a PC Card modem. Why doesn't the name of my PC Card modem show up in the Port Name pop-up menu?

A: Make sure your PC Card modem software is properly installed. For instance, with the Global Village PowerPort Platinum Pro PC Card, which combines Ethernet and a 28.8 Kbps modem, you can use the Ethernet portion of the card without having the Global Village Toolbox file installed in your Extensions folder. However, the modem portion of the card won't work then.

Q: Why do I get an error message from MacPPP or FreePPP complaining about having insufficient memory?

A: It's been suggested that if you installed MacPPP with SAM active, and used the "allow" feature in SAM, that MacPPP and possibly MacTCP would be corrupted. The fix is to turn SAM off and reinstall both MacTCP and MacPPP from scratch.

You might also try adding a space to the beginning of the name of the MacTCP control panel (this problem occurs only with MacTCP, not with Open Transport) to make it load earlier.

Q: I'm using MacPPP, and whenever I try to select CTS & RTS (DTR) or CTS only from the Flow Control pop-up menu, it tells me that it doesn't work with CTS and that I might have a bad modem cable. My modem is an internal Global Village modem, so I don't have a cable. What should I do?

A: Zap the parameter RAM (PRAM). Press Command-Option-P-R while restarting your Mac. Press the keys until the Mac has made the restart sound several times.

Q: My Open button is grayed out, so I can't click it to connect.

A: The first and most likely possibility is that you have not selected the PPP or FreePPP icon in the MacTCP control panel. Make sure it's selected (try selecting another icon in MacTCP then reselecting PPP or FreePPP) and try again.

Next, try opening and closing the Chooser. I have no idea why this works, but it has reportedly worked for some people.

There are some known conflicts that might cause this. One possible conflict might be with an older version of the shareware SpeedyFinder, although the most recent versions solve this. Also, the elderly screen saver called Moiré has been implicated in this problem. Finally, many Performas came with 2400 bps Global Village TelePort/Bronze modems, and if you upgrade to a faster modem, you should move the Global Village Toolbox file out of the Extensions folder and the GV TelePort Bronze file out of the Control Panels folder before trying again. And of course, if you have the SLIP extension from VersaTerm SLIP, InterSLIP, or MacSLIP installed, that may cause the problem as well.

You might try zapping the parameter RAM (PRAM). Press Command-Option-P-R while restarting your Mac. Press the keys until the Mac has made the restart sound several times. Then reconfigure MacTCP.

Be very wary of any fax or remote control software that might have taken over the modem. Even if it doesn't conflict directly with MacPPP or FreePPP, the fax software may leave the modem in an unusable state. One reader reported that the GlobalFax software from Global Village caused this problem unless AppleTalk was turned on (which is screwy).

Check to see if Virtual Memory is on or if RAM Doubler is installed, and if so, turn them off. That helped in at least one situation.

One reader reported that the file KODAK PRECISION CP-CP1-CP2 as installed by Adobe Photoshop caused the Open button to be grayed out. Removing it solved the problem.

Q: My Open button is still grayed out.

A: Reinstall MacTCP from scratch, making sure to delete MacTCP DNR and MacTCP Prep. This one once threw me for an hour.

Q: I still can't click the Open button.

A: Okay, one last possibility. Try reinstalling your System from scratch. Reinstalling the System seemed to help a number of users (mostly using Macintosh Performas) with this problem. First, make sure you have a full set of System disks, since you must disable the System on the hard disk before installing to ensure a completely clean install. Then, drag your System file to your desktop, and restart with the Install disk. Install a new System, and then restart with your hard disk again. If any updates from Apple exist for the version of the System you use, reinstall them as well. Throw out the System file sitting on your desktop, then completely reinstall MacTCP (throwing out MacTCP DNR and MacTCP Prep as well) and MacPPP (throw out the PPP or FreePPP extension and the Config PPP control panel if you're using MacPPP), and try again.

Q: When I click the Open button, MacPPP never even dials out but times out waiting for OK during the checking for modem phase. Do I have a bad modem init string?

A: This timeout is independent of the modem initialization string, since MacPPP isn't even getting that far. The problem is probably related to the flow control or port speed settings. Try different settings, and make sure you don't select 14,400 or 28,800 for the port speed, since some modems can't handle those as port speeds.

Also, it's possible that you have a bad modem cable, although you probably would have noticed that if you've used the modem before.

Finally, make sure you don't have spurious characters (or trailing spaces!) in your modem init string—delete the entire string and retype it manually.

Q: Nice try, but I still can't get MacPPP to recognize my internal Supra modem.

A: Ah, that's different. Larry Blunk mentioned a problem with the Supra and perhaps some other internal PowerBook modems. It seems that they are normally in a low-power state and can take a few seconds to warm up when MacPPP opens the serial driver and tries to dial out. Because the modem is warming up, it ignores the first initialization string that MacPPP sends, and MacPPP doesn't try again. The workarounds include using the terminal window or trying to script the modem initialization string in the Connect Script dialog. You might also try switching to FreePPP 2.5.

Q: When I click the Open button, MacPPP complains about the serial port being in use.

A: First, make sure you are using a free serial port. If you have AppleTalk turned on in the Chooser, you can't connect your modem to your Printer port. PowerBooks with only one serial port, called a Printer/Modem port, suffer the most from this, so make sure you have AppleTalk turned off.

Second, distrust all fax software. It's evil stuff and will often prevent MacPPP or FreePPP from accessing the modem properly.

Third, you might try zapping the parameter RAM (PRAM). Press Command-Option-P-R while restarting your Mac. Press the keys until the Mac has made the restart sound several times.

Q: What does the FreePPP error message that says "Link Established but was not reliable and was disconnected" mean?

A: Generally it means that the modem string for your modem isn't right. If you're using the Auto Detection feature in FreePPP, try entering a modem init string manually (see Chapter 12, "PPP and SLIP," for details).

Q: I need to dial a calling card number, but MacPPP dials too quickly. How can I slow it down?

A: Insert one or more commas in your phone number to provide two-second pauses. Also, beware that MacPPP's Phone Number field can't hold all that many characters, so you might have to eliminate all dashes (which are unnecessary) from your phone number to make it fit.

Q: Why can't I type into the terminal window?

A: In some cases, the terminal window doesn't display the characters you type (this might be related to local echo settings in the modem initialization string) until you press Return. Typing blind is a pain, but you shouldn't have to use the terminal window much.

Q: For some reason, I can't connect using port speeds over 19,200 bps. Why would that be?

A: Some modems don't work well at speeds over 19,200 with their default configurations. You might need to twiddle with the modem initialization string to get them to work. Don't worry about it too much, though, since 19,200 bps is fast enough for a 14,400 bps modem.

Also, activating the FAXstf 3.0 LineManager option, according to one reader, prevents MacPPP from working with the SupraFAXmodem v.32bis at speeds above 19,200. Distrust fax software.

Q: Why can't I connect using MacPPP set at 14,400 bps with my 14,400 bps modem or at 28,800 bps with my 28,800 bps modem?

A: You're confusing modem speed and port speed. The port speed setting in MacPPP should always be set faster than the modem speed to take advantage of modem compression capabilities. Some modems don't recognize 14,400 or 28,800 bps as valid port speeds and won't work at all. FreePPP solves this problem by eliminating those speeds.

Q: My modem connects, and MacPPP gets to the Establishment phase, and then the Mac crashes. What could be happening? (I can use the terminal window to log in fine.)

A: One reader reported a problem such as this. It seems that the remote system sent a "banner page" of all sorts of text after accepting the password but before starting PPP. MacPPP saw the banner page and got confused because it was expecting PPP code at that point. The solution is to send several \d delay tags after sending the password by including another Out line with the tags in it in MacPPP's connect script; this gives MacPPP time to ignore the banner page before starting PPP.

Q: My modem connects, MacPPP or FreePPP get to the Establishment phase, and then I get a Link Dead message. Why?

A: The most likely reason is that something in the login chat script is wrong. You might have entered the wrong userid or password, or entered them incorrectly. Try using the terminal window to connect manually and see what's happening.

It's also not uncommon for a provider to make a mistake in setting up an account such that it's not a PPP account, or perhaps such that it links to a different userid or password.

Also, see the previous question and answer, since sometimes the previous problem doesn't result in a crash, but merely a Link Dead message.

Some providers give different userids and passwords for dialing in than they do for email, for example, or different userids and passwords for shell accounts versus PPP accounts. Double-check to make sure you're using the correct ones.

Occasionally, the problem is sporadic, and at that point, all you can do is keep trying to connect. You might be getting a bad connection, or perhaps your provider has a bad modem or a bad phone. Ask the tech support folks at your provider if it continues.

Q: Sometimes when I'm trying to connect and MacPPP has to redial, I get a failure dialog box with a Retry button. What should I do?

A: Click it. I'm not positive of the circumstances in which this dialog box appears, but I always just click Retry and eventually it connects.

Q: I upgraded to FreePPP, and my connection script doesn't work any more. I can still log in with the terminal window, though. What happened?

A: Make sure the first line of your connection script is still correct (most just send a Return character). Try reselecting the Send menu item in the Do column and make sure the Return checkbox is checked for that line.

Q: I use a Global Village PowerPort with my PowerBook 500-series Mac, and although it works fine the first time I dial out in any session, on subsequent tries it doesn't seem to be working. It won't show the menu status information, nor will it make any sounds. What's wrong?

A: This appears to be a problem exclusive to the PowerPort modems in the PowerBook 500 series. The problem lies in the Global Village software, and is actually only cosmetic, although it's easy to get impatient and assume it's not working. Check for a later version of the Global Village software in `<ftp://ftp.globalvillag.com/pub/software/>`. In general, call your modem vendor if you're worried about having too-old modem software; an update might fix nagging problems.

Q: Now that you mention Global Village, I'm having trouble with a Global Village Gold II modem that came with my Performa. Can you offer any suggestions?

A: Yes, buy a real modem. It's not really that bad, but that particular model of modem that comes with the Performas has caused no end of headaches. Try the init string **AT&F1&K3**, and if that doesn't work, contact Global Village tech support by phone at 408/523-1050 or through email at techsupport@globalvillage.com. In general, disable Global Village's fax software, but be wary of disabling all of its software—some of the modems require it to be present.

One reader reported having constant trouble with an internal TelePort Gold IIv and upon calling Apple at 800-SOS-APPL, determined that it was actually a defective modem. Although it's unusual, it's always possible to get a bad modem.

Q: I can connect on occasion, but not all the time. What could be wrong?

A: Some modems, the US Robotics Sportster and the Global Village TelePort/Gold in particular, sometimes have problems if you are using an incorrect modem initialization string. Check your string carefully.

Also, sometimes I'll see failed connections on my Northwest Nexus account when I know I have everything set up fine. Just try again a few times, waiting a bit between tries, if you can. I suspect these problems relate to a bad modem, line noise, or some other situation out of your control, and in my experience they always go away after several tries.

Q: MacPPP or FreePPP seems to dial the phone randomly on its own.

A: Click the Hard Close button, instead of the Soft Close button, to disconnect. The drawback to doing this is that you cannot use MacPPP's auto-connect feature after this unless you restart. Also, set a short idle timeout in Config PPP so it hangs up quickly if MacPPP does dial on its own.

Make sure you don't have any TCP-based applications set to launch during startup or any control panels that use the Internet (such as Network Time, Meeting Maker XP, NetPhone Alert, or Timbuktu Pro). They'll force MacPPP to dial out every time. If you switch to FreePPP, it has a checkbox that enables applications to connect. If that box isn't checked, no dialing will occur.

Finally, Vladimir Butenko of Stalker Software finally tracked down an internal timer within MacTCP (not Open Transport) that attempts a connection approximately 5.5 hours after the last connection was closed. Switching to Open Transport gets around this timer problem.

Q: I can connect properly, but I experience very slow transfer rates in Anarchie and Fetch. It seems okay at first, but gets progressively worse until the connection is basically dead.

A: First, if you have the port speed set to 57,600 bps, try setting it down to 38,400 bps or 19,200 bps, especially if you're using a slower Macintosh with a fast modem.

Second, I've seen this happen with MacPPP and with MacSLIP, but in both cases, I was able to solve the problem by turning off all unnecessary extensions and control panels. The hard part was isolating which of them were causing the problem, and in some cases, more than one did. On my parents' LC II running MacSLIP, the APS PowerTools CD driver software turned out to be the culprit. On my PowerBook 100 (this was an embarrassing problem that haunted me for months), the problem was caused by PBTools 2.0, a PowerBook utility. Another user reported problems with SuperClock and the Spirit CD control panel. Yet another reader reported that the "~Cubhouse Issue 4" CD-ROM software and Apple's Print Share 1.1.1 both caused this problem as well. In general, I'd look for any control panel or extension that is in constant use, such as a clock, a battery-monitoring utility, or a CD driver control panel (two others of which, the MindLink CD driver and the Apple CD driver, have been implicated in other performance problems as well).

Third, if your telephone line has a lot of noise on it (this is especially common in old houses and rural areas), you should call the telephone company and ask it to repair your line. They might not be able to, given the installed wiring, but it's worth a try.

Q: Can you suggest any solutions for why my modem disconnects randomly?

A: Make sure you have call waiting turned off (add ***70,** to your modem init string or ask your phone company what its codes are). Also check to make sure you don't have **&D2** in your init string (if so, replace it with **&D0**—that's a zero. Make sure you're using some form of hardware handshaking (see Chapter 12, "PPP and SLIP," for more information) and that your modem init string uses hardware handshaking as well. Finally, try different cables for the modem and for the phone line. Trying a different phone jack might even be worthwhile if nothing else helps.

Also, really bad line noise can cause this problem as well, so call the telephone company and ask it to check out your line if you suspect line noise.

If someone in your house picks up another telephone while you're using the modem, that can cause a disconnect as well. You might want to tell people when you're using the modem so they don't accidentally pick up the handset on another phone.

Q: Any idea why MacPPP crashes when I click the Hard Close button?

A: No, but one reader who was experiencing this tracked it down to a conflict with SAM, the anti-virus program. If you run SAM or any other anti-virus software, try removing it first. If that doesn't work, try shutting off all unnecessary extensions and control panels and see if that makes a difference. If it does, work your way back up to a full set and see which file is the culprit. I personally use and recommend only Disinfectant for anti-virus purposes.

Q: When I try to launch FreePPP Setup from either the FreePPP Menu or the FreePPP Control Strip, it doesn't work. Any idea why?

A: You need to rebuild your desktop. Restart your Mac, holding down the Command and Option keys until it asks if you want to rebuild the desktop. Click the OK button.

InterSLIP Q&A

Even though InterSLIP isn't used nearly as often as FreePPP or MacPPP, it does work with Open Transport and it's still free. Thus, the following troubleshooting information is still useful for some folks.

Q: I can't find InterSLIP Control on my disk.

A: You don't need InterSLIP Control if you use System 7. It is necessary only with System 6.

Q: I copied the gateway and dialing scripts into the proper folders. Why don't they show up in the pop-up menus in InterSLIP?

A: Two things to check here. Those files should be text files, so if they are any other type, they may not show up, since InterSLIP won't recognize them. If you simply save from Microsoft Word, for instance, those files will be of type WDBN and not of type TEXT. Use Save As and select the Text Only option that exists in most word processors. Second, if you copy those scripts in while InterSLIP is running, it won't recognize them until you quit and launch InterSLIP Setup again. You don't have to restart; simply quit and relaunch.

Q: If I launch an application without manually connecting with InterSLIP, InterSLIP tries to dial the phone twice, then the Mac hangs. What's going on?

A: In my experience, InterSLIP's auto-connect feature doesn't work well. This might not be InterSLIP's fault, and it does work for some people, so if it does for you, great. If not, make a habit of connecting manually before you launch a program such as Fetch. Since Eudora doesn't open a TCP connection until you check for mail, you can use it without connecting InterSLIP first. One person said that he had solved his auto-connect problems by adding a "pause 30" statement in his Gateway script just before it exits. This may help, although my Mac never even dials the phone before freezing on auto-connect.

Q: When I click the Connect button, nothing happens. Why not?

A: This points directly at an extension conflict with either InterSLIP, Open Transport, or MacTCP. I would recommend pulling all unnecessary extensions and control panels out. Or, better yet, use an extension manager such as Apple's free Extension Manager or the powerful (but commercial) Conflict Catcher from Casady & Greene, which can actually help in your testing process. Leave only Open Transport's TCP/IP control panel or MacTCP and InterSLIP, and try again. If the problem disappears, slowly replace the extensions and control panels that you use until the problem reappears, identifying the culprit in the process. I've seen problems possibly related to MacTOPS, DOS Mounter, SuperLaserSpool, and GlobalFax, the control panel with the Calcomp Drawing Slate, and a two-way conflict with AutoRemounter and PSI FaxMonitor. In general, be wary of any extensions that modify a network or a modem, including fax or remote control software. I'm also generally suspicious of anti-virus software. Even if these programs don't specifically conflict with InterSLIP, they may leave the modem in such a state that InterSLIP cannot dial out properly.

Q: I use MacTCP, and although I removed all of my extensions and control panels, I still get nothing when I click the Connect button.

A: Try reinstalling MacTCP from scratch (throwing out MacTCP DNR and MacTCP Prep) and InterSLIP (throw out the entire InterSLIP Folder, the InterSLIP extension, and InterSLIP Setup), and reinstall from fresh copies. If you have custom scripts, there's no need to throw them out.

Q: It still doesn't work.

A: Shoot. The next thing to try is reinstalling your System. First, make sure you have a full set of System disks, since you must disable the System on the hard disk before installing to ensure a completely clean install. Then, drag your System file to your desktop, and restart with the Install disk. Install a new System, and then restart with your hard disk again. If any updates from Apple exist for the version of the System you use, reinstall them as well. Throw out the System file sitting on your desktop, then completely reinstall MacTCP (throwing out MacTCP DNR and MacTCP Prep) and InterSLIP (throw out the entire InterSLIP Folder, the InterSLIP extension, and InterSLIP Setup), and try again.

Q: Sorry to be a pain, but it still doesn't do anything when I click the Connect button.

A: Okay, I don't really know what's happening here. Try getting a PPP account and use FreePPP, or purchase VersaTerm SLIP or MacSLIP and see if they work any better. I wish I could give a better answer, but I can't.

Q: My modem doesn't seem to work with the Hayes-Compatible Modem script.

A: You need a dialing script, which is similar to an ARA script. For starters, I recommend the Minimal Dialing Script I provide on the Internet Starter Kit CD-ROM. It works with most modems if you enter the proper modem initialization string.

Q: I'm using a dialing script, and when I click Connect, it says Dialing, but I don't hear the modem dial or see it do anything else.

A: I've seen this happen a few times. I suspect the script is in some way incorrect—perhaps the error correction and data compression have been turned on improperly. Try the Hayes-Compatible Modem script. If that doesn't work, try the Minimal Dialing Script on the Internet Starter Kit CD-ROM. If that doesn't work, ask your modem company for a good ARA script that you can modify (in theory, an ARA script should work without modification, but is best when modified). If that fails, beg for help from others with the same modem on the net, preferably in `comp.sys.mac.comm` or the Mac Communications mailing list (see the "Reporting Problems" section earlier in this chapter for subscription information).

Q: The modem seems to connect, then hang up. What's going on?

A: The most likely reason is that something in the login chat script is wrong. You might have entered the wrong userid or password, or entered them incorrectly. It's also not uncommon for a provider to make a mistake in setting up an account such that it's not a SLIP account, or perhaps such that it links to a different userid or password.

Also, some providers give different userids and passwords for dialing in than they do for email, for example, or different userids and passwords for shell accounts versus SLIP accounts. Double-check to make sure you're using the right ones.

Finally, use a terminal emulator to walk through the login process manually. Sometimes, the provider's system is experiencing a high load and doesn't respond to your gateway script quickly enough. If this is the case, try increasing the numbers in the statements that serve as timeout values.

Q: I can connect on occasion, but not all the time. What could be wrong?

A: Some modems, the US Robotics Sportster and the Global Village TelePort/Gold in particular, sometimes have problems if you are using an incorrect modem initialization string. Check your string carefully.

Also, sometimes I'll see failed connections on my Northwest Nexus account. They range from receiving tons of data when InterSLIP says "Waiting for prompt" to nothing at all happening when InterSLIP says "Waiting for prompt," "Sending username," or "Sending password." I've even had InterSLIP report "Login incorrect" when I know full well it was fine. Just try again a few times, waiting a bit between tries, if you can. I suspect these problems relate to a bad modem, line noise, or some other situation out of your control, and in my experience they always go away after several tries.

Again, check to see if the timeout values in your gateway script might be too short. If the script times out before you get in on some occasions, it could cause this frustrating inconsistency.

Finally, some people have suggested renaming the Global Village extensions used by Global Village modems so they load after MacTCP. It's worth a try if you have one of those modems.

Q: InterSLIP connects fine, but none of the programs seem to quite work, although they try to connect.

A: Try toggling your TCP Header Compression checkbox (also sometimes known as CSLIP). If that checkbox doesn't match the setting for your account, things will fail. Essentially what happens is that small tasks such as looking up a machine name succeed, but anything else fails.

Q: InterSLIP connects fine, but I can't transfer files or messages of any size without the Mac hanging. Why not?

A: It could be related to your modem init string's settings for flow control, so check that carefully. Make sure you're using the proper MTU size in InterSLIP. Also, try turning off all unnecessary extensions using an extension manager or by dragging them from the Extensions and Control Panels folders to Extensions (disabled) and Control Panels (disabled) folders and restarting.

If you use the Apple Express Modem or a GeoPort Telecom Adapter, also make sure to try the latest Express Modem software available at this or another Apple FTP site: `<ftp://`

`ftp.info.apple.com/Apple.Support.Area/Apple.Software.Updates/US/Macintosh/Networking_and_Communications/Other_N-C/`.

Q: I had InterSLIP working, but now that I've moved my hard disk to another machine, it crashes whenever I launch InterSLIP Setup.

A: Delete your InterSLIP Prefs file. For some reason, possibly related to the location of the InterSLIP Setup window, this has happened on several machines we've seen.

Q: InterSLIP works fine, except that when I click the Disconnect button, my modem doesn't hang up. What can I do?

A: First off, if you use a dialing script other than the built-in Hayes-Compatible Modem script, it usually will have an "@hangup" section. My Minimal Dialing Script has one, and will hang up the modem just fine if you use it instead of the Hayes-Compatible Modem script.

Some people recommend adding **&D2** to the end of your modem initialization string. Doing so will hang up the modem if DTR goes low, which it does when you click the Disconnect button. Unfortunately, DTR can also go low if you have a fast modem and a slow Mac and the modem transfers more data than the Mac can handle at that point. Using a port speed of 38,400 bps or 57,600 bps with a 14,400 bps modem can exacerbate this problem. If you run into this problem, you'll see random hang-ups while downloading large files. If you do use **&D2**, you may be able to set an S-register (S25 in at least some modems) in the modem init string that lengthens the time DTR can be low before the modem realizes it, thus preventing the hangups. Only worry about this if you like reading modem manuals. Overall, the Minimal Dialing Script is a better solution.

Tune in Next Week…

I've gone through a ton of problems and solutions here, almost all of which are related to making the connection to the Internet. I wanted to put this chapter at this point in the book so people could install the software, work through the step-by-step instructions, and, if any problems arose, solve them.

However, there are plenty of other things that can go bump in the Internet, mostly related to what you do after you're connected. Rather than turn this chapter into a monster, I've added sections to the ends of the chapters about email, Usenet news, FTP, and the Web covering some of the most common problems and solutions for each of those Internet services. And, of course, there's a lot of information in those chapters that might provide you with the solution to your problem. When all else fails, if your problem concerns one of those services rather than just connecting to the Internet, turn to the appropriate chapter and flip to the end for further installments of "Things that Go Bump in the Net."

PART II

Internet Essentials

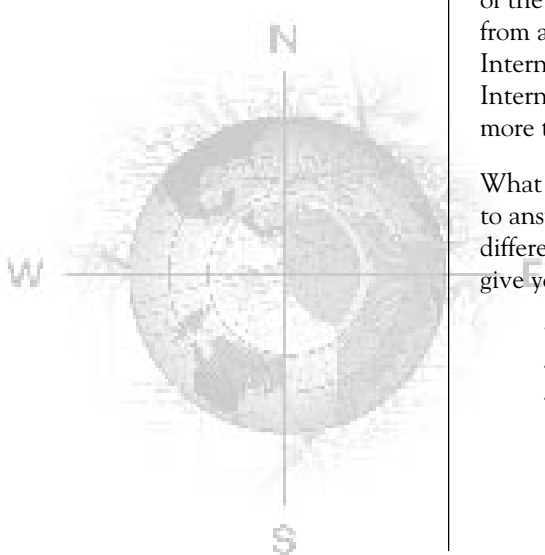
After you've installed all the software and set up your Internet connection with a provider, you come to the five chapters that make up Part II, "Internet Essentials." The first three chapters in Part II are introductory and background material, and I recommend that you read them. However, the final two chapters in Part II are utterly essential—you will have trouble using the Internet if you don't read them.

- Chapter 6, "What Is the Internet?" answers that difficult question of what the Internet is, anyway.
- Chapter 7, "What Can You Do on the Internet?" goes further by providing some real-life examples of how the Internet can work for you.
- Chapter 8, "Internet Past, Present, and Future," takes a spin through the history of the Internet, looks at the major issues confronting the Internet and Internet users today, and peers into the crystal ball to make some predictions about what we'll see in the future.
- Chapter 9, "Addressing and URLs," explains how email addressing and URLs work.
- Chapter 10, "File Formats," provides information about the many different file formats used on the Internet.

Chapter 6 What Is the Internet?

Contents:

- Computers
- Networks
- Software
- People—Doing What They Do Best



By now you've had a chance to install the software that comes with this book, choose an Internet service provider, and perhaps even start playing with the Internet, either by browsing the Web or perhaps sending your first piece of email. If so, that's great, since experimentation is the best way to learn anything.

However, the Internet is a large and confusing place, not just from the technical aspects, but also from the social aspects. I would be remiss in my duties as an author if I didn't introduce you to some of the social and historical underpinnings of the Internet, along with the technical workings. I feel it's important, both for you and for the Internet, that people who get on the Internet using this book know something about the community they are entering. That knowledge serves not only to protect you from undesirable and embarrassing parts of the Internet, but also to protect the Internet community from any mistakes you might make. First, let me define the Internet in this chapter and tell you what you can do on the Internet in the next chapter. After that, we'll get into the more technical details about the Internet.

What is the Internet? That question is tremendously difficult to answer because the Internet is so many things to so many different people. Nonetheless, you need a short answer to give your mother when she asks, so here goes:

> *The Internet is a huge number of computers connected by networks, software programs, and millions of people spread all around the world.*

Note that the Internet is made of all of these pieces: the computers, the software programs, the networks, and the millions of people. Some people attempt to simplify the definition of the Internet by talking about only one of these facets, so you might hear someone say that the Internet is the "network of networks." That's true, and it's as true as saying that the Internet is millions of computers or all the software that makes Internet communications possible. To reduce the Internet to any one of these facets is to do it an injustice.

Computers

In the infancy of the computer industry, IBM decided that it did not need to get into the computer business because the entire world needed only a handful of computers. Talk about a miscalculation! Many millions of computers of all sizes, shapes, and colors have been sold in the decades since IBM's incorrect assumption. The computers connected to the Internet today range from the most powerful supercomputers all the way down to your friendly local Macintosh and garden-variety PC clone.

You can split these machines into two basic types: server computers (sometimes also called "hosts") and client computers. There's no inherent difference in the hardware itself; the difference lies in the purpose for which that hardware is used. As you might guess from the name, server computers serve information. They're permanently connected to the Internet so that you can retrieve information from them 24 hours a day. When people talk about the number of computers on the Internet, they're talking about the number of servers, mostly because it's possible to count, or at least to estimate statistically, their numbers.

In contrast, client computers are the machines that you and I use to access the Internet to retrieve information. Client computers generally connect to the Internet through a modem and as a rule won't have (or need) as much RAM or as large hard disks as the more expensive servers.

An estimated 9.5 million servers are connected to the Internet. These numbers change constantly, as you can see in Table 6.1, which lays out the data collected by Network Wizards over a number of years. You can find the latest version of this data on the Web at `<http://www.nw.com/>`.

Table 6.1 *Internet Host Growth*

Date	Number of Servers
January 1996	9,472,000
July 1995	6,642,000
January 1995	4,852,000
July 1994	3,212,000

Date	Number of Servers
January 1994	2,217,000
July 1993	1,776,000
January 1993	1,313,000

I emphasize using client computers in this book because after all, my main focus is to help you gain access to the Internet. However, in Chapter 23, "Set Up Your Own Server," which is new to the fourth edition of *Internet Starter Kit for Macintosh*, I do discuss running a server using a Macintosh. It's not hard—it just requires a dedicated connection and some time and effort on your part.

If you're new to the Internet, don't worry about what sort of computers are involved, either as clients or servers. For the most part, looking at the Internet in terms of the computers is fairly meaningless. As we all know, computers become obsolete quickly, and the computers used on the Internet are no exception. If your computer meets the requirements outlined in Chapter 1, "The Right Stuff," you'll be fine, although Internet software is becoming increasingly large and RAM-hungry as time passes.

Networks

In addition to the computers are various types of network links, ranging from super-fast T-1 and T-3 lines that Internet providers use all the way down to 9,600 bps modems, which are about as slow as normal users can stand. Just as with your telephone, you rarely notice this technical side of the Internet unless something goes wrong.

In basic terms, two computers attached together form a local area network (LAN), and as that network grows, it might become connected to other independent LANs. That configuration is called an internet, with a small *i*. The Internet, with a capital *I*, is the largest possible collection of interconnected networks.

BTW

An Internet old-timer once commented that the term initially proposed for the collection of all the interconnected networks was "WorldNet." That term seems to have faded into obscurity—unfortunately, since it's rather apt. Common usage now includes "Internet" (the safest term), "the net" (sometimes capitalized), and "cyberspace" (a heavily overused term stemming from William Gibson's science-fiction novel *Neuromancer*, which, ironically enough, he wrote on a manual typewriter with images of video games, not the Internet, in his head). The term "information superhighway" (an unfortunate term that has spawned imagery of toll booths, speed bumps, on-ramps, and road kill, but which means almost nothing in the context in which it's generally used) has come in and gone out of fashion as well.

As with computers, worrying too much about the specifics of the various networks that make up the Internet is pretty much pointless. The network links constantly change and are replaced with faster connections. As long as such transitions are handled properly, you'll never notice any of this. In my opinion, normal users don't need to worry about these technical details, and as such, to define the Internet in terms of its network links isn't particularly helpful.

Software

As for the software that makes up the Internet, the programs that probably come to your mind first are the freeware and shareware files stored on the Internet for downloading—games, utilities, and other applications. Here I want to talk briefly about the software that runs on all the computers and over all of these networks. Without these pieces of software to store and forward email, to send you files when you request them, and to search through databases of information, the computers and networks would be quite useless.

Learning the details of this underlying software isn't all that useful for a normal user (although anyone who plans to set up a server must learn quite a bit about all the picky technical details). Most people don't know or care what specific Web server software any given site runs as long as that Web site responds when they connect to it.

However, I want to hammer home a few key points to help you understand, on a more gut level, how this setup works. First, Internet servers run software programs all the time. When you use electronic mail or the Web or most anything else, you are interacting with a software program on the server, even if it doesn't seem like it. That point is important because as much as you don't need to know the details, I don't want to mystify the situation unnecessarily. The Internet, despite appearances, is not magic.

Second, because it takes two to tango on the Internet, a software program is always running on both sides of the connection. Remember the server and client distinctions for machines? That's actually more true of the software, where it's referred to as *client/server computing*. So, when you run a program on the Mac, say something such as Netscape Navigator (a Web client that retrieves information), it must talk to the Web server program that runs continually on the remote machine. The same is true no matter what program you use, be it an email client, an FTP client, or something else.

An analogy might help you get your mind around client/server computing. Think of a fancy restaurant where they bring around a dessert cart filled with luscious pastries at the end of your meal (see Figure 6.1). You're not allowed to get your grubby hands on the food itself, so the restaurant provides a pair of dessert tongs that you must use to retrieve your choice of desserts. That's exactly how client/server computing works. The dessert cart is the server—it makes the information, the desserts in this example, available to you, but only through the client program—the dessert tongs. If you want to expand the analogy, the waiter who brings you the dessert cart is the information provider who runs the server, and you, well, you're the person who's operating the client, the dessert tongs in the analogy.

Figure 6.1 Client/server computing as a dessert cart.

The third point to remember is that the Web server and Netscape Navigator are high-level programs with which you interact, but low-level software also handles the communications between Netscape Navigator and a Web server. This communication at multiple levels is how the Internet makes functions understandable to humans and still efficient for the machines, two goals that seldom otherwise overlap.

So, if you can cram the idea into your head that software makes the Internet work on both a high level that you see and a low level that you don't, you'll be much better off. Some people never manage to understand that level of abstraction, and as a result, they never understand anything beyond how to issue the magic incantations they have memorized. Seeing the world as a series of magic incantations is a problem because people who do that are unable to modify their behavior when anything changes, and on the Internet, things change every day.

People—Doing What They Do Best

The most important part of the Internet is the collection of millions of people, *Homo Sapiens*, all doing what people do best. No, I don't mean reproducing, I mean communicating.

BTW

The answer to the question of just how many people use the Internet has always been nebulous, but statistics I've seen recently indicate that there are about 30 million people using the Internet in some form or fashion.

Communication is central to the human psyche; we are always reaching out to other people, trying to understand them and trying to get them to understand us. As a species, we can't shut up. But that's good! Only by communicating can we hope to solve the problems that face the world today. The United Nations can bring together one or two representatives of each nation and sit them down with simultaneous translations. But using the wire and satellite transmissions of the Internet, anyone can talk to anyone else on the Internet at any time—no matter where they live.

I regularly correspond with friends (most of whom I've never met) in England, Ireland, France, Italy, Sweden, Denmark, Turkey, Russia, Japan, New Zealand, Australia, Singapore, Taiwan, Canada, and a guy who lives about 15 miles from my house. (Actually, my wife and I finally broke down and went to visit the guy who lives 15 miles away, and he's since become one of our best friends in Seattle and the managing editor of *TidBITS*.) I've worked on text formatting issues over the networks with my friend in Sweden, helped design and test a freely distributable program written by my friend in Turkey, and co-written software reviews with a friend in New Zealand, who had been one of my Classics professors back at Cornell. On the Internet, where everything comes down to the least common denominator of text, you don't worry about where your correspondents live. Although people use many languages on the Net, English is the *de facto* language of the computer industry, and far more people in the world know English than English speakers know other languages.

During the Gulf War, while people in the U.S. were glued to their television sets watching the devastation, people in Israel were sending reports to the net. Some of these described the terror of air raid sirens and their worry about SCUD missiles launched from Iraq. No television shot of a family getting into their gas masks with an obligatory sound bite can compare with the lengthy and tortured accounts of daily life that came from the Israeli net community.

The Internet also helped disseminate information about the attempted coup in the former Soviet Union that led to its breakup. One Internet friend of mine, Vladimir Butenko, spent the nights during the events near the Parliament. When everything seemed to be clear, he went to his office, wrote a message about what he'd seen, and sent it to the Internet. His message was widely distributed at the time and even partially reprinted in the *San Jose Mercury News*.

Although people on the Internet are sometimes argumentative and contentious, is that entirely bad? Let's face it, not all the events in the world are nice, and people often disagree, sometimes violently. In the real world, people might repress their feelings to avoid conflict, and repression isn't good. Or people might end up at the other extreme where the

disagreement results in physical violence. On the Internet, no matter what the argument (be it about religion, racism, abortion, the death penalty, the role of police in society, or whatever else), there are only three ways for it to end. First, and mostly likely, all parties involved may stop arguing through exhaustion. Second, both sides might agree to disagree (although this usually happens only in arguments in which both sides are being rational about the issues at hand). Third, one person may actually convince another that he is wrong, though I doubt this happens all that often since people hate to admit they're wrong. But notice, in none of these possibilities is someone punched, knifed, or shot. As vitriolic as many of these arguments, or "flame wars," can be, there's no way to compare them to the suffering that happens when people are unable to settle their differences without resorting to violence.

Most of the time on the net, an incredible sense of community and sharing transcends all physical and geopolitical boundaries. How can we attempt to understand events in other parts of the world when we, as regular citizens, have absolutely no clue what the regular citizens in those other countries think or feel? And what about the simple facts of life such as taxes and government services? Sure, newspapers print info-graphics comparing the tax burdens in various countries, but this information doesn't have the same effect as listening to someone work out how much some object, say a Macintosh, costs in France after you take into account the exchange rate and add a high VAT (value added tax), which comes on top of France's already high income taxes. It makes you think.

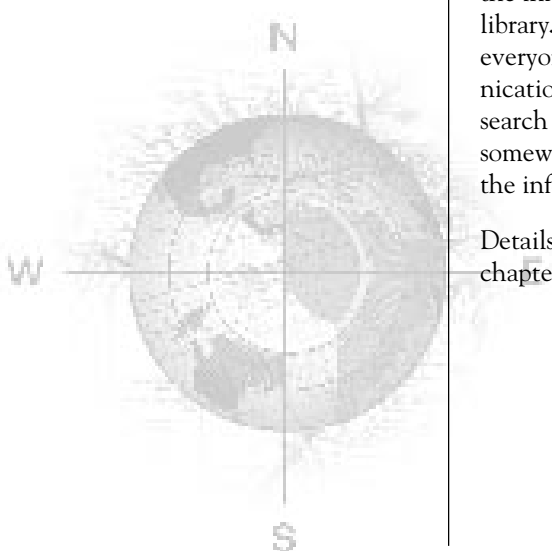
If nothing else, that's the tag line I want to convey about the Internet. It makes you think.

Maybe with a little thought and communication, we can avoid some of the violent and destructive conflicts that have marked world affairs. Many of the Internet resources stand as testament to the fact that people *can* work together with no reward other than the satisfaction of making something good and useful. If we can translate more of that sense of volunteerism and community spirit back into the real world, we stand a much better chance of surviving ourselves.

In the end, the reason why it's best to define the Internet in terms of people is that people are the only constant in a world of change. The computers, the networks, and the software will all change, but all those people communicating with one other through email, the Web, online chats, and live voice conversations will not disappear. The Internet is a communication medium, and a communication medium exists only to carry information between people. Without those people, the medium has no meaning.

Chapter 7 What Can You Do on the Internet?

Contents:



The possibilities for what you can do on the Internet are virtually endless. In many ways, the Internet is a reflection of the real world, with all of the real world's options, choices, and decisions, not to mention attractions and dangers. Those possibilities play out slightly differently on the Internet, but in the end, the Internet is what you make of it.

I've divided this chapter into two basic sections, "Communicating with People" and "Finding Information," and most of the Internet's activities fall into one or the other of those categories. When I'm talking about communicating with people, I'm talking about activities in which there is another person on the other end of the conversation, be it email or a real-time conversation. In contrast, much of your time on the Internet is spent finding information, and although that information was created and posted by someone, accessing the information is more like looking something up in a library. When you communicate with someone, it's clear that everyone involved is an individual, and the lines of communication tend to be direct and impermanent. When you search for and download information, the entire act is somewhat less personal and can involve many people, and the information is likely to remain available for some time.

Details on all of the Internet services mentioned in this chapter come in Part III of the book.

Communicating with People

One of the main complaints about computers and in particular the Internet is that they're impersonal, that they isolate us from the real world and enable us to avoid interacting with real people. I consider that criticism utter balderdash. One of the main attractions of the Internet is that it provides access to more people than was ever possible before. Even more important, the Internet gives you access to just the sort of people with whom you want to talk. That's because the Internet breaks down arbitrary geographical boundaries and enables people to collect along the lines of their common interests.

Various services on the Internet enable these gatherings of like-minded people, including email, Usenet news, IRC, and real-time audio and video services.

Email

Electronic mail, or email, is much like regular postal mail, although it arrives much faster and is much easier to send, and it's generally limited to text. Because of this, email messages tend to be shorter than normal letters, although you get many more of them.

Email is used by the largest number of people on the Internet, although in terms of traffic, the heaviest volumes lie elsewhere. Almost everyone who considers herself connected to the Internet in some way can send and receive email.

Personal Email

Most personal exchanges happen in email. All of your email comes into your electronic mailbox, and unless you let them, no one else can easily read your mail. When you get a message from a friend through email, it's not particularly different from getting that same message, printed out and stuffed in an envelope, through snail mail (the Internet term for paper mail). Sure, it's faster and may have been easier to send, but in essence personal email is just like personal snail mail. Email is an excellent way to stay in touch even with people whom you regularly talk to on the phone because it's quick and easy. Even though I talk to my parents often, I also send them email because it's more appropriate for quick notes.

I've noticed that the attraction of being able to communicate more easily with friends and family is perhaps the most powerful one for many people considering getting on the Internet. I've talked to a number of older people who get access to the Internet purely because it's the best way for them to keep in touch with their children at college. This trend has continued up the age spectrum, and I hear more and more reports of grand parents in their seventies and eighties obtaining Internet access in order to stay more connected to their families. Years ago, when I started on the Internet, communicating with friends and family was not possible since none of my existing friends or family had

electronic mail. Now, however, everyone in my immediate family has an email address, and many people in my extended family do as well.

So, in terms of what you can do on the Internet, I'd have to say the most important thing for many people is simply sending and receiving email between friends and relatives. Email can of course go beyond people you already know, and another reason that some people are attracted to the Internet is that they feel isolated in the real world, and the Internet offers a haven of people with similar interests. You can and will find new friends on the Internet. You might even meet some of them in person and have them become real-world friends as well.

Let me tell you a story about how this happened to me. Several years ago, I was exchanging email with Peter Lewis, who writes Internet software, including Anarchie. Peter lives in Australia, but because of the Internet, this fact seemed immaterial. Most of my Internet friends might as well live in Australia, since I never see them. I can't remember what Peter and I were talking about, but he asked if I planned to attend the Mactivity conference in San Jose that July. I said no, I had another conference at the same time. Since Peter had said he was going to be in the U.S. for Mactivity, I then offered the throwaway social invitation and said that if he was ever in the Seattle area, he was welcome to stay with us for a bit. I never thought he'd accept, in part because Peter was an Internet friend, and Internet friends don't tend to appear in the real world. I also hadn't realized that Peter was going to be in the States for an entire month around this conference.

Peter's next message said something to the effect of, "Sure, how's July 12th through 17th?" I gulped and went to tell Tonya that I'd inadvertently invited someone neither of us had ever met to stay with us for five days. She asked, practically enough, how old he was and if he had any food weirdnesses that we'd have to cook around. I couldn't answer either question. When I met Peter at the airport in July, I wore my Eudora (the email program many of us use) t-shirt so Peter could recognize me. He said later that he figured he could go home with anyone wearing a Eudora t-shirt.

To make a long story short, Peter was the best houseguest we've ever had. He ate everything, had fun doing everything, and was utterly neat, which was a big help in our tiny little house at the time. We took him around to user groups and to meet friends, and wherever he went, people paid him their shareware fees for Anarchie, which is shareware, meaning you can evaluate it before you pay for it. I think he came out ahead financially on the trip. Since then we've managed to get together once or twice when he comes to the U.S., and we're planning to take a trip to Australia when we can find a free month. Several other friends of Peter's have also come and stayed with us, and they were a great time as well. That simple act of opening up in email to someone I didn't particularly know has resulted in finding some new close friends. I don't think there's anyone out there who would avoid becoming friends with people if it were sufficiently easy.

I don't want to make it sound as though this experience with Peter was unusual, because in fact we've repeated it a number of times at varying levels with a number of people in the Internet world. Now, whenever we go to trade shows, we look forward to meeting our friends and spending time with them.

I also don't want to imply that email is entirely social. My entire business is possible only because of email. I discuss issues surrounding my books with my editor using email, submit completed chapters using email, and because I save every piece of email that I send, my email is the record of my business as well. I can always go back a month or a year and see what I was writing to specific people.

In fact, email sometimes gains the least likely converts because of its business uses. One friend of mine is best described as a telephobe—he hates talking on the telephone and has only one at his house out of necessity. This friend had been equally disparaging email until he was forced to try it, after which he became an instant email proponent. He discovered that with email, he no longer had to play telephone tag with coworkers or try to arrange meetings to talk about simple topics. Email enabled him to work more flexible hours because he didn't care when his coworkers were present, and their email was waiting whenever he wanted to read it.

Simultaneous Email to Multiple People

Because it's trivial to send the same piece of email to multiple people at once, you also can use email much as you would use snail mail in conjunction with a photocopy machine. If you write up a little personal newsletter about what's happening in your life and send it to all the relatives at Christmas, that's the same concept as writing a single email message and addressing it to multiple people. It's still personal mail, but just a bit closer to a form letter.

An extremely common use of this method of sending the same message to a number of people is for distributing jokes. If I come across what I think is a funny joke, I'll forward it on to those of my friends and family who I think will appreciate the humor. You could use this to let people know you're moving, that you got a new job, or just to tell them about a funny thing that happened.

Email messages sent to multiple people are even better than an answering machine for conveying simple information. At one point, for example, the local Macintosh user group held steering committee meetings at my house. I could have called all the steering committee members before each meeting to remind them about it, but because all I wanted to say was, "Don't forget the meeting tomorrow night," contacting them was easiest through email.

Distribution Lists

Sending email to multiple people all at once is useful for individual messages, but if you go one step further, you end up with a distribution list. You can set up a simple distribution list merely by creating a group of addresses to which you send email, or, if you or someone you know has an email server, you might be able to create a distribution list on the server, so when you or anyone else sends mail to it, the server automatically distributes the message to everyone on the list. Distribution lists are one-way only—you can't reply to a message from a distribution list and have it go back to the entire list.

It's much more likely that you'll end up on someone else's distribution list, and depending on how it's set up, you might be able to add yourself, or the owner of the list might have to add you manually. Most distribution lists are free, although commercial ones with high-quality information are increasing in number.

You can get lots of good stuff from distribution lists, ranging from full-fledged publications (such as my newsletter, *TidBITS*) to a daily report of closing stock prices in your stock portfolio. One service, which costs about $40 per year, even provides short bits of business information about the stocks in your portfolio.

> **BTW**
> The stock service I refer to above is called Closing Bell, and although it's sent to you in email every day, you sign up for it on a Web site at <http://www.merc.com/> that contains information about a number of other distribution lists you can subscribe to, including weather reports, sports headlines, news briefs, and quotes of the day.

I subscribe to a number of distribution lists, including a stock price service, several newsletters with short summaries of computer industry business news, and even one run by Apple Fellow Guy Kawasaki that distributes propaganda and stories about how wonderful the Macintosh is. I even subscribe to some totally frivolous distribution lists, such as the *Dilbert* newsletter, which cartoonist Scott Adams sends out to a distribution list every so often. What I like about these distribution lists is that after an initial bit of work, I don't have to do anything to get them—they just appear in my mailbox and wait for me to read them.

Discussion Lists

A distribution list that can accept postings from anyone on the list is a discussion list or mailing list. Sending a submission to a discussion list is much like writing for a user group or alumni newsletter. You may not know all of the people who will read your message, but it is a finite (and usually small) group of people who share your interests. Discussion list messages aren't usually aimed at a specific person on the list, they are more intended to discuss a topic of interest with the people who have joined that list. Posting to a discussion list is not like writing an article for publication, because the content of most discussion lists more resembles the editorial page of a newsletter than anything else. You'll see opinions, rebuttals, diatribes, questions, comments, and even a few answers. Everyone on the list sees every posting that comes through, and the discussions often become quite spirited.

The topics discussed on discussion lists vary widely, and it's fair to say that you can probably find a list that discusses almost any topic that interests you. I participate the most in technical mailing lists about Macintosh and Internet issues, since that's where my professional interests lie at the moment. I also subscribe to some discussion lists devoted to single software products. You can get an incredible level of technical support from these sort of lists, and I recommend joining and participating in them.

Some lists are less technical and may cover issues of social, academic, or political natures.

In those cases, the discussions might not be quite so practical in terms of helping you solve a specific problem, but they might offer opportunities for learning and entertainment. Many people enjoy discussing their favorite sports teams, the relative idiocy of various politicians, and the events in popular television shows.

Because I run my own server, I've set up a discussion list for members of my family who have email addresses. We have three generations of relatives on this list, and the level to which the list has enabled us to get to know one another is quite impressive. In a large family such as mine, it can be hard to know or spend time with many relatives, scattered as they are around the country, and the discussion list has brought us together in ways that would otherwise have been impossible. I think the person most pleased by all this is my grandmother, who not only enjoys hearing from her children and grandchildren, but also derives incredible pleasure from seeing the far-flung members of her family get to know one another better.

Auto-Reply Email

The final way you can use email most resembles those "bingo cards" that you find in the back of many magazines. Punch out the proper holes or fill in the appropriate numbered circle, return the card to the magazine, and several weeks later you'll receive the advertising information that you requested. I've set up my Macintosh, for instance, to send an informational file about *TidBITS* to anyone in the world who sends email to a certain address (`info@tidbits.com`, if you're impatient and want to try something right away). A number of similar systems exist on the Internet, dispensing information on a variety of subjects to anyone who can send them email.

These auto-reply addresses are a standard way of doing business on the Internet, so you can often guess at the addresses and get back useful information. Say you want information on Adobe's products or Internet presence, for instance. You could try sending email to `info@adobe.com` (you may have noted the pattern in that email address; if not, wait until Chapter 9, "Addressing and URLs," and I'll explain it), and you will probably receive something back. It's worth a try with any company on the Internet, although you might not always get a reply, and sometimes you might get a reply from a person instead of from an automated system.

Usenet News

Remember what I just said about distribution and discussion lists in email? Well, for historical reasons, there's another way of disseminating the same sort of information on the Internet. It can be a bit much to swallow, but Usenet news can also be incredibly useful.

Like email discussion lists, Usenet news is interpersonal information—it comes from individuals and is aimed at thousands of people around the world. Unlike email, you cannot find out who makes up your audience. Because of this unknown audience, posting a message to a Usenet newsgroup is more like writing a letter to the editor of a magazine or

major metropolitan newspaper with hundreds of thousands of readers. We have ways of estimating how many people read each of the many thousands of Usenet groups (each of which is devoted to a separate topic), but the estimates are nothing more than statistical constructs (though we hope accurate ones).

From the standpoint of someone reading Usenet news, there is little difference between the kinds of topics you could also find in an email discussion list. You can do basically the same things in Usenet news as you can do in email discussion lists.

The primary difference between Usenet news and email discussion lists is that you need a special program to read Usenet news, called a "newsreader," whereas you can use your email program to read an email discussion list. There are both advantages and disadvantages to needing another program, but I think the primary disadvantage is that email discussion lists seem to have an informal limit to how many messages appear per day. Some Usenet discussions, called newsgroups, receive upwards of 300 messages each day, which is simply too much for most people to handle, even with sophisticated newsreading software. In contrast, perhaps because every post to an email discussion list appears in everyone's electronic mailbox, participants in email discussion lists tend to be slightly more restrained, so of the lists that I currently read, none have more than about 20 messages each day. The main advantage to using a newsreader is that you don't have a lot of messages cluttering up your electronic mailbox. Instead, you decide what you want to download and read.

Some newsgroups don't allow posting and thus have more in common with email distribution lists than email discussion lists. These groups tend to be more useful because you see only messages that were deemed sufficiently important by the person in charge of the newsgroup.

The main advantage of Usenet news over email discussion lists is that the newsreading software provides you with a complete list of discussion topics, called newsgroups. This list makes it easy to scan through and find topics of interest. It can be more difficult to find email discussion lists that interest you.

BTW

A number of Web conferencing systems are appearing these days that enable you to carry on the same sort of discussions on a Web site as you would in a Usenet newsgroup or an email discussion list. For the moment, these systems are clumsy and not nearly as frequented as either of the other two methods of carrying on discussions, but I think we'll see more of this in the future.

IRC

You may have noticed in my analogies for various types of email and Usenet news above that I always used paper analogies. I did that in large part because email and Usenet news, although potentially speedy, can't be used to carry on a fluid conversation. Even when I'm

talking with my friend Peter in email and we're both at our computers reading and replying to email as soon as it comes in, it still takes a minute or five between messages. That's not bad to Australia, but it's not as interactive as a telephone, where the conversation is literally live.

You can have live conversations on the Internet with people all around the world using a service called Internet Relay Chat (IRC). You can carry on discussions with multiple people at the same time—each one of you typing in what you want the others to see and watching both your words and theirs scroll by on your screen. The IRC software identifies what each person says, so you can tell who says what. IRC is pretty much text-only, although I've heard of programs that make additional kinds of communication (such as drawing on a common whiteboard) possible.

In IRC, discussions are broken up into topics, called channels, and if there isn't a channel chatting about a topic you want to talk about, you can always create a new one. Unlike newsgroups and mailing lists, IRC channels are ephemeral; they don't necessarily stick around all the time (although a few standard ones do).

I have little experience with IRC, mostly because what experience I do have isn't particularly positive. I've found using IRC to be similar to finding yourself at a party where you don't know anyone and are desperately attempting to make small talk with everyone in sight. When I've interviewed random people in various IRC channels, the one commonalty was that none of them had been on the Internet or using IRC for long. My suspicion is that if you don't happen on a group of people chatting about a topic of interest fairly quickly, you rapidly lose interest in IRC.

Needless to say, some people do spend a great deal of time on IRC over many years, so obviously my indictment should be taken as one person's opinion. IRC distinguishes itself in times of crisis, and stories of up-to-the-minute information about the Presidential campaign or about a catastrophic natural disaster being distributed through IRC abound.

> **BTW**
> The commercial services such as AOL and CompuServe reportedly make a great deal of their money from their versions of online chatting, since people spend a great deal of time online in chats. If this applies to you, consider switching to the Internet and IRC, where you can probably spend the same amount of time for much less money.

I do have one final idea as to how you can use IRC. I mentioned above that a number of people in my family have email addresses and participate in an email discussion list. I've heard reports of other families that arrange to be online at exactly the same time on the same day so they can use IRC to have live conversations. Although I don't know if that would be easy to organize for my family, it would probably be fun.

BTW
I noted above that Web conferencing software emulating discussion groups is gradually appearing. Another up-and-coming technology on the Web is one that simulates the kind of live interactivity you get with IRC. Although it's not at all common yet, I anticipate it being popular eventually because it's more controllable than IRC, and you don't need a separate IRC client to use it.

MUDs

Although text adventure computer games have faded into the depths of time, when I first started using computers, they were all the rage. Computers didn't have the horsepower for fancy graphics and speedy animations, so some of the best games relied on nothing but text and the imaginations of the players. You moved around a world of some sort by typing directional commands such as "Go South" and interacted with objects and other entities in the world with commands such as "Pick up key" and "Woo fair maiden." The systems were quite primitive in their responses and possibilities, but the writing and the puzzles were imaginative enough to hold a person's attention for quite some time.

Now change the venue to the Internet and fast-forward some years. The Internet is in place, and although computers have more multimedia power, the Internet is relatively slow and entirely text-based. It's not much of a stretch to enable people to play these text adventures over the Internet, and from that point of time somewhere in the past, not much more of a stretch (although an impressive programming feat) to enable multiple people to exist in the same text adventure at the same time, not only interacting with the world but also creating it while role-playing whatever character makes sense.

That's the essence of a MUD, which stands for Multi-User Dungeon (the acronym has also been expanded to Multi-User Dimension or Multi-User Dialogue). Other forms of MUDs have arisen over the years, so you may hear of MOOs, MUSHes, and MUCKs as well, but they all share the same essential features. Why do I bring them up here?

Think about it. If, in IRC, you can talk with other people about different topics, a MUD is an imaginative next step. You can not only talk to other people about various things, but you can also interact with them in an imaginary world, complete with its own landscape, physical laws, and objects. You can pretend to be anyone or anything you want. In this imaginary world, you're judged by how well you write your character in interacting with the other characters, and you can do anything and be anything you want. The freedom from the tyranny of the real world is significant. Those things that you don't like about your life, you can eliminate online. If you're shy in person, you can be a swaggering bravo online. It's all up to you.

I must warn you that my description above, if enticing, should be considered a warning as well. More so than anything else on the Internet, MUDs have proven addictive, and there are numerous cases in which people have spent so much time playing in a MUD that

they've ruined their real lives. MUD addicts have destroyed relationships, failed out of college, and been fired from jobs. It's happened to people I've known, and others have warned me of the dangers as well.

Again, I want to make sure you realize that although MUDs are extremely interesting and have numerous useful functions (after all, you could easily have a business MUD where you had a conference over the Internet, rather than flying around the world, and there are a number of MUDs for aiding in education), they're also the most dangerously addictive part of the Internet. Use them with that knowledge and please, please don't let MUD use harm your real life.

Audio and Video Conversations

IRC and MUDs may be live, but they're not particularly high-tech in today's world of sound and video capabilities. Thanks to faster modems and better technology, we're starting to see more and more people using programs that enable them to talk over the Internet using microphones attached to their computers. With an inexpensive video camera, you can even talk to people while you watch them in a window on your screen.

Although you can do these things, there are two barriers that stop many people. First, although most recent Macs include sound input capabilities, you must have a microphone to get sound into your Mac. Not all Macs ship with microphones; contact your Apple dealer if you need to buy one. If you're interested in sending video over the Internet, you need a video camera and the sort of Macintosh that can accept video input. There are so many different models of the Macintosh with different configurations that I can't easily tell you if your Mac has video input capabilities. The only guaranteed way to tell is if your Mac has the letters "AV" in the name. Other Macs might have the necessary hardware, and you can buy it for yet more models; contact a Mac hardware vendor for details.

FYI

The one video camera you can use with most Macs, since it connects to either your modem or printer port, is the Connectix QuickCam. It's relatively low quality, but is sufficient for basic videoconferencing on the Internet.

Second, although modern 28.8 Kbps modems are quite fast, they're barely up to the task of sending acceptable-quality sound over the Internet, and they can't quite handle real-time video with any kind of smoothness. Video frames sent over a modem always break up and look choppy—the slower the modem, the choppier the action.

Aside from the basic gee-whiz aspect to talking to someone somewhere else on the Internet with your computer, there's the very real fact that you don't pay extra to talk to them. So, if you have a friend in another country (or even a long-distance telephone call away), it might be worth putting up with the low quality and clumsiness of using the Internet for your conversation to avoid paying high long-distance telephone rates. I have friends who

could have saved hundreds, if not thousands, of dollars in telephone bills while they were attending graduate school at universities 2,000 miles apart. Long-distance relationships may be hell, but the Internet can make them somewhat more bearable.

Similarly, although I don't think we're quite to the point where most people can do this, I can see sending video over the Internet as a fabulous attraction to new grandparents and other relatives. Baby pictures are all fine and nice, but live Internet BabyCam is definitely cooler.

Finding Information

Those, then, are the main ways in which people can communicate with one another over the Internet. The second major way that people use the Internet is in a research mode, finding and utilizing information. You can retrieve many different types of information from the Internet, and depending on the sort of information, you might use different tools, just as you do when communicating with people in different ways.

FTP

FTP, which stands for File Transfer Protocol, is one of the basic underpinnings of the Internet. Until 1995, more data was transferred via FTP than by any other method, including the Web, which finally overtook FTP during that year. FTP is extremely simple—it's how you copy files from one computer on the Internet to another. What can you do with FTP, then?

There are two main uses for FTP these days. First, hundreds of shareware and freeware programmers post their freely distributable software to the Internet every day, and when they do so, it's made available on FTP servers. FTP servers are designed to transfer large files as quickly as possible, and since FTP has been around for so long, many tools exist for making FTP as simple and seamless as possible. There's an informal organization called Info-Mac, which has a mailing list called the Info-Mac Digest and an FTP site called the Info-Mac Archive. The Info-Mac Archive holds about two gigabytes of files, almost all of them Macintosh programs and utilities of every conceivable type. In my estimation, somewhere between 20 and 100 new files appear in the Info-Mac Archive each week.

If you want to retrieve a new version of Eudora, the main Macintosh email program, or perhaps a utility that enables you to simulate the Page up/Page down keys on a Macintosh PowerBook, you generally do so via FTP. That's the main use of FTP: retrieving files, often software programs, for use on your Macintosh. In the past, FTP was more heavily used for all sorts of data, but these days it's mostly used for downloading (another word for retrieving) software. Over time, FTP will gradually fade away even for this, and we'll use the Web for downloading most everything, including programs.

FTP's second use is less likely to diminish for some time. When people create Web sites, they need some way of uploading the files from their computers to the Web server. Web

browsers such as Netscape Navigator may work well for retrieving information from the Web, but they have no provisions for uploading (the reverse of downloading, or copying to a server instead of from a server) information. Considering that a Web site might consist of hundreds if not thousands of files, you can see that a good FTP program that makes it easy for you to upload files is an important tool to have if you want to create a Web site.

World Wide Web

Nowadays, when you want to find information on the Internet, you use the World Wide Web, or Web. The Web is a way that information can be made available to many people on the Internet, and that information can come complete with fonts, styles, graphics, and even sounds and movies. Even more interesting, information on the Web can be linked, making it easy to jump from one bit of information to a related bit. The Web is not the Internet, and the Internet is not the Web, despite the misconception held by many people. Just like email, Usenet news, and FTP, the Web is merely another facet of the Internet as a whole.

Hundreds of thousands of Web servers have sprung up around the Internet, providing information on an incredible variety of topics. If you want to find information about a certain model of the Macintosh, you can do that on Apple's Web site. If you want to read the full text of legislation passed by Congress the day after it has been passed, you can do that on the Library of Congress Web site. If you want to see when your favorite musician will be touring your hometown, you can probably do that. You can explore dinosaur exhibits in museums whose physical space doesn't compare to their virtual presentation on the Web. You can view pictures of the Shoemaker-Levy comet smashing into Jupiter, or perhaps you'd prefer to look at pictures from the history of medicine. You can shop for computer hardware and software on the Web, compare prices, and order over the Internet at any hour of the day.

These days, it seems that there's little you can't do on the Web. Even as recently as a year ago, the Web held information that was primarily related to computers and the high-tech industry. That trend was changing even then, but now I believe the Web has become an invaluable resource to anyone, not just those in the high-tech industry. Let me give you an example or two from my personal experience.

My wife Tonya and I moved in the fall of 1995 to a house on the side of a mountain, up a mile-long private road. The road's paved, but it's one lane, climbs 800 feet in that mile, and has some astonishing switch backs. Our neighbors warned us that we'd need a four-wheel-drive vehicle before the winter, and although we weren't particularly interested in buying a new car after buying a new house, we agreed that not having one if the weather turned to snow would be foolish.

Tonya went looking on the Internet for information about buying cars, since we've bought only one new car before this, and that was at a silent sale where there was no negotiating.

She found a Web site that was advertising some guy's book about buying a car, and as a teaser for the book, it had information about common car dealer sales techniques and how to circumvent them. Also on this site were tremendous amounts of information about different cars, even including the coveted dealer invoice price. We were looking at a 1996 Subaru Legacy Outback, and with the aid of the negotiating advice and the dealer invoice numbers, we were able to negotiate the price down to just a few hundred dollars over dealer invoice, saving several thousand dollars off the sticker price. Without that information from the Internet, it's unlikely that we would have done so well. You can get that information from other sources, of course, but the fact of the matter was that we didn't know where to find those sources and we suspected they weren't free anyway. (And yes, the car performed admirably in the snowy winter that followed.)

As my second example of the real-world uses of the Internet, consider this. After moving, we decided that we wanted to have our well water tested to make sure there weren't any nasty heavy metals or pesticides or anything in it. We're computer people; we haven't the foggiest idea where you go to get your water tested. We hate looking for information in the telephone book because it seems that we never guess at the right category, so it always takes us a long time to find anything.

This time I went out on the Internet to find out more about water quality issues and see if I could find out where we could have our water tested. I performed a rather simple search (on "water quality") in one of the main Web search engines that attempt to index the entire contents of the Web, and one of the first Web sites that came up was called the Water Treatment FAQ. Knowing that FAQ stands for Frequently Asked Questions, I was jubilant—this site would undoubtedly have useful information, so I could make a more informed decision about our water. I wasn't disappointed; the Water Treatment FAQ proved to be quite informative, and even better, the same site offered water tests for sale. It provided a sample report so you could see how thorough the test was, and it took credit cards over the Web. I typed my credit card number in, and a few days later the water test arrived. We followed the instructions for filling all the different bottles, sent the samples back, and received the test results back a few weeks later, learning that our water was somewhat hard, but had nothing worrisome in it otherwise.

I offer you these real-life Internet success stories not because I think you necessarily want to buy a car or need to have your water tested, but because I want you to realize that you can find a vast quantity of information on the Web that can aid you in your everyday life. Computer companies are undoubtedly still among the best represented, but businesses and organizations of all types are continually jumping on the Web, increasing its utility to us all.

> **BTW**
> In Chapter 20, "Finding Things on the Internet," I'll show you the tools that I use for finding everything that I've mentioned here.

The final point I'd like to make about the Web is that you can also put your own information on the Web for the world to see. That information might range from information about your friends and family to your résumé to your company's entire product line with online ordering. It's up to you.

The Internet Is What You Make of It

Whatever advantage you want to take of the Internet, I'd like to make two comments. First, because information on the Internet comes from so many sources, many of which are individuals, much of it has avoided the neutrality processing introduced by the mass media (although more of the mass media arrives on the Internet constantly as well). If you want unfiltered opinions on both sides of any issue ranging from the death penalty to abortion to local taxes, people usually are discussing the issue at length somewhere on the net.

Because of the lack of filtering, you may read a bit more about any one subject than you do in the mass media. As with any discussion in real life, it's up to you to distill the raw information and figure out what you think about any given topic, be it the current political climate, the chances of your favorite team in the playoffs, or the news from your grandmother that an elderly great-aunt has passed away. The Internet is what you make of it.

Second, you get only the information you want. For about a year, Tonya and I followed a weekly routine with the Sunday *Seattle Times*. First, we'd compete for the comics and then for the *Pacific Magazine*, which has in-depth articles. Then we'd settle down: I'd read the Sports section and the Business section, and my wife proceeded to the Home & Garden section. Good little stereotypes, weren't we? The point is that I was completely uninterested in reading at least three-quarters of the two-inch-thick stack of paper, and so was Tonya. So why were we paying for the entire thing only to bring it home and not even read most of it? A good question, and one that newspaper publishers should get their duffs in gear and answer.

We answered it by ceasing to bother with the Sunday paper. Not only was it a waste of paper, especially considering that we didn't read most of it, but dealing with it all was also a waste of time. I now get the news I want on the Internet through a combination of mailing lists, newsgroups, and Web pages that cover my interests closely. I can't get all the comics that I'd like to read yet, but a number of them, including *Dilbert* from Scott Adams, have arrived on the Internet.

The same overkill problem applies to junk mail. I instantly throw out about 90 percent of the snail mail I get, whereas almost all email I get is at least worth reading.

On the Internet, when all is said and done, I get only what I ask for. Periodically, my interests change, so I switch things around, but I don't have to read, or even deal with, topics that either bore or irritate me. Again, the information is out there, the people are out there, and it's up to you. The Internet is what you make of it.

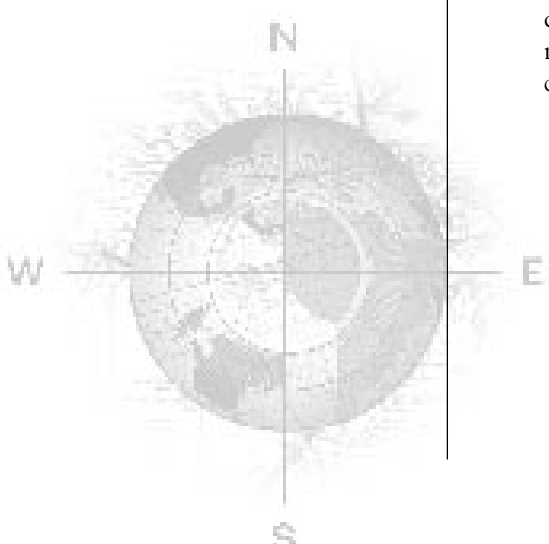
Chapter 8 Internet Past, Present, and Future

Contents:

- Internet Past
- Internet Present
- Internet Future

The Internet was formed by a process of relatively rapid accretion and fusion (but keep in mind that this industry is one in which computer power doubles every few years). In 1980, there were 200 machines on the Internet—that number is now about 9.5 million. The grain of sand that formed the heart of this giant electronic pearl came from the U.S. Department of Defense (DoD) in 1969. I'm pleased to be older than the Internet, having been born in 1967, but I'm not enough older to talk authoritatively about world conditions at that time. So, please bear with my second-hand retelling.

After we take a fast spin through the history of the Internet, I cover some of the big issues of today's Internet, and following that, a quick look at what you can expect to see in the future. Of course, that assumes my prognostications are accurate, but hey, I'll bet I can do better than the local TV weatherbeing.



Internet Past

In the 1950s, the Russian Sputnik program humiliated the United States. To better compete in the space race, the U.S. space program (at the time under the auspices of the military) received major government funding. That funding came from the Department of Defense's (DoD) Advanced Research Projects Agency (ARPA). In the early 1960s, the space program left the military and became NASA, but ARPA remained, and so did its funding. What to do with the money?

The DoD was, at that time, the world's largest user of computers, so J.C.R. Licklider and others proposed that ARPA support large-scale basic research in computer science. ARPA didn't originally require that the research it supported be either classified or directly related to military applications, which left the door open for far-reaching research in many fields. In 1963, ARPA devoted a measly $5 to $8 million to its computer research, the Information Processing Technologies Office (IPTO), first under Licklider, and then subsequently under the 26-year-old Ivan Sutherland, who had developed an early (perhaps the earliest) graphics program at MIT. After Sutherland, a 32-year-old named Robert Taylor headed IPTO. Taylor managed to double IPTO's budget at a time when ARPA's overall budget was decreasing, and he even admitted to diverting funds from military-specific projects to pure computer science.

Around this time, ARPAnet (Advanced Research Projects Agency Network) began connecting various computers around the country to ARPA research sites. Computers were expensive, and sharing them was the only way to distribute the resources appropriately. Distribution of cost via networks proved to be an important force in the development of the Internet. Proponents like Taylor ensured the early survival of the fledgling ARPAnet when it was all too vulnerable to governmental whimsy.

In 1969, Congress got wind of what ARPA was up to in terms of funding basic research with money from the defense budget. Three senators, including the still-active Edward Kennedy of Massachusetts, pushed through legislation requiring that ARPA show that its programs were directly applicable to the military. In the process, ARPA's name changed to reflect its new nature; it became the Defense Advanced Research Projects Agency, or DARPA. (Years later, the name changed back to ARPA, just to confuse the issue.) Bob Taylor became entangled in some unpleasant business while reworking military computers in Saigon during the Vietnam War and left DARPA shortly thereafter. He was succeeded by Larry Roberts, who played a major role in getting the then two-year-old ARPAnet up and running. Stewart Brand, founder of *The Whole Earth Catalog*, wrote at the time:

> *At present some 20 major computer centers are linked on the two-year-old ARPAnet. Traffic on the Net has been very slow, due to delays and difficulties of translation between different computers and divergent projects. Use has recently begun to increase as researchers travel from center to center and want to keep in touch with home base, and as more tantalizing sharable resources come available. How Net usage will evolve is uncertain. There's a curious mix of theoretical fascination and operational resistance around the scheme. The resistance may have something to do*

> *with reluctance about equipping a future Big Brother and his Central Computer. The fascination resides in the thorough rightness of computers as communication instruments, which implies some revolutions. (Stewart Brand, in* II Cybernetic Frontiers, *Random House, 1974)*

So if DARPA had to justify the military applications of its research, what survived? Well, the ARPAnet did, and here's why. As leaders of the free world (please pardon the rhetoric), we needed the latest and greatest methods of killing as many other people as possible. Along with offensive research comes defensive research; even the DoD wasn't so foolish as to assume we could wage a major war entirely on foreign soil. For this reason, the widespread U.S. interstate highway system served double duty as a distribution medium for tanks and other military hardware. Similarly, the Internet's precursor was both a utilitarian and experimental network. ARPAnet connected both military research sites (hardware was expensive and had to be shared) and was an experiment in resilient communications networks that could withstand a catastrophe—including, in the imaginations of the DoD planners of the day, an atomic bomb.

Interestingly, the resiliency of the ARPAnet design, as carried down to the Internet, has led some to note that the Internet routes around censorship as it would route around physical damage. It's a fascinating thought, especially in regard to Stewart Brand's earlier comment about Big Brother. If anything, the Internet actually has served to reduce the threat of a Big Brother, because it makes communication between people so fluid and unrestricted. But, I anticipate myself.

Gateways

As a result of the machinations described previously, the Internet Protocol, or IP (the second half of TCP/IP) was created. Essentially, the point behind IP-based networks is that each computer knows of, or can determine, the existence of all the others, and thus can route packets of information to their destination via the quickest route. While doing this, the computers can take into account any section of the network that has been destroyed, be it by a bomb or by an over-enthusiastic telephone repairperson. This design turns out to work well; more important, it makes for an extremely flexible network. If your computer can transmit a properly addressed packet of information to another computer on the Internet, that computer will worry about how to deliver it, translating as necessary. That's the essence of a gateway—it connects two dissimilar networks, translating information so that it can pass transparently from one to the other.

In the early 1980s, the military began to rely more and more heavily on the ARPAnet for communication, but because the ARPAnet still connected a haphazard mix of research institutions, businesses doing defense work, and military sites, the military wanted its own network. And so the ARPAnet split in half, becoming the ARPAnet and the Milnet (Military Network). The ARPAnet continued to carry traffic for research sites, and even though the military now had its own Milnet, traffic passed between the ARPAnet and the Milnet by going through gateways.

The concept of gateways proved important in the history of the Internet. Alongside the development of the Internet came the development of a number of other, smaller, networks such as BITNET, JANET, and others that used protocols other than IP. These new networks also included some like Usenet that didn't care what protocols were used. Most of these new networks were regional or dedicated to serving certain types of machines or users.

Perhaps the largest driving force behind the growth of the Internet is the need to connect with other people. The grass is always greener on the other side of the fence, and gradually gateway sites sprung up so that email could pass between the different networks with ease.

Usenet

I'm going to take a brief break from the Internet itself, because at approximately the same time the Milnet split off from ARPAnet, a host of other networks came into being, probably the most interesting of which was Usenet, the User's Network.

Usenet started in 1979, when some graduate students decided to link several Unix computers together in an attempt to better communicate with the rest of the Unix community. The system they created included software to read news, post news, and transport news between machines. To this day, that simple model continues, but whereas once two machines were on Usenet, today there are hundreds of thousands. The software that transports and displays Usenet news now runs not only on Unix machines, but on almost every type of computer in use on the networks. The topics of discussion have blossomed from Unix into almost any conceivable subject—and many inconceivable ones. Like all the other network entities, Usenet quickly grew to be international in scope and size despite relying heavily on very slow modem connections for much of its early history.

Unlike many of the other networks, Usenet grew from the bottom up, rather from the top down. Usenet was created by and for users, and no organization—commercial, governmental, or otherwise—had a hand in it originally. In many ways, Usenet provided much of the attitude of sharing that exists on the Internet today. In the past, you usually got a Usenet feed (that is, had another machine send news to your machine) for free as long as you were willing to pass the feed on to someone else for free. Due to commercial pressures, the days of the free feeds are no more, but the spirit of cooperation they engendered remains in much of what happens on the Internet.

I don't want to imply that Usenet is a happy carefree place where everything is free and easy, because much of the time it's noisy and unpleasant and exists only because of the utility of some of the information that it carries. Despite the attitude toward sharing, the survival of Usenet is due in large part to the resourcefulness of network administrators at major sites. Faced with mounting telephone charges for long-distance calls between Usenet hosts, these administrators found a way to carry Usenet news over the TCP/IP-based Internet rather than the previous modem-based connections. Thus, they prevented the

costs of carrying Usenet from coming to the attention of the bean counters poised to strike unnecessary expenses from their budgets. The TCP/IP connections of the ARPAnet, and then the Internet, were already paid for. So, by figuring out how to carry Usenet over those lines, the network administrators managed to cut their costs, keep users happy, and save Usenet from itself in the process. In other words, Usenet may be an anarchy, but it wouldn't stand a chance without some occasional help from high places.

For more information about Usenet, read Chapter14, "All About Usenet News."

BITNET

Shortly after Usenet took its first faltering networked steps, Ira Fuchs of City University of New York and Greydon Freeman of Yale University decided to network their universities using IBM's then-new NJE communications protocol. Although this protocol later expanded to support other types of computers, the vast majority of machines on BITNET (the "Because It's Time" network) have always been IBM mainframes. Fuchs and Freeman made their connection in the spring of 1981. BITNET grew rapidly, encompassing over 100 organizations on 225 machines by 1984, and by 1994 reaching the level of 1,400 organizations in 49 countries around the world. Most BITNET sites were at universities, colleges, and other research institutions.

BITNET was always a cooperative network; members passed traffic bound for other sites without charging, and software developed by one was made available to all. Unlike Usenet, however, BITNET developed an organizational structure in 1984 in the form of an Executive Committee, made up of representatives of all the major BITNET nodes. Also in 1984, IBM provided a large grant that provided initial funding for centralized network support services. This grant, coupled with the fact that most of the machines on BITNET were IBM mainframes, gave rise to the erroneous rumor that BITNET was an IBM network. In 1987, BITNET became a nonprofit corporation. In 1989, it changed its corporate name to CREN, the Corporation for Research and Educational Networking, when it merged its administrative organization with another of the educational networks, CSNET (the Computer+Science Network). Today, BITNET has all but disappeared, as most of the member institutions have moved over to the TCP/IP-based Internet. After all, that's where the action is.

NSFNET

The next big event in the history of the Internet was the creation of the high-speed NSFNET (National Science Foundation Network) in 1986. NSFNET was developed to connect supercomputer sites around the country. Because supercomputers are terribly expensive, the NSF (National Science Foundation) could afford to fund only five supercomputers (and even then it received some major financial help from companies like

IBM). With this limited number, it made sense to network the supercomputers so that researchers everywhere could use them without traveling great distances. At first, the NSF tried to use the relatively slow ARPAnet, but that attempt quickly became bogged down in bureaucracy and red tape.

The NSF therefore decided to build its own network. Merely connecting the five supercomputer sites wasn't going to help the vast majority of researchers, of course, so the NSF created (or used existing) regional networks that connected schools and research sites in the same area. Then those networks were connected to the NSFNET.

To quote from W.P. Kinsella's *Shoeless Joe*, "If you build it, they will come." Perhaps not surprisingly, after all of these networks were able to communicate with one another, the supercomputer usage faded into the background. Other uses, most notably email, became preeminent. One of the important features of the NSFNET was that the NSF encouraged universities to provide wide access to students and staff, so that the population and traffic on the net increased dramatically.

In 1987, the NSF awarded a contract to a group of companies to manage and upgrade the NSFNET. This group was made up of IBM, MCI, and Merit Network, which ran the educational network in Michigan. The group dealt with the massive increase in traffic by replacing the old lines with much faster connections.

Eventually, the NSFNET entirely supplanted the ARPAnet, and in March of 1990, the ARPAnet was taken down for good, having played the starring role for over 20 years. Other networks followed suit, and before long, the NSFNET was the main game in town, if you consider "town" to be the United States (the situation was undoubtedly different in other countries). The NSFNET's reign lasted about five years, during which various companies started to put their own networks into place and to connect them to the NSFNET so email and other net traffic could pass back and forth. Similarly, other countries created networks that could also link into the U.S. NSFNET.

One of the reasons for this buildup in commercial networks is that no one thought that it was a good idea for the federal government to fund the NSFNET forever. Privatization of the Internet was the goal for some time, but it took seven or eight years to come to fruition, because, I suspect, the financial rewards weren't sufficiently obvious and the government tends to move slowly.

The Commercial Internet

In April of 1995, the National Science Foundation closed the NSFNET. That's not to say that all the Internet traffic that moved along the NSFNET went away; instead the connections were taken over by the companies who had set up their own networks alongside the NSFNET. These companies include most of the big telephone companies, such as Sprint, MCI, and AT&T, and a few smaller companies such as ANS (Advanced Networks and

Systems, now owned by America Online) and MFS (Metropolitan Fiber Systems, which was originally a natural gas company with the foresight to run fiber optic lines along its natural gas pipelines).

The National Science Foundation shut off the NSFNET in April of 1995 but didn't completely leave the game. To ensure that traffic could be passed between all these corporate-run networks, the NSF designated three Network Access Points (NAPs): one in San Francisco, one in Chicago, and one in New York. You can think of these NAPs as places where all the different networks meet and exchange traffic meant for one another, much as ancient marketplaces acted as places for merchants to exchange trade goods. These NAPs are actually operated by telephone companies. Other NAPs have popped up as well, ensuring that traffic will always be able to get from one part of the Internet to another.

The World Wide Web

Up to now I've discussed the Internet in terms of the actual networks involved, because the types of things that you could do over the Internet were relatively limited. You could send and receive email and Usenet news, and you could copy files from one computer to another using FTP. The University of Minnesota's Gopher protocol expanded on FTP, so that it could not only transfer information from one computer on the Internet to another, but also display it without requiring another program. Despite all this functionality, when the World Wide Web appeared, it brought a lot of attention to the Internet.

I talk about the Web in more detail in Chapter 16, "All About the World Wide Web," but probably the most important fact about the Web is its sex appeal. Whereas all the previous Internet services might have provided quality information, the Web could provide that same information and do so in an attractive manner. Web pages could hold text in different styles and sizes, and they could mix text and graphics, just like in magazines.

All of the other benefits of the Web aside, this basic attraction caught the attention of the media, because the Web finally offered a way that they could distribute information to a large number of people on the Internet without completely giving up their aesthetic presentation. So the media was attracted to the Web as a new place to publish information, and at the same time, the media started to cover the Web in print and broadcast stories. Without that press coverage, the Internet might have continued to grow at the 15 percent per month rate to which it had become accustomed, but it wouldn't have become nearly as well known outside of high-tech industries and education. Essentially the media, because of the Web, put the Internet on the map for normal people who didn't otherwise think about electronic communications.

For many people, the Web is the Internet, and as much as that's a completely mistaken impression, it's hard to argue too much when they haven't seen how far the Internet has come over the years. Even now, I personally feel that email is the most important thing you

can do on the Internet. I use the Web all day long, but the Web is still primarily a one-way medium, whereas email is inherently bidirectional. I find information on the Web, but replying to my email forces me to think.

Internet Present

We've arrived at the present, which is a good time to address some of the questions that have built up throughout the historical discussion so far (such as who pays for all of this). It's also a good time to talk about some of the major issues that confront the Internet today. For the most part, these issues remain unresolved and there are no easy answers. When I can, I'll try to provide some ways you can think about the topic or some pieces of advice that you perhaps can integrate into your life.

Who Pays?

By now you might be a bit confused as to who pays for all these Internet connections now that the U.S. government no longer does. The trick is to remember that everyone must pay an Internet provider for access to the Internet, right up to the largest companies, such as MCI and Sprint, who don't have to pay anyone, but must install all of the networks to which they sell access. So, when you pay $20 per month to your local Internet provider, keep in mind that your Internet provider probably pays $2,000 per month to a larger Internet provider, and that larger provider may pay $10,000 per month to Sprint or MCI or some main other major provider for its connections. Those numbers aren't exact, but the basic principle applies nonetheless.

This food chain of Internet providers is less clear if you have a free Internet account thanks to your school, for instance. In that case, the institution pays for the Internet connection and funds it in part from your tuition. If your workplace offers Internet access and doesn't limit your use of it, consider that a benefit of working there, along with retirement and health benefits. But at this point most people, like me, pay for their Internet access directly, usually somewhere between $15 and $30 per month. It sure beats cable television.

> **BTW**
> It's worth noting that people like flat-rate fees for most things (telephone and cable service come to mind), and in the past, most personal Internet accounts were usage-based, with a trend toward flat-rate service in the past few years. I believe the increasing number of flat-rate Internet accounts was helped in part by the first edition of this book, with its flat-rate offer for a true Internet connection from Northwest Nexus. I'm unaware of any other widely available flat-rate accounts that predate the offer from Northwest Nexus. I like to think I had a positive influence.

I explained who *does* pay for the Internet, but that avoids the question of who should pay and how they should pay. This issue faces all Internet users and will continue to do so for some time, especially in other countries.

- Should Internet users be charged by how much they use the Internet? After all, that would seem to be a more equitable way of dividing the costs. My suspicion is that those who seldom use the Internet would be in favor of this sort of time-based charging, whereas those who spend a lot of time on the Internet would oppose it. One concern is that usage charging might place too high a price on sharing information and knowledge and could thus actually hurt the Internet.

- Perhaps Internet rates should be assessed by usage, but not by time? Some countries, such as New Zealand and Australia, have instituted volume-based charges for Internet access. You can spend as much time online in those countries as you like, but you pay for every byte that you send to or receive from another country. This sort of billing also hits heavy users more than light users, and it also discourages the sharing of information, especially for people who want to run servers that might serve thousands of files a day.

- One concern is that the current trend toward flat-rate charging may prove ineffective when the Internet is asked to carry time-sensitive information. By "time-sensitive" I don't mean the latest news; instead I'm talking about real-time audio or video, for which it matters a great deal that each packet of information arrive promptly and more or less in order. In contrast, it doesn't matter how long it takes to deliver most email messages as long as they arrive within a few hours. Some have suggested charging more for "priority" packets, so that you'd pay extra if you needed your packets of information to move across the Internet quickly ("quickly" could be interpreted in terms of seconds rather than tens of seconds, not hours).

Politics

The issue of who runs what on the Internet is confusing. No one person or organization runs the Internet as such. I think of the Internet as a collection of fiefdoms that must cooperate to survive. The fiefdoms are often inclusive as well, so that one group may control an entire network, but another group controls a specific machine in that network. As a user, you must abide by what both of them say, or find another provider.

Some guiding forces exist, mostly in the form of several important groups, all of which are volunteer-based (as is most everything on the Internet). The Internet Architecture Board, or IAB, sets the standards for the Internet. Without standards, the Internet wouldn't be possible because so many types of hardware and software exist on it. Although you must be invited to be on the IAB, anyone can attend the regular meetings of the Internet Engineering Task Force, or IETF. The IETF's meetings serve as a forum to discuss and address the immediate issues that face the Internet as a whole. Serious problems, or rather problems

that interest a sufficient number of volunteers, result in working groups that report back to the IETF with a recommendation for solving the problem. This system seems haphazard, but frankly, it works, which is more than you can say for certain other organizations we could probably name.

- For the most part, the Internet is free of governmental control, which is generally considered a good thing. Various people in government, who tend to not actually use the Internet, periodically attempt to involve government in the Internet to a greater extent.
- It might be impossible to govern the Internet to any greater extent than it is now, for the simple reason that the Internet is a global entity, and no one government can legislate Internet use or Internet users in other countries.
- If you want to get involved with what organization there is on the Internet, I suggest that you participate and contribute to discussions about the future of the net. Gradually, you'll learn how the system works and find yourself in a position in which you can help the net continue to thrive.
- Perhaps the most important fact about the loose control structure of the Internet is that it works, and it works far better than do most organizations. By bringing control down to almost the individual level and by requiring cooperation, the Internet survives without the strong central government that most countries use and claim is necessary to avoid lawlessness and anarchy.

Pornography and Censorship

Perhaps the biggest issue facing the Internet today is what to do about all that smut. I mean, you connect to the Internet and you've got naked ladies just bursting out of your modem.

I'm being facetious, because I think the entire problem has been blown way out of proportion, mostly due to the efforts of misguided and misinformed politicians trying to make a name for themselves. These politicians introduced legislation in the U.S. that outlaws indecent or obscene speech on the Internet. This legislation, called the Communications Decency Act, was passed by Congress in early 1996 and signed into law by President Clinton. Various reasons exist for the success of the Communications Decency Act, not the least of which is that it is part of the much larger and more important Telecommunications Reform Act of 1996. Without a line-item veto, President Clinton couldn't eliminate the Communications Decency Act without throwing the proverbial baby out with the bathwater.

Political opposition to the Communications Decency Act was doomed from the start because most politicians will not risk opening themselves up to charges that they're "in favor of pornography." The Internet community mounted massive opposition to the

Communications Decency Act as soon as the first drafts became public, and as soon as it was signed into law, several groups immediately filed suit against the government, claiming the restrictions were unconstitutional and in violation of the First Amendment's free speech protections. A judge immediately passed an injunction against the enforcement of the law, and the Clinton administration said it wouldn't enforce the law, which calls for large fines and prison sentences, until there was a final rule on the constitutionality of the law (which is where we stand today).

As a writer and publisher, I'm appalled by such inroads on the First Amendment. It requires almost no stretch at all to expand the term "indecent" to ideas inimical to those in power at any given time. Now that you understand my bias, let me outline a few of what I consider to be the salient facts of the matter; after you have these facts under your belt, you can better decide for yourself what you think of this issue.

- Indecency and obscenity are extremely relative. What offends me might not bother you at all. What's disgusting in one culture may be considered perfectly normal in another. Pictures of frontal nudity are commonplace in nonerotic magazines in other countries; however, such nudity would never appear in similar magazines in the United States. Modern movies would make a Victorian lady faint. I emphasize this relativity because the Internet is global and laws in one country cannot apply to citizens of another. Such laws are thus unenforceable, and when that's true, those laws risk being selectively enforced. The best adjective I can raise to describe selective enforcement of laws is "chilling."

- Much of the rhetoric surrounding the pornography debate revolves around child pornography existing on the Internet. In this case, I feel that additional legislation is utterly misplaced. I've become acquainted with some of the facts surrounding a recent case of child pornography transmitted over the Internet. The method of distribution proved completely immaterial in court and the child pornographer was easily convicted under existing laws.

- Another rhetorical nexus of the pornography debate centers around whether or not children should be allowed to view it online. Recalling my own childhood, I don't remember it being particularly difficult to find pornography if I so wanted, irrespective of my parents' wishes. Although I don't have children of my own, I feel rather strongly that the issue is not one of whether or not children can view pornography online, but one of whether or not parents have taken the time and effort to educate their children about the subject. The fact that it's so easy for a teenager to flip through a copy of *Playboy* at a newsstand makes complaining about the contents of `<http://www.playboy.com/>` seem inconsistent at best. Finally, I would ask what happens to the child who has been "protected" from everything as soon as the child leaves home for college. Does protecting a child in June of his or her senior year of high school but not in September make sense? Educate, don't legislate.

- There seems to be a common misconception that the Internet is awash in smut. Speaking as someone who spends up to eight hours a day actively using the Internet,

I think that although pornography exists on the Internet, it makes up a minuscule percentage of the information available. In addition, nothing on the Internet is forced on you; if you want to view pornography, you must go find it yourself.

- Finally, has anyone ever bothered to ask children what they thought? Are they rational, thinking beings, or do their opinions not matter in such a debate?

Online Shopping and Security

Online shopping is rapidly becoming commonplace on the Internet, much as mail-order shopping has become a tremendously popular way to purchase items without venturing out of your house. Online shopping has a number of advantages over even mail-order shopping. If you know exactly what you want, as is generally the case when you want to buy a specific book or CD or software package, it's easy to search an online store for that product. With only a little more effort, you can compare prices at several different online vendors. Stores that exist only online have much lower overheads than either physical stores or mail-order vendors (mailing out all those catalogs is not only environmentally offensive, it's incredibly expensive), and lower overheads make it possible for online stores to reduce their prices. That's always a popular option with consumers. Online stores are always available—if you're like me, you don't always remember to order from a catalog during the hours they staff their phone lines, and some people, also like me, aren't particularly fond of talking to the salespeople on the other end anyway.

As much as online shopping's allure is undeniable, and as much as some online vendors have done quite well, many people express concern about the security issues of transmitting credit card information across the Internet. Might not some unethical cracker steal that credit card number and make fraudulent use of it? Let me set out some of the facts of the matter to reassure you that such security issues are primarily a matter of perception, not reality.

- As of the spring of 1996, I have yet to hear of a recorded instance of a credit card number being stolen during an online transaction. That's not to say it hasn't happened, but if so, it hasn't been publicized at all. Compare that record with the millions of dollars of credit card fraud that happens every year via existing transaction methods.

- Every time you give a waiter in a restaurant your credit card, you're taking a far greater risk than by sending it across the Internet. The fact of the matter is, although it's technically possible to steal a credit card number from the Internet, to do so would be incredibly difficult, and might involve additional criminal activity, such as breaking and entering to gain access to an Internet provider's network. It's a lot easier to get a job as a waiter.

- Read your credit card agreement carefully. Most contain language protecting you from damages resulting from theft of your card after $50, assuming you notify the credit card company as soon as you know. Some credit card companies even waive that $50 liability if there was no signature involved in the transaction. Credit card companies also employ sophisticated pattern-matching software to help them identify rogue transactions, such as might have been caused by a stolen number.

  For instance, a friend once received a call from his credit card company several days after a trip to San Francisco. He'd used his card in a restaurant, where the number had evidently been stolen. He returned to Seattle, used the card several more times for gas and groceries, and then the thief attempted to use the card in San Francisco to order several thousand dollars of cellular phone equipment. My friend's credit card company noted that the trip to San Francisco wasn't unusual, but the fact that he'd used the card again in Seattle before the errant charges appeared back in San Francisco was strange. In addition, he usually charged small things, not large-ticket items. So, they called to see if the cellular phone equipment purchase was legitimate. He assured them it was not, and they took care of it and didn't hold him liable for a penny of it.

- When credit card fraud occurs, you are highly unlikely to suffer any damages. In fact, the party that suffers is the merchant, who must then build the cost of credit card fraud into the cost of doing business.

- This perception of insecurity has prompted companies that make Web servers to come up with ways of encrypting your number in transit that are more than sufficiently secure. Anyone who could break this encryption (and meet all the other technical requirements for tapping into Internet traffic) could earn a lot more money in legitimate work than in stealing credit card numbers.

- No one forces you to do anything that makes you uncomfortable. If you don't feel comfortable typing your credit card number online, don't.

Crime and Privacy

One concern held primarily by our law enforcement agencies is that criminals could use the Internet as a way of communicating with one another about future crimes. The technology that generally raises such concerns is encryption software, with which you can ensure that no one but the recipient of your message reads what you have written. The most well-known piece of software for this purpose is called PGP, for Pretty Good Privacy. PGP ensures a level of privacy that's secure enough to prevent anyone, including the government, from easily decrypting an encrypted message, at least with today's technology. This concern has led to the U.S. government classifying PGP and other encryption techniques that cannot currently be broken as munitions, which enables the government to prevent its export outside of U.S. borders (less secure encryption techniques that the

National Security Agency [NSA] can break are legal to export). Does this reaction to the secure communications made possible by encryption technology make sense? Should we even worry about the issue?

- Needless to say, attempting to prevent anything on the Internet from leaving U.S. borders is just plain foolish. PGP is widely available on the Internet all around the world—just try searching on the Web for "PGP" and see how many foreign sites your search turns up.

- The belief that PGP and other forms of encryption technology developed in the United States are the only forms of unbreakable encryption is pure hubris. There are plenty of brilliant mathematicians in other countries who can and have created such encryption methods. I see no reason to assume that criminals smart enough to use encrypted communications wouldn't use an encryption method from another country.

- Why should we assume that only criminals have a use for encryption? Right now, you cannot assume that anything you write on the Internet is private (although it's a decent bet unless you make a mistake and send your note to an entire mailing list). But with encryption, you do have the guarantee of privacy, and there are situations in life in which privacy is of the utmost concern. When Tonya and I bought a house, we found a mortgage broker who did everything via email, which was great. When it came time to send him all of our financial details, though, we decided that we weren't comfortable with the privacy of email and opted for snail mail. If both we and our mortgage broker had been able to deal with encrypted email easily, we wouldn't have worried about it. Ironically, after we moved, we started having trouble with snail mail being stolen.

- Finally, it's easy to create a code that's very hard to break, and if I was planning a life of crime, that's what I'd do. You simply agree, with your cohorts, what certain words or phrases mean, and then you can exchange perfectly innocuous mail that in fact details the dates and times of your crimes. Unless one of you rats on the others (which would bring down a crime ring based on encrypted communications as well), your code is secure.

Equal Access

Another issue facing the Internet today is that of equal access. There is no circumventing the requirements I laid out in the first chapter of this book. You simply must have a computer and some way of connecting to the Internet, and as we all know, those items are neither free nor cheap. Is it fair to restrict access to the Internet to those who can afford it?

It's a good question, and one that has many facets. I cannot answer it for you, and I'm not even sure that my opinions on the subject are fully formed. As with the previous section, however, let me list some issues that you might use to better come up with your own opinion.

- Is access to the Internet sufficiently valuable that the question of universal access even makes sense? Does our society provide equal access to other resources of perhaps greater utility, such as dedicated teachers? How do we measure the value of Internet access to those who would not have otherwise been able to afford it?
- If we assume that universal access to the Internet is of sufficient value to the society, who should ensure that anyone can get access? I can see a case being made for the federal government being the provider of Internet access to the masses in this country (since all too often the government is the provider of welfare), but might it not be more in the interests of industry to provide that access in order to create a future customer?
- Should Internet access be provided to individuals, like telephones, or be provided to communities, like libraries? Perhaps it makes more sense to establish public places where anyone can access the Internet for free than it does to attempt to subsidize a computer and an Internet account for everyone.

Inappropriate Uses

As the Internet becomes more widely used, inappropriate uses continue to appear. For the most part, there are no technical ways of fighting these abuses other than by refusing to participate in any way, since many of them rely on the often unwitting participation of uninvolved people.

The most famous example of Internet abuse was the so-called Green Card debacle. In the spring of 1994, the husband-and-wife law firm of Canter & Siegel posted a blatantly commercial message advertising a green card lottery and immigration services. That wasn't the problem. The problem was that they posted it to 5,000 Usenet newsgroups, an act colloquially called spamming (consider the image of the contents of a can of Spam hitting a fan). Discussions about Celtic culture, Macintosh communications (where I first saw it), and Washington state politics were all interrupted, along with thousands of others completely apathetic about anything to do with immigration. Or at least they were apathetic until they were bludgeoned repeatedly with Canter & Siegel's post. All of a sudden, everyone cared a great deal about immigration, and sent 30,000 irate flame messages (more than 100 megabytes of text) to the offenders. That many messages was far more than Canter & Siegel's provider, Internet Direct, could handle, and its machine went down like a boxer on the wrong end of a knock-out punch.

Internet Direct disabled Canter & Siegel's account immediately, and details about their history began to surface. They'd been kicked off of other providers for similar smaller-scale posts in the past, they'd been suspended from the bar in Florida in 1987 for conduct the Supreme Court of Florida deemed "contrary to honest," and so on. Canter & Siegel garnered a huge amount of press (most of it negative, but as the saying goes, "I don't care what you say about me as long as you spell my name right"). They even announced in a

newspaper interview that they were setting up a company to provide services to other companies who wanted to flood Usenet with advertising, and they wrote a book (which has received awful reviews) about how to advertise on the Internet. That's a bit like Bonnie and Clyde writing a book about bank security.

The Canter & Siegel fiasco raises the question of how the Internet should be policed. In the past, and in the present, transgressions have been dealt with much as they might have been in the perhaps-fictional view of the American Old West. Everyone takes justice into his or her own hands, and if a few innocents are hurt in the process, well, it was for the greater good. When Canter & Siegel spammed Usenet, thousands of people flamed them back.

This process of frontier justice is more commonly known as mail bombing. Mail bombs are generally small Unix programs (before you ask, I don't know of any for the Mac and don't condone their use) that simply send a user-configured number of messages (using a specified file as the message body) to a given address, potentially ensuring that none of the mail bomb messages come from real addresses. A better solution came from a Norwegian programmer, who created a spambot (his term, not mine) program that somehow figures out which newsgroups Canter & Siegel spammed (yes, it has happened again, although on a smaller scale each time) and bounces the spamming message back to them, along with a short note daring them to sue him, since he's in Norway.

Frontier justice sounds like great fun, especially when slimy lawyers are on the other end, but it raises some interesting issues. Mail bombing a machine doesn't affect just that machine—it affects many of the machines nearby on the Internet. In the case of a public machine like Internet Direct's, it also hurts an innocent business and hundreds of innocent users who also use that machine. And, although the Internet as a whole can deal with the occasional mail bomb attack, if such things happened every day, they would seriously impair Internet communications. Such possibilities raise the spectre of regulation, something that most Internet users disapprove of (though certain usage regulations are built into the service agreements of almost every Internet provider for liability reasons). So, will the government get involved and lay down the law about inappropriate Internet use? Probably not. The people who must do the regulation are the providers themselves—there is no way to prevent everyone from retaliating from such spam attacks as Canter and Siegel's, so the best place to stop them is at the level of the providers. They can simply refuse to give problem users an account or remove accounts when abuse occurs. But the government itself? I certainly hope not.

The moral of this story is that you should not send out random spams, either in Usenet news or in email (I get lots of email garbage too and always report the offenders to their Internet providers).

Here are a few other common abuses of the Internet that you should be aware of and should avoid at all costs.

- Chain mail is far more dangerous on the Internet than in snail mail, because it's so easy to pass on. If you receive a message that tells you to forward it on to other people, that's chain mail. Sometimes the causes in question (the cessation of nuclear testing, support of public broadcasting, and so on) are laudatory, but the fact of the matter is, any message that asks to be forwarded to others is chain mail. If you forward a message to everyone you know, and they forward it to everyone they know, and so on, it wouldn't take many generations before that particular message overwhelmed the entire Internet. Such is the power of exponential growth.

- An issue related to chain mail is virus warnings. Viruses are small programs that reproduce themselves to move from computer to computer. Viruses often have some negative effect as well, and although the Macintosh world has essentially no viruses in comparison to the PC world (under 30 compared to tens of thousands), they are real. However, more dangerous than the viruses themselves are virus scares, which can eat up thousands of hours of time around the world for no reason. If you ever think you've found a previously unknown virus (for known ones, just download Disinfectant from `<ftp://ftp.tidbits.com/pub/tidbits/select/disinfectant.hqx>`), please do not post warnings to all the mailing lists you can. That just causes hysteria and interrupts the productivity of thousands of people. Instead, inform one person who can pass your warning on to the people who create Macintosh anti-virus tools. The best person is often the moderator or owner of a Macintosh mailing list—if all else fails, send such a warning to *TidBITS* at `editors@tidbits.com` and we'll forward it on if necessary.

- Many people seem to think that just because something has appeared on the Internet, it's fair game to copy. That's absolutely untrue, and in fact, everything that you or anyone else writes is by definition protected by copyright law. Do not copy any material without permission for distribution, either on or off the Internet. It's both illegal and unethical, and frankly, with information on the Internet, it's generally quite easy to ask for permission. Information that generally appears in commercial publications, such as the Dilbert comic strip, is especially tempting. Don't do it, or the publishers of those resources will remove them from the Internet entirely, as happened a while back with Dave Barry's humor columns.

- I wish I didn't even have to mention this one, but don't upload commercial software to the Internet. It's even worse than copying copyrighted information, because a commercial software program probably took a team of programmers months, if not years, to create, and by doing so, you're robbing them of the rewards due to them in return for their hard work. Piracy just doesn't fly on the Internet.

Commercialization

Those of us who have been on the Internet for a long time are often amazed at the level to which the Internet has been taken over by commerce and often crass commercialism. In

the past, commercialism was strictly forbidden on the Internet, primarily as a result of the NSFNET's Acceptable Use Policy. As the NSFNET faded away and then disappeared, so did its prohibitions against commercial use, and that, combined with the rise of the World Wide Web, attracted numerous companies to the Internet.

Many people who have come to the Internet after this influx of commercialism might not have quite the same sense of concern about this issue, so let me lay out some of the reasons why we old-timers occasionally worry about it.

- Much of the Internet was built on a base of sharing and camaraderie, rather than on commercial interest. Although it might smack of socialism, I feel that the Internet is as strong as it is today because of the thousands of selfless volunteers who devoted years of time and effort to improving the Internet. Even today, many of the most popular mailing lists and FTP sites are run by volunteers for no financial recompense. Similarly, when people help others on the net, they're doing so out of a sense of community and the simple desire to help others. If we allow the Internet to lose that sense of sharing, we all suffer greatly.

- In many ways, the Internet is a standards-oriented place. Groups of volunteers get together and evaluate existing work and decide on standards. Those standards are then published for anyone to read and implement in software, which is the reason anyone on the Internet can receive email from anyone else, among other things. If we let companies such as Netscape and Microsoft define the standards as they'd like to do to create highly profitable monopolies, we risk placing great parts of the Internet at the mercy of a small number of companies. Sayings about not putting all your eggs in one basket come to mind.

- Many Internet resources have little or no commercial value, which isn't to say that they are not inherently valuable. If the only resources that could survive on the Internet were the sort of thing that we users would pay for, I think we'd see a tremendous loss in useful information. As we all know, the world is subjective and everyone has his or her biases. If everything on the Internet has to meet some level of commercial viability, then we'd lose resources that espoused unpopular opinions or explained abstract topics. In effect, we'd have turned the Internet into mainstream television.

Information Overload

An unimaginable amount of new information appears on the Internet every day, and those of us who like to think that we can or should somehow keep up with a specific field are being torn apart by this influx of data. When I started writing the *Internet Starter Kit* series of books, I felt that at least on the Macintosh, I knew pretty much all there was to know. As time has passed, I've learned more and more, but the amount to learn has increased at an even greater rate. I think it's safe to say that more information appears on the Internet in a single day than anyone could hope to absorb in a year of full-time work.

I think people who have been on the Internet for a while may be more at risk of feeling overwhelmed than newcomers who can perhaps just accept the facts of life on the Internet. But, assuming that you too find the amount of information on the Internet overwhelming, here are some ways around the problem that you might be able to apply to your own situation.

- Focus on just the specific bits of information that interest you and learn to ignore the rest.
- Separate your interests; perhaps you can consider some Internet sites or mailing lists part of your job and read them during the day, whereas others might be purely recreational, and those you could read at night.
- Make sure you have the appropriate software to deal with the flood of information. For instance, if your time is worth anything, consider buying an email program like Eudora Pro that can filter messages into different mailboxes or a Usenet newsreader like NewsHopper that downloads only postings that match your filters.
- If you find yourself dreading the thought of having to read through a high-volume mailing list or Usenet newsgroup, just ditch it. Stop killing yourself and learn to say no. The world won't end because you miss the one useful posting out of 300 on a given day.
- Let your friends and colleagues do your filtering for you. At this point, I receive a ton of information in email, and much of it is from people who think I'd be interested in some Web site or quote from an industry newsletter. I could go out and find the same information myself, but why duplicate the effort?
- Don't let your bookmarks breed like bunnies. It's easy to create a bookmark to every site that looks interesting, but if you don't think you're going to want to go back soon, don't bother. I try to restrict my bookmarks to sites that I consider truly useful, and periodically I go through and weed out those that I can no longer even identify. Concentrate on bookmarks to sites you visit often, like Yahoo at `<http://www.yahoo.com/>`.
- Try not to let email build up in your In box. I've found that if my In box is relatively clean, I feel more on top of my information, whereas if it's meandering up toward 200 or 300 messages, I start to panic. File or delete mail when you're done with it—you'd be amazed how it ceases to be a problem after it's out of your In box.

Internet Future

I hope this chapter has so far provided a coherent view of where the Internet has come from, along with some of the people and networks that were instrumental in its growth. After any history lesson, the immediate question concerns the future. Where can we expect the Internet to go from here?

I'm an optimist. I'm sure you can find someone more than happy to tell you all the horrible problems—technical, political, and social—facing the Internet. I don't hold with such attitudes, though, because something that affects so many people around the world didn't appear so quickly for no reason. In one way or another, I think most people understand on a visceral level that the Internet is good, the Internet is here to stay, and if they want to be someone, they would do well to get access today and contribute in a positive fashion. Of course, books like this one only encourage such utopian attitudes.

Growth

In any event, I predict that the Internet will continue growing at an incredible rate. You might make an argument for the rate of growth slowing from its 15 percent per month rate based on the fact that it's silly to assume that anything can continue to grow at such a breakneck speed. I feel that such growth is self-propelling and that bringing more people and resources onto the Internet only further fuels the expansion. I think that growth is good—the more people, the more resources, the more opinions, the better off we all are.

Growth will hit different parts of the Internet in different ways. We all benefit when more information appears on the Web. I'm always amazed when I revisit some topic, like Web pages devoted to musicians, some months after I've done my initial research. The growth is astonishing. However, growth has its dark side. For many people, Usenet news has failed to deal with the growth of the Internet, and many newsgroups regularly receive several hundred messages each day. That's simply too much for most people to read, and as a result, I believe that the percentage of people who post requests for information is increasing in comparison to the number of people who actually provide information. Such a trend can't go on for long before the entire system collapses under the weight of so much pointlessness.

I find that mailing lists are now more valuable to me than Usenet newsgroups for this very reason. I can more easily control the amount of time I spend reading a mailing list, and I can more easily read them whenever I want. Despite a few excellent efforts, Usenet newsreading software has not evolved sufficiently quickly to deal with the overwhelming growth in traffic.

Costs

This Internet growth will be encouraged by the ever-decreasing cost of Internet access. As more and more Internet service providers appear, they discover that because they all provide more or less the same service, the main way to compete is on price. As soon as there are several Internet providers in a city, you can expect one of them to undercut the others. Adding to this trend are the national providers, several of whom offer flat-rate $20 per month rates. When you start graphing these costs against time, you'll see that it won't

be long before the communications costs of accessing the Internet will be essentially zero. I doubt that Internet access will ever be totally free, but the trend is a downward spiral, and many Internet providers will find it difficult to compete, especially when the telephone companies start offering Internet access as part of their standard services.

Along with the cost of Internet access dropping, I expect to see the cost of the software needed to access the Internet continuing to drop. Not all that long ago, if you wanted to use the Internet, you had to buy at least one piece of software on the Mac, MacTCP. Now MacTCP's functionality is bundled with the System software on every new Macintosh. Most of the good Internet software has long been either freeware or inexpensive shareware, and I don't see that changing, and expensive commercial software is rapidly being forced to become either cheap or free to compete with the marketing scheme used by Netscape. In what turned out to be a successful attempt to build market share, Netscape essentially gave away copies of Netscape Navigator on the Internet itself. Although its ambiguously worded license agreement does in fact state that most users should pay for the program, Netscape reaped huge rewards by making it easy for anyone who wanted a copy of Netscape Navigator to get one. Because of Netscape's success, I doubt anyone will be able to get away with selling Internet software for much at all in the future.

Standardization

I also expect to see the Internet continue to standardize, both officially and informally. At a higher level, I think that using various network resources will become easier as they start migrating toward similar interfaces. Just as it's easy to use multiple applications on a Mac because you always know how to open, close, save, and quit, so it will be easier to use new and enhanced services on the Internet because they will resemble each other more and more. Even now, people rely heavily on network conventions, such as prefixing site names to indicate what services they provide, like `ftp.tidbits.com` for FTP and `www.tidbits.com` for the Web.

As much as the Internet will become ever the more standardized in many ways, I don't believe that it will ever be governed to a much greater extent than it now is (at least in the U.S.), simply because I don't believe it's feasible. How can you govern something that spans the globe or police something that carries gigabytes of data every day? The U.S. government could easily ban pornographic postings, for example, but how does that affect someone from a different country? Or how does that affect U.S. users retrieving the pornographic images from another country? Remember, the Internet can just route around censorship. It's all very confusing, and it will be some time (if ever) before the government understands all of the issues surrounding the Internet sufficiently to produce reasonable legislation. Of course, that begs the question of unreasonable legislation, but that's always a concern.

Increases in Speed

Although it's unlikely that standard modems will get much faster than the 28.8 Kbps in common use today, I do expect that we'll be using faster connections to the Internet as a matter of course in the next few years. Modems are unlikely to increase in speed for two reasons. First, although I'm not an engineer, I gather that we're starting to approach the theoretical speed limits of an analog telephone line with existing modems. A few companies have released 33.6 Kbps modems, but because they aren't widely available, there's no point in buying one over a less-expensive 28.8 Kbps modem. The second reason I doubt we'll see faster modems is more significant. The existing telephone lines that most of us use aren't in particularly good condition in many parts of the country and the world. Most 28.8 Kbps modems can't even achieve their full speeds in both directions because of poor line quality. For instance, on my main modem line (which is better than my other telephone line), I can usually get 26 Kbps receiving information and 21.6 Kbps sending, although it's not uncommon for my modem to drop to 24 Kbps receiving and 16.8 Kbps sending. Until cleaner phone lines are universal, even our existing modems can't perform to their specifications.

Increases in speed will come instead from new technologies. I believe ISDN will lead the various new communications technologies just because it has a head start in hardware, software support, and acceptance within the telephone companies. ISDN lines can run at speeds ranging from 56 Kbps to 128 Kbps, depending on a number of variables with your phone company and Internet provider. ISDN is here today, but still not common. Second in line will be cable modems that will provide theoretical speeds up to 10 Mbps over the same wire that carries cable TV, although I expect the real-world speeds to come in much lower. Cable modems might be as far as five years out because the current cable installations aren't capable of carrying high-speed or bidirectional traffic. Even worse, cable systems are shared, so if all your neighbors were using the Internet at the same time over cable modems, the throughput would drop radically. Telephone companies are starting to experiment with technologies with names like ADSL (Asymmetric Digital Subscriber Line) and HDSL (High-speed Digital Subscriber Line) which promise amazing speeds over the same wires you use for normal telephone usage today. The problem with these new technologies is that the telephone companies must invest vast sums of money in the hardware to support them, and that investment may take some time or not happen at all. In addition, it's unclear what hardware you would need to use these high-speed lines, and perhaps more important, how expensive it would be.

The basic rule is that you can always get higher speeds if you're willing to pay more for the privilege. As time passes, the amount you must pay for those speeds should continue to drop, although I wouldn't be surprised if the speeds that you can get with plenty of money will continue to increase at the same time.

Ascendence of Multimedia

One of the most obvious trends on the Internet is the ascendence of different media types. At first, text ruled the Internet, and it took some time before you could even send graphic files back and forth. Then the World Wide Web appeared and introduced different text fonts and sizes, along with graphics on the same page. You could also make links to sound and video files on Web pages, but you needed other applications, called helper applications, to listen to or view those files.

Now we're starting to see plug-ins for Netscape Navigator and other Web browsers that enable Web designers to put sounds, animations, and movies on Web pages in just the same way as they mixed text with graphics before (see Chapter 16, "All About the World Wide Web," for more details).

I don't doubt that this trend will continue in the future, such that we'll see more and more of these different types of media showing up. The tools for creating and presenting these different media types will continue to improve, making it easier for nonprofessionals to create passable video clips, for instance. The speed, however, at which most people access the Internet must increase for multimedia to take off at full speed. Current modems simply can't provide the kind of throughput necessary for a normal user to download large movies or sounds before becoming overly impatient. When more people have faster connections, I think we'll see these multimedia Web pages proliferate.

Intertainment?

The ways that we all use the Internet will almost certainly change as well, and one of the main suggestions from pundits is that the Internet will become more of an entertainment medium than a pure information medium. I believe this prediction is based on the increasing number of "normal" people who presumably aren't as interested in information as in a game.

Although I tend to agree that the Internet will be used more and more for leisure pursuits, I tend to think that many pundits underestimate the intelligence and inquisitiveness of many people. The Internet may be relatively hard to use today in comparison to a television, but the options are so much wider and the rewards are so much greater. In fact, some of the surveys I've seen report that the increase in Internet use has been offset by a corresponding decrease in the amount of television the survey respondents watch.

It's also worth considering that the Internet is pretty much infinitely expandable in terms of what sort of content it can hold. Even if entertainment content becomes a much larger percentage of the content available on the Internet, there's no reason to assume that it will replace more useful informational resources. The Internet will always be an immensely valuable information resource, and as time goes on, I believe that it will become perhaps the most useful information resource available.

Gotta Get an Agent

One of the problems with the proliferation of information I mentioned previously (no matter what type of information) is that the more information there is, the harder it can be to find any given piece of information. Even worse, because the information that interests you may change frequently, finding that information repeatedly may be an increasingly onerous task.

The standard industry savior presented to solve this problem is the so-called "intelligent agent," a program that goes out on the Internet and finds the information you've asked for, perhaps revisiting the same sites at regular intervals to see if anything new and interesting has appeared.

The reason why I talk about agents in this "Internet Future" section is that the computer industry has been pretty much incapable of coming up with any useful examples of this sort of software. The closest we have right now are programs that enable you to set up a series of filters that operate on incoming email or Usenet news, perhaps marking messages from certain people or on certain subjects.

Despite the industry's insistence that agent software will solve all of our information overload problems, I once asked about the reality of agents at an industry panel I was moderating. When put on the spot, the programmers on the panel admitted that truly useful agent software was quite a ways off, not necessarily so much because of the difficulty of programming an agent, but because of the difficulty in making sense of the vast quantity of information on the Internet that has little organization or categorization at all. Computers are bad at understanding English (witness the classic confusing sentence, "Time flies like an arrow, but fruit flies like a banana") and as such, an agent program would have trouble evaluating the utility and relevance of the information it found.

The first agents that we'll see will be relatively simple, such as the ones we have today that can send a search to several search engines at the same time. I've seen another that can search several online CD stores to see which has the lowest price on a given CD (several of the stores promptly locked out the program when it tried to query their price database).

The reality of the situation aside, I do believe that sooner or later someone will come up with truly useful agent software. If it's marketed well, it could be the next killer application, the program that no one can afford to be without.

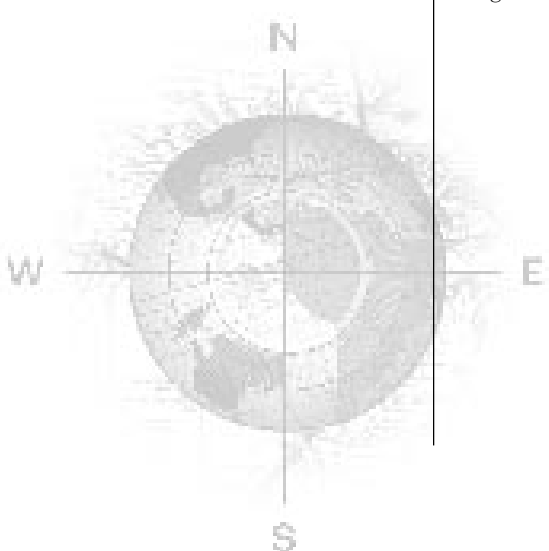
Chapter 9 Addressing and URLs

Contents:

- Addressing
- Newsgroup Names
- URLs

We've been zipping along so far, connecting you to the Internet and giving you some of the historical and social background to the Internet in the preceding eight chapters. I've tried to avoid including too many email addresses, machine names, or URLs (Uniform Resource Locators) because you might not know what they are or how they're formed, and until you do, they look like so much gobbledygook. This chapter explains the gobbledygook, and unless you're already comfortable with this information, I strongly recommend that you spend some time here reading carefully. You cannot escape this level of technical detail on today's Internet, and although the topic is not difficult, it is full of picky little details.

I first discuss how email addresses and machine names are formed, where they come from, and that sort of thing. After that I tell you about URLs. URLs provide a coherent method of uniquely identifying resources on the Internet, from Web pages to files available through FTP. But let's start at the beginning…



Addressing

All Internet computers think of each other in terms of numbers (not surprisingly), and all people think of them in terms of names (also not surprisingly). The Internet uses the domain name system to make sense of the millions of machines on the Internet. In terms of the numbers, each machine's address, commonly called the IP number, is composed of four numbers, each less than 256. People are generally bad about remembering more than the seven digits of a phone number, so the folks working in this field came up with a program called a domain name server. Domain name servers translate between the numeric addresses and domain names; real people can remember and use the domain names while real computers can continue to refer to each other by IP number. That way, everyone is happy. See Table 9.1 for some examples of IP numbers and domain names for some popular sites.

Table 9.1 Domain Names and Corresponding IP Numbers

Domain Name	IP Number
whitehouse.gov	198.137.241.30
www.microsoft.com	198.105.232.4
cyberdog.apple.com	130.43.6.5
www.ibm.com	204.146.46.133
webcrawler.com	192.216.46.55

> **BTW**
> Domain name servers, although generally part of the background technology that enables the Internet to work seamlessly, are tremendously important. Without them, very little on the Internet can get through.

Despite the fact that all IP numbers are sets of four numbers, the corresponding domain name can have between two and five sets of words. Domain names can have more than five sets of words, but it's not generally done because it wouldn't be much easier to remember than the corresponding IP number. One of the machines I use now, for instance, is called `www.tidbits.com` (three words), and the machine I once used at Cornell was called `cornella.cit.cornell.edu` (four words). The domain names may look daunting, but in fact they are quite easy to work with, especially when you consider the numeric equivalents, such as `205.199.66.6` for `www.tidbits.com`. Each item in those addresses, separated by the periods, is called a domain, and in the following sections, you are going to look at them backward, or in terms of the largest domain to the smallest.

BTW
A random aside for those of you who are students of classical rhetoric: The process of introducing topics A, B, and C, and then discussing them in the order C, B, and A is called chiasmus. This little known fact is entirely unrelated to the Internet, except that after the first edition of this book I took a lot of good-natured flak on the Internet about my classical education, so I figured I should at least pretend to know something about the topic.

Top-Level Domains

In any machine name, the final word after the last dot is the top-level domain, and a limited number of them exist. Originally, and this shows the Internet's early Americo-centric view, six top-level domains indicated to what type of organization the machine belonged. Thus, we ended up with the following list:

- `com` = commercial
- `edu` = educational
- `org` = organization, usually nonprofit
- `mil` = military
- `net` = network
- `gov` = government

That setup was fine at first, but as the number of machines on the Internet began to grow at an amazing rate, a more all-encompassing solution became necessary. The new top-level domains are based on countries, so each country has its own two-letter domain. Thus, the United Kingdom's top-level domain is `uk`, Sweden's is `se`, Japan's is `jp`, Australia's is `au`, and so on. Every now and then another country comes on the Internet, and I see a domain code that totally throws me, as Iceland's `is` code did the first time.

BTW
If you want to see the complete list of country codes, check out `<http://www.nw.com/zone/iso-country-codes>`.

The United States has this system, too; so, for example, a friend's site has the domain name `memory.ithaca.ny.us`. Unfortunately, because so many sites already existed with the old domain names, it made no sense to change them. Thus, we have both types of top-level domain names here in the U.S., and you just have to live with it. Most people in the

United States also prefer the shorter scheme, so my friend might prefer `memory.com` instead of the longer `memory.ithaca.ny.us`, since it's easier to remember and type. Unfortunately, as the number of short names dwindles, I suspect more machines will be forced to use the longer geographical names.

> **BTW**
> On occasion, you might see two other top-level domains, `bitnet` and `uucp`, such as in `listserv@bitnic.bitnet` or `ace@tidbits.uucp`. In both of these cases, the top-level domain indicates that the machine is on one of the older networks that have more or less disappeared.

Many machine names are as simple as it gets: a machine name and a top-level domain such as `webcrawler.com`. Others are more complex because of additional domains in the middle. Think of an address such as `cornella.cit.cornell.edu` as one of those nested Russian dolls (see Figure 9.1). The outermost doll is the top-level domain, the next few dolls are the increasingly specific domains.

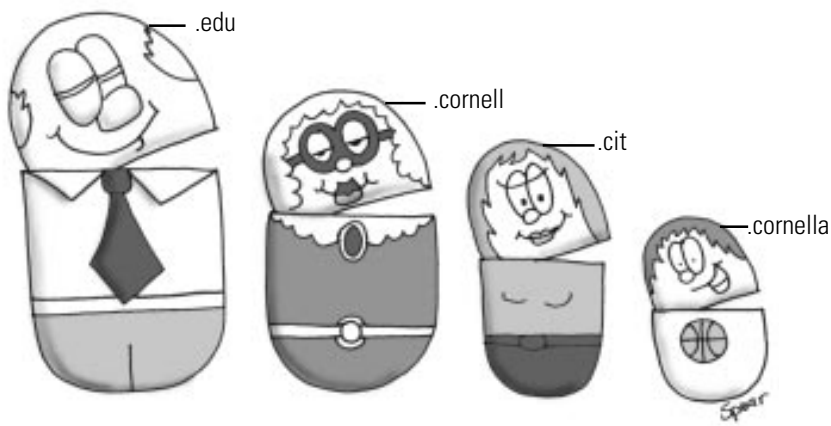


Figure 9.1 The Russian doll approach to Internet addresses.

Mid-Level Domains

What do mid-level domains represent? It's hard to say precisely, because the answer can vary. The machine I used at Cornell, known as `cornella.cit.cornell.edu`, represents one way the mid-level domains have been handled. The machine name is `cornella`, and the top-level domain is `edu`, because Cornell claims all those undergraduates are there to get an education. The `cit` after `cornella` is the department, Cornell Information Technologies, that runs the machine known as `cornella`. The next part, `cornell`, is obvious; it's the name of the overall organization to which CIT belongs. So, for this machine anyway, the

hierarchy of dolls is, in order, machine name, department name, organization name, and organization type.

This is similar to how my system is set up now, since I control the `tidbits.com` domain, and each of my Macs has a name within that domain. So, for instance, my desktop Mac is called `penguin.tidbits.com`, and my server is `www.tidbits.com`.

In the machine name for my friend's machine, `memory.ithaca.ny.us`, you see a geographic use of mid-level domains. In this case, `memory` is the machine name, `ithaca` is the city name, `ny` is the state name (New York), and `us` is the country code for the United States.

Mid-level domains spread the work around. Obviously, the Internet can't have machines with the same name; otherwise, chaos would erupt. But because the domain name system enables mid-level domains, the administrators for those mid-level domains have to make sure that everyone below them stays unique. In other words, I could actually name my machine `cornella.tidbits.com` because that name is completely different from `cornella.cit.cornell.edu` (though why I'd want to, I don't know). And, if they wanted, the folks at Cornell could put a new machine on the net and call it `tidbits.cit.cornell.edu` without any trouble, for the same reason. More important, the people at Cornell who run the computers don't need to bother anyone else if they want to make that change. They control the `cit` domain, and as long as all the machines within that domain have unique names, there aren't any problems. Of course, someone has to watch the top-level domains such as `com` because it's all too likely that two people may want `tidbits` within `com` as a mid-level domain (but I've already got it, so they can't have it).

The task of handing out domain names is handled by the Internet Network Information Center, or InterNIC. As a user, you shouldn't have to worry about naming problems, because everyone should have a system administrator who knows who to talk to, and you need the cooperation of your provider anyway—you cannot set up a domain on your own.

> **BTW**
> Setting up a new domain with the InterNIC now costs $100 to create and $50 per year in maintenance fees. In many ways, the fees, instituted in 1995, were designed to stop people from registering tons of frivolous domains. They also helped slow down the problem with someone registering a domain name that is another company's trademark—`mcdonalds.com`, for instance.

Machine Name

The next part in the full domain name is the machine itself; in the name `penguin.tidbits.com`, for example, `penguin` is the name of my machine. In my case, the machine is a Macintosh 660AV, but people use all sorts of machines, and because the system administrators often are a punchy, overworked lot, they tend to give machines silly

names. Large organizations with more centralized control lean more toward thoroughly boring names, such as the machine at Cornell, which was called `cornella` (as opposed to `cornellc`, `cornelld`, or `cornellf`).

> **BTW**
> For those who are wondering, the naming scheme I use is based on the names of species of penguins. Also, if you're wondering why you can send email to `ace@tidbits.com`, if my machine is really called `penguin.tidbits.com`, it's because of the magic of the domain name system. Since most people like shorter addresses, it's common to map the shorter domain name, `tidbits.com`, to point to the server that handles mail specifically, `king.tidbits.com` in my case. Then, I set Eudora to look for mail on `king.tidbits.com` and everything works swimmingly. These are the sort of machinations that Internet providers continually handle. You as the user can usually ignore them.

One of the reasons for boring names is that in the early days, machines on BITNET, one of the older alternative networks, had to have names with six to eight characters. Coming up with a meaningful unique name within that restriction became increasingly difficult. The other major alternative network, Usenet, doesn't put a limit on the length of names, but it requires that the first six characters be unique. Currently, the Internet enables the second-level domain to be up to 24 characters, and the third-level domain can be up to 72 characters. In no case can the full domain name go over 256 characters, however.

Special services often keep their names even when they move to different machines or even different organizations. Because of this situation, a machine that runs a service might have two names, one that goes with the machine normally and one that points solely at that service. My Web server, for instance, runs on a machine called `king.tidbits.com` but is generally referred to as `www.tidbits.com`. This practice of giving Internet computers multiple names is extremely common.

To summarize, you can have multiple domains in a machine name, and the further you go to the right, the more general they become, often ending in the country code. Conversely, the further you go to the left, the more specific the domains become, ending in the machine name because it's the most specific.

But what about email addresses, which have userids? They're even more specific than machine names, since a single machine can support many userids.

Userid

Now that you've looked at the machine name, you can move on to the userid or username, which identifies a specific user on a machine. Both terms are equally correct and commonly used (with two exceptions—the old commercial service GEnie and the FirstClass BBS software both treat userids and usernames separately). If you set up your own machine

or work with a sufficiently flexible provider, you can choose your own username. Choosing your own name is good because then your correspondents can more easily remember your address, assuming of course that you choose a userid that makes sense and is easy to type. If I made my address `ferdinand-the-bull@tidbits.com`, people who typed the address slightly wrong and had their mail bounce back to them would become irritated at me.

> **FYI**
> I want to emphasize that when you choose your userid, which you can do only once, you should choose something that's short, easy to remember, and easy to type. I also recommend that you try to work your name into it—userids such as `coolguy` sound juvenile. So think about possible userids before you sign up with a provider.

Unlike Macintosh filenames (and America Online userids), Internet userids cannot have spaces in them, so convention dictates that you replace any potential spaces with underscores, dashes, or dots, or omit them entirely. Other reasonable userids that I could conceivably use (but don't) include `adam_engst@tidbits.com` or `adam-engst@tidbits.com` or `adam.engst@tidbits.com` or `adamengst@tidbits.com`. However, all of these names are more difficult to type than `ace@tidbits.com`, and because I have good initials, I stick with them.

Unfortunately, there are a limited number of possible userids, especially at a large site or if you work with a provider serving many customers. So Cornell, for instance, with its thousands of students and staff, has opted for a system of using initials plus one or more digits.

Microsoft uses yet a different scheme: first name and last initial (using more than one character from the last name to keep the userids unique). As Microsoft grew, people with common names, such as David, became frustrated with having long userids, so the company started using other schemes such as first initial and last name. Why am I telling you this? Because knowing an organization's scheme can prove useful at times if you're trying to guess how to send mail to someone at that organization, and so that I can note a societal quirk. At places such as Microsoft where people use email so heavily, many folks refer to each other by email names exclusively. When my wife, Tonya, worked at Microsoft, she had a problem with her username, `tonyae` (first name and last initial) because it looked more like TonyAe than TonyaE to most people.

The real problem with assigned userids comes when the scheme is ludicrously random. Some universities work student ID numbers into the userid, for instance, and CompuServe userids are mere strings of digits such as `72511,306`. I believe the scheme has something to do with octal numbers or some such technoweenie hoo-hah. I don't speak octal or septal, or any such nonsense, and as a result, I can never remember CompuServe userids.

> **BTW**
> To be fair, CompuServe has reportedly starting enabling its users to choose userids in addition to the numbers.

Remember that email addresses point at an individual, but when you're using services such as FTP or the Web, you have to connect to the machine first. This might seem obvious, but it often trips people up until they get used to it. It seems, for example, that you could FTP to `anonymous@space.alien.com`. The Internet doesn't work that way, though, and you FTP to `space.alien.com`, and once there, log in as `anonymous`. More about FTP in later chapters.

Punctuation

Enough about userids. What about all this punctuation? Better known as Shift-2 (on U.S. keyboards anyway), the `@` symbol came into use, I imagine, because it's a single character that generally means "at" in traditional usage.

> **BTW**
> The `@` symbol is generally universal for Internet email, but not all types of networks have always used it. Some BITNET machines, for instance, once required you to spell out the word, as in the command **TELL LISTSERV AT BITNIC HELP**. Luckily, almost everything uses the `@` symbol with no spaces these days, which reduces four characters to one, and probably has saved untold person-hours worth of typing over the years.

As long as you're learning about special characters, look at the dot. It is, of course, the period (or full stop) character on the keyboard, and it serves to separate the domains in the address. For various reasons unknown to me, the periods have become universally known as dots in the context of addresses. When you tell someone your email address over the phone, you say (or rather, I'd say because it's my address), "My email address is ace at tidbits dot com." The other person must know that "at" equals the `@` symbol and that "dot" equals the period. If he's unsure, explain yourself.

Newsgroup Names

Just as email addresses make sense after you know all the parts, so do the Usenet newsgroup names. Although they resemble email addresses, the basic principles are a bit different.

BTW

Although, like email addresses, Usenet newsgroups use periods to separate different parts of the name, people tend not to use them in conversation. If, for example, you were to tell a friend about an interesting discussion on `comp.sys.mac.misc`, you'd say, "Check it out on comp sys mac misc." Part of the problem might be the linguistic clumsiness of saying all those "dots," but I suspect more of the reason is that precision isn't nearly as necessary. Unlike email addresses, you seldom type out newsgroup names. It also might have to do with the fact that newsgroup names are all unique and easily parsed.

The premise of the Usenet newsgroup naming scheme is that of a hierarchy. The naming scheme makes figuring out how to name new groups easy. More importantly, it maps over to a hierarchical directory (or folder) structure, which is how the files are actually stored on the news server. On the Unix machines that hold the newsgroups, therefore, you might find a directory called `news`. Inside that directory are other directories corresponding to the top-level parts of the hierarchy—`alt`, `comp`, `misc`, `news`, `rec`, `sci`, and so on. These directories are abbreviations for alternate, computers, miscellaneous, news, recreation, and science, respectively.

BTW

I could attempt to list all the top-level hierarchies, but it's a pointless task. There are many local hierarchies that I have no way of finding (just as many other machines probably don't carry the `halcyon` or `seattle` hierarchies that I can see), and I couldn't begin to guess which hierarchies your machine might carry.

Some Usenet newsreaders carry this hierarchical distinction over to the Mac, mimicking a Finder-like folder structure. As an example of how this might work, let's dissect the name of `comp.sys.mac.misc`, a popular newsgroup. If we first look into the `comp` folder, we see more folders corresponding to `lang`, `sys`, and so on. Under `sys` we find many folders, one for each computer system. There are `atari`, `amiga`, `ibm`, `mac`, and gobs of systems that you may have never even heard of. (I certainly haven't heard of all of them.) After we go into the `mac` folder, we find the lowest level of the hierarchy—files, if you will, that correspond to individual topics on the Mac. These include `advocacy`, `apps`, `databases`, `games`, `hardware`, `misc`, `portables`, `system`, and others. One way of visualizing this hierarchical structure is by thinking of a tree, with each of the newsgroups as a leaf and the hierarchical folders as branches that increase in size as they become more general (see Figure 9.2).

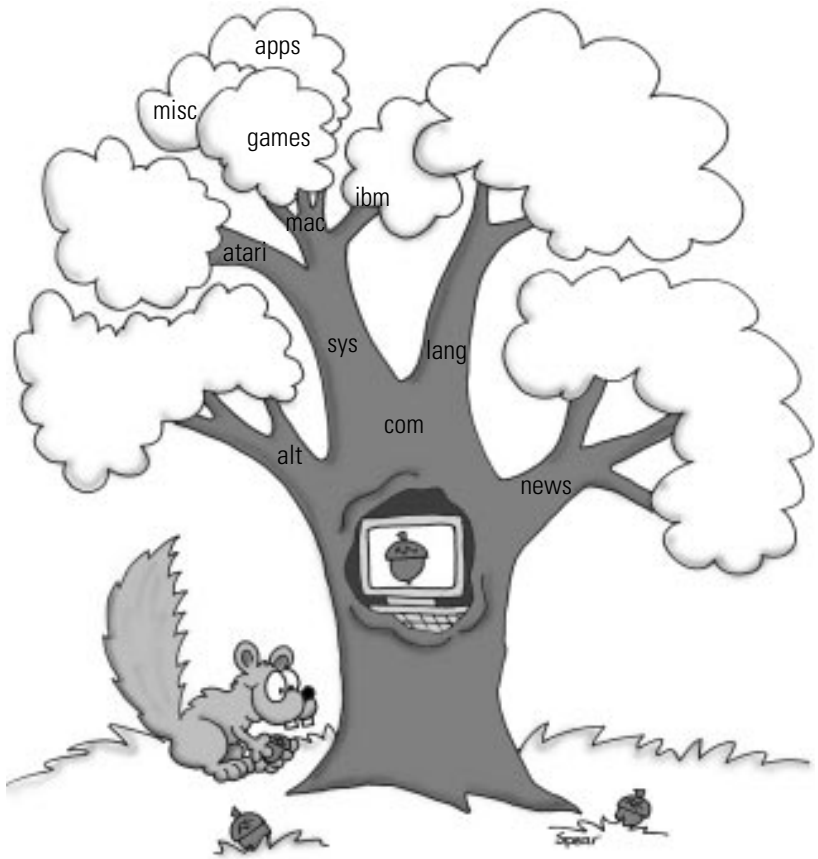


Figure 9.2 An abbreviated Usenet hierarchy tree.

This system might seem a tad clumsy, but remember, it exists to categorize and classify newsgroups. After you've become familiar with some of the main hierarchies, it becomes much easier to find any given newsgroup by browsing through the lists.

> **BTW**
> Historically, this structure was used so that as little C code programming as possible had to be done to store and retrieve Usenet news. A design goal for B-news and C-news, the earliest Unix news servers, was to make as much of it as possible run as Unix shell scripts, precluding any fancy binary database back ends. Why was that? Laziness is the mother of some invention.

Enough on machine names, email addresses, and newsgroup names, then. If you keep the previous discussions in mind when you use the Internet, you shouldn't find addresses

confusing. If you are confused, perhaps that address is seriously malformed. I've seen that happen all too often because people aren't necessarily careful when they type addresses. Copy-and-paste works more reliably.

URLs

Before we look in detail at any of the Internet services such as FTP or the Web, I want to explain URLs, or Uniform Resource Locators. URLs constitute the most common and efficient method of telling people about resources available through FTP, the World Wide Web, and other Internet services. URLs have become so popular that the Library of Congress has even added a subfield for them when it catalogs electronic resources.

FYI
URL stands for Uniform Resource Locator, although some people incorrectly switch "uniform" for "universal." Also, URL is properly pronounced "You Are Ell," and not "Earl." My confirmation on this bit of linguistic pickiness is someone from CERN who helped develop the World Wide Web.

What Are URLs?

A URL uniquely specifies the location of something on the Internet, using three main bits of information that you need in order to access any given object. First is the URL scheme, or the type of server making the object available, be it an FTP or Web server. Second comes the address of the resource. Third and finally, there's the full pathname or identifier for the object, if necessary.

FYI
Don't worry if I talk about Internet services that you haven't read about in detail yet. That's what Part III, "Using the Internet," is for, but I first want to explain the way that people (and this book) provide pointers to specific resources available through the Internet.

This description is slightly oversimplified, but the point I want to make is that URLs provide a consistent way to reference objects on the Internet. I say "objects" because you can specify URLs not only for files and Web pages, but also for stranger things, such as email addresses and Usenet news postings. Table 9.2 shows the main URL schemes that you're likely to see.

Table 9.2 Common URL Schemes

Scheme	Internet Protocol	Sample Client
`ftp`	File Transfer Protocol	Anarchie
`gopher`	Gopher protocol	TurboGopher
`http`	HyperText Transfer Protocol	Netscape Navigator
`mailto`	Simple Mail Transport Protocol	Eudora
`news`	Net News Transport Protocol	NewsWatcher

FYI

When URLs appear in running text, as they do in this book, they are often (and should be) contained within angle brackets, also known as the greater-than and less-than characters. The angle brackets are not part of the URL, but separate it from any surrounding text.

Also, URLs sometimes must break between two lines in publications. If you see a two-line URL that doesn't look quite right, stick the two lines back together when you type or paste it into a Web browser, perhaps without a hyphen that might have been introduced in the production process.

URL Construction

If you see a URL that starts with `ftp`, you know that the file specified in the rest of the URL is available through FTP, which means that you could use an FTP client such as Anarchie to retrieve it. If the URL starts with `gopher`, use TurboGopher or another Gopher client. If it starts with `http`, use Internet Explorer, NCSA Mosaic, Netscape, or some other Web browser.

FYI

You can use a Web browser to access all of the URL schemes in Table 9.2, although Web browsers are not necessarily ideal for all tasks. Web browsers work well for accessing files on Gopher servers, but FTP through a Web browser is clumsy. Similarly, although it's handy to use `mailto` URLs to send mail, I dislike doing so because then I don't have a record of my outgoing mail, as I do when I send mail from Eudora. Finally, although Web browsers have become better at news, I still prefer using a real newsreader such as NewsWatcher for `news` URLs. You *can* put a screw in the wall with a hammer, but it's not the best tool for the job.

After the URL scheme comes a colon (`:`), which separates the scheme from what comes next. If two slashes (`//`) come next, they indicate that a machine name in the format of a

domain name or IP number will follow, such as with <http://www.apple.com/> or <ftp://ftp.info.apple.com/>. However, if the URL points at an address in some other format, such as the email address <mailto:president@whitehouse.gov>, the slashes aren't appropriate and don't appear.

> **BTW**
> In some rare circumstances, you might need to use a username and password in an FTP URL, and that would look something such as this: <ftp://username:password@domain.name/>.

The last part of the URL is the specific information that you're looking for, be it an email address or more commonly the path to the directory of the file that you desire. Directory names are separated from the machine name by a slash (/). You might not have to specify the path with some URLs if you're connecting only to the top level of the site, such as <http://www.tidbits.com/>.

So, for instance, let's dissect a URL that points at the Product Support page on Apple's Web server: <http://www.apple.com/documents/productsupport.html>.

First off, the http part tells us that we should use a Web browser to access this URL. Then, www.apple.com is the name of the host machine that's running the Web server. The next part, /documents/productsupport.html, is the full path to the file the Web browser shows us, so /documents is a directory, and productsupport.html is the actual file inside the /documents directory.

If an FTP or Gopher URL ends with a slash, that always means it points at a directory and not a file. If the URL doesn't end with a slash, it may or may not point at a directory. If it's not obvious from the last part of the path, there's no good way of telling until you to go there. Thus, this URL, <ftp://ftp.tidbits.com/pub/tidbits/>, points at a directory and will return the directory listing of the files there.

However, this URL, <ftp://ftp.tidbits.com/pub/tidbits/issues/1990/TidBITS#001_16-Apr-90.etx>, points directly at a file.

Because most Web servers support a default file that stands in place of a specific file in the URL, it's usually less important for Web users to realize whether or not they're specifying a file or a directory. In other words, <http://www.tidbits.com/default.html> points at a file, but the Web server running on that machine will display the same file (since it's the default) if you simply used <http://www.tidbits.com/>.

Using URLs

All of these details aside, how do you use URLs? Your mileage may vary, but I use them in two basic ways. First, if I see a URL in an email message, a Usenet posting, or perhaps even

on TV or a billboard, I either copy the URL and paste it into the appropriate program (Anarchie or Fetch for FTP, Netscape Navigator or Internet Explorer for the Web), or I simply type the URL into the appropriate program (it's still difficult to copy and paste from TV).

Actually, thanks to some clever programming and utility software that's widely available, I have a number of faster methods for retrieving information that URLs point to. In some programs I can Command-click the URL to launch the appropriate program and go to the URL, and in others I select the URL and press a key combination that I've defined. Newer Internet programs are beginning to emulate Web browsers, and whenever a URL appears in text, the program makes it blue and underlines it (the standard display for links in Web browsers) and enables you to double-click the URL.

> **BTW**
> I talk more about the utility software I use to perform these useful feats in later chapters, but the main program is called Internet Config, and it works in conjunction with an oddly named extension called ICeTEe. I'm also fond of a bookmark manager called CyberFinder from Aladdin Systems that enables the same functionality.

Second, whenever I want to point people to a specific Internet resource or file available on the Web or through FTP, I give them a URL. URLs are unambiguous and, although a bit ugly in running text, easier to use than attempting to spell out what they mean. Consider this URL: `<ftp://ftp.tidbits.com/pub/tidbits/issues/1995/TidBITS#261_30-Jan-95.etx>`.

To explain the same information contained in that URL, I would say something such as, "Using an FTP client program, connect to the anonymous FTP site `ftp.tidbits.com`. Change directories into the `/pub/tidbits/issues/1995/` directory, and after you're there, retrieve the file `TidBITS#261/30-Jan-95.etx`." A single URL enables me to avoid such convoluted (and boring) language, and frankly, URLs are in such common use on the Internet, you might as well get used to seeing them right now.

So, from now on, whenever I mention a file available through FTP or a Web site, I'll use a URL. If you try to retrieve a file or connect to a Web site and are unsuccessful, chances are either you've typed the URL slightly wrong, or the file or server no longer exists. It's *extremely* likely that many of the files I give URLs for will have been updated by the time you read this, so the filename at the end of the URL may have changed.

If a URL doesn't work, and this is a general piece of good advice, try removing the filename from the last part of the URL and look in the directory that the original file lived in for the updated file. If all else fails, you can remove everything after the machine name and work your way down to the file you are after.

> **BTW**
> If, after all this, you want to learn more about the technical details behind the URL specifications, check out <http://www.w3.org/hypertext/WWW/Addressing/URL/Overview.html>.

Weird Characters

There is one rather messy part to URLs that you don't usually have to deal with but that comes up on occasion, most commonly in relation to Gopher URLs. There are certain characters, including spaces, that cannot appear in a URL. If one of those characters would appear, it's replaced with what's called an escape code, consisting of a percent symbol and the hexadecimal number corresponding to that character.

The reason this comes up most often in relation to Gopher URLs is that Gopher enables long names for files and directories, and it enables pretty much any character within them, including spaces, slashes, question marks, and so on. So a Gopher URL might look like <gopher://gopher.tc.umn.edu/11/Information%20About%20Gopher>. The %20 escape codes in the URL stand for spaces on the real Gopher menu title.

For the most part, you don't have to worry about the way the spaces and other characters are translated (see Table 9.3 for a list of some common characters that show up in a URL as escape codes). I just wanted to show you that this sort of thing happens so you won't be confused the first time you see a URL with what seem like garbage characters in it.

Table 9.3 Some Reserved Characters in URLs

Character	Escape Code Replacement
=	%3D
;	%3B
/	%2F
#	%23
?	%3F
:	%3A
space	%20
~	%7E

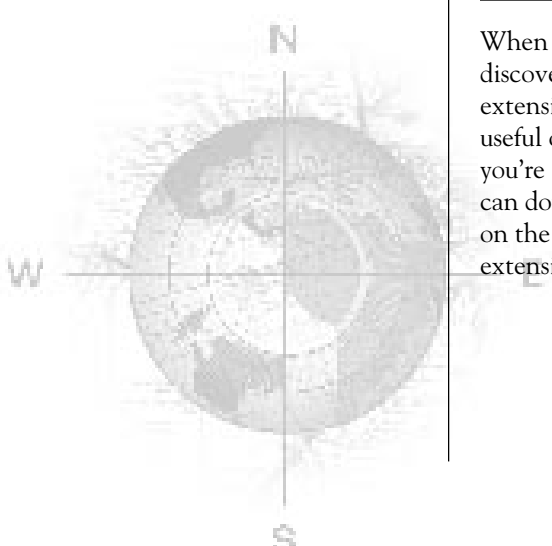
I realize this chapter contains a lot of dense information to try to cram into your head. As much as I'd like to pretend that it's not all that necessary, you simply cannot get around on the Internet unless you understand how machine names and email addresses are put together. And, a working knowledge of URLs, no matter how ugly they may seem to you now, is absolutely essential if you're to understand where you're going and what you're seeing. If you've found this chapter overwhelming, try just using the Internet for a while, but plan to come back and read this chapter again later after you've seen more URLs and email addresses.

Chapter 10 File Formats

Contents:

On the Macintosh, we're all used to the simple concept of double-clicking a document icon to open it in the proper application. The Macintosh keeps track of which documents go with which applications by special type and creator codes stored with each file. Thus, we tend not to think about file formats as much as people who use operating systems that lack the Mac's elegance. Nonetheless, every Mac file does have a format, and if you've ever seen the "Application not found" message, you may have wished for an easier way to determine a file's format.

> **BTW**
> Various utility programs such as PrairieSoft's commercial DiskTop and Apple's free ResEdit can show you the type and creator codes that the Mac's Finder uses to link documents and applications. You can find ResEdit at <http://www.info.apple.com/Apple.Support.Area/Developer_Services/Tool_Chest/Developer_Utilities/ResEdit_2.1.3/>.



When you start exploring on the Internet, you quickly discover that most files on the Internet have filename extensions, as is standard in DOS. Extensions are extremely useful on the Internet because they identify what sort of file you're looking at. On the Mac, you see a different icon or you can double-click a file and see what program launches, but on the Internet, all you get is the filename and extension.

FYI
Files that you download from the Internet may not have their associated type and creator information that links them to an application, and if so, double-clicking them won't work. There are two workarounds. You can either drop the file on the icon of a program you think can open it, or you can launch that program manually and from the File menu choose Open to open the unknown file. Read on for information about how to determine what sort of file you may have downloaded.

Unlike standard DOS usage, in which every program seems to have at least one or two extensions for its documents (.wk1, .wks, .doc, .wp, .dbf, .ndx, .idx, and other thoroughly memorable three-letter combinations), a limited set of extensions is in common use for files that Mac users care about. These extensions fall into three basic categories: those used to indicate text encoding, those that identify various compression formats, and those used to mark certain types of text, graphics, sound, and video files.

FYI
Unless I state otherwise, all the programs I mention in this chapter are located either at <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/> or down one folder in <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/>.

Text Encoding

You can divide all computer files into two basic types: text files and binary files. Text files by definition contain just the characters you could read in a book, for instance. You can open a text file in any word processor and read the information contained within the file. Binary files, in contrast, contain information that people can't read. That information could range from executable instructions that make up a program such as ClarisWorks to formatting information that tells ClarisWorks that text in a certain file is formatted using the Helvetica font at a size of 12 point. Just as you cannot read the binary instructions that enable ClarisWorks to work, you cannot read the binary formatting information in a ClarisWorks document.

I raise the distinction between text files and binary files for one important reason: For the most part, you can read text files on any computer, whereas binary files are specific to a certain type of computer or a specific program. Remember that you can use any number of different types of computers on the Internet, and you begin to see why text files are so important. If a file available on the Internet is available in a text format, you can read that file with any type of computer, not just a Macintosh.

Luckily, most programs enable you to save files in a variety of formats, including text. If you don't explicitly save a file in some kind of text format, then it's probably a binary data file, although there are exceptions.

BTW

The main exceptions are Apple's TeachText and SimpleText and Nisus Software's Nisus Writer word processor. TeachText and SimpleText can save only text files. Nisus Writer saves its files in such a way that all other programs see them as text files (the formatting lives in the file's resource fork, if you were wondering).

Generally, 256 different characters can appear in a text file—the collection of these characters is called the ASCII character set. (ASCII stands for American Standard Code for Information Interchange.) Computers of different types usually agree on only the first 128 characters in the ASCII character set. After those first 128 characters, which include the letters of the alphabet and numbers and punctuation, a Mac's accented letter might be a DOS machine's smiley face.

There's another, more important issue that comes into play when talking about text files on the Internet. Macintosh files are unusual in the computer world in that they can be split into two parts, called a resource fork and a data fork (it's not uncommon for documents to have only a data fork). In general, a resource fork contains code or formatting instructions, whereas the data fork contains the file's information. Since most other computer systems don't support files with two forks, uploading a Macintosh file with two forks to a PC clone running DOS, for instance, will result in the corruption of the file because there's no way for the PC clone to store the resource fork. Similarly, for a long time (and this is often still true) many email programs could transfer only text; binary files were corrupted in transmission.

So, the upshot of this issue is that if you want to transfer files between computers on the Internet, it's safest to encode binary files in such a way that all of the binary codes are converted to text characters. Using a program designed to encode binary files, you could take a binary file such as the SimpleText application, for instance, and convert it into a long string of numbers, letters, and punctuation marks. Another program can take that string of text and turn it back into a functioning copy of SimpleText (assuming it was decoded and tested on a Macintosh). I'll leave it to the philosophers to decide whether it is the same program.

After you have converted a binary file into a text file, you can upload it to an FTP site on the Internet or send it via email without worrying about what might happen to the file when someone tries to download it or receive in email. The main drawback to this sort of encoding is that the recipient must always decode the file before working with it, although many programs on the Mac decode for you automatically. In addition, the encoded file is almost always larger than the original, sometimes by up to as much as 35 percent.

Now that you understand why we go through such bother, people on the Internet use two main encoding formats (see Table 10.1): BinHex and uucode.

BTW
There's a third encoded text format called btoa that I've never seen used in the Macintosh world and basically never anywhere else either. If you ever run into it, try decoding the file with Aladdin's StuffIt Lite or StuffIt Deluxe, discussed shortly.

Table 10.1 ASCII Encoding Formats

Format	Advantages	Disadvantages
BinHex	Macintosh standard	Least efficient
uucode	Used by LAN email gateways	Doesn't encode resource fork

BinHex

BinHex is by far the most common format you see in the Macintosh world because it originated on the Mac and works best with Macintosh files. In fact, it's basically used only on Macs. You can identify most BinHex files by the .hqx extension they carry. Keep in mind that BinHex is another one of these computer words that works as a verb, too, so people say that they "binhexed" a file before sending it to you.

There are two flavors of BinHex, but they aren't interchangeable. The BinHex 4.0 format was originally created by Yves Lempereur and has been around seemingly forever. BinHex 5.0, which also came from Yves, is slightly more recent but unfortunately causes massive confusion because it doesn't turn binary files into ASCII. Ignore BinHex 5.0 entirely, because everyone else does.

FYI
BinHex 4.0 is a file format, and numerous programs can encode and decode BinHex 4.0 files. Yves also wrote a *program* called BinHex 4.0 years ago, but it has some known bugs and should be avoided (there's nothing wrong with the BinHex 4.0 *format*). I recommend that you use Aladdin's free StuffIt Expander for debinhexing files, especially because it can also expand various compression formats.

Using BinHex

Every BinHex file starts with the phrase "(This file must be converted with BinHex 4.0)" even if another program actually created the file. Then comes a new line with a colon at the start, followed by many lines of text gibberish. Only the last line can be a different length than the others (each line has a hard return after it), and the last character must be a colon as well (see Figure 10.1). Occasionally, something happens to a BinHex file in

transit and one line is shortened by a character or two or even deleted. When that happens, the file is toast.

Figure 10.1 Example of BinHex.

BinHex suffers from only one major problem other than a confusing name. It's fairly inefficient, so binhexed files are larger than might be ideal. Its other real problem is that even though tools exist for debinhexing files on other platforms, they aren't common. Use uucode if you plan to send binary files that have only a data fork (such as Microsoft Word files, for instance) to a user on another platform.

Encoding and Decoding BinHex

A wide variety of programs have appeared over the years for encoding and decoding BinHex files, including most of the compression programs that I talk about shortly. However, the program that I've found to be the easiest for creating BinHex files is the shareware DropStuff from Aladdin Systems. Its only conceivable drawback is that it's shareware, so it pops up a dialog box each time you use it until you pay the shareware fee. Binhexing a file is as simple as holding down the Option key and dropping a file on DropStuff. A dialog box (see Figure 10.2) appears that enables you to set various options (DropStuff, as you might expect, also compresses files), and after you click OK, DropStuff binhexes your file.

> **BTW**
> If you double-click DropStuff itself, you can choose Preferences from the File menu to set as defaults the choices normally offered by the DropStuff dialog box. Then, if your defaults are set correctly, you can just drop a file on DropStuff to have it automatically compressed and binhexed. Holding down the Option key while dropping something on DropStuff enables you to change the defaults.

The only totally free program I could find offhand for creating BinHex files is something called AutoBin. I haven't used it much, but it worked in my limited testing.

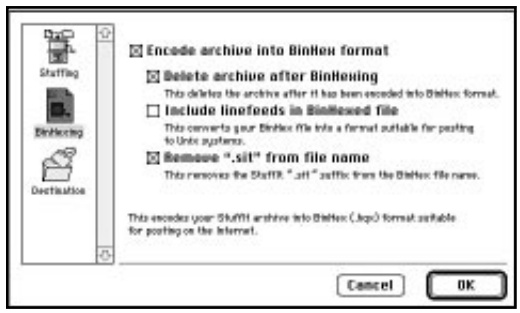


Figure 10.2 DropStuff BinHex options.

As much as DropStuff is my choice (and the choice of many others) for creating BinHex files, almost everyone agrees on the utility to use for decoding BinHex files: StuffIt Expander. This free utility, also from Aladdin Systems, is the standard for decoding BinHex files. If you pay your shareware fee for DropStuff (whose full name is DropStuff with Expander Enhancer), StuffIt Expander can also decode almost any other compressed or encoded file format you might see on the Internet. StuffIt Expander comes on the CD-ROM with this book, so you don't need to worry about downloading a copy. You can find some more information about it at `<http://www.aladdinsys.com/obstufex.htm>`.

Using StuffIt Expander is as simple as possible—just drop a BinHex file on the StuffIt Expander icon. Much of the time, you might not even need to do that, since many Internet programs like Anarchie and Netscape Navigator can automatically ask StuffIt Expander to decode a BinHex file that you've downloaded.

If you double-click StuffIt Expander and choose Preferences from the File menu, you can set some options, such as what you'd like it to do with the original files. If the decoded file is all that interests you, set StuffIt Expander to delete the intermediate files, as in Figure 10.3.

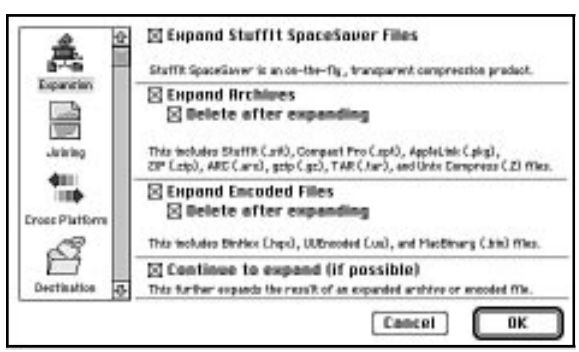


Figure 10.3 StuffIt Expander BinHex options.

Programs that can encode and decode BinHex files exist for other computer systems as well. Under Windows 3.1 or Windows 95, you can use a version of StuffIt Expander for Windows available at <http://www.aladdinsys.com/> to debinhex files, and if you wish to encode or decode BinHex files on a PC clone running DOS or Windows, you can find a DOS version of BinHex at <ftp://boombox.micro.umn.edu/pub/binhex/MSDOS/binhex.exe>. Under Unix, you must use a program called mcvert to debinhex files; ask your system administrator if it's installed if you're using a Unix machine. If you know your way around Unix, you can download mcvert at <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/mcvert-216.shar>.

uucode

In the Unix world, uucode (also called uuencode) is the most common format. You can identify a uuencoded file by its .uu extension. You might see slightly different extensions on occasion; I've also seen .uud and .uue. They're all the same.

You're unlikely to run across uuencoded Macintosh files frequently, mostly because uucode format ignores the resource fork of Macintosh files, making it useful for files that have only a data fork. Most programs, for example, store their code in the resource fork, so uuencoding and then uudecoding a program renders the result totally unusable.

FYI
Many LAN-based email programs (such as Microsoft Mail) that have Internet gateways encode binary files sent across the Internet in uucode format, since it's the most common.

Using uucode

Most uuencoded files start with "begin 644" followed by the filename. From that point on, they look a lot like BinHex files: rows upon rows of text gibberish with each line being the same length. (Actually, these lines may not all look the same length when you're viewing them on the Mac because Unix machines use the ASCII 10 linefeed character instead of a carriage return, which the Mac uses to end a line.)

BTW
Because the number 644 is related to Unix file permissions (don't ask), other numbers are possible at the top of uuencoded files, although I see them less frequently.

All uuencoded files end with a linefeed, a space, the word "end," and another linefeed (see Figure 10.4).

Figure 10.4 Example of uucode.

Encoding and Decoding uucode

Quite a few utilities exist on the Macintosh for creating uucode files, although I have to admit that I don't have a specific one to recommend because I can't remember the last time I had to uuencode a file. The only real reason to uuencode a Mac file (remember the problem with losing resource forks) is if you're sending a file created in something like Microsoft Word, whose files are readable on both the Mac and under Windows, to a PC user. You might also uuencode some graphics files, since most don't have resource forks. For sending files between Macs, stick with BinHex. Some of the possibilities include UULite, UUTool, and a number of others, all of which are available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/>.

Decoding is a simpler question. If you've paid your shareware fee for DropStuff with Expander Enhancer, properly registering that fact within DropStuff enables StuffIt Expander to uudecode files. In my opinion, that's the best option. If you want a totally free solution to the problem, try Aaron Giles's free uuUndo at <http://guru.med.cornell.edu/~giles/projects.html#uuundo> or Stuart Cheshire's StUU <http://rescomp.stanford.edu/~cheshire/#Software>, either of which should work fine.

> **BTW**
> Eudora Pro, but not Eudora Light, can automatically encode and decode attachments that use uucode.

MacBinary

It's not entirely unusual to see files posted on FTP sites, for instance, that are not binhexed. You might be wondering why these files aren't corrupted, given that it's unusual for other computer systems to be able to handle the two forks of a Macintosh file.

The answer is that there's another file format that protects a Mac file's resource fork when the file is stored on a machine that doesn't understand files with two forks. That format is called MacBinary, and it solves the problem by bundling both forks into the data fork. MacBinary doesn't encode the file in text format in any way—a MacBinary file is a true

binary file, but as long as the resource fork has been safely stashed in the data fork temporarily, the file isn't in danger of being corrupted.

Files in MacBinary format usually have an extension indicating that they're compressed in one of the formats I'll mention shortly, and often after that extension there will also be a .bin extension to indicate that the file is a MacBinary file.

Encoding and Decoding MacBinary

Many people don't realize that MacBinary is even a file format, because it has better support among applications that upload and download files from the Internet. So, when you upload a file using Anarchie or Fetch, for instance, it automatically uploads in MacBinary format if the file has a resource fork. The end result is that you need never worry about uploading something in MacBinary format; if it's necessary, the program you use to upload should do the encoding for you (and if it doesn't, use Anarchie or Fetch). If, for some reason, you should need to create a MacBinary file manually, there's a program called MacBinary II+ from Peter Lewis that will do it.

Decoding is slightly trickier. Both Anarchie and Fetch can decode MacBinary automatically as well, so if you download a MacBinary file from an FTP site with one of those programs, you'll never even realize it was in MacBinary, and you won't have to do anything additional to use the file. However, Web browsers fairly universally cannot decode MacBinary on the fly, which makes using them to download files more of a pain than it should be. There are two main utilities for decoding MacBinary files downloaded with a Web browser: StuffIt Expander (mentioned earlier) and MacBinary II+.

Compression Formats

Along with the various text encoding formats, on the Internet you frequently see a number of file extensions that indicate the files have been compressed. Almost every file available on the Internet is compressed because disk space is always at a premium.

Unfortunately, because the majority of Macintosh files stored on the Internet are binhexed after being compressed, you don't see the full benefit of the compression. Nevertheless, if your original file is 200K and a compression program reduces it to 75K, you're still on the winning side even if binhexing the file increases it back up to 100K.

Most people on the Internet compress Macintosh files in one of three formats: StuffIt, Compact Pro, or as a self-extracting archive. In addition, there are at least three or four other programs that can compress files in their own proprietary formats, but few people ever use them for files posted on the Internet, other than for self-extracting archives.

StuffIt

The most popular Macintosh compression format on the net today is StuffIt, which is used by a family of programs—some free (StuffIt Expander), some shareware (DropStuff with Expander Enhancer, StuffIt Lite), and some commercial (StuffIt Deluxe)—from Aladdin Systems. StuffIt archives, as they're called, contain one or more uncompressed files and always have the .sit extension. The only confusion here is that the StuffIt file format has gone through three main incarnations: 1.5.1, 2.0, and 3.0. The latest versions of all the StuffIt tools can read all of those formats, but not surprisingly, StuffIt 2.0-class tools can read only archives created in 2.0 or 1.5.1, and StuffIt 1.5.1 can read only archives in its specific format.

> **BTW**
> Although the StuffIt file format is version 3.0, the latest version of the program is 4.0—the file format didn't change when Aladdin revised the programs.

This limitation leads to the common problem on the net whereby people download an archive in StuffIt 3.0 format assuming they can expand it with an old StuffIt 2.0-class program because of the .sit extension. Unfortunately, because all three file formats use the .sit extension, the extension provides no useful distinction, and StuffIt 2.0 spits up all over a StuffIt 3.0 archive. Luckily, relatively few people still have older versions of StuffIt programs, so as long as you use a recent version of StuffIt, you should be fine.

Encoding StuffIt Archives

You can create StuffIt archives with any of a number of programs from Aladdin, including StuffIt Deluxe, StuffIt Lite, and DropStuff with Expander Enhancer. Even though I own StuffIt Deluxe, I almost always use DropStuff to create StuffIt archives. It's easy, fast, and has all the necessary options for the things I want to do (see Figure 10.5).

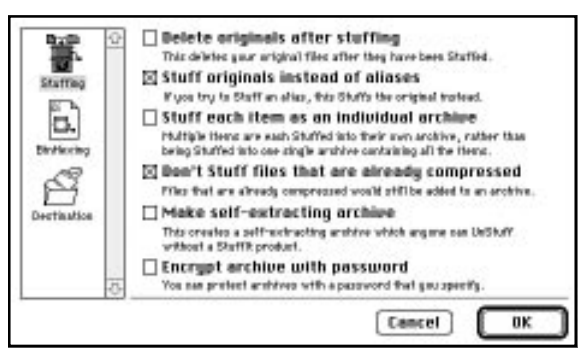


Figure 10.5 DropStuff StuffIt options.

The main time you might wish to use StuffIt Deluxe or StuffIt Lite is if you need to work with just some of the files in an archive. You might have a StuffIt archive that contains 200 files and realize that you need to expand or delete a single one. Expanding the entire archive to extract a single file is a waste of time and disk space, and recreating the archive to delete a single file is equally wasteful. In either case, StuffIt Deluxe or StuffIt Lite enable you expand or delete a single file, or, for that matter, continually add individual files to an existing archive. See Figure 10.6 for an example of a StuffIt Deluxe archive window.

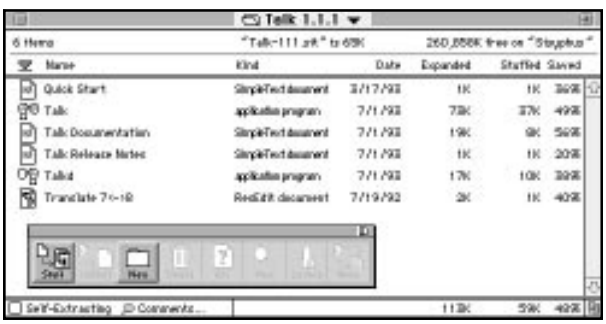


Figure 10.6 StuffIt Lite archive window.

Decoding StuffIt Archives

As I noted previously, StuffIt Deluxe and StuffIt Lite work fine for decompressing StuffIt archives, and you might want to use them for expanding a single file from a large archive. However, the program that absolutely everyone uses for this purpose, just as everyone uses it to decode BinHex files, is StuffIt Expander. StuffIt Expander is probably the most commonly used program on the Internet among Mac users.

StuffIt Expander can expand any StuffIt format; it can expand Compact Pro archives (discussed next), and it can debinhex files. It slices, it dices, and… let me just say that no one should be without StuffIt Expander. That's why I put it on the Internet Starter Kit CD-ROM. Thanks are due to Aladdin Systems for making such a useful tool available for free.

As I mentioned previously, there's actually a caveat to StuffIt Expander being free. When you pay your shareware fee, DropStuff with Expander Enhancer gives StuffIt Expander the capability to expand most of the file formats that the full StuffIt Deluxe can expand through its translators (see Table 10.2). I strongly recommend you register DropStuff with Expander Enhancer if you intend to work with many different file types from the Internet. You can also "enhance" StuffIt Expander by buying one of Aladdin's commercial programs, such as StuffIt Deluxe or SITcomm.

Table 10.2 Formats Supported by StuffIt Deluxe and StuffIt Expander

Format	Suffix	StuffIt Deluxe	StuffIt Expander
AppleLink Package	.pkg	Decode	Decode
AppleSingle	None	Encode/Decode	No
ARC	.arc	Decode	Decode
BinHex	.hqx	Encode/Decode	Decode
Compact Pro	.cpt	Decode	Decode
Gzip	.gz/.z	Decode	Decode
MacBinary	None	Encode/Decode	Decode
PackIt	.pit	Decode	No
StuffIt	.sit	Encode/Decode	Decode
StuffIt SpaceSaver	None	No	Decode
Tar	.tar	Encode/Decode	Decode
Text	.txt	Encode/Decode	No
Unix Compress	.Z	Encode/Decode	Decode
uucode	.uu/.uue/.uud	Encode/Decode	Decode
ZIP	.zip	Decode	Decode

Compact Pro

Although not as commonly used as the StuffIt programs, Compact Pro, a shareware compression utility from Bill Goodman, is also popular in the Macintosh world. Functionally, StuffIt Lite and Compact Pro are comparable—both create a compressed archive of one or more files.

Compact Pro files are always identified by their .cpt extension. You might see an earlier version of Compact Pro floating around on the net as well. It's called Compactor and uses the same file format as Compact Pro, so you don't have to worry about which version created a given file. Compactor is just an older version of Compact Pro, but Bill Goodman had to change the name for legal reasons. You can find Compact Pro in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/>`.

Encoding Compact Pro Archives

The only real option for creating Compact Pro archives is the Compact Pro application itself, although I've seen a few converters that can take a StuffIt archive and convert it to a

Compact Pro archive. Essentially, you create a new archive in Compact Pro, then from the Archive menu, you use the Add command to add files to your archive (see Figure 10.7). It works fine, and it's not hard, but it's nowhere near as simple as using DropStuff, which is one of the reasons the Compact Pro format has dropped in popularity over the years.

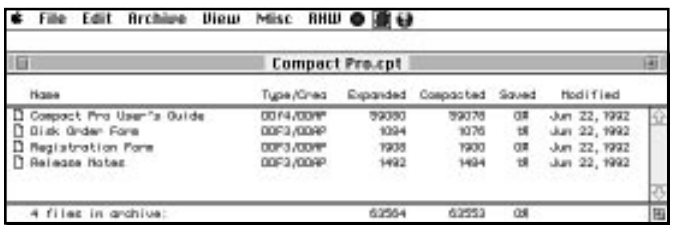


Figure 10.7 Compact Pro archive window.

Decoding Compact Pro Archives

You can, of course, use Compact Pro to expand files from Compact Pro archives, but that's generally too much work because StuffIt Expander can usually decode Compact Pro archives just as well as Compact Pro can. It's not inconceivable that you might someday run across a Compact Pro archive that was damaged in such a way that Compact Pro could expand it, but StuffIt Expander couldn't, but otherwise stick with StuffIt Expander.

Self-Extracting Archives

What if you want to send a compressed file or files to a friend who you know has no compression utilities at all? Then you use a self-extracting archive, which is hard to describe further than the name already does. Most compression programs can create self-extracting archives by compressing the file and then attaching a stub, or small expansion program, to the compressed file. The self-extracting archive looks like an application to the user, and if you double-click a self-extracting archive, the stub launches and expands the file. Internet sites prefer not to have many files, particularly small ones, compressed in self-extracting archives because the stubs are a waste of space for most people on the Internet, who already have a utility like StuffIt Expander.

You can almost always identify self-extracting archives by the .sea extension. You can tell by the icon which compression program created any given self-extracting archive, but on the whole it makes no difference.

> **BTW**
> The only exception to this naming scheme are self-extracting archives created by Alysis's SuperDisk program, which automatically appends a .x to the end of its self-extracting archives. I doubt you'll ever see one.

Unix Compression

The Unix operating system, which is in extremely wide use on Internet servers, has a built-in compression program called, in an uncharacteristically straightforward fashion for Unix, Compress. Compress creates files with the .Z extension (note the capital Z—it makes a difference). Although you seldom see files with that extension in Macintosh FTP sites, plenty of them exist on the rest of the Internet. Both StuffIt Expander (when enhanced by DropStuff with Expander Enhancer) and a program called MacCompress can expand these files, should you need to do so.

> **BTW**
> Incidentally, MacCompress was written by Lloyd Chambers, who later went on to write DiskDoubler and AutoDoubler, starting the transparent compression market in the Macintosh world.

Compress works only on a single file, but you often want to put more than one file in an archive. All of the Mac compression programs both archive and compress in a single step. Under Unix, however, you must perform the archiving step before you compress the file (and if you want to mail it to someone, then you may want to uuencode it as well). Another program called Tar (which stands for "Tape archive") creates archives of multiple files under Unix; Tar archives have a .tar extension. If you archive a bunch of files with Tar, then shrink them with Compress, and then uuencode the compressed file to send to someone, the resulting filename may end with .tar.Z.uue to indicate what you've done to it and in what order. You're unlikely to see a Tar file that you want to expand on the Mac, but if you do, look for Suntar or Tar at <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/>.

Another format, called Gzip, has also become common in the Unix world. Files compressed by Gzip have a .z or .gz extension. Gzip is the free GNU version of ZIP, a popular PC compression format. A Macintosh program, called MacGzip, recently appeared to decode these files, and once again, StuffIt Expander can also do the job when enhanced.

> **BTW**
> What's GNU? Not much, what's GNU with you? Sorry, but one of my editors made me put that in. GNU stands for the paradoxical "GNU's Not Unix" and is a project to create a fully functional version of Unix that you are free to do with as you please.

More Compression Formats

You might run across several other compression formats in your net travels. Not many people use these formats for files distributed to the world, but a few do, so the rest of us

have to stay on our toes. As usual, all of the applications mentioned below are available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/>.

DiskDoubler, from Symantec as part of the Norton DiskDoubler Pro package, can create "combined files" that carry a .dd extension. Symantec makes a free DDExpand application available for people who don't own DiskDoubler.

Alysis's SuperDisk can create its own .x self-extracting archives. Now Software's Now Compress, renamed Now QuickFiler and bundled with the Now Utilities, can make stand-alone and self-extracting archives. If you run into one of the stand-alone files, look for the free Now Compress Expander application, also called Expand Now.

> **BTW**
> Don't be confused about DiskDoubler's company because it has changed several times since the first edition of this book. Lloyd Chambers wrote DiskDoubler for his company, Salient Software, which was then purchased by Fifth Generation Systems. Then, Symantec bought Fifth Generation Systems, getting DiskDoubler and the other Salient utilities in the bargain. It's kind of an industry food chain…

If you run across a very old archive, it might have a .pit extension, which means that it was created by an old program called PackIt (which I haven't seen in years). Don't bother looking for PackIt, and if you find it, don't create any files with it because it's a dead format. StuffIt Deluxe (I don't have a PackIt file to even test this) claims to be able to expand PackIt files, but frankly, no one cares much anymore.

DOS Compression

Unfortunately, at some point you are bound to run into files compressed with DOS programs. The most common DOS format is the ZIP format, which uses the .zip extension. Several shareware tools such as ZipIt (available at <http://www.awa.com/softlock/zipit/zipit.html>) and UnZip exist for unzipping these files, and once again, an "enhanced" copy of StuffIt Expander can do the honors.

> **BTW**
> If you ever see a file with a .exe extension, that means it's a DOS program, or perhaps a DOS self-extracting archive. Don't bother downloading it because there's no way to decode such files on the Mac, and even if there were, you couldn't use it. Obviously, if you have SoftWindows or a DOS Compatibility Card in your Mac, that's a different story.

Other File Types

You may want to keep in mind a number of other file type issues, relating both to formatting text files for different systems and to dealing with graphics, sound, and video files that you find on the Internet.

Text Files

Text files are universally indicated by the .txt extension, and after that, the main thing you have to watch for is the end-of-line character.

First, a little background: Unix expects the end-of-line character to be a linefeed (LF, or ASCII character 10), which usually shows up on the Mac as a little box because it's a nonprinting character in most fonts. The Mac ends its lines with carriage returns (CR, or ASCII character 13), and to further confuse the issue, PC clones straddle the fence and use a carriage return and linefeed combination (CR/LF).

Because the Internet is nondenominational when it comes to computer religion (that is, the Internet as a whole; almost every individual is rabid about his or her choice of computer platform), most communication programs are good about making sure to put any outgoing text into a format that other platforms can read. Most programs also attempt to read in text and display it correctly no matter what machine originally formatted it. Unfortunately, as hard as these programs may try, they often fail, so you must pay attention to what sort of text you send and receive—via email, FTP, or whatnot.

Sending Text Files

When you're sending files from a Mac, the main thing to remember is to break the lines before 80 characters. "Eighty characters," you say. "How the heck am I supposed to figure out how many characters are on a line without counting them all? After all, the Mac has superior proportionally spaced fonts. Humph!"

Yeah, well, forget about those fonts when you're dealing with the Internet. You can't guarantee that anyone reading what you write even has those fonts, so stick to a monospaced font such as Monaco or Courier. I personally recommend Monaco 9 point if your eyes don't mind. Then, I recommend setting your word processor's ruler (if that's where you're typing the file) to approximately 6.25 inches. That way, you have around 64 characters per line, give or take a few. Finally, if you're using a sophisticated word processor such as Nisus Writer, you can run a macro that replaces spaces at the end of each line with hard returns. If you don't use Nisus Writer, you can probably find an option that enables you to Save As Text, and that inserts returns at the end of each line in the process.

BTW
There are also several programs, including a popular shareware utility called Add/Strip, that can add returns for you.

After your lines have hard returns (carriage returns on the Mac) at the end, you usually can send a file properly, because most communications programs handle hard returns properly. If you don't add returns and someone tries to read your text file under DOS, Windows, or Unix, the file may or may not display correctly. There's no telling, depending on that person's individual circumstances, but you usually hear about it when you screw up. Test with a short file if you're unsure whether you can send and receive text files properly.

Receiving Text Files

Often, programs that you would use to receive text, such as an email or FTP program, automatically strip and replace linefeeds with carriage returns on files coming in from the Internet. If that doesn't happen, you either can use Add/Strip, or just run a Find and Replace in your word processor.

FYI
If you search for the linefeed (by copying the little box from the document into the Find field in your word processor) and replace it with the carriage return, the file still has hard returns at the end of every line. Instead, try this: Search for two linefeeds; replace them with some special character that doesn't otherwise exist in the document (I usually use Option-8, the bullet •); then search for one linefeed and replace it with a space; finally, replace your bullets with carriage returns. As a result, you get nicely wrapped text (assuming of course, that there were blank lines separating paragraphs in the original file).

The other reason to view files from the Internet in a monospaced font with lines delimited by hard returns is that people on the Internet can be incredibly creative with ASCII tables and charts. Using only the standard characters you see on your keyboard, these people manage to create some extremely complex tables and graphics. I can't say they are works of art, but I'm often impressed. If you wrap the lines and view in a proportionally spaced font, those ASCII tables and graphics look like textual garbage.

Setext

One other note on text formatting on the Internet. Ian Feldman, with megabytes of comments from me and several others, has defined setext as a "structure-enhanced text" format specifically for electronic periodicals. Files encoded in setext format should have the .etx extension. *TidBITS* was the first publication to use setext, but more are switching to it. Setext has the advantage of being eminently readable online, where it conforms to

the least common denominator of Internet machines (shorter than 70-character-long lines, only the standard character set, and so on), but special front-end programs enable you to browse a setext file and add structure, navigational capabilities, and enhanced display features such as fonts and styles. The idea is to profit from the best of both worlds, the online text-based platforms and the graphically oriented client machines many of us use.

The trick setext employs to remain so unobtrusive online while retaining a format that special browsers can read, is making the code implicit in the text and using accepted online styles when possible (see Figure 10.8). The title of a setext file, for instance, is a line of characters followed by another line of the exact same number of equal signs, effectively forming a double underline. Subheads are similar, but they are followed by lines of dashes, forming a single underline. Words that should be bold when decoded are sandwiched by asterisk pairs like `**this**`, and words that should be underlined are sandwiched by underscores like `_this_`.

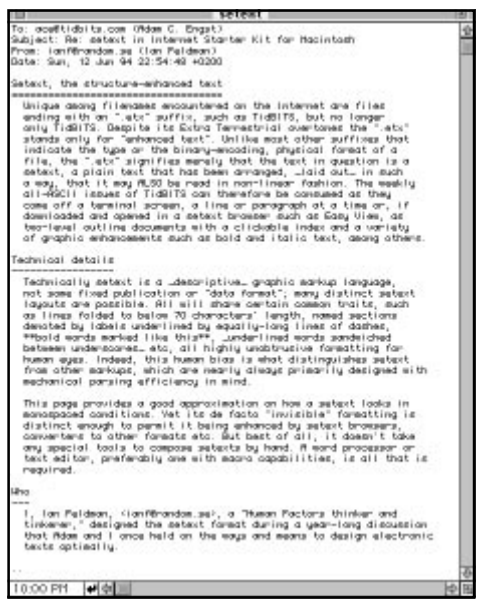


Figure 10.8 Example of setext.

It's best to read a setext in a browser such as Akif Eyler's Easy View (primarily a Macintosh browser, although limited versions are available for Unix and Windows). Easy View can replace the awkward underscores and asterisks with bold and underline styles and can break up a setext into its sections, displaying each subhead separately. But if you can't or don't want to use a program such as Easy View, any program that can display a text file will suffice.

HTML

I don't want to say much about HTML here. It is a text file format that you might run into on the Internet, but it is covered more in Chapter 22, "Create Your Own Web Site."

Graphics Files

For a long time, graphics files weren't commonly posted on the Internet except for use by users of a specific machine, because Macs were not able to read PC graphic file formats and vice-versa. Now, however, you can view some common formats on multiple platforms. Again, all of these utilities are available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/>.

GIF

First among these formats is GIF, which stands for Graphics Interchange Format. GIF was originally created by CompuServe. GIF files almost always have the extension .gif. GIF files are popular on the Internet because the file format is internally compressed, although it can show only 256 colors. When you open a GIF file in a program such as Giffer or GraphicConverter, the program expands the GIF file before displaying it.

The reason that GIF is important today, however, is that it's the only universal graphic format on the Web. All Web browsers that can display graphics understand the GIF format, and although many Web browsers can display graphics in other formats, support for those formats isn't as guaranteed as support for GIF. You'll read more about how to use GIF files on Web pages in Chapter 22, "Create Your Own Web Site."

> **BTW**
> It seems that almost no one can agree on how to pronounce GIF, either with a hard G sound or with a J sound. Take your pick; I won't argue with you either way.

JPEG

The second type of file format you commonly see is JPEG, which stands for Joint Photographic Experts Group. JPEG files, which are generally marked by the .jpeg or .jpg extension, use a different form of compression than GIF. JPEG file compression reduces the image size to as much as one-twentieth of the original size, but also reduces the quality slightly because it actually throws out parts of the file you can't see. You can view JPEG files (among other formats) with the free JPEGView from Aaron Giles, available at <http://www.med.cornell.edu/jpegview.html>.

JPEG files have become more popular on the Internet now that an increasing number of Web browsers can display JPEG images without help from a program such as JPEGView.

Why would you want to use GIF over JPEG or vice versa? Again, Chapter 22, "Create Your Own Web Site," will have more on this topic, but to summarize, JPEG images can have more than 256 colors in them and are thus better for photographic images. GIFs tend to be better for graphics created on the Mac, especially those with 256 or fewer colors.

> **BTW**
> If you run into one of the many other types of graphics file formats such as TIFF, PICT, or whatnot, try using GraphicConverter to view them. For the most part, you won't see anything other than GIFs or JPEGs on the Internet, luckily.

PDF

There's one final format that I'd like to mention here, although it's not exactly a graphic file. Adobe's Portable Document Format, or PDF, is a file format based on PostScript, Adobe's page description language for printing. PDF files can contain text and graphics, complete with fonts and styles that mimic the originals if you don't have the same fonts as were originally used.

PDF documents aren't common on the Internet, but you're likely to run into one sooner or later. You can identify them by their .pdf extension, and the only application that can read them is the free Adobe Acrobat Reader, available at <http://www.adobe.com/acrobat/readstep.html>.

Sound Files

With the advent of the Web, sound files have become far more common on the Internet, although they're so large that most people using a modem won't want to spend the hours required to download a short sound. But if you have either a fast connection or patience, there are several file formats that you should be aware of.

Sounds come primarily in the Sun .au format, also sometimes called Ulaw after the compression scheme used. As you might expect, files in this format have the .au extension. Two Macintosh programs can play Sun .au files: the free SoundApp from Norman Franke (available at <http://www-cs-students.Stanford.EDU/~franke/SoundApp/>) and the shareware SoundMachine by Rod Kennedy, available at <http://www.anutech.com.au/tprogman/SoundMachine_WWW/welcome.html>.

You might also run into the Windows WAVE format, identified by a .wav extension. SoundApp can play WAVE files. Other sound file formats exist, and between SoundApp and SoundMachine you should have no trouble playing any of them. Here's a list of all the sound formats that SoundApp supports, for instance.

- SoundCap
- SoundEdit
- AIFF and AIFF-C
- System 7 sound
- Sun Audio AU & NeXT .snd
- Windows WAVE
- Sound Blaster VOC
- Many varieties of MODs
- Amiga IFF/8SVX
- Sound Designer II
- PSION (.WVE)
- DVI ADPCM
- Studio Session Instruments
- QuickTime movies (soundtracks only)
- ny 'snd ' resource file.

BTW
Other less common audio file formats that you might run into include MIDI (check out Arnold's MIDI Player at <http://www.planete.net/~amasson/amp.html>) and MPEG audio (several players are available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/>). There's also RealAudio, a streaming audio format that I discuss more in Chapter 16, "All About the World Wide Web."

Video Files

Video has also become more popular on the Internet thanks to the Web, although video files, like sound files, are large and unwieldy. There are two video formats that you should know about: MPEG and QuickTime. MPEG stands for Motion Picture Experts Group. It's actually a compression format much like JPEG, although one optimized for compressing video rather than still images. MPEG files generally have the extension .mpeg or .mpg, as you might expect. The Macintosh program generally used to play MPEG files is Maynard

Handley's free Sparkle (which only works under System 7.5 or System 7.5.1, and not later versions of the system software).

QuickTime is Apple's technology for time-based data, and it can be used for sound, animations, and video, among other things. QuickTime movies usually have the extension of .mov. The most common application for playing QuickTime movies is MoviePlayer (previously called SimplePlayer), which comes with the QuickTime distribution from Apple. Many other applications, such as Leonard Rosenthol's Popcorn, can play QuickTime movies as well, but Movie Player works sufficiently well for basic QuickTime movies. You can find it, along with the necessary QuickTime extension, at the following URL: <http://quicktime.apple.com/qt/sw/sw.html>.

> **BTW**
> Chapter 22, "Create Your Own Web Site," has more information about using QuickTime movies on Web pages.

Apple also has a technology called QuickTime VR that enables you to move around in a three-dimensional scene or to fly around a three-dimensional object. QuickTime VR files aren't exactly movies, but I couldn't think of anywhere else to mention them and they generally have the .mov extension as well. To view a QuickTime VR file, you need the QuickTime VR Player, which is available for free from Apple in <http://qtvr.quicktime.apple.com/InMac.htm>. You must also have QuickTime installed to use QuickTime VR.

Actually, I lied. There is a third format you might see on occasion, AVI, indicated by a .avi extension. It's a Windows video format, and although no Mac programs can play AVI files, there is one that can convert AVI files to QuickTime movies, called, as you might expect, AVI to QuickTime Converter.

Format's Last Theorem

There you have it, a semi-exhaustive discussion of the major file formats you're likely to run into on the Internet and how to deal with them. (I could have gone into the nitty gritty of each file format, but then you'd have fallen asleep on me.) I'll leave you with Table 10.3, which summarizes the formats that you might see and need to decode.

Table 10.3 File Formats

Extension	Format	Decoding Program
.aiff/.aif	AIFF	SoundApp
.ARC	ARC	StuffIt Expander

Extension	Format	Decoding Program
.au	Sun au	SoundApp, Sound Machine
.avi	AVI	AVI to QuickTime, Internet Explorer
.bin	MacBinary	MacBinary II+, StuffIt Expander
.bmp	Windows Bitmap	GraphicConverter
.cpt	Compact Pro	Compact Pro, StuffIt Expander
.dd	DiskDoubler	DDExpand
.etx	Setext	SimpleText, Easy View
.hqx	BinHex	StuffIt Expander
.html/.htm	HTML	Web browsers, HTML editors
.gif	GIF	Giffer, GIFConverter
.gz/.z	Gzip	MacGzip, StuffIt Expander
.jpeg/.jpg	JPEG	JPEGView
.midi/.mid	MIDI	Arnold's MIDI Player
.mpeg/.mpg	MPEG	Sparkle
.mod	Amiga SoundTracker	SoundApp
.mov	QuickTime	MoviePlayer, QuickTime VR Player
.pcx	Paintbrush	GraphicConverter
.pdf	PDF	Adobe Acrobat Reader
.pict	PICT	SimpleText, GraphicConverter
.pit	PackIt	StuffIt Deluxe
.pkg	AppleLink Package	StuffIt Expander
.png	Portable Network Graphic	GraphicConverter
.ps	PostScript	LaserWriter Utility
.sea	Self-Extracting Archives	None necessary
.sit	StuffIt	StuffIt Expander
.snd	Macintosh snd	SoundApp, Finder
.tar	Tar	Suntar, Tar

continues

Table 10.3 Continued

Extension	Format	Decoding Program
.tiff	TIFF	GraphicConverter
.txt	Text	SimpleText, any word processor
.uu/.uue/.uud	uucode	StUU, StuffIt Expander
.wav	WAVE	SoundApp, Sound Machine
.wrl	VRML	Virtus Voyager
.Z	Unix Compress	MacCompress, StuffIt Expander
.ZIP	ZIP	ZipIt, StuffIt Expander
.x	SuperDisk self-extracting archive	None necessary

PART III

Using the Internet

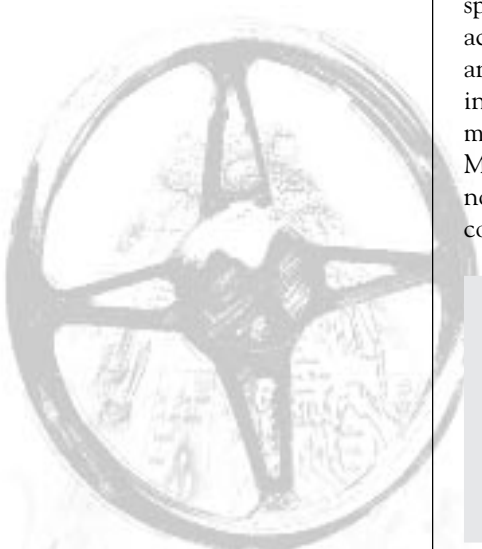
This section of the book is the largest, but you don't need to read straight through it. Each of the nine chapters looks at a different way of using the Internet, first providing background information and then reviewing the software programs you can use to access those services. Chapters 11 and 12 contain detailed technical information that very well might be useful, and I strongly recommend you read chapters 13 through 16, since they provide lots of useful information about the programs that you use the most. The next two chapters provide information about less commonly used programs, and the final chapter is interesting only if you plan to use either America Online or CompuServe to access the Internet.

- Chapter 11, "Open Transport and MacTCP," walks you through configuration and usage of both Open Transport and MacTCP, one of which you must use in accessing the Internet.
- Chapter 12, "PPP and SLIP," focuses on FreePPP, the main freeX PPP program for the Mac. The chapter also includes quick reviews of many of the other PPP and SLIP programs for the Macintosh.
- Chapter 13, "All About Email," contains a wealth of information that will help you learn how to interact with others on the Internet. Plenty of technical information about email is present as well, as it is in the other chapters.
- Chapter 14, "All About Usenet News," covers the wide world of Usenet news and reviews the main Usenet newsreaders.

- Chapter 15, "All About FTP," looks at the main way you transfer files on the Internet and the programs you use to download and upload files.
- Chapter 16, "All About the World Wide Web," discusses the part of the Internet that sees the most action these days, the World Wide Web.
- Chapter 17, "Real-Time Communications," looks at the many different ways of interacting with other people in real time on the Internet, ranging from typing to one another to full telephone-like conversations and games.
- Chapter 18, "Utilities and Miscellany," as you might expect, reviews all the other random pieces of Internet software.
- Chapter 19, "Commercial Services," uses much the same format as the other chapters about software, but concentrates instead on the two main commercial services, America Online and CompuServe.

Chapter 11 Open Transport and MacTCP

Contents:



Roughly speaking, Open Transport and MacTCP are translators. They enable the Macintosh to speak the language of the Internet, TCP/IP (Transmission Control Protocol/Internet Protocol). Normally, Macs speak AppleTalk to one another over Macintosh networks. You must have either Open Transport's TCP/IP control panel or the MacTCP control panel installed and configured properly for the TCP-based Internet programs such as Anarchie and Netscape Navigator to work.

Think of Open Transport and MacTCP as being akin to the Babel Fish from the *Hitchhiker's Guide to the Galaxy*. Pop one of them (but not both!) in your Mac's ear (the Control Panels folder, actually), and your Mac understands the Internet noise that flows in and out. The metaphor of speaking and languages isn't quite accurate because TCP/IP is actually a transport protocol. But the idea of Open Transport and MacTCP as translators that translate Internet gibberish into a language the Mac can understand seems to be the best metaphor. Luckily, everything that Open Transport and MacTCP do happens at such a low level that you never notice. In fact, after you set up Open Transport or MacTCP correctly, you should never notice that they're present.

FYI

Because the Internet is based on the TCP/IP protocols, the *only* way for a Mac to enjoy a true Internet connection is to use Open Transport or MacTCP. Without one of them and without a connection that uses PPP, SLIP, Apple Remote Access, or an Internet-connected network, you cannot use the TCP-based Internet programs. Period.

There are three types of people who are reading this chapter. The first type just wants to get on the Internet quickly and plans to use one of the Internet access providers listed in Appendix A, "Internet Starter Kit Providers." If you fall into this group, you should not need to configure much, if *anything,* in Open Transport or MacTCP. The Internet Starter Kit Installer takes care of all that for you. Also, if you fall into this group, you've probably already chosen a provider, installed all the software, and gotten on the Internet. That's what Part I, "Getting Connected" does for you.

The second type of reader cannot work with one of the Internet Starter Kit providers for some reason, usually related to none of them being a local call. If you fall into this category, unless the provider you sign up with locally has excellent instructions, you will have to configure either Open Transport or MacTCP from scratch. This chapter provides all the background information to help you do this, though you must still get the specific details from your provider.

Third and finally, some readers simply want to know more about how Open Transport and MacTCP work, perhaps out of curiosity or perhaps in order to better troubleshoot a problem. In conjunction with Chapter 5, "Things that Go Bump in the Net," I feel that I've provided a lot of useful information that should help you if you have troubles.

So, if you work with one of the Internet Starter Kit providers, you can pretty much ignore this chapter (although you might want to check out the quick reviews of Open Transport and MacTCP utilities at the end). Otherwise, read on!

What's the Difference?

To explain the difference between MacTCP and Open Transport, I must provide some history. MacTCP came out around 1988, and although it has had some problems over the years, it has been a serious success. MacTCP's success stems primarily from the fact that it provided a set target for programmers who wanted to write Internet applications. In contrast, until 1992, Windows programmers had no such standard for Internet access (in 1992, the WinSock standard appeared in the Windows world).

MacTCP's problems stemmed in large part from its long history and the fact that Apple never gave it the face-lift it so desperately needed. I bundled MacTCP 2.0.2 with the first edition of *Internet Starter Kit for Macintosh* in 1993, and although the second edition contained MacTCP 2.0.4 and the third contained MacTCP 2.0.6, basically nothing changed in MacTCP's interface (although some of the internal code changed quite a bit).

The reason I mention MacTCP's interface specifically is that it is almost criminally hard to understand. Only after three editions of the book, learning more about it each time, did I understand what most of the items in MacTCP's interface do, and although I believe my explanation is the best one ever written, I won't pretend that even my explanations make understanding MacTCP simple.

That, then, was one major goal with Open Transport—create an interface that mere mortals could use and understand. Luckily for us, Apple succeeded in a big way. Open Transport is far more than just a replacement for MacTCP, though. It's a complete rewrite of the entire communications infrastructure on the Macintosh. Open Transport's primary goal is to support multiple networking protocols (including AppleTalk, TCP/IP, and other mishmash acronyms such as SNA, DECnet, OSI, and X.25) in such a way as to insulate the user from the details and to simultaneously provide a single coherent target for developers to write network applications such as NewsWatcher.

In the process, Open Transport improves performance with its Power Mac-native code, supports more simultaneous connections than MacTCP's limit of 64 (which is important for popular servers), provides an interface for multiple configurations among which you can switch without restarting, supports new and old Internet standards for configuring a Mac on the Internet, and includes Balloon Help and an Apple Guide.

It would seem from my description above that Open Transport is the best thing since sliced electrons, and for some people that's true. Unfortunately, Open Transport works only on Macs with a 68030 CPU or newer, which leaves out the older Macs that I mentioned in Chapter 1, "The Right Stuff." Open Transport requires more memory than the "classic networking" combination of MacTCP and old AppleTalk that Open Transport replaces. Some 68030 and 68040 Macs might not have enough RAM to run Open Transport comfortably.

Also, some people became gun-shy about Open Transport, since the 1.0.x versions that first appeared had major problems (Open Transport was shipped too early because the Power Mac 7200, 7500, 8500, and 9500 required Open Transport). Many people retrofitted MacTCP back onto those machines in a move Apple didn't recommend but generally worked fine.

But then Apple released Open Transport 1.1 with the free System 7.5 Update 2.0 (which updates all versions of System 7.5 to 7.5.3) and with System 7.5.3. Open Transport 1.1 solved most, if not all, of the problems that had plagued the 1.0 series of versions. Open Transport 1.1 is the version I'm using and the version I'm writing about.

With Open Transport 1.1, Apple also released a little program called Network Software Selector that enables you to switch between Open Transport and classic networking, including MacTCP. Apple did this because not everyone might want to run Open Transport all the time. Older TCP-software might not work with Open Transport, or you might not have enough RAM to use it in all situations.

The upshot of that story is that although Open Transport is a good thing and worth using, if everything works fine for you with MacTCP, there's no real reason to switch to Open Transport (you're unlikely to see the performance difference over a modem connection, for instance). If you do switch, you can always switch back with the Network Software Selector. My suspicion is that most people with older Macs will stick with MacTCP, whereas almost everyone who buys a new Mac from now on will use Open Transport, since MacTCP probably won't even be supported on new Macs from now on.

The Internet Starter Kit Installer installs MacTCP (if it's not already installed) and configures it for you unless you have Open Transport installed already, at which point the Internet Starter Kit Installer configures Open Transport for you instead. The Installer won't install Open Transport for you, but there's no need for it to do so, since the only time you should have Open Transport is if you are running System 7.5.3 (and you should run Open Transport only with System 7.5.3 or later).

Open Transport

As you've read previously, Open Transport provides the low-level communications infrastructure for the Mac and both AppleTalk and TCP/IP. Open Transport has completely modern code in it, and more important for most users, it's easy to set up and use. Now, let's go over the questions that you need to ask, and get your Internet access provider to answer, before you can configure Open Transport on your own.

Open Transport Questions

First, of course, determine your connection method—via PPP or SLIP, or an Internet-connected network. If you connect via PPP or SLIP, you must ask a number of other questions, and I cover those in Chapter 12, "PPP and SLIP." In most cases, if you use a modem, you'll want to use PPP in favor of SLIP. If you connect through a network, most of the same questions apply, but your network administrator knows the details.

> **FYI**
> Again, if you use one of the Internet Starter Kit Providers listed in Appendix A, you do not need to collect any of this information!

Second, you must find out how Open Transport determines the IP address for your Macintosh. If you're connecting through PPP, the four possibilities are:

- manually
- using a PPP server (the most likely)
- using a BootP (Boot Protocol) server
- using a DHCP (Dynamic Host Configuration Protocol) server

If you're using an Internet-connected network to connect, you might have another option, RARP (Reverse Address Resolution Protocol). Don't worry about what all these acronyms mean or stand for—they're all ways that Open Transport can figure out what your IP address is when you connect to the Internet. Your Internet provider or network administrator can answer this question for you easily.

FYI

In talking with a number of Internet providers, I find that most call manually addressed accounts "static" (because your IP address is assigned once and never changes) and server-addressed accounts "dynamic" (because the server assigns you a different IP address on the fly each time you connect).

If you have a manually addressed account, you must find out what your fixed IP number will be. It will be four numbers, separated by periods, and should look something like `192.135.191.128`.

If you connect through Ethernet (an Internet-connected network), you also need to ask for the IP numbers of your Subnet mask and your Router address. This sounds intimidating, but again, if you connect in this fashion, you should have a network administrator who can help you fill in those numbers.

BTW

If you're setting up your own network for Internet access, you probably have a Class C address, which means your Subnet mask would be 255.255.255.0, and you should know the IP address of the router you use to connect to your Internet provider. See Chapter 23, "Set up Your Own Server," for more information on permanent Internet connections.

No matter what, you need to know the numeric IP addresses of one or more (preferably at least two) "domain name servers," which are machines that translate between names that you enter, such as `nwnexus.wa.com`, and the numeric addresses that the machines all use, such as `192.135.191.1`. Finally, although this bit isn't required, ask what your local domain is. There's a field in the TCP/IP control panel where you can enter that information. See Table 11.1 for examples of each of these bits of information.

Table 11.1 Open Transport Account Information

Item	Example
Connection method	FreePPP, InterSLIP, Ethernet
Addressing style	manually, server (PPP Server, BootP, DHCP)
IP address (if manually)	192.135.191.128
Router address (if necessary)	192.135.191.253
Subnet mask (if necessary)	Ask (255.255.255.0)
Primary and secondary domain name servers	198.137.231.1
Local domain	`halcyon.com`

FYI

Every now and then I get a complaint from people who say that they don't have an Internet provider or network administrator to ask. I hate to tell them, but unless they are in complete charge of the machine that they connect to, they must have an Internet provider or someone who acts as the network administrator. You cannot set this stuff up entirely on your own—you must have the cooperation of the person who runs the machine to which you connect. This person usually works for the organization that provides your Internet access, such as a university information technology department or a company such as Northwest Nexus, the Internet access provider I use.

I realize this information is a bit much to swallow at once, but that's why I go over how to configure Open Transport in the following section, so you can see where each piece of information goes.

Installation and Setup

You should never have to install Open Transport manually—up to this point Apple has distributed it only as part of an installer that puts all the different parts of Open Transport in the proper places (see Table 11.2 for a list of pieces and their locations on both 68K- and PowerPC-based Macs).

Table 11.2 Open Transport Parts

Filename	Location	Used In?
AppleTalk	Control Panels	AppleTalk
Open Tpt ATalk 68K Library	Extensions	AppleTalk (68K machines only)
Open Tpt AppleTalk Library	Extensions	AppleTalk (Power Macs only)
Open Tpt Inet 68K Library	Extensions	TCP/IP (68K machines only)
Open Tpt Internet Library	Extensions	TCP/IP (Power Macs only)
Open Transport 68K Library	Extensions	Both (68K machines only)
Open Transport Library	Extensions	Both (Power Macs only)
Open Transport Guide Additions	Extensions	Apple Guide Help
OpenTptAppleTalkLib	Extensions	AppleTalk (Power Macs only)
OpenTptInternetLib	Extensions	TCP/IP (Power Macs only)
OpenTransportLib	Extensions	Both (Power Macs only)
TCP/IP	Control Panels	TCP/IP

A Brief Break: Installing PPP or SLIP

If you plan to connect through PPP or SLIP, take a moment and install FreePPP or InterSLIP because you cannot finish configuring Open Transport without FreePPP or InterSLIP installed.

> **FYI**
> From now on, rather than say "PPP or SLIP" and "FreePPP or InterSLIP," I'll only say "PPP" and "FreePPP." If you wish to use InterSLIP and a SLIP connection, just mentally substitute the appropriate terms.

The Internet Starter Kit Installer installs FreePPP for you, so if you used it, you're done. Installing FreePPP manually requires running the FreePPP Installer, called Install FreePPP, and letting it install FreePPP for you. (InterSLIP has a similar installer, but I couldn't include it on the Internet Starter Kit CD-ROM, so you'll have to get a friend to download it from `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/conn/>`.) When you're done installing FreePPP, restart your Mac.

Configuring the TCP/IP Control Panel

I can't predict precisely how your TCP/IP control panel will be configured when you first open it because the installers that put Open Transport and FreePPP on your hard disk can modify those settings (much as the Internet Starter Kit Installer does, in fact). However, no matter what it looks like, it's easy to reconfigure the TCP/IP control panel so that it has the correct setup.

First off, from the Connect via pop-up menu at the top of the window, choose FreePPP. Then, from the Configure pop-up menu below that, choose the method of determining your IP address that your Internet provider has told you. In most cases, it should be Using PPP Server (see Figure 11.1).

Figure 11.1 TCP/IP control panel, set for Using PPP Server.

If you have a manually addressed account, when you choose Manually from the Configure pop-up menu, a field appears for your IP Address, which your Internet provider should also have given you (see Figure 11.2).

Figure 11.2 TCP/IP control panel, set for Manually.

If your Internet provider tells you to choose either Using BootP or Using DHCP, your work is done, as you can see in Figure 11.3 (it's the same for DHCP). Meanwhile, if you use either Using PPP Server or Manually, you must enter the IP addresses for one or more domain name servers, as you can see that I've done previously in Figures 11.1 and 11.2. Separate multiple domain name servers by pressing Return. If you enter more than one domain name server, Open Transport uses them from the top down. So, if the first domain name server doesn't respond to a request, Open Transport asks the second one. That's why it's often important to have a primary and secondary domain name server—it's not uncommon for one to go down periodically, but it's unusual that both would go down.

Figure 11.3 TCP/IP control panel, set for Using BootP Server.

FYI

The domain name server is used every time you use a program to connect an Internet site by name. So, if you use Anarchie to connect to ftp.tidbits.com, the domain name server looks up ftp.tidbits.com and sees that its IP number is 204.29.20.101. Since the computers always use IP numbers and people usually use domain names, the domain name server is an essential part your Internet connection.

Open Transport will not enable you to type anything but valid IP numbers, so you can't accidentally type any characters other than numbers or periods, which is a nice method of error prevention. In another nice update, you can add, delete, or change your domain name servers in the TCP/IP control panel without rebooting, something that MacTCP always forced you to do.

The one field that remains is the Search domains field. You don't have to put anything in there, and I never did so before creating these figures. However, if you want, you could enter your local domain, which enables you to use what are called "unqualified domain names" for machines in your local domain.

> **BTW**
> The first name of an Internet machine, for example coho, is also called an "unqualified domain name." The full name of an Internet machine, something such as coho.halcyon.com, in contrast, is called a "fully qualified domain name." You can use the unqualified domain name for domains listed in your Search domains field.

For instance, say I wanted to use Anarchie to connect to Northwest Nexus's anonymous FTP server at `ftp.halcyon.com`. Because I've included `halcyon.com` in my Search domains field, all I really have to enter in Anarchie's Get via FTP window for the Machine field is `ftp` (see Figure 11.4). When Anarchie asks for the IP number of that machine, Open Transport figures out that I mean `ftp.halcyon.com` and sends the proper IP number back to Anarchie. It can be a useful shortcut, but don't rely on it until you're sure you understand how domain names work in most instances.

Figure 11.4 Anarchie using an unqualified domain name.

> **BTW**
> You can enter more than one search domain, but Open Transport searches from the top down, so if you try to use an unqualified domain name for a machine in the second search domain, it won't work if there's a machine with the same unqualified domain name in the first search domain.

That's basically all there is to configuring Open Transport for use with FreePPP. If you're connected to an Internet-connected network, you select either AppleTalk (MacIP) or Ethernet from the Connect via pop-up menu. In both of these cases, you're likely to have a network administrator who can tell you how to configure TCP/IP for your network, and if you're connecting via AppleTalk and obtaining your IP address with Using MacIP Server, then there's nothing much to do at all (see Figure 11.5).

Figure 11.5 TCP/IP control panel, set for Using MacIP Server.

If you are told to use any of the other connection methods and configuration methods, you might need additional information from your network administrator. I don't want to show a bunch of nearly identical figures showing you all the possibilities, so I'll settle for Figure 11.6, which shows the information you need if you connect via Ethernet and configure your IP address manually. All of the other connection and configuration methods require some subset of this information.

Figure 11.6 TCP/IP control panel, set for Ethernet and Manually.

As I mentioned previously, the IP Address field contains your IP address. The Subnet mask field contains the subnet mask, and the best way to get that information is by asking your network administrator). Finally, the Router address field contains the IP address of the router that connects your network to the Internet. Again, I'm only listing this information for the people who have dedicated Internet connections—if you're using FreePPP and a modem, don't worry about all of this.

Basic Usage

There isn't much you can do with MacTCP other than configure it. In some ways that's good, since it's confusing to configure. In contrast, Open Transport provides a good bit more functionality. Although, for instance, you don't have to do any more configuration than I discussed previously, Open Transport offers two other user modes, Advanced and Administration, that provide some additional configuration options. To switch user modes, on the Edit menu choose User Mode (see Figure 11.7).

Figure 11.7 TCP/IP User Mode dialog box.

If you click the Advanced button and click OK, Open Transport puts you into Advanced mode, which provides additional options. If you instead click Administration, you're given the option of entering a password and you can then lock any of the settings you can see in Advanced mode by clicking padlock icons (see Figure 11.8).

Figure 11.8 TCP/IP in Administration mode with everything locked down.

There's no need to worry about any of the settings accessible only in Advanced mode, and if you're not worried about anyone changing your settings, don't mess with Administration mode either.

The only reason to switch into Advanced mode at all is that two buttons appear at the bottom of the window, as you can see in Figure 11.8. Clicking the Info button brings up a dialog box that tells you information about your Mac and your configuration (Figure 11.9 shows you the information for my dedicated connection). You can also bring up the Info dialog box by choosing Get Info from the File menu.

Figure 11.9 TCP/IP Info dialog box.

You might want to check the IP address of your Macintosh sometime, or perhaps you might want to see what version of Open Transport you're running at some point in the future.

Clicking the Options button brings up another dialog box (see Figure 11.10) that enables you to make TCP/IP active and inactive (if it's inactive, you save some memory). There's also a checkbox titled "Load only when needed." I recommend that you uncheck that checkbox. Reports on the Internet indicate that that option can cause problems, and the only liability to unchecking it is that the TCP/IP control panel will use memory as soon as the Mac boots up. If that checkbox is checked, TCP/IP won't use memory until you run an Internet program.

Figure 11.10 TCP/IP Options dialog box.

For many of us, Open Transport's killer feature is the capability to switch configurations without restarting the Mac, something that was impossible in MacTCP. Open Transport enables you to create multiple configurations with different names, something that required a utility program if you used MacTCP. Most people will probably never need two configurations, but if you switch Internet providers, for instance, or if you use a PowerBook at home through a modem and at work through an Internet-connected network, you'll appreciate Open Transport's flexibility.

To open the Configurations dialog box, choose Configurations from the File menu (see Figure 11.11). I've created four different configurations, two that use FreePPP and two that use my dedicated Internet connection. The main difference between the two FreePPP configurations and the two dedicated connection configurations is the domain name server settings.

Figure 11.11 TCP/IP Configurations dialog box.

The Configurations dialog box enables you to import and export your settings (mostly useful to people who want to set up other Macs using the same settings). You can't create new configurations directly—instead you must duplicate an existing configuration and give it a new name. If you have a configuration you don't use, the Delete button removes it.

The three buttons along the bottom of the dialog box are a little confusing. If you select a configuration in the list by clicking it and then click the Make Active button, the Configurations dialog box disappears and the TCP/IP control panel window reflects the new configuration. You can also double-click a configuration to make it active. Neither the Done nor the Cancel button affect your current configuration. Instead, if you create, rename, or delete a configuration, clicking the Done button saves your changes and closes the Configurations dialog box. The Cancel button cancels your changes and closes the Configurations dialog box. And, here's the tricky one, if you create, rename, or delete a configuration, then make a different configuration active with the Make Active button (or by double-clicking a configuration), your changes are saved before the Configurations dialog box disappears.

That's all there is to using Open Transport's TCP/IP control panel. Despite all the options, there's not much you can do or need to do, and I fully expect most people will never need to open the TCP/IP control panel after it's configured properly.

MacTCP

Until Open Transport came along, MacTCP was the only way you could use a true Internet connection on a Macintosh. Even now that Open Transport has replaced MacTCP on newer Macs and Power Macs with plenty of memory, lots of people will be using MacTCP for the next few years. If you fall into that category and need to configure MacTCP to work with an Internet provider that's not among the Internet Starter Kit Providers, read on for the complete scoop on how to configure MacTCP. If you've read the Open Transport section previously, some of this will sound familiar since you need the same basic information.

MacTCP Questions

First, you must determine your connection method—through PPP or SLIP, or an Internet-connected network. If you connect through PPP or SLIP, you must find answers to a number of questions, which I discuss in Chapter 12, "PPP and SLIP." In most cases, if you use a modem, you'll want to use PPP in favor of SLIP. If you connect through a network, most of the same questions apply, but your network administrator knows the details.

> **FYI**
> Again, if you use one of the Internet Starter Kit Providers listed in Appendix A, you do not need to collect any of this information!

Second, find out whether you are supposed to determine your address "manually," whether it's assigned dynamically when you call the "server" each time, or "dynamically" at random (which is seldom used, dangerous, and worth avoiding). Keep reading, but those three terms are extremely important and confusing because each corresponds to a choice in the MacTCP control panel; the way people talk about the methods doesn't always correspond.

In talking with system administrators, I find that most call manually addressed accounts "static" (because your IP address is assigned once and never changes) and server-addressed accounts "dynamic" (because the server assigns you a different IP address on the fly each time you connect). You see the problem.

If you have a manually addressed account, you must find out what your IP address number will be. It will be four numbers, separated by periods, and should look something like `192.135.191.128`. If you connect manually, you also need a gateway address number in the same format.

> **BTW**
> You may need this gateway address with a server-addressed account as well, but MacTCP doesn't enable you to enter it—some implementations of SLIP do. Depending on the configuration of your site, you may also need to find out your network class and subnet mask, and your network administrator should know what to tell you here. People who use PPP and SLIP do not, for the most part, ever need to configure the network class and subnet mask part of MacTCP.

No matter what, you must know the numeric IP addresses of one or more domain name servers, which translate between names that you enter, such as `nwnexus.wa.com`, and the numeric addresses that the machines all use, such as `192.135.191.1`. See Table 11.3 for examples of each of these bits of information.

Table 11.3 MacTCP Account Information

Item	Example
Connection method	PPP, SLIP, Ethernet
Addressing style	Manually, Server
IP address (if manually)	e.g., 192.135.191.128
Gateway address (if necessary)	e.g., 192.135.191.253
Network class (if manually and necessary)	A, B, or C
Subnet mask (if manually and necessary)	Ask
Primary and secondary domain name servers	e.g., 198.137.231.1
Local domain	e.g., `halcyon.com`

FYI

Every now and then I get a complaint from people who say that they don't have an Internet provider or network administrator to ask. I hate to tell them, but unless they are in complete charge of the machine that they connect to, they must have an Internet provider or someone who acts as the network administrator. You cannot set this stuff up entirely on your own—you must have the cooperation of the person who runs the machine to which you connect. This person usually works for the organization that provides your Internet access, such as a university information technology department or a company like Northwest Nexus, the Internet access provider I use.

I realize this information is a bit much to swallow at once, but that's why I go over how to configure MacTCP in the following section, so you can see where each piece of information goes.

Installation and Setup

If MacTCP hasn't been installed by the System 7.5 installer or another installer, the Internet Starter Kit Installer will install it properly. If by some chance, you have a copy of MacTCP loose on a disk and wish to install it, copy the MacTCP control panel to the Control Panels folder in your System Folder. If you drag the MacTCP control panel to the System Folder icon, the Mac copies it to the right place.

FYI
If you are upgrading from a previous version of MacTCP, write down all of your settings. Then, make sure to delete the old MacTCP control panel, the MacTCP DNR file that lives loose in the System Folder, and the MacTCP Prep file that lives in your Preferences folder. If you fail to delete these items before you manually install the new version, there's no telling what could go wrong.

A Brief Break: Installing SLIP or PPP

If you plan to connect through PPP or SLIP, take a moment and install FreePPP or InterSLIP because you cannot finish configuring MacTCP without either FreePPP or InterSLIP installed.

FYI
From now on, rather than say "PPP or SLIP" and "FreePPP or InterSLIP," I'll only say "PPP" and "FreePPP." If you wish to use InterSLIP and a SLIP connection, just mentally substitute the appropriate terms.

The Internet Starter Kit Installer installs FreePPP for you, so if you used it, you're done. Installing FreePPP manually requires running the FreePPP Installer, called Install FreePPP, and letting it install FreePPP for you. (InterSLIP has a similar installer, but I couldn't include it on the Internet Starter Kit CD-ROM, so you'll have to get a friend to download it from <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/conn/>.) When you're done installing FreePPP, restart your Mac.

Configuring the MacTCP Main Window

If you have already installed FreePPP or InterSLIP, restart to make sure that MacTCP loads. When the Mac comes back up, open the MacTCP control panel from the Control Panels folder (see Figure 11.12).

Figure 11.12 MacTCP control panel.

BTW
If you've installed another PPP or SLIP program rather than FreePPP, you have differently named icons instead of FreePPP in the MacTCP control panel main window. I have additional icons because of my direct Internet connection.

You must select one of the connection method icons (you may have more, fewer, or different ones) in the upper part of the control panel to tell MacTCP how you plan to connect. If you have a LocalTalk network attached to the Internet through a router, select the LocalTalk icon. If you have an Ethernet connection, select that icon. If you use FreePPP, select the FreePPP icon.

FYI
If you use MacTCP, I don't recommend installing multiple PPP and SLIP programs at the same time—they might confuse MacTCP. Also, if you want to switch between different PPP or SLIP programs, completely reinstall MacTCP before switching for the least trouble.

If your provider gives you a manually addressed account (a static address) and provides your IP address, type it into the IP Address field below the connection method area. If your host machine assigns you an address (a dynamic, or server-addressed account), leave this field alone, since MacTCP fills it in when you actually make a connection and are assigned an IP address by the server.

Configuring the MacTCP Configuration Dialog Box

Now click the More button to bring up the configuration dialog box (see Figure 11.13).

Figure 11.13 MacTCP configuration dialog box.

Remember that I said to ask whether your address was obtained manually or from your server? The answer to that question is the setting for the Obtain Address set of radio buttons. Select the button that corresponds to what your system administrator or Internet provider tells you.

It's time to talk about those Obtain Address buttons. Everything I have read or been told has advised avoiding the Dynamically button like the plague. The problem stems from the fact that when you use it, MacTCP makes up an address at random and then looks for duplicate addresses. Apparently, this process tends to fail and can result in duplicate IP addresses on the network at the same time, which is a bad thing. The situation is actually somewhat more complex, but suffice it to say that you should never select the Dynamically button unless your network administrator explicitly tells you to and provides a range of addresses from which MacTCP can choose. I've never heard of an Internet provider using the Dynamically button.

If you click the Manually button, you must enter, in the outer control panel window, the permanent IP address that your system administrator has provided for you. Either use the Manually button or the Server button, and remember that if your system administrator talks about dynamic addressing, he probably means what MacTCP calls a server-addressed account.

Next, if you have a manually addressed account and your system administrator gives you a gateway address, type it into the Routing Information Gateway Address field. If you use a server-addressed account, you can't type in the Gateway Address field, so don't try to enter anything there. MacTCP fills it in automatically when you connect.

The large IP Address area in the upper right looks hairy, but for most people, there's no need to touch anything in this area. That's the good news.

The bad news is that if you do have to mess with this section of the dialog box, you need help from your administrator. You may have to set the correct network class (the pop-up menu containing A, B, or C) and the subnet mask (the slider bar beneath the title in the dialog box) manually. Primarily, large networked sites must deal with subnet masks because they sometimes use a method called "subnetting" to handle their IP networks. If you have subnetting at your site, you also have someone who knows something about it and can provide details of how to configure MacTCP for your site. Be sure to ask nicely!

Configuring the Domain Name Server

You must fill in the Domain Name Server Information section with the name of your domain and the IP numbers of your name servers.

> **FYI**
> The domain name server is used every time you use a program to connect an Internet site by name. So, if you use Anarchie to connect to `ftp.tidbits.com`, the domain name server looks up `ftp.tidbits.com` and sees that its IP number is `204.29.20.101`. Since the computers always use IP numbers and people usually use domain names, the domain name server is an essential part your Internet connection.

As you can see in Figure 11.14, the interface for this section of MacTCP is quite confusing. Let me try to explain it as best I can.

Figure 11.14 MacTCP configuration dialog box.

FYI

Warning: This stuff gets pretty technical, so if you're not interested and everything works properly after you install MacTCP, just skip it. I use the `halcyon.com` domain as an example here, but if you don't use Northwest Nexus, you undoubtedly have a different domain, and you will also, of course, have different IP numbers for your domain name servers.

For each entry in the MacTCP Domain Name Server Information area, there are two fields and a Default radio button. The left field holds a domain name (*not* the name of a domain name server!). The right field holds the IP numbers of the domain name server that MacTCP uses to look up addresses in the domain listed in the left field. Only one of the radio buttons can be selected at a time, and MacTCP uses the line containing the selected Default radio button as your default domain name server. So, when I put `halcyon.com.` in the first left field, I'm telling MacTCP to use the name server at `198.137.231.1` for all requests within the `halcyon.com` domain. In other words, the domain name server at `198.137.231.1` is used only if the domain name that you're looking up ends in `halcyon.com`.

The domain name you enter in that first left field is also the domain name that MacTCP tacks on the end if you use a single word name, such as `coho`. The utility of this is that I could, for example, telnet to the machine `coho.halcyon.com` by merely entering `coho` in NCSA Telnet's connection dialog box. This isn't particularly helpful in normal usage.

BTW

The first name of an Internet machine, say, `coho`, also is called an "unqualified domain name." The full name of an Internet machine, something such as `coho.halcyon.com`, in contrast, is called a "fully qualified domain name."

Make sure to select the Default button next to this first entry. This button has two purposes. First, it identifies the domain that MacTCP uses to complete unqualified domain names. Second, it ensures that the domain name server in that line, `198.137.231.1`, is also used if no other lines in the domain name server configuration match the request. Reflect on this briefly while I cover the next few lines, since they interact with one another.

> **BTW**
> You may have noticed the period after the `halcyon.com` domain in the screenshot. That period positively denotes an absolute domain, as opposed to one that's relative to the current domain. However, MacTCP treats all names that contain at least one period as absolute names, so it actually makes no difference at all on the Mac, although it does on other computers.

Next, look at the second set of fields. In the left field I have a period, and the right field I have exactly the same IP number as in the first right field. This second line is necessary because the first line (the primary name server) won't be used for requests outside of the domain listed in the first line. By duplicating the IP number, we tell MacTCP to use the primary name server for all requests outside the `halcyon.com` domain also. Keep this in mind while we look at the third line.

The third set of fields has another period in the left field and a different IP number, `192.135.191.1`, in the right field. This IP number identifies my secondary name server, the name server that MacTCP queries if it doesn't get anything back from the first one.

Now we have all the pieces to make sense of this confusing configuration interface.

If a program asks for the IP number for a machine in the `halcyon.com` domain, MacTCP asks the machine in the first line (the primary name server) to handle the request. If MacTCP asks for the IP number for a machine anywhere outside the `halcyon.com` domain, the second line (also the primary name server) handles the request. Finally, if the primary name server is down, rendering the first two lines ineffective, the secondary name server in the third line kicks in to look up the IP number in question. Although the second line may seem redundant, it's not. If you didn't have it and asked for the IP number of a machine outside of the `halcyon.com` domain, that request would go to the secondary name server. If that name server were down, your request would fail.

> **BTW**
> You can't see it in the figure, but I have a fourth line with yet another period in the left field and a different IP number in the right field. It handles requests if the first two name servers are down. You can have three or more name servers, but that many aren't generally necessary.

I once ran into an interesting problem when helping a friend with MacTCP. He could connect to FTP and Web sites on the Internet just fine, but he couldn't get his mail, and when we checked, he couldn't connect to his provider's Web server either. It turned out

that he had only two entries in his MacTCP Domain Name Server Information section, and both were wrong in such a way that lookups outside his domain worked fine, but every time a program tried to look up a host within his domain (such as his mail server or Web server), it failed. So pay close attention when configuring your domain name servers—an incorrect configuration can cause quirky problems.

After you're done with all that domain name server information, click the OK button to save your changes, and close the MacTCP control panel. Depending on what you change and if you've used MacTCP yet that session, MacTCP may tell you that the changes won't take effect until you restart. Go ahead and restart your Mac if necessary. If I'm trouble-shooting, I usually restart every time I reconfigure MacTCP whether it tells me to or not, just to be safe.

MacTCP DNR and MacTCP Prep

After you configure MacTCP and restart your Mac, it creates two files. One, called MacTCP DNR, is loose in your System Folder, and the other, called MacTCP Prep, lives in your Preferences folder. MacTCP creates both files from scratch if you delete them and doesn't lose any settings in the process, because it stores settings both in its control panel and in the MacTCP Prep file. Deleting these files is a must when you're troubleshooting or upgrading to a new version of MacTCP.

> **BTW**
> MacTCP DNR stands for "MacTCP Domain Name Resolver." If you want to know more, turn on Balloon Help and point to that file with the arrow. Suffice it to say that throwing out the MacTCP DNR file and restarting can solve some weird MacTCP problems.

The MacTCP Prep file bears some additional discussion. When you configure MacTCP, it stores its settings in both the MacTCP control panel and in the MacTCP Prep file. Although this may seem redundant, it has a useful side effect. Since MacTCP reads its settings preferentially from the MacTCP Prep file, you can keep multiple MacTCP Prep files for working with different providers. Most people won't need this capability of course, but for those who do, it comes in handy. When I travel, for instance, I use different dialup accounts in different cities. I could use a utility such as MacTCP Switcher or MacTCP Netswitch, but since I don't travel frequently, I usually just pull out my old MacTCP Prep file and replace it in the Preferences folder with one customized for the new Internet access provider.

You can rename the MacTCP Prep file, which makes it easier to keep several different copies around. However, if you keep them in your Preferences folder, MacTCP preferentially uses the one called MacTCP Prep over any version with a modified name.

The Hosts File

Domain name servers didn't always exist, and before they did, each computer had a Hosts file that contained the IP names and numbers of all the Internet machines you could contact. When a program needed to translate an IP name into an IP number, it looked in the Hosts file for that information (and it failed unless the machine you wanted to connect to was listed). This worked fine when there were only several hundred machines connected to the Internet. In these days with millions of Internet machines, the Hosts file isn't as good a solution as the domain name server, but because there are still instances where people can't contact a domain name server, the Hosts file has remained with us.

> **BTW**
> Theoretically, you can use any Internet machine that is a domain name server as your domain name server, although if it's not local, domain name server lookups might be quite slow.

If you don't have a domain name server, you must use a Hosts file, which is a text file that lives loose in the System Folder on the Mac. Using the Hosts file can be dangerous if you don't need it, in fact, because it stores hard-coded information about which machines use which IP numbers, and if that information changes, the Hosts file will provide incorrect information to MacTCP. I've been bitten by this in the past, and don't recommend you install a Hosts file unless you know you need to.

> **BTW**
> One instance when you can't access a domain name server is if you're behind a firewall, which is a security system in which everyone must go through a secure host machine that is the only one in an organization connected to the Internet.

If you want to use the Hosts file, you must manually enter all the hosts to which you might want to connect, along with their IP numbers. You can edit the Hosts file with SimpleText, but make sure to create the host entries in exactly the same manner as shown here. Here's what a standard host entry looks like, with the domain name, the type of record (the letter "A"), the IP numbers, and a semicolon. Just copy this line and modify it for your own Hosts file.

```
consultant.micro.umn.edu. A 134.84.132.4 ;
```

> **BTW**
> Communications Toolbox Telnet tools like to use the Hosts file as a repository for Internet machines that you have connected to previously. In fact, the VersaTerm Telnet Tool adds sites to the Hosts file for you if you enter them into the tool's configuration dialog box.

Open Transport and MacTCP Utilities

A few utility programs have appeared that help you troubleshoot your Internet connection. In addition, a couple of utilities, MacTCP Switcher and MacTCP Netswitch, help ease the process of switching between two completely different MacTCP setups, such as you might have if you use Ethernet at work and PPP at home. Most of the following programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>` or `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/conn/>` and if not, I've listed their Web pages.

CyberPatrol

`http://www.cyberpatrol.com/`

Like SurfWatch (see the review coming up), which was the first utility for blocking sexually explicit sites on the Internet, the $49.95 CyberPatrol enables users to restrict the types of sites that can be accessed. However, CyberPatrol enables parents to set up their own list of words to block, unlike SurfWatch, and can also limit the total time online. A $19.95 subscription provides six months of updates as well. CyberPatrol works with commercial online services as well as the Internet. Overall, CyberPatrol offers more flexibility than SurfWatch, although I'd prefer to live in a world in which neither of these utilities was necessary.

DNS Lookup

Paul Herman's free DNS Lookup 0.92 enables you to look up information from a domain name server. Unless you know a fair amount about how the Internet works and especially about DNS, the information from DNS Lookup may not make much sense. Otherwise you might find it fascinating, since much of this information was previously only available through a Unix program called nslookup.

InterMapper

`http://www.dartmouth.edu/pages/softdev/intermapper.html`

Dartmouth College's InterMapper (available in an evaluation version—licenses will be available in the future) is an interesting tool for anyone who has to monitor an AppleTalk or IP network. InterMapper serves as an early warning system and reports configuration changes, interface errors, and reachability problems. Normal users probably have no use for InterMapper, but network administrators should take a look.

IP Monitor

`http://www.eskimo.com/~ravensys/ipmonitor.html`

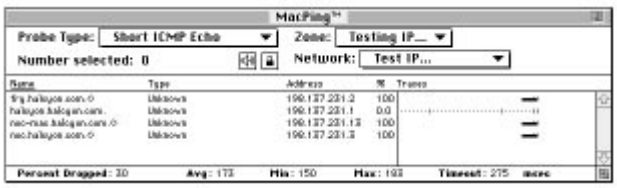
Eric Thauvin's $5 shareware IP Monitor 1.1 is a small application that displays your current IP number. If you have a static-addressed account or a dedicated Internet connection, that might not be too useful (you can open the TCP/IP or MacTCP control panels to find the same information). However, if you have a server-addressed account and your IP number is different each time you connect, which is common, IP Monitor could be quite useful. You can copy your IP number out of IP Monitor easily, and the program is also scriptable with AppleScript, Frontier, or QuicKeys, which could be useful for updating a Web page with your current IP number every time you connect, for instance.

MacPing

`http://www.dartmouth.edu/pages/softdev/macping.html`

Along with its shareware software, Dartmouth College sells some commercial applications. Included in this category are the $99 MacPing 3.0.2 and the $399 MacPing 3.0.2 Pro, ping utilities that work with both AppleTalk and TCP/IP networks such as the Internet. MacPing 3.0 is limited to testing five AppleTalk zones, whereas MacPing 3.0 Pro can test an unlimited number of AppleTalk zones. They're otherwise identical. Not being a network administrator, I'm not really sure what MacPing tells me, but I gather that by watching the way the pings come back from all the machines, you can tell where there might be a network problems. Check out its

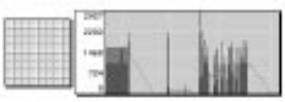
help text for more information about what all the parts of the window do. For ordering information check out the MacPing Web page, which has a link to a demo as well.



MacTCP Monitor

`http://gargravarr.cc.utexas.edu/mactcp-mon/main.html`

Chris Johnson's free MacTCP Monitor 1.0d34 is a simple utility that displays the MacTCP activity on your Mac in any given second. You can customize MacTCP Monitor's displays with different colors and labels, but one of the most interesting parts of MacTCP Monitor is that it can check in with a Simple Internet Version Control server and see if it's the latest version. If not, it downloads a new version with Anarchie's help. MacTCP Monitor is mostly useful to people running servers who want to keep an eye on how heavily MacTCP is being used, but it's fun to play with for normal users as well. MacTCP Monitor is not compatible with Open Transport 1.1.



MacTCP Netswitch

`http://www.nd.edu/~dwalton1/netswitch.html`

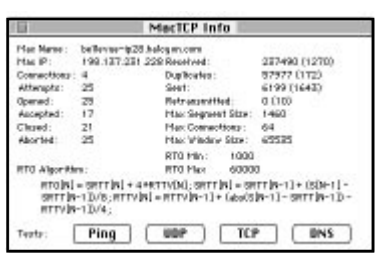
The free MacTCP Netswitch 2.0 control panel, written by David Walton of the University of Notre Dame, appears to be the more sophisticated of the two utilities for switching between MacTCP connections. It works by sensing at startup whether you're connected to an AppleTalk network, and if so, what zone you're in. After it's sensed whether you're in a network or not, it swaps in an appropriate MacTCP Prep file from a group of preconfigured ones. The major advantage of the way MacTCP Netswitch senses the environment at startup is that theoretically you don't have to restart because the control panel forces MacTCP to load the proper MacTCP Prep file at startup. There's no need for MacTCP Netswitch with Open Transport.

MacTCP Switcher

John Norstad's free MacTCP Switcher 1.1 requires a bit more interaction from the user than MacTCP Netswitch. After you have MacTCP set up properly, you run MacTCP Switcher and save a configuration file that records the current MacTCP settings. Do the same for your other configurations. To restore a saved configuration, double-click it in the Finder, and when MacTCP Switcher prompts you, click the Set MacTCP button to set MacTCP to use the saved configuration. Another alert then appears telling you that MacTCP has been set; it may also tell you to restart your Mac, and provide a Restart button to do so. MacTCP Switcher doesn't work with whole MacTCP Prep files, as MacTCP Netswitch does, but instead copies the relevant resources from the MacTCP Prep file to the configuration file and back again. The MacTCP Switcher never touches the MacTCP control panel itself. There's no need for MacTCP Switcher with Open Transport.

MacTCP Watcher

MacTCP Watcher is a free program written by the prolific Peter Lewis to display the internals of MacTCP's workings. You must be an expert to decipher most of this information, and Peter claims that even he doesn't know what most of it means. However, if you're having troubles with MacTCP, MacTCP Watcher proves to be one of the best tools available for troubleshooting a bad connection. I still don't understand what it complains about, but it tends to react in specific ways to specific problems, and those reactions are usually more useful than the generic error messages that come back from other programs. MacTCP's other functions include a ping test, which is a bit like sonar over a network. It's useful for determining whether a remote machine is up, and if so, about how far away it is (or how slow the network to it is). The UDP and TCP tests mean less to me, but I use MacTCP Watcher's DNS button to match IP names and numbers. So, definitely pick up MacTCP Watcher, and poke at the buttons to see if anything that comes back looks useful. I always have a smashing good time looking at stuff I don't understand. MacTCP Watcher works under Open Transport but won't display much information.

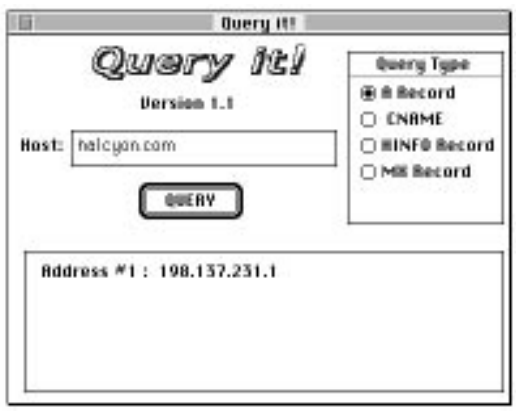


OTTool

Neon Software's OTTool 1.0b3 is a free utility that shows a variety of configuration information related to Open Transport. On the TCP/IP side of things, it displays your IP address, net mask, router, domain name server, and a few other bits of information. As an added bonus, OTTool enables you to look up domain names and to ping remote machines on the Internet to see if they respond.

Query it!

Chris McNeil has a free, easy-to-use, and potentially useful program called Query it! 1.1 that enables you to query your local name server to find out more information about various Internet hosts. The most useful piece of information you can get from Query it! is the IP address for a host, the number that goes with the name. I asked Query it!, for instance, to tell me the address of `halcyon.com`. That's all there is to Query it!, although you can see if the CNAME, HINFO Record, or MX Record results are of interest to you. Although Paul Herman's DNS Lookup can return more information, Query it! is easier to use.



SurfWatch

`http://www.surfwatch.com/`

SurfWatch Software (now owned by Spyglass) makes a $49.95 product eponymously called SurfWatch, whose goal is to prevent users from visiting sexually explicit sites on the Internet. SurfWatch works by modifiying MacTCP (it doesn't currently work with Open Transport, nor does it work with the non-TCP commercial online services) to block sites in a specific database that SurfWatch Software maintains. An update subscription costs

continues

SurfWatch, *continued*

$5.95 per month. SurfWatch also watches for and blocks sexually explicit words in URLs or search phrases, preventing users from finding sexually explicit sites that aren't yet in the SurfWatch database, which you cannot modify. SurfWatch Software bills its product as being useful for preventing government regulation, and although that may be true, I'm still bothered by using a technological solution to a social problem. Education is more important than either regulation or technological restrictions that any savvy 14-year-old could break.

Vicom Internet Gateway

`http://www.vicomtech.com/vig.main.html`

Vicom Technology's $400 Internet Gateway is essentially a software router. It runs on a Macintosh and uses a modem to connect via PPP or SLIP to an Internet provider. What's interesting about the Vicom Internet Gateway, though, is that it enables all machines on your network to access the Internet through that single modem connection. In other words, you need only one IP address to provide Internet services to multiple machines on your LAN. I found the Vicom Internet Gateway troublesome to set up due to confusing documentation, and it requires some work on your Internet provider's end as well. However, after I got it working, it worked fine. More problematic is the high price of the Vicom Internet Gateway and the fact that it more or less takes over a Mac. A dedicated hardware router costs about the same and should be less troublesome.

Chapter 12 PPP and SLIP

Contents:

When you get an Internet connection these days, you will almost always end up using PPP (Point to Point Protocol), or less commonly, SLIP (Serial Line Internet Protocol), to make the connection via a modem or an ISDN line. If you have a network, either Ethernet or LocalTalk, connected to the Internet, you don't need PPP or SLIP. Although PPP and SLIP are functionally equivalent, I concentrate on PPP because it's easier to set up and use and much more common these days.

The easiest way to understand PPP and SLIP is to pretend that you don't have water service inside your house (see Figure 12.1). Every time you want to take a shower, you must run a garden hose out to the water hookup outside, take your shower, and then reel the hose back in. That's exactly what PPP or SLIP do—they establish a temporary, low-speed connection to the Internet. You must create that connection before you can run programs such as Anarchie or Internet Explorer.

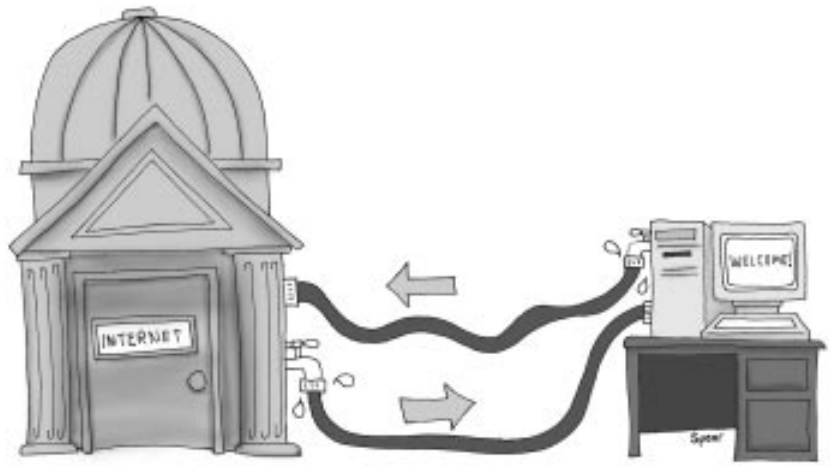


Figure 12.1 The Internet water pipe.

FYI
Although most implementations of PPP and SLIP enable you to launch an Internet program without connecting first (the PPP or SLIP software sees what's up and then establishes the connection), I've found that auto-connect features can be flaky. If you can use one, great, but if it doesn't work reliably, connect manually first.

Before I go any further, I'd like to tell you that all of the information in this chapter is to a certain extent optional. If you've signed up with one of the Internet Starter Kit Providers listed in Appendix A, installed the software using the Internet Starter Kit Installer, and are happily cruising the Internet, then most of the rest of this chapter is background information and additional detail that you do not absolutely need to know. That said, I think you will find much of this information useful, and if for any reason you decide you want to switch to a different PPP program, you'll want to read the reviews of the main options. And so, with that note for the impatient among you, onward!

What's the difference between PPP and SLIP, and should you care? The answer to the first part of the question seems to be that PPP is SLIP done right. Apparently, SLIP was literally designed on the back of an envelope and implemented in an afternoon. PPP, in contrast, was designed more carefully and is far more flexible, so that in theory it supports multiple protocols (such as AppleTalk and TCP/IP) at the same time and over the same connection.

FYI
PPP and SLIP accounts are not identical. You cannot use a SLIP account with FreePPP, nor a PPP account with InterSLIP.

The capability to support multiple protocols is neat because if you can connect to an Internet host that runs AppleTalk as well as TCP/IP, you can use Internet programs and AppleTalk services at the same time, such as file sharing and printing to LaserWriters. The reality is that not all Macintosh PPP implementations support anything besides TCP/IP, and an even harsher reality is that almost no Internet service providers support AppleTalk, so this capability is almost useless unless you're in a large business or university that runs AppleTalk on its servers.

As to whether or not you should care about how PPP and SLIP differ, my impression is that it doesn't make much difference. PPP is becoming the standard because Apple is working on supporting it more fully. Also, PPP has proven to be somewhat more reliable than SLIP in the past, although that may be related to the specific implementations of PPP and SLIP. In general, I believe that PPP is the way to go, if possible. That's why the Internet Starter Kit Installer installs FreePPP by default.

Does that mean that if you have a SLIP account already, you should run out and switch it over to PPP? If everything you want to do with your account works as you expect, definitely not. PPP and SLIP are functionally identical, and all, or almost all, Internet programs should work the same way with either SLIP or PPP accounts. I haven't seen significant performance differences between the two, although PPP occasionally feels a little more responsive for interactive use (as opposed to raw download speed when you're retrieving a file through FTP).

FYI

If you want to switch from SLIP to PPP, you must first switch your account to PPP with your provider. When that's done, throw out MacTCP, MacTCP DNR, MacTCP Prep (it's less likely that you'd be using SLIP with Open Transport, but if so, Open Transport can be easily reconfigured), InterSLIP, and InterSLIP Control (if installed) and restart before installing FreePPP.

PPP

We have licensed the most popular implementation of PPP for the Macintosh, FreePPP, and included it on the CD-ROM with this book. FreePPP is an updated version of a program called MacPPP, which was written by Larry Blunk of Merit Network, Inc., one of the companies that helped run the NSFNET. Commercial competition for FreePPP comes primarily from InterPPP II, a beefed-up version of PPP from InterCon Systems, and from MacSLIP 3.0 from Hyde Park Software. There are a number of other PPP programs out there, but for the most part they come with specific hardware devices and aren't distributed separately.

I concentrate on FreePPP because the other PPP implementations, being commercial, come with printed documentation and support. In addition, FreePPP is free, works

extremely well for most people, and is easy to configure, so it's the best choice for anyone starting out. If you discover that you need the added flexibility of something such as InterPPP II or MacSLIP, feel free to check them out.

PPP Account Questions

If, for whatever reason, you've decided to work with a provider other than one of the Internet Starter Kit Providers, you must configure FreePPP manually. (Flip back to Chapter 2, "Choosing a Connection," for information on how to pick an Internet service provider.) After you decide on an Internet provider, you need certain information from that provider to configure FreePPP. For convenience, I list the most common pieces of information that you need in Table 12.1.

Table 12.1 PPP Information

Item	Question
Phone Number	What number do I call to connect to the server?
Login Name	What is my PPP account login name? This name can be different from your userid or machine name.
Password	What password should I provide when logging in?
Login Procedure	What should I expect to receive from your host machine and how should my Mac respond when logging in?

Although they are less common, there are other variables that you may need to set in FreePPP, and if that's true, your Internet service provider should give you that information. The vast majority of providers work with the default settings.

FreePPP

The free FreePPP, maintained by a nonprofit group called the FreePPP Group, is my dialup connection method of choice. This is mostly because it's free and because of its simple configuration and setup. FreePPP has an interesting history, and if you know where it came from, it might help you avoid some confusion when you see people discussing it on the Internet.

Originally, there was a program called MacPPP. I included MacPPP 2.0.1 with the second and third editions of Internet Starter Kit for Macintosh because it was free, good, and essentially the only game in town. As time passed, though, Merit Networks didn't update MacPPP, and even as I write this, MacPPP 2.0.1 is still the official version of MacPPP from Merit. The source code to MacPPP was freely available, though, and when it became clear

that Merit had no plans to update MacPPP, a number of enterprising programmers made their own modifications. As a result, you might see a number of different versions of MacPPP with a variety of version numbers, some of which have letters in the name to indicate who made the changes as well.

For simplicity's sake, there are only a few versions of MacPPP that you should worry about. Version 2.0.1 is still available and still works with Macs using MacTCP, although not with Open Transport. After version 2.0.1, ignore all version numbers of MacPPP up to version 2.5. Version 2.5 is one that Apple modified for the Apple Internet Connection Kit product. So, other than MacPPP 2.0.1 and MacPPP 2.5 (and later), avoid all the other unofficial and unsupported versions of MacPPP.

FreePPP came out of one of those modifications, MacPPP 2.1SD, written by Steve Dagley. Steve modified MacPPP 2.0.1 to support port speeds higher than 57,600 bps, the previous limit, and when Open Transport came out, he also modified his version of MacPPP to work with Open Transport. Apple licensed his code for the basis of its version of MacPPP, which had to work with Open Transport. Around this time, it seemed that there were a huge number of these unofficial modifications to MacPPP, and Steve managed to get most of them integrated into his version of MacPPP. After discussions with me and others, Steve decided to change the name to FreePPP to reduce the confusion with all the different version numbers.

Thus was born FreePPP, and the FreePPP Group grew out of the group of programmers who donated their code to the effort. All of the other modified versions of MacPPP fell to the wayside other than Apple's, which continues to share code with FreePPP (and today they're still almost identical at a base level, although FreePPP has more features).

Installing FreePPP

Installing FreePPP manually requires using an Install FreePPP installer (also known as the Internet Setup Monkey), which puts all the various parts of FreePPP in the proper places on your hard disk. See Table 12.2 for a list of the parts of FreePPP, where they end up, and what they do.

Table 12.2 Parts of FreePPP

Filename	Location	Used for
FreePPP	Extensions folder	Makes the connection
FreePPP Control Strip	Control Strip Modules folder (optional)	Helps you open and close connections and FreePPP Setup
FreePPP Guide	Extensions folder	Help information for FreePPP
FreePPP Menu Prefs	Preferences folder (optional)	Stores preferences for FreePPP Menu

continues

Table 12.2 Parts of FreePPP

Filename	Location	Used for
FreePPP Setup	FreePPP Folder	Configures your PPP connection
PPP Preferences	Preferences folder	Stores your PPP Preferences
PPPAutoDetectDB	Preferences folder	Stores modem strings for auto-detection
Various Read Me documents	FreePPP Folder	Provide additional information
~FreePPP Menu	Control Panels folder (optional)	Helps you open and close connections and FreePPP Setup

FYI
Once again, the Internet Starter Kit Installer installs FreePPP properly for you. I include these instructions so you know what's happened.

To install FreePPP, double-click the Install FreePPP icon. It launches and displays the main installation window (see Figure 12.2).

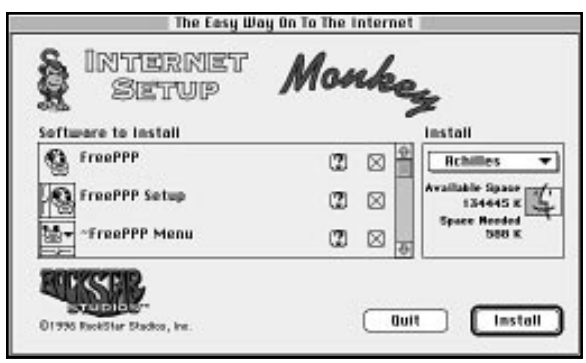


Figure 12.2 Internet Setup Monkey.

You can pick the hard disk to use from the pop-up menu to the right, and you can choose which pieces of FreePPP to install by selecting the checkboxes to the right of each item. Clicking the question mark icon to the right of each item tells you a bit more about that item.

I recommend that you install everything that the Internet Setup Monkey recommends, with the possible exceptions of the FreePPP Menu and the FreePPP Control Strip. The FreePPP Menu puts a menu in your menu bar that enables you to connect and disconnect

quickly and to open FreePPP Setup. It should work for everyone, but it could conflict with other software you run, and it's not necessary. Similarly, if you don't use Apple's Control Strip (most common on PowerBooks), then there's no reason to install the FreePPP Control Strip.

After you've made your installation choices, click the Install button to start the installation process. First, Internet Setup Monkey asks if it can quit all of your running programs. If you have any unsaved work in another program, click the Quit button and save your work before starting the installation process again.

The Internet Setup Monkey is good about not deleting old copies of PPP-related files. Instead, it copies them to a FreePPP Backup folder, so you can always replace the newly installed files with the old ones if you have troubles. At the end of the installation process, the Internet Setup Monkey asks if it can configure TCP/IP (or MacTCP) for you (see Figure 12.3). Since the Internet Setup Monkey saves your current configuration as a backup, go ahead and click the Configure button. If you're at all concerned about losing your current configuration, instead click the Skip FreePPP Configuration button and flip back to Chapter 11, "Open Transport and MacTCP," for information on how to configure them for FreePPP.

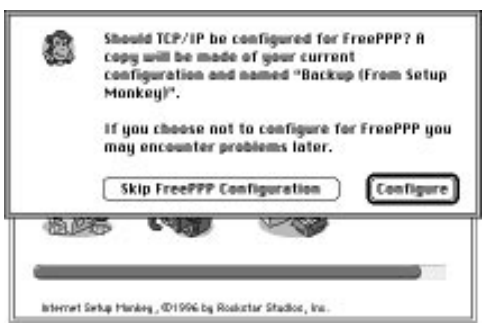


Figure 12.3 Internet Setup Monkey configuration dialog box.

When the Internet Setup Monkey is done, it restarts your Mac. After the Mac comes back up, you'll find a FreePPP Folder at the main level of your hard disk, and, if you had any form of MacPPP or FreePPP installed before, a FreePPP Backup Folder there as well. You can throw out the FreePPP Backup Folder after you've verified that your freshly installed FreePPP works properly.

> **BTW**
> You might want to double-check your settings in Open Transport or MacTCP right now, just to make sure things look right based on what you read in Chapter 11, "Open Transport and MacTCP."

Configuring the FreePPP General Panel

Now it's time to configure FreePPP using FreePPP Setup, which is in your FreePPP folder. You can also launch FreePPP Setup from either the FreePPP menu in the upper-right of your menu bar or from the FreePPP Control Strip, if you have that loaded.

> **BTW**
> If you have trouble opening FreePPP Setup from either the FreePPP Menu or Control Strip, try rebuilding your desktop by pressing the Command and Option keys while you restart your Macintosh.

When the FreePPP Setup window appears, click the triangle on the left side to display the configuration options for the General panel (see Figure 12.4).

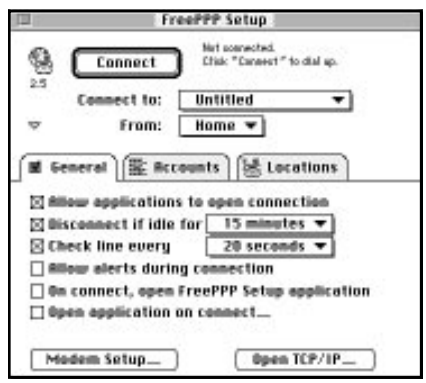


Figure 12.4 FreePPP General configuration.

> **BTW**
> For the purposes of this book, I'll refer to the different sections of FreePPP Setup as "panels," which you switch between by clicking their "tabs."

Although FreePPP is extremely easy to configure and use, it has a lot of options. Bear with me as I explain what they do and why you might want to use them.

The General panel contains options that affect FreePPP without regard for the account you're using or your location. They're the most generalized options in FreePPP's interface.

The Allow applications to open connection checkbox, if checked, enables FreePPP to establish an Internet connection automatically when you run a program such as Internet Explorer. The advantage of this option is that you do not have to establish the connection

manually. The disadvantage is that automatic connection features often don't work reliably with all applications. If it works for you, great. If not, turn it off.

> **FYI**
> If you notice any applications establishing connections when you don't want them doing so (which is more likely to happen with MacTCP than with Open Transport, due to a bug in MacTCP), uncheck this box to prevent all automatic connections.

The Disconnect if idle pop-up menu controls how long FreePPP will wait before disconnecting if you're not using the connection. I recommend you set this to 15 minutes or so—long enough that you won't have your connection hang up while you're reading a long posting in NewsWatcher, for example, but short enough that you're not hogging a modem at your Internet provider's end unnecessarily. I see two tremendous uses for this feature. First, for those people who pay by the minute for their connections, having FreePPP hang up if the line is idle could save you a fair amount of money. Second, if you want to download a large file before you go to bed, simply set FreePPP to a relatively short idle timeout value and it will hang up when it's done downloading the file.

I can't predict how different TCP-based applications will behave if their connection disappears due to the line being idle for five or ten minutes. If you anticipate being in a situation in which FreePPP might hang up after an idle timeout, make sure to save your work in all other open applications. Some applications might even hang your Mac, so be careful.

> **FYI**
> Some people have experienced problems with FreePPP (and the older MacPPP) connecting seemingly randomly. Although most cases are caused by a program such as Anarchie asking for TCP services, it turns out that there is an internal timer in MacTCP that can cause these unwanted connections. Solutions include (in order of elegance) using Open Transport, unchecking the Allow applications to open connection checkbox in FreePPP, setting a short idle time so the connection times out and hangs up automatically, or turning your modem off.

The Check line pop-up menu checks every so often to make sure the connection is actually working. If not, it warns you and asks if you want to reconnect. I recommend you leave this on, but you can set the time to longer than 20 seconds if you want. You'll mainly need this setting if you have a flaky connection.

The Allow alerts during connection checkbox controls whether or not you see alerts come up during the connection phase. I personally hate alert messages during actions I think should take place in the background (as FreePPP's connections do), so I always leave this off. If you want to automate your connection through AppleScript or Frontier, definitely leave this checkbox off.

The next two checkboxes enable you to have FreePPP launch either FreePPP Setup (assuming you've opened the connection from somewhere else) or another application when you connect. If you always want Internet Explorer running when you connect, for instance, you could use the Open application on connect checkbox to do that. If you want multiple applications to launch on connection, you must create an AppleScript applet or use some other utility that does the launching and select it in FreePPP Setup. If you want to learn more about AppleScript, look for a book called *The Tao of AppleScript*, by Derrick Schneider.

Two buttons remain in the General panel. The Open TCP/IP button opens Open Transport's TCP/IP control panel (it switches to Open MacTCP if you're using MacTCP instead of Open Transport). The Modem Setup button brings up another dialog box that helps you configure your modem (see Figure 12.5).

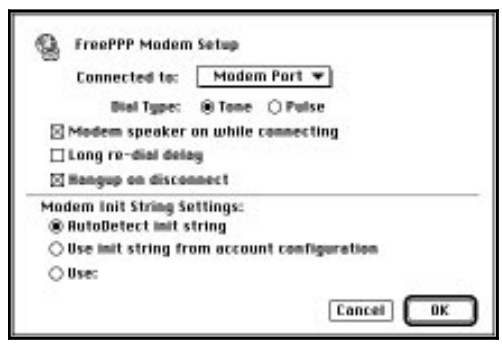


Figure 12.5 FreePPP Modem Setup dialog box.

Working with the modem is usually the hardest part of dealing with an Internet connection, so it's important to get these settings right. FreePPP provides some useful features that should help reduce problems.

The Connected to pop-up menu lists the possible ports where your modem might be connected. The most common are the modem port and the printer port, although you might see some other options here. PowerBooks with only one serial port call it a Printer-Modem Port, and PowerBooks with internal modems may call the port Internal Modem or just Modem (see the FYI below). If you use a PowerBook with a PC Card modem, the name of the PC Card should appear in the Connected to menu. Choose the appropriate port for your modem.

FYI

If you use a PowerBook with an internal modem, the Connected to pop-up menu might confuse you. A few PowerBook modems, including the Apple Express Modem and the Global Village PowerPort/Mercury for the PowerBook 500 series and Duos, are bus modems, and show up in the menu as Internal Modem. Other internal PowerBook modems are nonbus modems and use an internal connection to the Modem port. For these, choose Modem port. Mac AV users may also have a GeoPort option.

The Dial Type radio buttons tell FreePPP whether you're using a tone or pulse telephone line. Tone dialing is far more common than pulse these days.

I recommend you leave the Modem speaker on while connecting checkbox selected, at least while you're getting used to FreePPP and your Internet connection. It ensures that you hear the modem screeching until the connection is made, and can provide valuable troubleshooting information.

Only check the Long re-dial delay checkbox if you are in a country that requires a longer time between dialing attempts. This is not true of the U.S.

Definitely check the Hangup on disconnect checkbox, since without it FreePPP might not hang up the modem when it disconnects from your Internet account. I can't think of any good reason for unchecking this box.

Now we hit a powerful and subtle part of FreePPP Setup. As I said previously, modems are the problem with most Internet connections, and the most problematic part of using modems is finding the right initialization (or init) string. FreePPP 2.5 adds a fabulous new feature that attempts to detect what sort of modem you have and configure it based on a database of modem strings it has. That's what happens if you select the AutoDetect init string radio button.

However, it would be hubris to assume that any program could correctly identify all modems available in the world and configure them properly. To handle that case, the FreePPP Group added the next two radio buttons.

The first one, Use init string from account configuration, helps out if you have multiple Internet accounts that require different modem init strings. Although this is relatively uncommon, you might need to use a slightly different init string with a secondary Internet provider, perhaps because of the type of modems they use. Most people don't need to use this option.

The second radio button, labeled Use, enables you to enter your own modem init string that overrides the init string stored in FreePPP's database of init strings (see Figure 12.6).

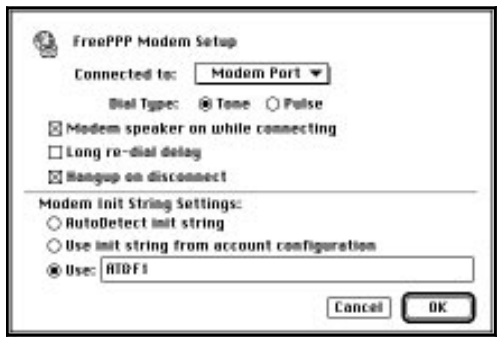


Figure 12.6 FreePPP Modem Setup, using a specific init string.

FreePPP 2.5 hasn't been out long enough for me to determine what percentage of the time it properly auto-detects different types of modems, but I suspect you might need to use this option with stranger types of modems, particularly those sold outside the United States.

You might wonder where you find that modem init string if FreePPP can't auto-detect your modem. The answer is simple: Look in Table 12.3, which contains some modem strings that users have sent me over the years (an updated version of this is available at <http://www.tidbits.com/iskm/modems.html>). If your modem isn't listed there or the string there doesn't work (I don't have most of those modems to test them), then turn to your modem manual. If you can't decipher it sufficiently, call the tech support folks for the company that makes your modem. You can also ask on the Internet, but I'd recommend the official methods first since they're more likely to work.

> **BTW**
> In general, stick with short modem init strings that use factory default settings (something such as AT&F1). I distrust long, complicated init strings because they're hard to decode and understand.

Table 12.3 Modem Init Strings

Modem	Init String
Aceex	
Aceex 1414 v.32bis	AT&F&D0\N3\Q3
Apple	*http://www.apple.com/*
Apple Express Modem	AT&F&Q5

Modem	Init String
AT&T	***http://www.att.com/***
AT&T DataPort 14.4	AT\N7%C1&C1&D0\Q3
Best Data	***http://www.bestdata.com/***
Best Data Smart One 14.4	AT&Q5%C1&C1&D0&K0
Boca Research	***http://www.boca.org/***
Boca 14.4Kbps v.32bis	AT&F&C1\N3
Boca Research V.32bis	AT&Q5%C1&C1&D0&K3
Cardinal	
Cardinal 14.4	AT&F&C1&D0&Q5
Compudyne	
Compudyne 1442F	AT&F&C1
CPC	
CPC Turbo Modem+	AT\N6%C1&C1&D0\Q3\V1
CPV	
CPV Delta 14.14	AT&F4X3
Data Race	
Data Race Apex V.32/V.32bis	AT\N7%C1&C1&D0\Q3
Data Race APL 1496	AT\N7%C1&C1&D0\Q3
Digicom	
Digicom Eagle 9600/Scout Plus	AT&F&D0
Dynalink (aka Telix and CMS?)	
Dynalink 1428vqe	AT&F&KS95=3&S1\N5%C3%E0L
Focus	
Focus 14.4	AT&Q5%C1&C1&D0&K3S36=7

continues

Table 12.3 Continued

Modem	Init String
Global Village	*http://www.globalcenter.net/*
Global Village PowerPort Gold/Silver	AT&F\J0\Q3\N7%C1\V2W1
Global Village PowerPort Mercury (100 series)	AT&F1
Global Village PowerPort Mercury (200/500 series)	AT&F
Global Village PowerPort Mercury (200/500 series)	AT&F%C0\N0
Global Village TelePort Bronze	AT&F
Global Village TelePort Gold II	AT&F1&K3
Global Village TelePort Mercury	AT&F1&K3
Global Village TelePort Silver	AT\J0\N3%C1&C1&D0\Q3\V1
Global Village TelePort Silver/ Gold/Mercury	AT&F1
Global Village TelePort Platinum	AT&F1W1S95=44
GVC Technologies	*support@gvc.com*
GVC FAX 14400 V.42bis/MNP5	AT&F2&D0
GVC Fax 144	AT\N6%C1X4&C1&D0\G0\J0\Q3\V1
Hayes	*http://www.hayes.com/*
Hayes Accura 144	AT&F
Hayes Accura 28.8	AT&F
Hayes Optima 14400 v.32bis	AT&F&D0
Hayes V-Series/Ultra	AT&Q5S36=7&C1&D0&K3
Hayes Optima 288	AT&F&k3L1M0S7=90S9=16S10=36
Intel	*http://www.intel.com/*
Intel 14.4 EX	AT&F&D0
Intel 14.4EX	AT\N3%C1&C1&D0\Q3
Intel 96EX	AT\N3%C1&C1&D0\Q3

Modem	Init String
MacWarehouse	
Line Link 14.4 E	AT&F&C1
PowerUser 14.4E	AT&F&C1
Fast Mac V.34	AT&F1
Macronix	
Macronix	ATS36=7&Q5%C1&C1&D0&K3
Macronix Maxlite 14.4	AT&F&C1&Q9\N3
Magic	
Magic 14.4 V.32bis	AT&F&C1
Magnum	
Magnum 144	AT&F1&K3
Magnum 288	AT&FE0&C1&D0
Megahertz	*http://www.megahertz.com/*
Megahertz 14400/P2144	AT&F&C1&D0
MegaHertz V.32bis	ATS36=7&Q5%C1&C1&D0&K3
Microcom	*http://www.microcom.com/*
Microcom Desk Porte/QX/4232 bis	AT&F&D0
Microcom QX/V.32c	AT\Q5%C3&C1&D0\J0\Q3
Microcom v.34 (to TeleBlazer V.34)	ATZ&C1&D2+MS=11%E1
Multi-Tech	*http://www.multitech.com/*
Multitech MT 932 Series	AT&F&D0&E4
Multitech MT1432 Series	AT&F&D0&Q1&E11
Multitech MT1432 ZDX	AT&F&D0
Multitech MT2834ZDX	AT&F0
Multitech MT2834ZDX	AT&D0&E4&E6
MultiTech MultiModem 224E/V.32	AT&E1&E15&C1&D0&E4$BA0

continues

Table 12.3 Continued

Modem	Init String
Netcomm (Australia)	*http://www.netcomm.com.au/*
Netcomm Roadster 28.8	AT&F%E2&C1&D2S0=0S7=60-K0
Practical Peripherals	*http://www.practinet.com/*
Practical Peripherals 14400FXMT	AT&F&C1
Practical Peripherals 14400FXSA	AT&F&C1N0
Practical Peripherals 28.8 V.FAST	AT&K3&D0&C1
Practical Peripherals 9600SA/14400SA	ATS36=7&Q5&C1&D&K3
Practical Peripherals MC288MT II v.34	AT&F3
Practical Peripherals MC288LCD v.34	AT&F3
Prometheus	
Prometheus Pro Modem Ultima	AT&F&D0
Prometheus Pro Modem 144e	AT&F&C1&D0&K3
Prometheus Ultima/Home Office	AT\N3%C1&C1&D0\J0\V1\Q3
Prometheus V.32/V.32bis	AT&C1&D0*E1*F3*S1
Prometheus CyberPort 28.8 v.34	AT&F&C1
PSI	
PSI Comstation V	AT&F
PSI PowerModem II/IV	AT&F
Quicktel	
Quicktel Xeba 14.4	AT&F&C1
Quicktel 2814XVR 28.8	AT&F&C1&D2S7=90S10=60S95=1
Racal	*http://www.racal.com/*
Racal ALM 3223	AT&F&D0
Racal ALM 3226 V.32bis	AT&F&C1
SpectraCom	
Spectra Pocket Modem 14.4	AT&F
SpectraCom V.32bis PocketFax	AT&Q3S36=7%C1&C1&D0&K3

Modem	Init String
Supra	*http://www.supra.com/*
Supra 14.4 LC	AT&F1
Supra 2400 V.42bis	AT&Q5S36=7%C1&C1&D0&K3
SupraFAXModem v.32bis	AT&F1
SupraFAXModem 288	AT&F1
SupraFAXModem 288	AT&F1%C0
Telebit	*http://www.telebit.com/*
Telebit QBlazer	AT&FS58=2S180=1S190=0
Telebit QBlazer/T3000	ATS180=2S190=1S51=252S58=2S68=2
Telebit T1600	AT&F9
Telebit WorldBlazer	AT&F9X2
UDS	
UDS FasTalk Fax32bx/V.3225	AT\N3%C1&C1&D0\G0\J0\V1\Q3
UDS Fastalk V.32 bx	AT&F&C1\N3\Q3
UDS Motorola V.3225L/V.3229L	AT&F&C1\Q3
USRobotics	*http://www.usr.com/*
USRobotics	AT&M4&K1B0&A3&B1&D0&H1&I0&N0&R2
USRobotics Courier HST Dual	AT&F&C1&D0
USRobotics Courier V.32 bis/as	AT&F&D0&H1&K2
USRobotics Courier Dual Standard v.34USRobotics Mac & Fax	AT&F&D0&H1
USRobotics Mac & Fax	AT&D0&F1&H1&K2&M5
USRobotics Sportster 14.4	AT&F1&H1&C1&D0X4
USRobotics Sportster 28.8	AT&F1
USRobotics Sportster 9600	AT&F&H1
USRobotics Sportster V.34	AT&F&A3&B1&H1&R2&D0&C1X4S7=90
USRobotics Sportster V.34	AT&F0&A3&B1&H1&K3&R2&S1X4S40=2

continues

Table 12.3 Continued

Modem	Init String
Viking	
Viking PCMCIA modem with PowerBook 5300c	AT&F&C1&D2S7=55S37=17
Viva	
Viva 14.4	AT&F&C1
Wang	
Wang 14.4	AT&F&C1&D0
Zoltrix	
Zoltrix 14.4	AT&F&C1&D0
Zoom	*http://www.zoomtel.com/*
Zoom 14.4 V.32/V.32 bis	AT&F&C1
Zoom 2400 v.42bis	AT&Q5%C1W1&C1&D0S36=7&K3
Zoom V.32/V.32bis	AT&Q5S36=7%C1&C1&D0&K3
Zoom VFX 14.4 V.32bis	AT&F&C1&D3&K3&Q5%C3\N3S7 =60S36=7S46=138
Zyxel	*http://www.zyxel.com/*
Zyxel U-1496	AT&F&D0
Zyxel V.32bis	AT&C1&D0&H3&K4&N0

When you're done with FreePPP Setup's Modem Setup dialog box, click the OK button to save your changes.

Configuring the FreePPP Accounts Panel

That's it with the General panel, so click the Accounts tab to switch over to the Accounts panel. In this panel you can create multiple accounts. You might work with two different Internet providers, for instance, or perhaps you and a roommate share the same computer but use different accounts. Either way, the Accounts panel enables you to work with multiple accounts—you can edit existing accounts by selecting them and clicking the Edit button, create new accounts by clicking the New button, duplicate existing accounts by selecting them and clicking the Duplicate button, and finally delete accounts by selecting

them and clicking the Delete button. You'll notice that whichever account you have selected appears in the Connect to pop-up menu above the three tabs (see Figure 12.7). You can switch between accounts either by choosing the appropriate account from the Connect to pop-up menu or by selecting it in the list of accounts.

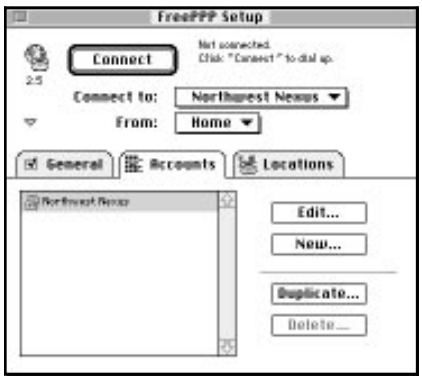


Figure 12.7 FreePPP Accounts panel.

Clicking either the New button or the Edit button opens the Accounts Setup dialog box, which has three tabs for Account, Connection, and Options (see Figure 12.8).

FYI

One good use for multiple accounts is using one account for home and another for when you travel, if you use a PowerBook to connect to the Internet, since the dialing options are likely to be different away from home.

Figure 12.8 FreePPP Accounts Setup dialog box.

Type anything you want in the Server name field—it's purely for your use.

In the Phone number field, enter the phone number you must dial to connect to your Internet provider, including the area code in parentheses. FreePPP Setup is picky about the parenthesis. FreePPP will not dial the area code unless you check the Dial area code box—the area code is used by the Locations Setup dialog box. Also, if you must dial long distance, make sure to check the Dial as long distance checkbox. FreePPP Setup uses these two checkboxes to determine how to form the phone number, in conjunction with the Locations Setup dialog box I'll get to shortly.

FYI
If you need to make the modem pause during dialing, perhaps to get out of a hotel phone system, enter one or more commas to add two-second pauses.

Skip down to the User name and Password fields and enter your username and password in them, noting that your password doesn't appear as readable text. Now, if your provider said that they support either PAP (Password Authentication Protocol) or CHAP (Challenge Handshaking Authentication Protocol) when you asked what you had to do to log in back in Table 12.1, leave the Connect pop-up menu set to Directly. That's the best situation, if your provider supports PAP or CHAP, which is becoming more common.

The Connect pop-up menu has four settings: Directly, Using Connection Script, Using Terminal Window, and Manually. As you go down the menu, the method of connecting becomes less and less automated. The Directly setting tells FreePPP to use PAP or CHAP and requires you enter only your username and password. The Using Connection Script setting tells FreePPP to use a connection script you set up—this is probably the most common setting and will be covered in more detail later.

BTW
In some situations, FreePPP's terminal window doesn't show on-screen what you type, but the characters will be sent when you press Return.

The Manually and Using Terminal Window settings are similar because they require you to do some of the work of making the connection. Thus, they're primarily useful when you're troubleshooting a connection because they let you see what's going on. The difference between them is that the Manually setting requires you to initialize and dial your modem manually (it's not hard, but it requires that you know some basic modem commands), whereas the Using Terminal Window setting does the modem initialization and dialing for you but requires you to manually enter your username and password (see Figure 12.9).

FYI
I strongly recommend that you use FreePPP's terminal window if you're having trouble getting connected because it often reveals problems on the provider's end (such as it didn't set up a PPP account for you) and eliminates any mistakes you might have made in the connect script.

Figure 12.9 FreePPP terminal window.

If you use the terminal window, after you enter your username and password, PPP generally starts up. If that's true, the Autodetect PPP Startup checkbox makes FreePPP look for the start of the PPP session and close the terminal window after it does start. If, for some reason, auto-detecting the start of the PPP session fails, uncheck that box and click the Start PPP button after you see some gibberish characters. If you do something wrong and want to stop the connection process, click the Exit button.

Let's step back briefly to the Using Connection Script setting, since I suspect most people will end up using it in favor of the Directly setting (and it's a lot easier than logging in manually each time). Click the Edit connection script button to bring up the Connection Script dialog box (see Figure 12.10).

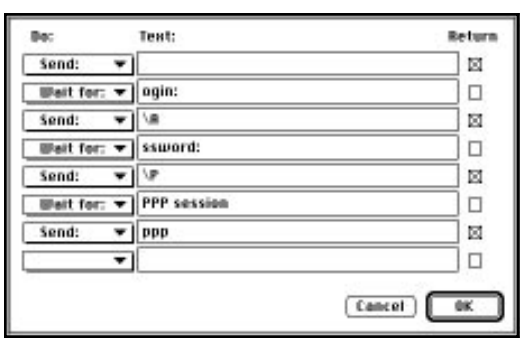


Figure 12.10 FreePPP Connection Script dialog box.

In the Connection Script dialog box you replicate the process of logging into your host manually (the terminal window can be helpful in figuring out the connection script). You select the Send menu item in the Do column to indicate that FreePPP should send the contents of the Text field to the right (along with a carriage return if the Return checkbox is selected for that line). Alternately, you can select the Wait for menu item to indicate

that FreePPP should wait for the string specified in the Text field to appear before moving on to the next line. You can also set the pop-up menus to be empty, at which point they do nothing.

My connect script in Figure 12.10 says, when translated: "Send a carriage return as soon as you're connected. Then wait for the string 'ogin:' to appear, and after you've seen it, send the username 'Ptidbits' and a carriage return. Wait for the string 'word:' to appear, and then send the password and a carriage return. Wait for the string 'PPP session' and then start PPP." As you might have guessed, the "\A" and "\P" are special commands that stand in for my username and password. They enable me to keep my password secret, which might be important if lots of people have access to my Mac and thus to my connection script. The final "ppp" is another special command that starts the PPP session—although the FreePPP Guide claims erroneously that the "ppp" command is necessary, it's a still good idea to use it if you get messages such as "Starting PPP" from the PPP server, or if the server takes a long time to start PPP, as CompuServe does.

> **BTW**
> The words "login" and "password" often have their first letter or letters removed in scripts such as this because you never know whether or not the first letter will be capitalized.

Table 12.4 contains a list of the special commands you can use in your connection script. Read the section on creating connection scripts in the FreePPP Help (available from the Help menu to the left of the Application menu in the menu bar) for more information about these commands and their limitations.

Table 12.4 Script Commands

Command	Function
\d	Waits for a few seconds.
\r	Equivalent to pressing Return or checking the Return checkbox.
\A	Prompts you for a username or uses the contents of the User name field.
\P	Prompts you for a password or uses the contents of the Password field.
ppp	Starts the PPP session.

One nice touch in FreePPP is it assumes you want to alternate Send and Wait for lines, so if you type the items you want in each line, FreePPP selects the proper menu item for you in most cases, and if it's a Send line, also checks the Return checkbox at the right to send a Return after sending the line. When you're done creating your connection script (and it very well might look different from mine—ask your Internet provider if you can't figure it out with the terminal window), click the OK button to save your changes.

BTW
If you're unlucky, connecting to your PPP server will require more than the eight fields FreePPP provides here. In that case, if your server doesn't support PAP or CHAP, your only option may be to use InterPPP II or MacSLIP 3.0. That's not entirely true, since you can do some funky scripting within FreePPP by using \r (which sends a Return to the host), and \d (which forces a short delay). The trick when creating such a hacked script is to use delays instead of the Wait for menu items, thus enabling you to cram more functional script lines into the same space.

That's all there is to the Accounts Setup panel; now click the Connection panel. There are only two options here (a modem initialization string field appears if you selected Use init string from account configuration back in the Modem Setup dialog box). You can set your Port Speed and your Flow Control (see Figure 12.11).

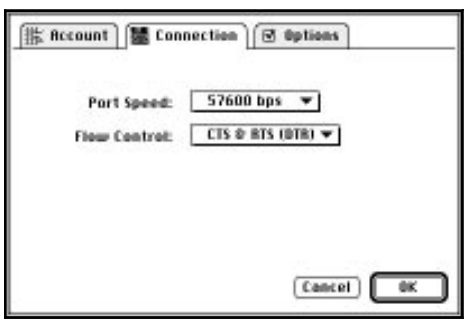


Figure 12.11 FreePPP Connection panel.

Set the Port Speed pop-up menu to 57,600 bps if it will work with your modem, and always try to use a port speed faster than your modem, so it can take advantage of the modem's compression capabilities. There is no point in setting the port speed higher than 57,600 if you use a modem—the fastest modem cannot realistically achieve that kind of throughput. If you have an ISDN connection, you will want to select one of the higher speeds.

The Port Speed pop-menu controls the speed at which the Mac and the modem communicate, not the speed at which the two modems communicate (unless it happens to be slower than the fastest speed the modems have in common, at which point it forces the modems to communicate at that speed).

BTW
Port speed is irrelevant if you use a bus modem, since it doesn't use the modem port.

Flow control, sometimes called handshaking, is one of the most confusing topics in telecommunications on the Macintosh. The basic idea is that the flow of the incoming and outgoing packets must be organized and controlled or else you experience the packet equivalent of traffic jams and accidents. Handshaking can be done in software or hardware, but software handshaking, also called XON/XOFF, doesn't work for high-speed connections. One important point: If you enter your own modem init string into FreePPP, make sure it turns XON/XOFF off, or your connection almost certainly won't work.

For a modem to do handshaking in hardware, you need a special cable (luckily, one comes with most fast modems sold for Macs, although every now and then someone has trouble because he or she uses an old cable).

The Flow Control pop-up menu has options for None, CTS only, RTS (DTR) only, and CTS & RTS (DTR). I recommend that you try setting CTS & RTS (DTR) as the first try. If you experience random hangups when a lot of data is coming in, try dropping down to CTS only. I don't recommend you try None or RTS (DTR) only.

FYI

Internal PowerBook bus modems can have the Flow Control pop-up menu set to None; all other modems must use some sort of flow control.

Let's move on to the Options Setup panel—click the Options tab to display it (see Figure 12.12). As you can see, there's not a lot to do here, and most people can ignore it entirely.

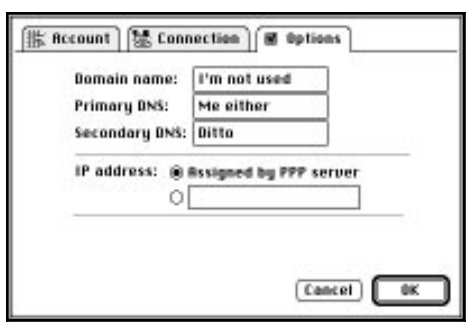


Figure 12.12 FreePPP Options panel.

The only people who need to use the Options panel are those who have a static IP address, and even if you do, chances are good that you won't need to enter your IP address in the IP address field. The reason is that FreePPP is generally able to pick up your IP address from the server, even if it's the same each time you connect. If you have a static-addressed account and have troubles connecting, try entering your IP number here. That's it, so click the OK button to save your changes.

Configuring the FreePPP Locations Panel

Back in the main FreePPP Setup window, click the Locations tab for the final bout of configuration (see Figure 12.13). The Locations panel contains configuration options that make it easier to connect to the Internet using FreePPP from a number of different locations. You might, for instance, use a PowerBook and connect to your Internet provider at both home and work. At work you may need to dial 9 before you can get out of the phone system, and FreePPP's Locations panel can help.

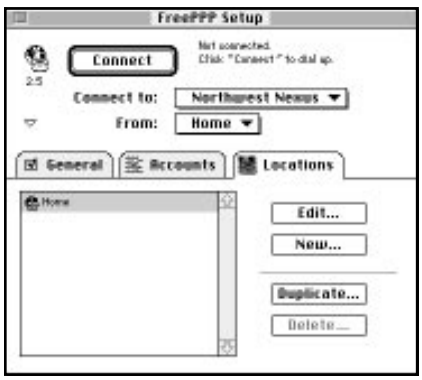


Figure 12.13 FreePPP Locations panel.

The Edit, New, Duplicate, and Delete buttons work just as they did in the Accounts panel, and the selected location appears in the From pop-up menu above the Locations panel, just as the selected account appeared in the Connect to pop-up menu. Click the Edit or New buttons to bring up the Locations Setup dialog box (see Figure 12.14).

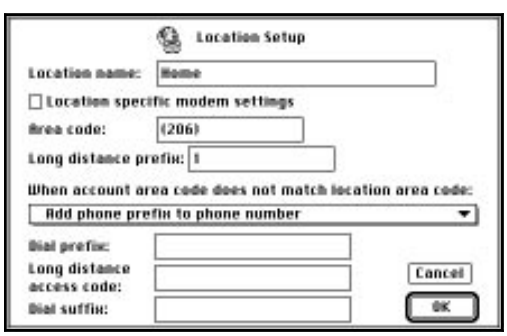


Figure 12.14 FreePPP Location Setup dialog box.

Give your location a name by entering it in the Location name field. You cannot have two locations with the same name, and it's a good idea to be descriptive here.

If you check the Location specific modem settings checkbox, an Edit modem settings button appears to the right of the checkbox. Clicking that button brings up a dialog box that enables you to override any modem setting at all. I doubt this will be a common thing for people to want to do, but if you need that capability, it's there.

Next, enter the area code for this location in the Area code field. Make sure to enclose it in parentheses—FreePPP Setup is adamant about that formatting. The long distance prefix field should contain 1 for most people, as it does for me, but you can enter up to 15 digits in this field if dialing long distance is more complicated for you. These two fields are used by the Dial area code and Dial long distance checkboxes in the Accounts Setup panel.

Now we get into the esoteric phone settings. The pop-up menu under the Long distance prefix field has three settings, each with a different use. Pay close attention because this stuff is hard, and keep in mind that when the menu says "phone prefix," it means "the contents of the Long distance prefix field."

- The first setting can be read as "When the area code listed in the account phone number field does not match the area code for the current location, do nothing." No special modification of the phone number will take place.
- The second setting (selected in Figure 12.14) can be read as "When the area code listed in the account phone number field does not match the area code for the current location, add the long distance prefix to the account phone number."
- The third setting can be read as "When the area code listed in the account phone number field does not match the area code for the current location, remove the area code from the account phone number and add the long distance prefix to the account phone number."

Assume that I travel to San Francisco, which is the 415 area code. I switch to my San Francisco location in the Locations panel, but I still want to connect to Northwest Nexus back in Seattle, which is the 206 area code. Since the account area code and the location area code don't match, the first setting would just dial the phone number I have entered in the Account Setup panel for Northwest Nexus. It probably wouldn't work, because it would dial 455-8455.

The second setting should work because it would see that the two area codes are different and would add the contents of the Long distance prefix field to the phone number for Northwest Nexus. It dials 1(206) 455-8455 (see Figure 12.15 for the settings).

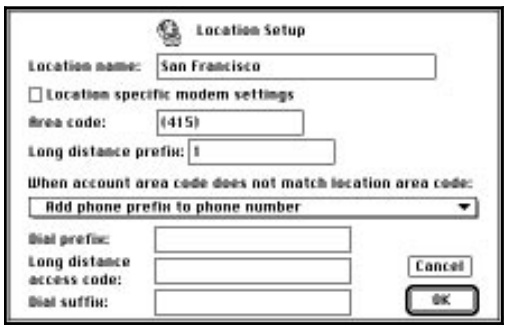


Figure 12.15 FreePPP Locations Setup dialog box, set for San Francisco.

To be honest, I can't imagine the situation in which you'd need the third option, but given the ever-increasing complexity of the telephone systems we're getting these days, I'm sure someone must have needed it or the FreePPP Group wouldn't have included it.

After that powerful but confusing pop-up menu, we see three more fields, Dial prefix, Long distance access code, and Dial suffix. You use these three fields to form the long sequences of numbers you dial when using a calling card to dial out from a hotel, for instance. In this situation, you might need to dial 8 to get out of the hotel's phone system, dial a calling card number, the actual phone number, and then some kind of a suffix. These fields can be configured in a variety of ways, which means you may need to experiment a bit with your specific situation.

When you're done setting the options in the Location Setup dialog box, click OK to save your changes. After you've done that, you're completely done configuring FreePPP.

Basic Usage

After you've configured FreePPP Setup properly, using FreePPP is a piece of cake. You can establish an Internet connection in one of four ways using the parts of the FreePPP package:

- You can launch an Internet application to create an automatic connection.
- You can click the Connect button in FreePPP Setup to connect manually.
- You can choose Open PPP Connection from the FreePPP menu (it looks like a phone) in the menu bar.
- You can select Open PPP Connection from the FreePPP Control Strip in the Control Strip.

FYI

Be careful of the auto-connect mode. If you do something such as put Netscape Navigator in your Startup Items folder, it will launch on every startup and make FreePPP establish a connection to the Internet. Certain control panels or extensions also can also activate the auto-connect feature.

No matter what you do, FreePPP dials the modem and establishes your Internet connection (see Figure 12.16 for the Connection Status dialog box). FreePPP runs through a set of status messages, some of which flash by quickly. If you experience trouble at any given step, try to remember where you had the trouble when you switch to the terminal window for troubleshooting.

Figure 12.16 FreePPP Connection Status dialog box.

If you open the connection from FreePPP Setup, or open FreePPP Setup after connecting, you see that the Connect button has changed to Disconnect, and FreePPP is tracking how long you've been on (see Figure 12.17).

Figure 12.17 FreePPP Setup when connected.

There are only two things you can do in FreePPP Setup when you have a connection established (other than change configuration settings). You can click the Disconnect button to drop the connection (choosing Close PPP Connection from either the FreePPP Menu or the FreePPP Control Strip has the same effect). It's a good idea to quit all Internet applications other than Eudora before you drop the connection—some applications don't like having the connection pulled out from under their little electronic feet.

More interestingly, you can choose Information from the File menu, which displays a small information window with your IP number, the Server's address, the current throughput in bits per second, and the best throughput in bits per second (see Figure 12.18). If you click the More Details button, a large and ugly dialog appears with gobs of technical information.

Figure 12.18 FreePPP Setup Information window and dialog box.

The small FreePPP Setup Information window is quite neat because it can tell you if your connection is proceeding at a reasonable pace, even in applications such as Eudora that don't give you any indication of throughput (Anarchie, Fetch, and Netscape Navigator do).

Evaluation and Details

My only real quibble with FreePPP is that it almost has too many features—for someone who doesn't travel and uses only a single Internet provider, much of FreePPP's flexibility is wasted. Overall, though, I find FreePPP to be an excellent program.

FreePPP 2.5 is the current version of FreePPP, and it's free for anyone to use and to give away, although you cannot redistribute it as part of a commercial package without permission. See the For Distribution document for details. If you wish to pay for FreePPP, the FreePPP Group asks that you donate money to one of a number of charities listed in the Read Me file.

The FreePPP Group deserves kudos for making such a fine program available to the Macintosh Internet community for free. The best place to ask FreePPP questions is on a mailing list such as the Apple Internet Users mailing list (send a message containing the

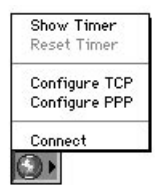
command **info mac-communications** to `listproc@solutions.apple.com` for information on how to subscribe) or in a newsgroup such as `comp.sys.mac.comm`. You can retrieve the latest version of FreePPP on the Internet from either `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/conn/>` or from its Web page at `<http:/www.rockstar.com/ppp.shtml>`.

FreePPP and MacPPP Add-Ons

There were a number of useful little add-ons to MacPPP that made life easier for MacPPP users. Some simplified the process of connecting and disconnecting. Others helped you track how much time you spent online, an important feature if you're paying by the minute or for a long-distance call. However, as you've no doubt realized by this time, FreePPP 2.5 includes a timer in FreePPP Setup, and the FreePPP Menu and FreePPP Control Strip make connecting and disconnecting quite easy. Because of this, many of the old MacPPP add-ons have no more purpose in life. Most of the following programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/conn/>`, and I've also listed Web pages where available. Check this FTP directory for yet more PPP add-on programs—since FreePPP 2.5 just came out, more are sure to appear.

Control PPP

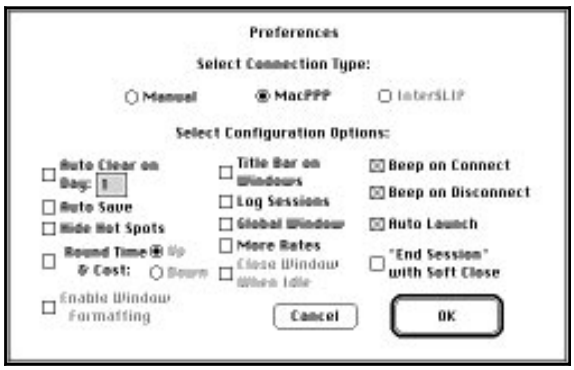
This postcardware utility from Richard Buckle primarily makes it easier for MacPPP and FreePPP users to connect and disconnect. Control PPP is a Control Strip module that enables you to connect and disconnect from the Control Strip, as well as open MacTCP or Open Transport and MacPPP or FreePPP. It also indicates if PPP is open or not, which is handy for PowerBook users with internal modems. Although written for Control Strip, Control PPP also works with some limitations with Desktop Strip, which runs most Control Strip modules, and probably with a similar commercial utility called DragStrip.



Internet Logger

Eric Preston's $15 shareware Internet Logger 2.0 helps you track how long you've spent on tasks, specifically how long you spend on your Internet accounts. Internet Logger can handle complex session rate structures for bill purposes, and it helps you estimate costs by day or month. Internet Logger provides automatic connections

through PPP or SLIP, or you can use it as a manual timer. If counting up isn't what you need, Internet Logger can also count down, which could be useful for prepaid hours or staying within a limited set of hours each month. If you have multiple Internet providers, each can have its own log file, and you can have multiple timers as well.



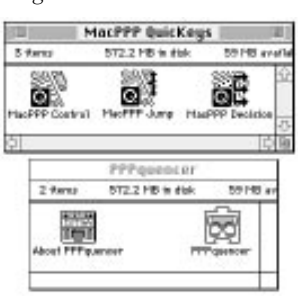
MacPPP Control

`http://www.scriptweb.com/scriptweb/osaxen/macppp_control.html`

MacPPP Control 1.5b2 from Mark Alldritt is an AppleScript Addition that enables you to perform limited AppleScript scripting on MacPPP and FreePPP. You can open and close the MacPPP connection and test whether or not the connection is open or closed. MacPPP Control comes with two sample scripts that I used for a long time to connect and disconnect. If you do much with AppleScript and use a PPP connection, you should definitely check out MacPPP Control.

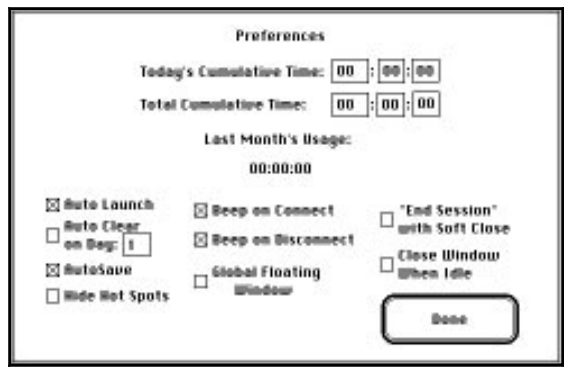
MacPPP QuicKeys and PPPquencer

Richard Buckle's postcardware MacPPP QuicKeys 3.1 and PPPquencer are extensions to CE Software's QuicKeys macro utility and to the shareware macro utility KeyQuencer. These extensions help QuicKeys and MacPPP or FreePPP communicate, enabling you to control PPP from within QuicKeys or KeyQuencer. They enable you to open and close MacPPP or FreePPP, choosing a hard or a soft close when you close MacPPP, trigger other macros based on whether or not PPP is open or closed, and finally jump a specified number of steps forward or backward in a QuicKeys sequence macro. If you use QuicKeys or KeyQuencer and PPP, you might want to check out these extensions.



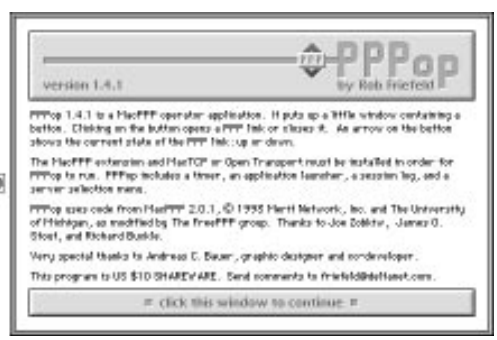
MacPPP Timer

MacPPP Timer 1.5.2 is a $10 shareware utility from Eric Preston that helps you keep track of how much time you spend connected to your PPP account. MacPPP Timer is similar to Eric's Internet Logger, but slightly cheaper and dedicated to working with MacPPP (and FreePPP in future versions). You must launch it manually, but because you can open a MacPPP session from within MacPPP Timer, that's not a serious hardship. Once active, MacPPP Timer automatically displays the amount of time you're connected for that session and for a cumulative amount of time.



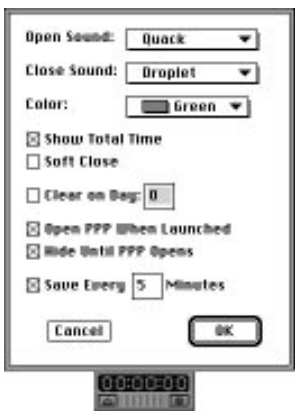
PPPop

Rob Friefeld's $10 shareware PPPop 1.4.1 is a small application that serves as a front end to MacPPP and FreePPP. Like other utilities for controlling MacPPP and FreePPP, PPPop enables you to connect or disconnect, open all of the related control panels, and see the status of your connection at a glance. PPPop includes a timer, can launch other applications on connection, enables you to switch between different Internet providers, and plays sounds when the connection is opened and closed (and you can customize the sounds—a fabulous opportunity for April Fools jokes!).



PPPremier Timer

Nathan Lamont's free PPPremier Timer 1.2.1 works along the same lines as Internet Logger and MacPPP Timer. It enables you to open and close your PPP connection quickly and easily (and you can override automatic connections and disconnections by pressing Option while launching or quitting), and in the process keeps track of how much time you spend online. PPPremier Timer tries to remain simple otherwise, offering a good interface and the capability of playing a sound when PPP opens or closes, but not much else.



Other PPP Software

Although I recommend that you start with FreePPP, especially since it is included on the Internet Starter Kit CD-ROM, there are several other implementations of PPP that might interest you for one reason or another. You don't need investigate these programs if FreePPP works for you, as it does for most people.

InterPPP II

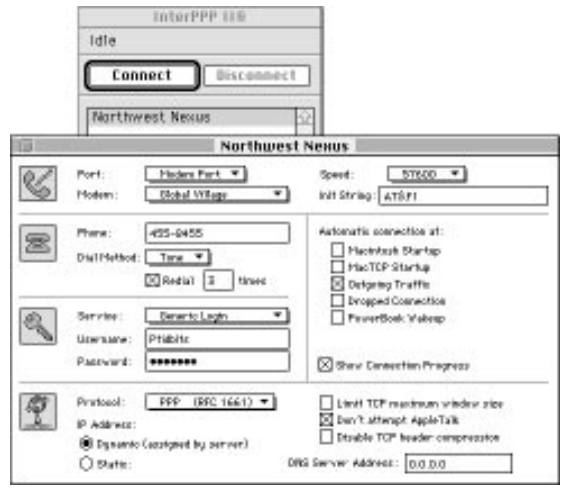
`http://www.intercon.com/products/interppp2.html`

InterCon's InterPPP II 1.1.3 is one of the most well-known of the commercial PPP clients. InterPPP's main advantage over the current version of FreePPP is that it can carry AppleTalk over the PPP connection. Of course, your host machine must speak AppleTalk as well as TCP/IP and make useful AppleTalk services available for this to be of any use. In contrast to FreePPP's many panels and dialog boxes, you configure almost all of InterPPP from a single dialog box, which is great, although it doesn't offer as much flexibility. InterPPP has its own flexibility, which it obtains by supporting dialing and connection scripts written in Connection Control Language (CCL), a standard but obtuse scripting language. InterPPP II also supports SLIP. You can download a fully functional demo

continues

InterPPP II, *continued*

of InterPPP II from the Web page above, although you must request a demo key that enables the software for a few weeks. For more information, send email to `sales@intercon.com`.



MacPPP 2.5

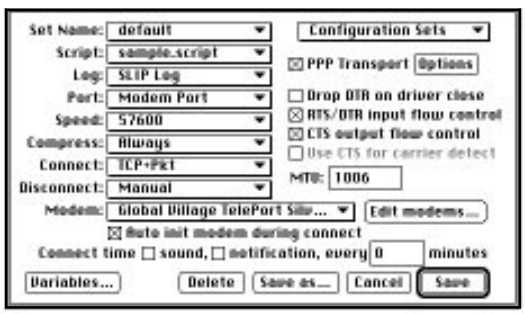
`http://cybertech.apple.com/AICK.html`

Apple's MacPPP 2.5 shares the basic functionality of FreePPP since it's based on the same code. Originally, the only way you could get MacPPP from Apple was if you bought the Apple Internet Connection Kit. However, when Apple updated MacPPP to version 2.5, it released the update on the Internet and didn't restrict it to owners of the Apple Internet Connection Kit. In other words, anyone can download MacPPP 2.5 from Apple's FTP sites and use it, but unless you own the Apple Internet Connection Kit, Apple won't help you with any problems you may encounter. Frankly, I can't see any reason that you should bother with MacPPP 2.5 when FreePPP has the same basic code. MacPPP's interface is almost identical to the original MacPPP 2.0.1, and it lacks many of FreePPP's great features.

MacSLIP

`http://www.zilker.net/~hydepark/`

The $49.95 MacSLIP is written by Rick Watson of Hyde Park Software and is marketed by TriSoft. MacSLIP started as a SLIP-only program, but in version 3.0 it added support for PPP. MacSLIP consists of a control panel and a MacSLIP extension. It sports an automatic connection feature, ships with a number of modem initialization strings, can notify you of your connection time, and displays statistics about the IP address, connect time, and serial line from within the control panel. My main complaint about MacSLIP is that the scripting language used to connect to your host—although full-featured and powerful—is not the sort of thing a novice wants to mess with. Conversely, for an accomplished scripter, MacSLIP's scripting language might be just what you've always wanted. You can get more information about MacSLIP from `info@hydepark.com`, and you can contact TriSoft at `trisoft@bga.com` or 800/531-5170, 512/472-0744, or 512/473-2122 (fax).



Simple PPP

`http://www.animats.com/simpleppp/simpleppp.html`

John Nagle's Simple PPP 1.4.5 attempts to live up to its name and provide a simple PPP solution that's also completely free. The current version, which is a very early release, works only with MacTCP, but I'm sure that will have changed by the time you read this. Simple PPP's feature set includes automatic redial, automatic reconnect (even picking up dropped transfers!), faster performance, useful diagnostics, and a fix for the MacTCP "ghost dialing" problem. Early reports from users seem quite positive, which bodes well for Simple PPP becoming another free alternative for users who find FreePPP's feature set to be overkill.

SonicPPP

`http://www.sonicsys.com/sonicppp.html`

SonicPPP 1.2, from Sonic Systems, is a simple PPP client that Sonic Systems is releasing for free to help demo the company's hardware PPP server. SonicPPP is composed of a control panel and an extension, and works with PPP servers that support PAP and CHAP, as well as those that require connection scripts. The only configuration you can make to SonicPPP right now is through the Apple Modem Tool, which handles the dialing for SonicPPP. SonicPPP does support AppleTalk over PPP, which isn't surprising given Sonic's experience in the AppleTalk networking market.

SLIP

Although I recommend PPP over SLIP, in practice the two methods of connecting to the Internet work almost identically. Performance is similar, and after SLIP or PPP is set up, ease of use is equally similar. If you don't have access to a PPP account, there's nothing wrong with using InterSLIP or one of the other implementations of SLIP and a SLIP account.

> **BTW**
> You may also hear about CSLIP accounts. CSLIP stands for Compressed SLIP, and it's handled by an option in the SLIP program. You don't need a different SLIP software to use a CSLIP account. CSLIP might also be referred to as SLIP using Van Jacobsen header compression or RFC 1144 TCP header compression. It does not compress the data being transferred, it just reduces the amount of overhead information that needs to be transferred over the modem.

SLIP for the Macintosh has four different implementations (not counting programs that support SLIP internally, because they're of no use if you want to use another program that doesn't support SLIP internally). Three are commercial: InterPPP II from InterCon Systems, MacSLIP from Hyde Park Software, and VersaTerm SLIP from Synergy Software. The fourth is the freeware InterSLIP, and also comes from InterCon.

SLIP Questions

When it comes time for you to get a SLIP account, look in Chapter 2, "Choosing a Connection," for information on how to pick an Internet service provider. All of the Internet Starter Kit Providers support PPP, but if none of them are in your area, you may have to decide between providers that offer only SLIP. After you decide on a provider, you need certain information from that provider to configure InterSLIP or other SLIP software. For convenience, I list the most common pieces of information you need in Table 12.5.

Table 12.5 SLIP Information

Item	Question
Phone Number	What number do I call to connect to the server?
Login Name	What is my SLIP account login name? (This name can be different from your userid or machine name.)
Password	What password should I provide when logging in?
MTU	What is the maximum transmission unit size? (1,006 is the standard MTU for SLIP; I've heard of using 296 for CSLIP.)
Header Compression	Should I use RFC 1144 TCP Header Compression (also known as CSLIP)?
Login Procedure	What should I expect to receive from your host machine and how should my Mac respond when logging in?
IP Address	What is my IP number (if a manually addressed account)?
Gateway Address	What is my gateway IP number (if a manually addressed account)?
Domain Name Server	What is the IP number of my primary domain name server?

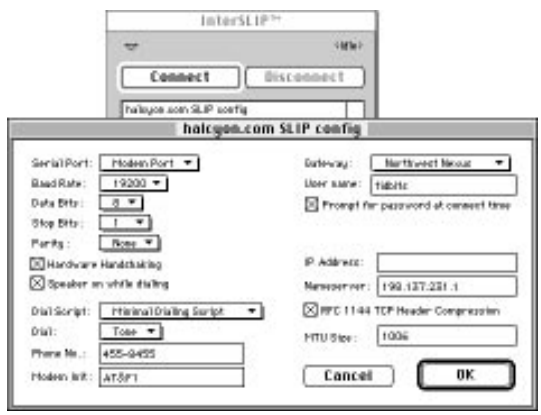
SLIP Software

Although I recommend InterSLIP as the first SLIP program you should try, that's because it's free and it works well for many people. There are also several other implementations of SLIP that work better for some users. One of them, VersaTerm SLIP, is notable because it's easier to configure than either InterSLIP or MacSLIP, which I listed previously in the "PPP Software" section. InterCon's InterPPP, also listed previously, supports SLIP as well.

InterSLIP

`ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/conn/`

InterCon Systems' InterSLIP 1.0.1 is the freeware standard for accessing the Internet through SLIP. It's flexible and works well, although it achieves its flexibility through dialing and gateway scripts written in an obtuse language called CCL, or Connection Control Language. If you use InterSLIP, you'll almost certainly need a dialing script and a gateway script, and if you do need them, you'll probably either need to write your own or modify one of the ones available on the Internet (although I've included my InterSLIP Minimal Dialing Script on the Internet Starter Kit CD-ROM). After you configure InterSLIP properly, it's a good and reliable method of connecting (and one that I used for a year or so before switching to a PPP account). InterCon does not support InterSLIP—if you use it, ask for help only on the Internet and don't expect anything from InterCon. Do note that if you use InterSLIP, there are a number of add-on programs and prewritten scripts that make using it even easier. If possible, check the FTP URL at the beginning of this entry for a list or ask your provider for help.



VersaTerm SLIP

`http://www.synergy.com/vt.htm`

Synergy Software claims that VersaTerm SLIP was the first commercially available SLIP for the Macintosh, and in my experience, it's also stable and reliable. VersaTerm SLIP includes an extension, a control panel, and an application, VersaTerm AdminSLIP, with which you interact. Of all the SLIP programs, VersaTerm AdminSLIP uses the easiest method of writing a script, providing a simple dialog box for creating the login script. In addition, VersaTerm AdminSLIP includes a simple but useful terminal emulator for troubleshooting connection problems. You can't buy VersaTerm SLIP by itself; it comes with Synergy Software's other VersaTerm packages, which range widely in price and capability.

ARA

Another, less common method of making a TCP-based connection, is through Apple Remote Access, or ARA. ARA is commercial software from Apple that enables you to make a modem connection to another Mac appear as though it were a LocalTalk or Ethernet connection (only much slower, of course). ARA comes bundled with many models of the PowerBook, and is available separately from Apple dealers and mail-order vendors; the street price is about $60 for the ARA 2.0 client software. I include ARA in this chapter because although it's not a common solution, it can be an easy one if you have ARA and access to one of the few Internet providers that support it.

The advantages of using ARA over PPP or SLIP are that ARA is generally easy to configure, it's supported by Apple and by most modem vendors, and of course, after you make the connection, you have AppleTalk services as well as TCP services. Several Internet providers use ARA as their primary connection method for Macintosh users (see Table 12.6 for a list).

Table 12.6 ARA Providers

Name	Phone	Email Address	Web Page
Digital Forest	206/836-4272	info@forest.net	http://www.forest.net/
Imagina	503/224-8522		http://www.imagina.com/
knoware	(Netherlands)	info@knoware.nl	http://www.knoware.nl/
Micronet Communications	907/279-0051	sales@micronet.net	http://www.lasertone.com/
Open Door Networks	541/488-4127	info@opendoor.com	http://www.opendoor.com/

More commonly, though, large organizations with dedicated Internet access on their networks provide ARA dialup facilities and also support TCP-based Internet access over those connections.

I haven't personally used ARA to access the Internet, although many people have gotten it to work fine using the network at their organization and a Mac at home. If you work with a commercial provider such as Open Door Networks, most of the following details won't matter to you, since Open Door Networks will have configured everything for you such that you only need to double-click a connection document (see Figure 12.19) or alias file to establish the connection. (Thanks to Alan Oppenheimer of Open Door Networks for much of this information.)

Figure 12.19 ARA Connection window.

You can use ARA to connect to the Internet if you have a high-speed Internet connection at work, for example, and you want to connect from home. To use ARA to connect to the Internet, you need a Macintosh with a fast modem, the ARA client, and Open Transport or MacTCP at home. At work you need a Macintosh running the ARA server (or a dedicated piece of hardware from a company such as Shiva that provides only ARA dialup facilities), another fast modem, and most importantly, a network link through an IP gateway (such as the Apple IP Gateway or the Shiva FastPath). The gateway connects the ARA server's AppleTalk network to Ethernet and then out to the Internet. So, if you can't use the Mac at work with TCP applications to access the Internet, you won't be able to do so through ARA, either.

Second, you need a unique IP address that will be assigned to your home Macintosh, either permanently or by the server each time you dial in, because using a Mac on the Internet through ARA is just like using a Mac on the Internet in any other way. The person in charge of your ARA server or your IP gateway must set up this IP address for you.

After you have those two things done, all you may need to do is bring up the ARA connection to have your Mac at home fully connected to the Internet.

Configuration for Open Transport and MacTCP is relatively similar—first let's look at MacTCP. If you've never configured MacTCP before, it is probably already configured correctly for a connection over ARA. Just to be sure, however, follow these instructions, noting that there are a few differences between configuring MacTCP for use with PPP or SLIP.

1. Before making the ARA connection, open the MacTCP control panel and make sure the icon in the upper left corner (the AppleTalk connection) is selected. The proper icon is usually LocalTalk or Remote Only, but it might be EtherTalk.
2. Click the More button in MacTCP and select server addressing (a manually addressed account will work but is less common in this situation and requires more work). Make sure nothing is typed into the domain name server information fields.
3. Close MacTCP and bring up the ARA connection.

4. Open MacTCP again, and, if you see a list of zones underneath the icon in the upper left corner, select the zone containing your IP gateway. If you aren't sure which zone contains your IP gateway, ask your network administrator.

For Open Transport, the concepts are the same, but the details are a bit different.

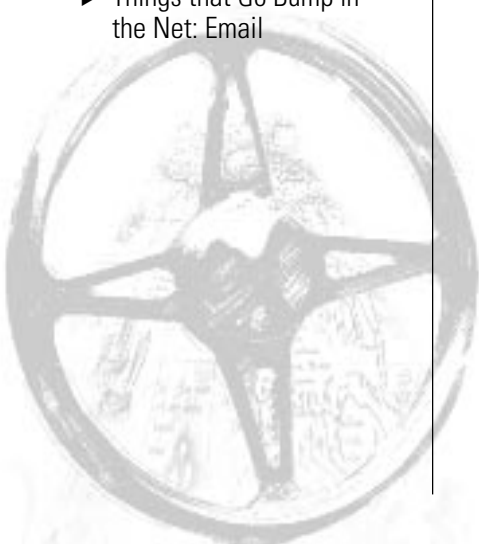
1. Open the TCP/IP control panel and from the Connect via pop-up menu choose AppleTalk (MacIP).
2. Next, from the Configure pop-up menu, choose Using MacIP Server, and if necessary, click the Select Zone button and choose the zone that contains your MacIP server.
3. Close the TCP/IP control panel and bring up the ARA connection.
4. If things don't work, ask your network administrator.

This process ensures that traffic from your Mac will go through the gateway that handles the encapsulation of packets for Ethernet. Because your Mac at home isn't really on Ethernet, its packets will be ignored unless you choose a zone in which an IP gateway lives.

After you've properly configured Open Transport or MacTCP the first time, you should be able to establish an ARA connection to work any time thereafter. You'll then be able to use the TCP-based applications just as though you were directly connected or were using PPP or SLIP to make your connection.

Chapter 13 All About Email

Contents:



Electronic mail is the most pervasive application on the Internet, and for good reason. What better way to communicate with so many people so quickly? But to use and understand email appropriately, you should know more about what the relevant social mores and pitfalls are in sending and receiving email, how email is constructed, and how you can use the various programs available for email.

Electronic Communications

As a simple method of transferring text from one person to another, email obviously has much in common with traditional letter writing, but is so fast and easy that it tends to be much more informal. In that respect an email conversation can more closely resemble a telephone conversation. Perhaps you can best think of email as speedy postcards. You can (and probably will) have long, involved, extremely serious discussions in email, but to judge from the email I and my friends receive, most is short and to the point.

As with any method of communication, email has its own rules and quirks, and because huge groups of people may all participate in the same discussion, email can also be used to build virtual communities. Let's look at some of these rules and social mores that have grown up around email communications, and then talk a bit about how you can become a part of these virtual communities.

> **BTW**
> Much of what I have to say about virtual communities that spring up around email communications applies equally well to other virtual communities, such as those that might form around a Usenet newsgroup, an IRC channel, or a specific MUD. Keep these issues in mind because I won't repeat myself in those chapters.

Technicalities of Writing

I can offer several simple pieces of advice that will start you on the right foot when writing email. Let's start with the trivial. Get in the habit of pressing the Return key twice between paragraphs to insert a blank line between them; that additional white space makes email messages much easier to read. Nothing is harder to read than page after page of unbroken text.

Actually, something is worse than unbroken text, and that's page after page of unbroken text in capital letters. DON'T USE ALL CAPS, BECAUSE IT LOOKS LIKE YOU'RE SHOUTING! No one uses all capital letters for long because everyone hates reading it and will tell you, nicely the first time, to stop. After that first warning, people will get rude.

Try to pay attention to niceties like grammar and spelling. Some people claim that the Internet is a vast wasteland of misspellings and poor grammar, and to a certain extent they're correct. Historically, the sort of people who frequented the Internet were computer people, specifically programmers, and although it's a stereotype, many programmers hate writing and tend to do so badly. I prefer to take the opposite view. I believe that sending email offers a chance for people to regain writing skills that have been lost in the decline of letter writing.

I raise this issue because the way you write says a fair amount about you. Just as the way you look in public affects the opinions that others have of you, so does the way you write on the Internet affect the way others judge your ideas and arguments. If you make lots of spelling mistakes and write in sentence fragments, you sound uneducated and you're likely to have a harder time convincing people to agree with you.

I'm harping on these English class details not because I expect you to spell-check and proofread every message you write, but because as email is used more for serious business correspondence, you must be aware of how others view your writing. Most people behave professionally at work, and email should reflect that. When you write to a friend about your plans for the weekend, spelling and grammar mean a lot less.

Email Content

I suppose now is a good time to talk about email manners. I wrote previously about how email resembles normal mail (hereafter called by its common name in the Internet community, snail mail), but it also differs from snail mail in many ways. Think of the difference between a short note to your mother, a memo at work, and a formal business letter. Most email falls somewhere between the short note and the memo, and seldom do you ever see an email message with the formality and rigidity of a business letter.

> **BTW**
> Speaking of manners, it's rude to send someone a file that's attached to an email message when the contents of the file could just as easily have been typed or pasted into the email message itself. Why make your recipient run another program just to read a few lines of text?

Salutations

How do you start these messages? Email acts as the great equalizer. Most of the time, you know someone's name and email address when you send email to him, nothing more. `joeschmoe@alien.com` could be a janitor, a summer intern, or the president of a Fortune 500 firm. Similarly, any address ending in edu might belong to a student, some member of the staff, a world-renowned professor of underwater basket weaving, or the president of a university. You have no way of knowing.

Most people react to this lack of context by treating everyone with the same level of polite, but informal, respect. Seldom do people use their titles on the Internet, so equally seldom do correspondents use those titles in email. Everyone is on a first-name basis. While I was at Cornell, I took a class called Seminar in Critical Thinking with the well-known astronomer and science advocate Carl Sagan. On the first day of class, an awed undergraduate (but braver than the rest of us) asked, "How should we address you, Dr. Sagan?" He replied, "You can call me Mr. Sagan, Professor Sagan, Dr. Sagan, or Herr Doktor

Professor Sagan." He paused and peered out at the class. "Or you can call me Carl." Carl it was then, and the class benefited greatly from that level of informality, just as the Internet does.

With the informality of email in mind, the standard salutation of "Dear" sounds inappropriately formal and stilted to my ears (apologies to Miss Manners). Since email more closely resembles spoken communication than written, I opt for the less formal and more colloquial "Hi," which has served me well. Some people forego the salutation completely, relying solely on their recipients first name (or no salutation at all), but that approach feels abrupt to me, as if someone called me on the phone and stated my name without a "Hello" or so much as a questioning tone. Do what you like, though; no one has laid down rules on this matter.

The Way You Write

The way you write deserves thought. Because email is so quick, and it's so easy to respond without thinking, many people often reply hastily and less politely than they would had they taken a moment to consider. Remember, you want to achieve a certain effect with an email message, just as you do with any form of communication. If you simply whack your first thoughts into a message, it probably won't properly convey your true feelings. If you want information from someone, phrasing your request politely only increases your chances of getting that information, and if you wish to comment on someone else's words, doing so in a reasoned and level-headed manner ensures that that person won't immediately consider you a serious jerk.

You also must remember that informal though email may be, it lacks most of the nonverbal parts of communication that we seldom consider in normal speech. All inflection, body language, and facial expressions disappear in email, since it's text only. Only two ways exist to convey inflections such as sarcasm or irony that would be obvious in spoken conversation.

First, polish your writing skills. There is no substitute for clear and coherent writing. Many people find writing difficult, but I recommend that you don't think of composing email as writing, but as speaking to someone who sees your words but cannot see or hear you. Most people who claim they can't write have little trouble making themselves understood when speaking.

Second, utilize smileys, which are strings of punctuation characters meant to be viewed by tilting your head (which is usually easier than tilting your monitor) to the side. (If they still look wrong, try tilting your head to the other side.) People have come up with literally hundreds of different smileys, and you can find lists containing them on the Internet. There are even several books of smileys!

I take the view that only two, or maybe three, smileys are at all useful. The first is the happy face :-), which implies that what you just said was meant as humor or at least

shouldn't be taken too seriously. I often use it to imply that I would have said something with a smile. A variant of the happy face uses the semicolon instead of the colon ;-) and (because of the wink) implies that the preceding sentence was somewhat sarcastic or ironic. Finally, the frowning face :-(implies that you aren't happy about whatever you just said.

I use smileys in email, especially when I don't have time to craft each letter as carefully as I would like. I miss not being able to use them (I could, but no one would understand) in snail mail occasionally, and I actively try to avoid using them in TidBITS, favoring instead words that convey my feelings without the crutch of the smiley. When in doubt, use smileys. If I say in email, "Well, that was a stupid thing to do!" the message is much more offensive than if I say, "Well, that was a stupid thing to do! :-)" Believe me, it is.

Flaming

I might have given the impression that the Internet is a utopia where everyone always behaves nicely and ne'er is heard a discouraging word. Unfortunately, that's not so, and in reality you see plenty of flaming on the net. Flaming happens when, in a discussion list, you innocently mention that you like your Macintosh, and 17 PC clone owners immediately jump on you in email and pummel you within an inch of your electronic life for saying something so obviously stupid and incorrect when everyone knows that only weenies, wimps, and little wusses use those toy Macintosh computers, which are good only for paperweights—and expensive paperweights at that, because you can buy three completely configured, top-of-the-line Pentium-based PCs for the same price as a used Macintosh Classic—without a hard disk. And by the way, did I mention that your mother wears combat boots and your father wears ballet slippers? :-)

The preceding paragraph is flaming (except for the smiley, which I threw in to indicate that I was kidding about your parents' footwear), and if you must respond to an inflammatory message, which I don't recommend, do it in private email. No one else wants to read your flames. Think before you lower yourself to flaming; it never solves anything. I have found in almost every case that replying calmly and clearly embarrasses almost anyone (assuming that person is normal and rational, which is not always a good assumption) so thoroughly that they immediately apologize for being such a jerk. And yes, I know how hard it is not to just tee off on someone. Restrain yourself and rest assured that everyone who sees your restraint will think more highly of you for it.

> **BTW**
> My favorite method of responding to long and vitriolic flames is to send back a one-line message reading, "You may be right. -Engst." I heard about this technique in an interview with Tom Brokaw, I think, and it works extremely well, confusing the recipient to no end and generally putting a stop to the flaming.

Often, people flame companies or large organizations that are doing stupid things. Governments are favorite, though slow-moving and not very challenging, targets. This sort of flaming is more acceptable, although you may start a flame war if other people don't share your opinions on some major topic, such as whether the Mac is better than Windows. Flame wars happen when lots of people start flaming one another in the same discussion group. As a spectator, you may enjoy watching the occasional flame war, as I do, but again, they never solve anything, and they waste a huge amount of bandwidth (which is composed of transmission time, people time, and disk storage throughout the world).

FYI

I've decided that a certain amount of flaming can be positive because there are only three ways of ending an argument on the Internet: agree to disagree, win your opponent over to your side, or stop from exhaustion. In no case does anyone get knifed or shot, and if participating in a flame war lets people blow off some steam, that's better than them going home and abusing their children. Everything is relative.

Privacy

Keep in mind that no matter what you say, it might not be private. Always assume that gobs of people can and do read every message you send. These people include your coworkers, your system administrator, system administrators on other machines through which your email travels, random pimply faced fools who like poking around in other people's email, and last, but certainly not least, the government, probably in the form of the CIA, FBI, Secret Service, or National Security Agency. I realize this sounds alarming, and it is most certainly not entirely true, but it's theoretically possible for all of those people to read your email.

In reality, email carries significant privacy, but because you have no guarantee of that privacy, you should stay aware of what you say. This suggestion is especially true if you use email at work, where you could lose your job over ill-considered remarks in email. It's always a good idea to check your employer's policy about email privacy.

BTW

There have been a number of court cases regarding ownership of email (Does it belong to you? Does it belong to your employer?) at some large companies like Epson and Borland. Since it may come down to a matter of their lawyers being meaner than your lawyers, don't push it.

This lack of privacy carries over to mailing lists and Usenet news (where you want people to read your messages, but you might not want the government to keep tabs on your postings). In fact, some people have gone so far as to include inflammatory keywords in otherwise innocuous postings, just to trip up the rumored government computers scanning for terrorists, assassins, space aliens, nudists, vegetarians, card-carrying broccoli lovers, and other possible undesirables.

There is one relatively common way of ensuring that your email remains private. PGP (Pretty Good Privacy), written in 1991 by Philip Zimmerman (who was harassed by the U.S. Government for several years because of PGP), is an encryption program. If you've ever made up a code in which you assign each letter in the alphabet a different number and then translate a short message into the corresponding numbers, you've used encryption.

PGP differs from that sort of simple substitution encryption in two ways. First off, PGP is highly secure, which means that even the government probably can't read anything encrypted with PGP. Needless to say, this irritates the government to no end, which is why they harassed Zimmerman for so long (they recently dropped the case against him). For more information about PGP and the case against Philip Zimmerman, see the International PGP Home Page at <http://www.ifi.uio.no/pgp/>.

Second, PGP uses what is called "public key encryption," which solves a problem with our simple substitution encryption example above. For that method of encryption to work, I would have to tell you the key to decrypting the message. That means we have to transmit two bits of information—the encrypted message and the key itself, and transmitting the key is asking for trouble. Public key encryption gets around the problem by using two different keys, a public key and a private key. Here's the subtle part. The recipient of the message creates both keys, and the public key is used to encrypt the message. Anyone can use it. However, the only way to decrypt the message is with the private key, which only the recipient has.

So, if you wanted to send me a private message, I'd create two keys and send you the public key. You'd use the public one to encrypt the message. I'd keep the private key, and when your message arrived, I'd use my private key to decrypt the message and read it. Since only I have my private key, the message is secure on its way to me.

So PGP can keep our messages secure. But how do I know that you really sent me that message? Someone could have forged it to appear as though it were from you and used my public key to encrypt it. PGP has another feature that solves this problem: a digital signature. Digital signatures sort of work in reverse of the encryption method that I just explained. When you send me a message and use PGP to attach a digital signature, PGP uses your private key to create a one-way (so no one can reverse-engineer your private key) code. When I receive the message, I use your public key, which is the inverse of your private key, to verify the digital signature. Then, of course, I'd use my private key to decrypt the message itself. For a more detailed explanation how all this works, check out the EFH PGP Workshop at <http://www.efh.org/pgp/pgpwork.html>.

If all this encryption sounds confusing, fear not. It is confusing, and the reason is that cryptography is an incredibly serious subject and tremendous amounts of thought have been put into schemes like PGP. They're not designed to be easy to use—they're designed to be secure, and ease of use and ease of understanding aren't particularly necessary at first.

Of course, this is a book for Macintosh users, and as a whole, we're not particularly into ugly, hard-to-use software. There are several AppleScript-based packages, MacPGP

Control and MacPGP Accessories, that simplify the process of using PGP encryption somewhat, but I'd like to see PGP built into email programs, as it reportedly will be with the next version of Eudora Pro.

Virtual Communities

Although the quirks of individual email are interesting in their own right, I'm more fascinated with what happens when a group of people all end up in the same virtual place such as a mailing list. The dynamics of how these people arrive, introduce themselves (often picking the personality they wish to display), interact, and become part of the community are truly unusual. As much as I think you'll find the subject interesting, I also recommend thinking about the issues I raise here when you start to participate in these virtual communities.

> **BTW**
> Again, much of what I say here applies to Usenet newsgroups in particular, not to mention IRC channels and MUDs.

Net Alter Egos

Superman, Batman, the Black Cat, Spiderman, Phoenix—all these comic book heroes and heroines shared one feature other than great bodies and skintight uniforms that showed every curve. They all had alter egos who could mix in normal society without anyone realizing their true identities. One minute, mild-mannered reporter Clark Kent was being brow-beaten by Lois Lane; the next minute (and a phone booth later), Superman was saving the world from the latest crazed super villain. Bruce Wayne and Batman, Peter Parker and Spiderman… Can anyone who has read comic books not have wanted an alter ego at some point? Our alter egos would be stronger, smarter, and always ready with a clever comeback to any insult from dastardly villains of every ilk.

The Internet doesn't change your physical appearance or capabilities, but due to the lack of visual interaction, it enables you to portray yourself in any manner you so choose. Some people might become crusaders for truth and justice, albeit in a single discussion list, whereas others might turn into psychotic lunatics in a subconscious rebellion against abusive parents or whatever. I doubt that most people change all that radically in their net personas, but keep in mind that you can never know what any given net citizen is like in person, without a face-to-face meeting.

There is another phenomenon that relates to this concept of net alter egos—that of amplification. Because the Internet enables any single person to send a message to tens of thousands of other people around the world and to maintain intellectual discussions with

numerous people on a number of different topics, the Internet amplifies the individual, or enables her to do far more than any single person could do outside of the Internet.

The Internet thus enables the individual to become more important and more influential than would otherwise be possible in real life. Of course, the extent to which this happens to you is directly related to the level of interest and utility of your postings. Those who do good stuff are respected, whereas those who merely clog the Internet with garbage are universally reviled. Well-known, yes, but infamous.

Many people act more or less the same way they do in person; my email, for instance, tends to reflect my personality relatively well, I think. Then again, I probably interact with more people in more ways in email than in real life, so I may be a bad example. However, many others have an electronic personality that is distinctly different from their real personality.

The question, then, is whether or not the absence of face-to-face communication on the Internet enables people to communicate more or less naturally. Perhaps the question within that question is just what it means to communicate naturally. Are we communicating naturally when we're distracted by the other person's appearance, manner of speaking, or personal aura? Or is there a higher form of communication between two minds, where the closest you can come to such distractions are the individual quirks of someone's writing style?

Let's take as an example one form of human interaction that's in abundant supply in nontechnical groups on the Internet: flirtation. People love to flirt electronically for a number of reasons. Since it's so unlikely that you'll ever meet the target of your wiles in person, there's much less fear of rejection; since you're judged entirely by your words (and skillful use of smileys), you don't need to worry about your weight or hair. So, what you'll find is that people who couldn't possibly force themselves to buy somebody, anybody, a drink in your typical bar become remarkably fluent in the language of romance when you put them behind a keyboard and monitor. Which is the real person? Hard to say. Obviously, the talent for personal interaction is there, but that talent takes a vacation when the someone's around to interact with in person.

Likewise, you'll find people on the Internet telling total strangers things they'd never say to many of their friends if they had to say them face to face. Incredibly personal information will find its way into your email from surprising sources, and you might feel comfortable talking freely with someone you've never met on another continent. People are willing to bare their souls, revealing aspects of themselves you'd never see in person.

Although most people are reasonably pleasant in email because they know that email lacks the body language and intonations of normal speech, there are exceptions. Some people are no doubt more obnoxious in email than they would be in real life because they can more easily get away with it, but I suspect that most of these exceptions occur simply as a matter of limited time to answer too much email, temporary personal problems in real life, or perhaps as a response to the frustration of being asked the same question over and over again.

Of course, it's equally common for people to interact better remotely than they do in person. There have been a number of occasions on which I've conversed quite happily with someone via email, and then, when the time came to meet them, found that I wasn't all that fond of them. Usually, the meeting also dampened later email conversations, since it's difficult to communicate with someone you've met without recalling your impressions of that meeting.

In one respect, I like this facet of Internet communication more than any other, because it says that when we communicate purely on an intellectual level, we can often do so far better than when we're staring into each other's faces. I see the Internet as important not because of the information available on it, but because of the ways it opens channels of communication between people who would never otherwise talk due to barriers of language, geography, religion, or even philosophy.

It's interesting, because people can find almost any excuse to avoid talking to one another in person, whereas online you can't pry them apart with an electronic crowbar. Although I won't pretend that talking on the Internet could solve the world's problems, the model of communication in which anyone can say anything and is allotted attention commensurate with the coherence and interest of the message is one I would love to see more of in the world.

One way or another, when you start out on the Internet, you'll have to deal with the issue of net personalities. You may find yourself acting subtly different in certain discussion groups, and after a while you begin to learn what you can expect from certain types of people, or where you can find people who act in certain ways. In fact, just as in the real world, you search around and eventually find a place where you feel comfortable, socially and technically.

Finding Your Niche

The first task that faces any Internet newcomer, or "newbie," in Internet parlance, is finding the group of people with whom you want to hang out. This of course assumes that you're not an antisocial hermit who doesn't want to have anything to do with other people. Don't become discouraged if it takes you some time to find just the right place. If you were anything like me, it took years during adolescence to do the same thing in real life, and I can guarantee that it won't take that long on the Internet.

As with anything on the Internet (and in real life, for that matter), many ways of finding your future group of friends exist. They range from extremely low-tech methods, such as a friend telling you about a specific group, to high-tech methods of running complicated searches on the Web. I find that hearing about things from friends is perhaps the best way to find new groups on the Internet, because your friends have already thought about what goes on in the group and whether or not it's the sort of discussion that would interest you. If you search on the Web for a discussion group, you may find one that sounds great, but all

you have to go on is a one-paragraph description that may or may not be in the slightest bit accurate or helpful.

I talk more about how to find discussion groups in Chapter 20, "Finding Things on the Internet," so I won't repeat myself here, but suffice it to say that one of the major advantages of Internet discussion groups is that you can follow what's going on with the group without feeling embarrassed about being quiet.

> **BTW**
> To get a sense of the wide variety of discussion groups available, check out the list of mailing lists at Liszt, located at: <http://www.liszt.com/>.

Lurking

The next trick, once you've found a group that interests you, is learning how to assimilate without offending your new-found acquaintances. The first thing most people do, or at least should do, is lurk. Don't worry, I'm not suggesting you spend your spare time in dark alley ways, frightening passersby. On the Internet, lurking is an innocuous occupation practiced by the vast majority of Internet users. It simply means that you read and observe the goings-on without contributing to the group. Think of the old adage about how children should be seen and not heard. On the Internet, no one even sees the lurkers, and there's nothing to hear from a lurker, either.

On a related subject, many discussion groups automatically send you a charter that states what topics are acceptable for discussion. I realize this might seem obvious, but you should consider that charter required reading, especially while you're in the lurking phase. There is no better source than a charter for information about what to do, what not to do, and especially who not to antagonize (meaning, the list owner, who might remove you from a discussion group for violating the charter).

The advantage of lurking is that you can easily judge the kinds of discussions that go on in the group. If it's a technical group, you can figure out how much you know about the topics being discussed in relation to many of the other participants, and you can see who else in the group is more or less at your level of knowledge. I am more likely to become friends with people on the Internet who know roughly as much as I do about Internet topics, because that commonality enables us to have more interesting discussions with one another. You can benefit by lurking in social, political, or other nontechnical groups as well. Watching the discussion for a while enables you to understand the biases of the group at large or perhaps some of the more vocal participants, and knowing how the group reacts to new ideas and opinions can help you decide how to make your introduction once you decide to cease lurking.

Introducing Yourself

Once you do decide to participate in the discussions (and I strongly recommend that you do so when you feel you have something useful to add), be careful at first, since people are often judged on first impressions on the Internet. If you act as though you're Zeus's gift to the net, people will quite correctly consider you to be a serious jerk. I suppose that if "serious jerk" describes you well, you might want to stick with that tone in your posts, but if you want anyone to listen to you and respond in a thoughtful and intelligent manner, you should pick up a little humility at the 7-Eleven.

With your early posts, be especially careful of details like hitting Return twice between paragraphs, not using all capital letters, and proofreading your message before you send it. Remember, you're creating first impressions with your early messages in a group; no one knows you yet. I'd also recommend keeping those initial messages short and to the point, since people are more likely to read concise messages than long, rambling ones. Finally, if you're asking for help in a technical discussion group, try not to complain about the product in question—by complaining you start off on a negative foot that may not endear you to the regulars in the list. Along with not complaining, I recommend that you avoid embroiling yourself in controversy immediately—stick to more innocuous subjects until you're a bit more well known.

I realize that I'm advocating that you pussy-foot around a discussion list at first, but that's just until the list has had a chance to get to know you and your areas of expertise or opinion. After you've been on a list for a while, feel free to let your personality show through your manners.

Discussion lists are little worlds all to themselves, so what you've done or said in one group generally won't be known in another. This can be both good and bad—if you were a major contributor to one group and move to another, your reputation probably will neither precede nor follow you. You must prove yourself all over again, although you'll likely know how to go about it more adeptly the second time. However, if you managed to become known as a major drip on one list, you can move to another and enjoy a clean slate.

One of the Gang

Everything I've said so far is a one-time process with any given discussion group. But what about the majority of the time you spend on the list? How do you assimilate into the day-to-day conversations that ebb and flow across the wires? How do you become one of the gang? Hopefully, it's mostly a matter of being your normal friendly self, but here are a few other things to consider.

Since many of the discussion lists and Internet groups exchange useful, at least to the participants, information, making yourself useful always speeds the assimilation process. The more I learn about the business world, the more I realize it's not so much what you

know, it's who you know. On the Internet, however, that doesn't fly. No one gives a hoot who you know, but if your knowledge is valuable to members of the group, they appreciate it. You must still dole out your knowledge with the online equivalent of a smile, since no one likes a know-it-all in the real world or on the Internet, even if you do. Know it all, that is.

I mentioned list charters previously—keep in mind that someone runs every list and might be fairly specific about what they will and will not allow people to talk about. You should of course pay attention to these rules, but many people go beyond following the rules to attempting to enforce them. Don't do this. If other people are having off-topic discussions or otherwise breaking the rules, let the list owner step on the transgressors. There's nothing worse than a list where someone makes a mistake, perhaps even an egregious one, and everyone immediately jumps on them. Instead of one mistaken post, now the entire list has to read 20 or 30 off-topic posts. Let the list owner handle these situations, and if you feel the need to help, send the list owner mail alerting him to the situation. If you're participating in a newsgroup, for which there's no list owner, just relax and ignore the problem.

Every discussion group has some sort of implied pecking order, as do all groups of people. The list owner automatically holds a fairly high position in that pecking order, and by lurking in the group you should have figured out which one of the members the group respects the most. Watch how you respond to those people in particular, since they're likely to be the ones who either know the most or make the best arguments. There's nothing wrong with disagreeing with the experts or the trend-setters, but be aware that it's dangerous to argue with the author of a program, for instance, about how that program works. Aside from the fact that you're likely to lose any such arguments, your position in the eyes of the rest of the group may suffer. Pick your arguments and be sure of your facts and your logic before leaping into the fray.

I guess what I've tried to say in the last few sections is that you should think about what you're doing. Thinking before acting seems to be all too uncommon, and a little thought can prevent many frustrations and embarrassments.

I've tried to practice what I'm preaching here on the main groups in which I participate currently, the Info-Mac Digest and the Apple Internet mailing lists. The Info-Mac Digest carries general Macintosh discussions, and since I know that there are plenty of knowledgeable and helpful folks on the list, I don't attempt to answer every question to which I happen to know the answer. However, if a question comes up in one of my fields of expertise, such as MacTCP connections to the Internet, Nisus Writer (the word processor I use), recent events in the industry, or certain PowerBook issues, I try to jump in and help out. Much of the research I do for articles in TidBITS aids me in this process, so even if I decide not to write an article about something, I often share the knowledge I picked up on Info-Mac. Similarly, I often help out on the Apple Internet mailing lists.

It is important that you don't answer every question to which you know the answer because—if everyone did that—the list would become clogged with identical answers. I usually counsel patience when answering a question. Wait to see if someone else jumps in

and answers the question, and if no one does in a day or so, go ahead and answer it. If you see several similar answers arriving shortly after the question, you know that not only was your answer unnecessary, but it would also have merely clogged the group further.

Signal-to-Noise Ratio

This concept of the ratio of useful messages to useless messages has a specific term on the Internet. It's called the signal-to-noise ratio, and it probably comes from a field like electrical engineering. The basic idea is that signal is information that interests you, and noise is information that you would prefer never darkened your monitor. So, for instance, if I'm reading the Info-Mac digest and I see a message about how certain versions of a program can cause disk damage, that's useful information and is signal. In contrast, yet another message whining about how Apple is going to go out of business tomorrow is noise—I have no use for such information.

Note that I didn't say that signal was information of general interest, since it's not. Signal is information that interests you, and possibly no one else. What interests you may bore me stiff, and vice versa. That's why it's likely that we will participate in different groups on the Internet. But, in fact, any group talks about a large number of different topics, and as an individual, you may find yourself utterly uninterested in most of them. That's fine—there's no one checking up on you to see if you read all the messages in a group.

If you have a technical bent, you may consider any socializing to be noise, since it doesn't convey useful information for you. And, for the socialites (or is it socialists?), the socializing on a list, whether or not the list is supposed to be technical, might be just the ticket. Everyone's different, and that's why so many different discussion groups have appeared on the Internet. Whenever the signal-to-noise ratio drops below a certain level in any given group, the members of that group might start working on ways to improve the focus of the discussions. Rules might become more strict, or perhaps another group will split off to talk about the topics that were considered noise by many people in the first group. In the end, dealing with the signal-to-noise ratio is the mechanism by which the Internet continues to evolve to meet the needs and desires of the people on the net.

Enough about socialization—let's turn now to the technical issues of how email is constructed and how it travels through the Internet.

Email Construction

What makes up an email message? Most messages have two important parts, with a third optional part. The first two parts are the header and the body of the message, and the third nonessential part is the signature. Email headers contain technical information about the

message, the body contains the actual message, and the signature generally provides more information about the sender.

Headers

Think for a moment about the outside of an envelope you might receive in snail mail. There's quite a lot of information that you can pick up just from looking at the envelope. You know who sent the letter and where they live from the return address. You know whether or not the letter was addressed to you or to someone else in your house. The postmark tells you when the message made it to the post office, and the stamps tell you approximately how heavy the letter is, without you even having to lift it.

The information on the outside of an envelope is useful to you when you're flipping through your mail, but it's really meant for the post office employees and machines that handle the mail. After all, you know what your address is, but if the sender got it wrong, even to the point of transposing two digits in the ZIP code, the letter might never arrive. The return address is similarly multipurpose. You know who sent the message as soon as you open it, so the main use of the return address for you is that you're guaranteed to be able to reply to the message even if the sender forgot to include her address inside. The return address's primary function is again for the post office—should your address have been written incorrectly, the return address enables the post office to return the letter to the sender.

You, of course, realize all of those facts about regular letters, but in fact they apply to email messages as well. The equivalent of the outside of the envelope is the email header, which looks like gobbledygook. Just as the outside of an envelope is for the post office's benefit, the email header is for the benefit of the email programs that send, route, and receive email. You're lucky that you can read headers as well as you can, but it's good to look at he header quickly when you receive email, since it tells you a lot about its message.

In most email programs you can set an option to see only an abbreviated header, which is good, because much of the information in the header is of no use to a person, and in some cases you can hide the header altogether, which can be dangerous because it might not be clear who was the primary recipient of the message. I recommend that you choose an abbreviated header display if available. An abbreviated header shows only information that is likely to be useful, such as who sent the email to you, when it was sent, the message subject, and to whom it was sent (not always only you—remember that it's easy to send the same piece of email to multiple people).

Now that you know why you should care about email headers, let's look at a typical header, culled from one of my archived pieces of email (see Figure 13.1).

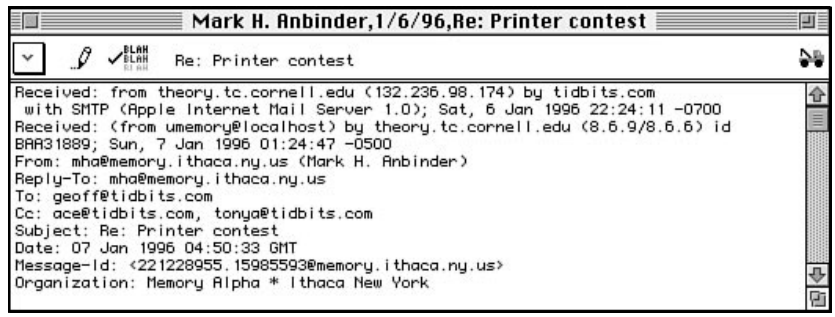


Figure 13.1 A sample header.

We start with the glop at the top.

```
Received: from theory.tc.cornell.edu (132.236.98.174) by tidbits.com
 with SMTP (Apple Internet Mail Server 1.0); Sat, 6 Jan 1996 22:24:11 -0700
Received: (from umemory@localhost) by theory.tc.cornell.edu (8.6.9/8.6.6)
id BAA31889; Sun, 7 Jan 1996 01:24:47 -0500
```

The preceding lines are merely routing information that tell you where a message went and when it arrived there. You have to read the routing information backwards to follow the flow, so this message traveled from some sort of gateway (called `umemory@localhost`) to Cornell's Theory Center, `theory.tc.cornell.edu`, and from the Theory Center, the message jumped to my machine, `tidbits.com`.

You generally can ignore this part of the header and many email programs won't display it. It can be fun to see where your message went at times. If your message bounces—that is, if it fails to go through for some reason and comes back to you—looking at this part in the header helps you determine how far it got and which machine didn't like it. More about how to handle bounces in a bit.

```
From: mha@memory.ithaca.ny.us (Mark H. Anbinder)
```

The From line indicates who sent the email and is self-explanatory. It's conceivable, although unlikely, that you'll receive email from "anon" or "anonymous" with a correspondingly anonymous sounding email address. The message has probably been sent through an anonymous remailer, and is a way of making sure that no one knows who sent it. I see the utility of anonymous remailers, but I also feel that people should generally stand behind their words. Finally, it's also worth noting that there's no way short of PGP to be sure that the person listed in the From line is the person who sent the message. It's easy to forge email, and it's not uncommon. If you suspect a message has been forged, check the Received lines to see if the message comes from machines that make sense.

```
Reply-To: mha@memory.ithaca.ny.us
```

The Reply-To line isn't required, but it's relatively commonly used to ensure that replies go to a specific address, no matter what the From line looks like. For instance, my true address is currently `ace@adelie.tidbits.com` because I'm running a mail server on `adelie.tidbits.com`, my PowerBook 520. However, I might change servers back to my main server when I travel, at which point my real address would be `ace@king.tidbits.com`. By making sure the Reply-To line is always set to the generic `ace@tidbits.com`, I don't have to worry about someone accidently sending email to a server that I'm not using. Reply-To lines are especially common in mailing lists, in which the mail looks like it's from a specific person, but replies are directed back to the list via the Reply-To line.


```
To: geoff@tidbits.com
```

The To line can have one or more entries, and it specifies, reasonably enough, the recipients of the mail. The recipient might not be you because you might be a person mentioned in the Cc line or even the Bcc line (which you don't see because Bcc stands for Blind Carbon Copy). Every now and then you'll see an email message with a blank To line—all that means is that your address and possibly others are in either the Cc or Bcc lines.

```
Cc: ace@tidbits.com, tonya@tidbits.com
```

The Cc line lists all the people who received copies of the message. There is no functional difference from being on the To line or the Cc line, but in theory if you receive only a copy, the message shouldn't concern you as much. In practice I notice little difference, although in recent years, I've taken to paying less attention to messages in which my address is in the Cc line rather than the To line. I get way too much email.

```
Subject: Re: Printer contest
```

The Subject line should give a clear and concise description of the contents of the email message. In practice, this description often isn't true, especially after a discussion proceeds, changing topics occasionally, with everyone using the reply function to keep the Subject the same. After a while the Subject line bears no resemblance to the contents of the message, at which point it's time to change the line. You may see "Re" and "Fwd" fairly frequently—some email programs add them to replies and forwards automatically.

```
Date: 07 Jan 1996 04:50:33 GMT
```

The Date line lists the date that the email was sent originally, not the time you received it or read it, and might indicate the time zone in which the sender lives (although this one doesn't). I find it difficult to keep track of what time it is in other countries. Do you know the local time in Turkey right now? Some messages use a number, either positive or negative, and the acronym GMT, which stands for Greenwich Mean Time. Unfortunately, this use requires that you know what time it is in Greenwich, England, and that you know how your local daylight savings time is involved. Time zones confuse me.

FYI
The best way to determine what time it is in another part of the world is to open the Map control panel, click the appropriate spot on the map of the world, and look at the time display. Finding the appropriate spot is up to you. I hope you paid attention in geography class.

```
Message-Id: <221228955.15985593@memory.ithaca.ny.us>
```

The Message-Id line uniquely identifies each message. It's generally of no use at all, and although it looks like an email address, it's not.

BTW
Only once have I found the Message-Id information useful. For some reason, one of my hosts was duplicating some files that went out, and often the only difference between the messages was that at a certain point they started having different ids. Unfortunately, I never figured out how to solve the problem; I just switched to another host.

```
Organization: Memory Alpha * Ithaca New York
```

The Organization line identifies the organization of the sender, as you might suspect. Individuals often have a good time with this line because they don't have real organizations to put down and can thus include fake organizations such as "Our Lady of the Vacant Lot Enterprises."

You also might see other lines in the header that identify which program mailed the message, to whom the recipients should reply, the type of data included in the message, how the data is encoded, and that sort of thing. In general, you don't have to worry about anything in the header very much, but it's worth taking a look every now and then to see if you can tell what's going on in there.

There is one other line that you never see in incoming email but can use when you're sending email. Imagine that you're having a discussion about a friend, and you want your friend to be aware of the discussion without letting the primary recipient of the email know. You could of course forward your reply to your friend after you've sent it, but you could also use the Bcc line in the header. Bcc stands for Blind Carbon Copy, and none of the recipients in the To or Cc lines know who might be in the Bcc line.

FYI
Be careful with the Bcc line! Many email programs come set to "reply to all," which means that when you reply to a message, your reply goes to everyone who received the original, as opposed to just the sender. That's normally not a problem, but if someone sends you a message by putting your address in the Bcc line, and then you reply to everyone who received the

message, the privacy of the Bcc line has been compromised. Also, some LAN-based email programs such as Microsoft Mail and cc:Mail don't necessarily honor the Bcc line. Using the Bcc line is not secure—to be secure, send a separate copy.

Body

Enough about the email headers. The interesting part of any email message is the body, although there isn't all that much to say about it from a technical standpoint because most of the time the email program you use handles all of the details.

The least common denominator of email message bodies is that they contain text. In the past, straight text was all that email messages could contain. Now, however, that's changing, and it's possible to store nontextual information in message bodies, a process that's done using MIME, or Multipurpose Internet Mail Extensions.

Essentially, MIME is a way to encode and identify types of information on the Internet, and although it began as a way of including nontextual information in email, it's also used on the Web to identify different types of information so Web servers and browsers know what to do with those types of information.

The primary use of MIME in email now is to enable you to attach files to a piece of email, just as you might use a paper clip to attach a business card to a normal letter. An increasing number of email programs on all types of computers now understand how to handle basic MIME attachments, so when they see an attachment in an email message, they can extract it from the message and save it as a file.

Now, take the concept of an attachment one step further. What if, say, an email program knew how to display graphics as well as text in its message windows. If that were true, you could paste a graphic into an email message and send it to a friend. There are three possibilities at this point. First, if your friend's email program doesn't support MIME at all, she'll probably see major textual garbage in the body of the message after the text you wrote (it might be possible to decode the garbage using a program called Mpack discussed later in this chapter, but I wouldn't bet on it). If your friend's email program supports MIME but doesn't know how to display graphics internally, then it will probably save the graphic as a separate file that she can open with a graphics program. Finally, if her email program both understands MIME and can display a graphic internally, then it will decode the MIME attachment and display the graphic, just as you pasted it in.

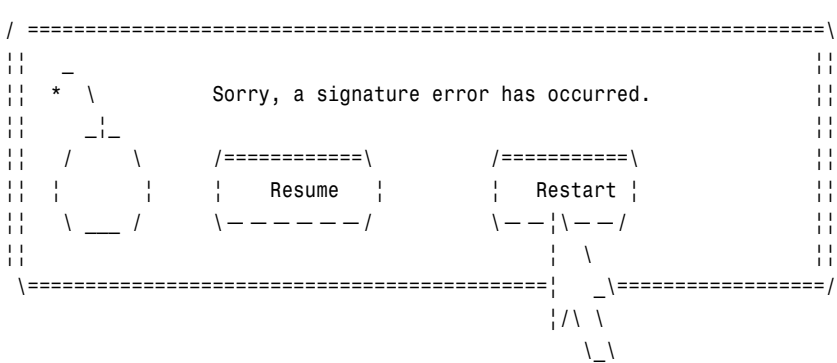
MIME is inherently generic, and it can handle almost any sort of data. For instance, a use that's likely to become more common in the future is styled or "rich" text that contains fonts, sizes, and colors. An email program that supports styled text would probably save the style information as a small MIME attachment that another program could either interpret to show styled text on the other end or merely save as a file and otherwise ignore.

As you can see, it takes two to tango, and MIME is useful only if lots of email programs support it. Beyond basic MIME support, it's even better if all these email programs support the same MIME types. Otherwise, all these graphics and movies and styled text bits that we can add to mail will just be MIME ships passing in the night.

Signature

Signatures are what you'd expect: text that goes at the bottom of every message you send. Most email programs provide a facility for creating signatures. Most people include their names (real or pretend) in their signatures; it's considered good form to include your preferred email address in your signature as well, just in case the address in the header isn't useful for some reason or another.

After you get past the basics of name and email address, however, you can put anything you want in your signature. URLs to home pages are popular, and many people lean toward clever quotations or manage to express some sporting partisanship of their favorite team, usually with an erudite "Go Weasels '96" or some such. (It's hard to grunt in email.) I prefer clever quotations, especially if changed once per day—not that I have time or energy to think them up or type them in every day. Here is a signature that must have taken some time to create, because all the lines and dashes had to be typed in the right place:



Courtesy of A. Marsh Gardiner, gardin@harvarda.harvard.edu

BTW

If you want to create graphical versions of words and phrases using only ASCII characters, check out the FIGlet Web page at <http://st-www.cs.uiuc.edu/users/chai/figlet.html>.

Many people also use signatures to disclaim their messages. The signature acts as a disclaimer, usually stating that the opinions and facts stated in the preceding message have no relationship to the organization paying for the account or employing the individual.

Disclaimers are important online because readers have no context in which to take postings. If Ferdinand the Bull posts a glowing review of specific species of cork tree, for example, he should also note at the bottom of his review that he is a paid consultant of Corking Good Times International, and is therefore biased. More common are glowing reviews from users who "have no relationship with Corking Good Times International, other than as a satisfied customer." Disclaimers also serve to ensure that no one takes the words of a single employee as the policy of the entire organization. Marketing departments hate that. "But Joe said online that Apple was going to give free Macs to everyone whose birthday falls on the second Tuesday of odd months this year." "Yeah, sure buddy."

One warning, though. Mailing lists that are published as digests—that is, lists in which a moderator collects the day's messages and concatenates them into a single file—frown on or even reject postings with multiple line signatures. This suggestion makes sense, if you think about it. A large digest file can have 50 messages in it, and if every person has a four-line signature, the digest suddenly becomes 200 lines longer than necessary.

How Does Email Work?

To many people, email and other Internet services are essentially magic, and these people are in awe of how well they work. However, as with everything in the real world, the Internet is merely the product of some clever people, and clever people often invent systems that are actually quite simple and elegant. It's not particularly difficult to understand how email really works, and that understanding can go a long way at times.

As a method of explaining how email works, let's follow a message that I might send to my mother, who works at Cornell University. The process will be the same for any message you might want to send.

I create my message in my email program, Eudora, as I would any message. The most important part of the message is the To line in the header, since without that line, there's no way that my message could be delivered to my mother. It's also important to have Eudora configured properly so that it inserts my email address in the From line. When you're creating a message, you can check these lines at the top of the message window to make sure they're correct.

After I finish creating the message, I connect to my Internet provider and send the message. When I send a message, my copy of Eudora, which is an SMTP (Simple Mail Transfer Protocol) client (check back to Chapter 6, "What Is the Internet?," if you've forgotten how the client/server relationship works—remember the dessert cart analogy?), connects to the SMTP server that I specified in the Settings dialog box. SMTP is actually incredibly simple, and Eudora chats with the server using a small set of commands. Eudora says, "Hello," the SMTP server replies with another "Hello," then Eudora says, "I have a message to send to Adam's mother at this email address," and the SMTP server says, "Okay." Once the SMTP server has agreed to the transfer, Eudora sends my message, asks

for confirmation that the message made it, and when the SMTP server says that the message arrived successfully, Eudora marks my message as sent and either goes on to the next message or quits if there are no more messages.

Eudora has done its job at this point, and my message is sitting on the SMTP server on my Internet provider's machines. The SMTP server then asks another program running on my provider's machine, a domain name server, how to send this message. The domain name server looks up the domain name in my mother's address, `cornell.edu`, and figures out how to route the message. In the old days, the route might pass through five or ten other computers, but with the way the Internet works today, most mail goes directly to its destination.

After the domain name server reports back to the SMTP server on how to deliver the message, my Internet provider's SMTP server connects directly to Cornell's SMTP server, and another conversation takes place between the two SMTP servers. At the end of the conversation, Cornell's SMTP server has my message, and my provider's SMTP server has washed its hands of the message entirely.

Now the message has reached Cornell, but my mother can't retrieve it just yet. Before that can happen, Cornell's SMTP server must transfer the message to my mother's POP mailbox. SMTP servers transfer mail around the Internet, whereas POP mailboxes hold mail until a user retrieves it. So, once the Cornell's SMTP server has placed the message in my mother's POP mailbox, the SMTP server is done.

You can think of POP mailboxes as electronic analogues to post office boxes. Snail mail continually accumulates in a post office box until you go get it, and similarly email continually accumulates in a POP mailbox until you retrieve it with an email program. When my mother wants to see if she has a message from me, she checks mail using her copy of Eudora. Along with being an SMTP client, Eudora is also a POP client, which means that it can talk to a POP server to retrieve the contents of a POP mailbox.

So when my mother checks mail (she must be connected to the Internet, but at work she has a direct Internet connection to her desk), Eudora connects to Cornell's POP server, and the two programs have a simple conversation not unlike the conversation Eudora had with the SMTP server. Eudora first sends my mother's userid and password, since the POP server won't let just anyone read my mother's mail. After that, Eudora asks the POP server for the first message in the POP mailbox, the POP server sends it, and after Eudora has received it successfully and stored it in my mother's In box, Eudora tells the POP server to delete that message and send the next one. This process continues until the POP server says that it has no more messages, at which point Eudora disconnects and displays the messages, including the one I sent.

That's all there is to it, and in fact, the process is so simple that it could easily take less time for a message to travel from my copy of Eudora to my mother's copy of Eudora than it took you to read the paragraphs explaining the process. Perhaps the most important fact about the process is that because it's so simple, it scales well. In fact, I seldom send one

message—I usually send 20 or 30 messages at a time, and I receive hundreds of messages a day, spread out over several connection attempts. When you think about how many people on the Internet send and receive mail constantly, the fact that the process works as well as it does is quite impressive.

Now that you have a sense of how email works, let's look at what features you should look for in an email program. I recommend that you use Eudora Light, which is included on the Internet Starter Kit CD-ROM, but there are many other options, and one of them might better fit your needs and desires.

Using Email Programs

All email programs share basic features that you need in order to read, reply, and store your email quickly and efficiently. However, after these basic commonalities, the differences between programs mount quickly, so I concentrate on those differences when I talk about each program later on. For the moment, though, let's look at what an email program must do at a minimum.

Creating New Email

When creating new mail (or replying to email), an email program should provide all the features that you're used to when you're writing in a Macintosh word processor. However, because every email program implements text entry and editing on its own, none of them compares to a full-fledged word processor, and a few barely even compete with SimpleText. My dream, which isn't all that far off, is to be able to use Nisus Writer, the word processor with which I'm writing this book, for writing my email. With the growing acceptance of Apple events, this change will happen. I just hope it happens sooner rather than later.

I might be odd in this respect, but I think that any email program should make it easy to save a copy of everything you write, preferably automatically. I send more email than most people, often as many as 1,500 messages per month, but I like to be able to go back and see what I said, forward a message to someone who lost it, or just browse through the thoughts that appeared in my writings at that time. Why bother to keep a diary if you're writing about most of what happens in your life in email to friends? More importantly, my outgoing email is a record of my business, and as such, I consider the capability of automatically saving outgoing mail to be essential.

One subtle problem with some email programs is that they store messages as individual files, which wastes tons of disk space. Because most messages are relatively small, they can take up a full block size on disk. For instance, the partition of my hard disk that holds email is formatted to 700MB or so. That means that a 500-byte email message in Claris Emailer's format takes up about 20K on disk, since that's the smallest file size possible with such a

large disk. Considering how many hundreds of messages I get and send and keep each day, this inefficiency is problematic. It also slows down all sorting and finding operations because it's always harder to work with multiple files than with a single one.

Finally, whenever you create email, your email program should enable you to send the mail to a nickname or alias, which is merely another, easier-to-remember form of an email address. So instead of typing `ferdinand-the-bull@cork.tree.com` every time you want to send that person email, you can type the shorter `Bull`. Be careful with nicknames, because it's easy to create more than you can easily remember, at which point they don't particularly help any more. Defining nicknames for everyone you might ever send email to is a waste of time; settle for defining a nickname only after you decide that you are likely to send that person email frequently.

> **BTW**
> You want to be slightly careful with nicknames, because occasionally the recipient sees the nickname as well as the address. A friend once created a nickname "DA BOSS" for his supervisor, who thought it was funny when she saw it at some point. I can think of some less humorous situations.

Reading Email

An email program should enable you to display and scroll through an email message easily. Because you're using a Macintosh, you should be able to do all the standard Macintosh things to text in a window, such as copying and pasting into a different program, resizing the window to display more text, selecting all the text with a single command, and that sort of thing. Modern email programs should support Apple's drag-and-drop technology for moving text within a message, between messages, or between programs.

Although you usually can choose the font and size in which you view messages in Macintosh email programs, I recommend that you stick to a monospaced font such as Monaco or Courier. In email people must format tables and graphics with spaces, and monospaced fonts such as Monaco and Courier display these tables and graphics properly. Proportionally spaced fonts such as Times and Helvetica don't work as well because the characters in these fonts can have different widths, with a lowercase i being thinner than an uppercase W. Few of these features are generally available with a Unix mail program; that's one of the major advantages of using the Mac.

> **BTW**
> Some email programs come with special monospaced fonts that are supposedly easier to read than the standard Monaco and Courier. If you see fonts like TTYFont, VT100, or Mishawaka, they're designed for displaying Internet email on the screen. I prefer Monaco 9 point.

Replying to Email

Much of the mail you receive requires a reply of some sort, so an email program should make replying extremely easy, either with a Command-key shortcut or a single click on an icon. An email program also should facilitate quoting the original message, or prefixing each line with one or two special characters, usually a greater-than symbol (>) and a space. Using quoting, you can easily include some of the message you're replying to so that the recipient has some context to know what you're talking about. A nice feature that not all programs share is the ability to select just a certain part of the original message and have the email program quote only that selected text in the reply and ignore the rest of the original message (see Figure 13.2).

Figure 13.2 Original text and quoted text.

> **BTW**
> Rick Holzgrafe of Semicolon Software has written a $10 shareware utility called SignatureQuote that enables you to quote messages properly even if your email program doesn't support it. SignatureQuote supports two quoting styles, two signatures that you can paste in; it can also join and split text. It's a must-have if you're locked into a lousy email program, and you can find it in <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/>.

Because an email message might have originally been sent to several people, an email program should give you the option of replying only to the sender or to all the people to whom the message was originally sent. At the same time, it ideally should make sure that you see the salient lines in the header. I've spawned a couple of embarrassing scenes by forwarding a message to a friend, and when my friend replied to me, his email program saw that mine had included the original message's address in the Reply-To line in the header. So his reply, instead of going just to me, went back to the sender, which was a mailing list that went to thousands of people. Oops! Luckily, I didn't say anything embarrassing and neither did he, so we were safe, but that's a good example of how two computer professionals who know better could have been thoroughly embarrassed in public. Think of this situation as standing up in a crowded restaurant and shouting loudly that your underwear has holes. You get the idea.

More powerful email programs provide filtering features that can act on incoming mail based on the contents of the header or the body of the message. Filtering features are necessary, in my opinion, if you receive any significant amount of email at all, and with the 200 messages or so that I receive every day, filters are essential. Filters can mark messages, move them to specific mailboxes, and some can even automatically reply to a message or forward it to someone. I find that I mostly use filtering features to move messages from mailing lists and specific people to specific mailboxes, although recently I've also started to mark certain messages within mailboxes.

Navigating and Managing Email

Another important feature of an email program is the manner in which it enables you to move between messages, save messages in different mailboxes, and delete unwanted messages. Most email programs display a list of the messages in an In box area, and some indicate which messages you have already read, replied to, or saved to disk. Opening a message usually opens a new window to display the message, and sometimes closing the window (with or without deleting the current message) opens the next unread message—a nice feature for those who receive a great deal of mail. Being able to sort the list of messages by date, subject, or sender is useful, and you should be able to select multiple messages at once to move them to another mailbox or delete them.

FYI

Some of these navigation features might not exist in the email program you use, but with a macro program such as CE Software's QuicKeys, you might be able to simulate them. QuicKeys or other utility programs such as Now Menus from Now Software's Now Utilities can simplify the process of manipulating messages by enabling you to assign Command keys to commonly used commands. For instance, I can press Command-5 to save a comment about TidBITS in the proper mailbox.

Speaking of multiple mailboxes, all email programs should support them, though unfortunately not all do. Most people want to save some of the messages they receive, so a program should enable you to create your own mailboxes for filing away messages on different topics. Of course, if you can create a new mailbox, the email program should enable you to do everything you can do in your In box to the messages in the new mailbox.

You might wish to pay attention to how different email programs save messages, since there are two basic techniques. Some email programs save each message as a single file in a folder, and that folder doubles as the mailbox. This method is simple, but tends to waste a ton of disk space, although it is more efficient if you make regular backups. In contrast, many email programs save multiple messages in a single file, which is then the mailbox. The single-file approach means that more data must be backed up each time you perform a backup, but it uses much less disk space and generally makes for faster searches.

On occasion, you might wish to save the message you're looking at to a text file without copying and pasting the entire thing into a word processor. Such a feature is extremely easy to implement, but a surprising number of programs lack it. In an ideal world, of course, you could select multiple messages and save them all to a single file with a single command.

You will undoubtedly want to delete many of the messages you receive. This area may seem straightforward, but the better email programs follow Apple's lead with the Finder and enable you to trash a file without actually immediately deleting it. The easier it is to delete a message (and it should be very easy since you're likely to want to delete most of the mail you receive), the more likely you will eventually delete something accidentally. If the email program deletes immediately, your message is toast. The other advantage of the two-stage delete (in which a message is put in a trash can before being deleted later) or a delayed delete (in which a message is marked as being deleted but isn't actually deleted until you close the mailbox) is that you then don't have to put up with an annoying confirmation dialog box every time you delete a message.

BTW

I keep tons of messages in my Eudora Trash mailbox, and I find that I go back to it regularly. Unfortunately, I get so much mail that I must periodically sort by date and delete the oldest half of the mailbox because I often need the disk space. It's embarrassing running out of disk space when you have 10MB of mail in the Trash mailbox.

Finally, as the volume of email that many people receive continues to grow, I think every good email program should have some method of searching through stored mail. I currently have about 160MB of stored mail, and although I'm sure I'm unusual in that regard, it doesn't take more than a few hundred messages before you start longing for a Find command. Being able to find a specific message is good, but even better is the ability to find all the messages in a mailbox that match the search terms and select them. I often use such features for locating and then deleting unnecessary but related email.

Moving on, much of the mail you're likely to get will come from mailing lists discussing a variety of topics.

Mailing Lists

There's no accounting for taste, and similarly, there's no accounting for different interests. I might be interested in electronic publishing, tropical fish, and competitive distance running, whereas the next person might favor The Simpsons, aviation, and Irish culture. As a result, discussion groups have sprung up around almost every imaginable topic, and if your area of interest isn't represented, it's not too difficult to start your own group. These groups take two forms: mailing lists and Usenet newsgroups. I talk more about Usenet in the next chapter; here I'll concentrate on mailing lists.

The beauty of mailing lists is that they cover specific topics and they come straight to you, without any extra work on your part. If you find yourself interested in a topic, you can subscribe to the appropriate mailing list, and all the traffic comes directly to your electronic mailbox.

Mailing lists have several advantages over Usenet news. Because of the way Usenet news propagates throughout the Internet, mailing lists often arrive faster than any given posting in a newsgroup. Because mailing lists arrive in your electronic mailbox, they might seem less intimidating than large newsgroups with many participants. And frankly, many of us who lead busy lives find mailing lists easier to keep up with because we don't have to run another program to read the list, whereas reading news always requires leaving that ubiquitous email program and running a newsreader.

A number of server programs operate mailing lists; the most well-known are LISTSERV, ListProcessor (also known as listproc), Majordomo, and the Macintosh-based ListSTAR. They all support similar commands for automatically adding yourself to and deleting yourself from a list; I'll cover those commands in a moment.

There also are many mailing lists that are run through hacks to the Unix mailer software—these generally require some sort of human intervention for subscribing and signing off, although sometimes they use nonstandard commands that do the same thing. Have I mentioned yet that I dislike programs that don't work in standard ways? They make life even more confusing than it already is.

> **BTW**
> You might wonder why LISTSERV doesn't have an E at the end and why it is spelled with all capitals. LISTSERV software started on IBM mainframes that run the VM/CMS operating system, which limited userids to eight characters (hence the missing E), and because the operating system itself was originally not case-sensitive, all commands and program names have traditionally been typed only in uppercase. The name also might have had something to do with early computer terminals not supporting lowercase, but I can't prove that theory. Just believe me—by convention, LISTSERVs are always addressed in the uppercase, although it doesn't matter any more.

Along with the different mailing list manager programs, you might have to deal with two other variables related to mailing lists—moderation and digests. Each of these possibilities slightly changes how you interact with the list, so let's look at each in turn and then go over the basics of using the list manager software as a subscriber.

Moderated vs. Unmoderated

I suspect most mailing lists start out unmoderated, which means that anyone can send a message on any topic (whether or not appropriate to the group) to the list. The mailing list software then distributes that message to the entire list. You see the problem already—no

one wants to read a bunch of messages that have nothing to do with the topic or discussion at hand. Similarly, if a discussion is spinning out of control and turning into a flame war, the list becomes a waste of time.

Thus was born the concept of the moderated mailing list. To stem inappropriate postings and flame wars, a moderator reads all the postings before they go out to the group at large and decides which are appropriate. Moderated groups tend to have less traffic, and the messages that go through are guaranteed by the moderator to have at least some worth. This system is good.

BTW

The Info-Mac Digest is a prominent example of a moderated group in the Macintosh world (it carries general Mac discussions). Although they're usually fairly lenient, moderators Gordon Watts, Demitri Muna, and Liam Breck do an excellent job, and their efforts are much appreciated by all. I'm also an Info-Mac moderator, but I help out with the files stored on the Info-Mac Archive, not with the Info-Mac Digest itself.

On the downside, moderated groups occasionally run into sticky issues of censorship because the moderator might not always represent the views of the majority of the readers. Moderator positions are volunteer only; I've never heard of a mailing list that elected a moderator, although it's certainly possible, particularly among lists that carry traffic associated with a professional organization.

There's a slightly different form of moderation practiced on some other lists that you might be interested in, such as the Apple Internet Users and Apple Internet Providers lists. Run by Chuq von Rospach of Apple, these lists employ a "List Mom" form of moderation, which means that although all postings appear whether or not Chuq approves, he reserves the right to tell people to take off-topic discussions elsewhere. Since I was about to start similar lists when Chuq created the Apple Internet Users and Providers lists, I volunteered to be an Assistant List Mom on Chuq's lists, which means I help steer the discussions so that they stay on track. Needless to say, I recommend both lists highly for discussions about the Mac and the Internet.

FYI

To subscribe to the Apple Internet lists, send email to `listproc@solutions.apple.com` and in the body of the message (the Subject line can be blank), put subscribe apple-internet-users *Your Full Name* or subscribe apple-internet-providers *Your Full Name*. After your subscription has been processed, you receive an information file, after which you can start posting questions and helping out with answers that you know. You cannot post to the list until you have subscribed.

I see no reason to choose to read or not read a mailing list based on its moderation until you've spent a while seeing what goes on in the group. I subscribe to various lists, some

moderated, some not, and both have their place. Keep in mind, though, that if you post to a moderated list, the moderator might reject your posting. Don't feel bad, but do ask why so that your future submissions stand a better chance of reaching the rest of the group. On the other hand, when posting to an unmoderated group, try to stick to appropriate topics, because people hate hearing about how you like your new car in a list devoted to potbellied pigs. Too many misdirected postings to a list might agitate list members to the point of asking for a moderator to limit the discussion.

Individual Messages vs. Digests

When the number of messages in a mailing list increases to a certain level, many lists consider creating a digest version. A digest is simply a single message that contains all the individual messages concatenated in a specific way. Why bother with a digest? Depending on how your email program works, you might find it awkward to receive and read as many as 30 messages a day. Just think how many messages you might have waiting after a week of vacation. If the messages are sent in digest form, a mailing list becomes easier to handle for some people because they get one big message instead of lots of little messages.

Unfortunately, digests have problems too. Some email gateways limit the size of incoming email messages. Digests such as Info-Mac, one of the most popular Macintosh mailing lists, can range in size from 30K to over 100K, so very few issues of the digest sneak through gateways with size limitations. In addition, you may find it easier to read (or skip through) small individual messages, whereas scrolling through a 100K file can take time and can be extremely awkward with some email programs. To add to the complication, certain email programs can break up a digest into its individual messages for easier viewing. I'm talking the email equivalent of digestive enzymes here.

You must decide for yourself whether a digest is easier or harder to work with, but only with some groups do you have any choice. Most mailing list software can automatically create a digest version of the list and mail it out once each day. The commands for subscribing to a digest version of a list vary widely, and on occasion you may have to subscribe to a different "-digest" list.

Mailing List Managers

Mailing list managers sport many sophisticated features for managing large mailing lists, and these features have made the programs popular among the people who start and run mailing lists (you didn't think lists just worked on their own, did you?). For instance, you can easily and automatically subscribe to and sign off mailing lists run with a mailing list manager without bothering a human (in most cases). This significantly reduces the amount of work that the list administrator has to do. These programs generally also have provisions for tracking the subscribers to a list, and for those who want to remain unknown, concealing certain subscriptions.

Mailing list managers can prevent unauthorized people from sending messages to the list or can make sure the moderators see messages before they go out. The Info-Mac list works like this, forwarding all replies to the main moderator, in this case Gordon Watts, who then builds the digest.

The LISTSERV software knows about other LISTSERVs running on other machines around the world and uses this knowledge to limit network traffic. When Gordon finishes a copy of the Info-Mac Digest, he sends it to the computer at Rice University in Texas that currently runs the Info-Mac list, which then sends it out to the thousands of readers on the Info-Mac subscription list.

LISTSERV is smart, however. It doesn't blindly send out thousands of messages, one per user, because that would waste network bandwidth, especially on expensive trans-oceanic links. Instead, the LISTSERV determines how to enlist the help of certain other LISTSERVs running around the world. If it knows of a LISTSERV site in Australia, for instance, it sends a single copy of the message to Australia along with the list of Australian readers to distribute to. If 100 people in Australia subscribe to the Info-Mac list, only one message crosses the Pacific instead of 100 identical copies of the same message. That's elegant.

Other mailing list managers don't have this feature, but even they can group outgoing messages by domain. For instance, if there are 200 people on America Online on a certain list, the mailing list manager would send out a single message to AOL's mail server along with a list of the addresses. AOL's mail server would then deliver each message internally.

> **BTW**
> ListProcessor used to be called Unix-Listserv and was distributed freely (version 6.0c is still free, even now that CREN has bought it and will be selling future versions), but after some unpleasantness regarding the term "Listserv," Anastasios Kotsikonas decided to rename it to avoid confusion. So, if you see references to Unix-Listserv, they're talking about ListProcessor.

In the previous edition of this book, I went through each of the major mailing lists managers and gave you the basic commands. However, something's changed since then, and it runs on the Macintosh. StarNine Technologies, now part of Quarterdeck, released a fabulous program called ListSTAR in 1995. ListSTAR is notable because it enables you to run a mailing list on a Mac, and even on a Mac that's not directly connected to the Internet (see Chapter 23, "Set up Your Own Server," for more details). However, what I find even more important about ListSTAR is that it's incredibly flexible, such that it has started to enable people like me who run mailing lists to break away from traditional commands and set up systems that are easier for users. Because of the different ways that people use ListSTAR, I can't really document it here, but it's either set up to emulate LISTSERV and ListProcessor or it has totally different methods of working that are quite a bit easier.

As a result, I next talk about the basic commands you use with mailing lists, not in terms of the different mailing lists managers, but in terms of the standard things you want to do on a mailing list.

List Addresses

Most traditional mailing lists have two email addresses associated with them: the address for the mailing list manager program, and the address for the mailing list. Why the dichotomy? Well, the mailing list manager address handles all commands, things such as subscriptions and requests for lists of subscribers and the like. The mailing list address is where you send submissions to the list, assuming of course that it's that sort of list.

If you want to send a command to the LISTSERV that handles the SCOUT REPORT (which reports on interesting new Internet sites), send it to `listserv@lists.internic.net`. Notice that nowhere in the address is the name of the list mentioned, which is a hint that you have to specify it somewhere else, such as in the subscription command.

> **BTW**
> You can subscribe to the SCOUT REPORT by sending email to `listserv@lists.internic.net` and putting SUBSCRIBE SCOUT-REPORT Your Full Name in the body of the message.

Let's talk about how to subscribe now, but please keep what I've just said about the two different addresses in mind. You must send commands to the mailing list manager address, and submissions to the list address. If you send commands to the list address, everyone must read them and you look like a fool to everyone on the list. If you send submissions to the mailing list manager address, it will simply reject them as invalid commands and you'll feel like a fool.

Subscribing to Mailing Lists

Subscribing to lists run by the traditional mailing list managers such as LISTSERV, ListProcessor, and Majordomo is quite easy, but also easy to mess up. You must send your subscription command to the mailing list manager address, which will be something like `listserv@domain.com`, `listproc@domain.com`, or `majordomo@domain.com`, along with whatever the rest of the domain name is. In the body of the message (not the Subject line), you type the subscription command, as outlined below for the three traditional list managers:

- LISTSERV: subscribe listname your full name
- ListProcessor: subscribe listname your full name
- Majordomo: subscribe *listname*

In each of the commands above, you replace **listname** with the name of the list, for example "Info-Mac," and **your full name** with your real name, such as "Jane Q. Public," assuming that your name is Jane Q. Public. Note that **your full name** is not your email address—the mailing list manager figures that out from the header of your message. Your full name must be at least two words. I don't know how rock star types such as Cher or Prince manage, although I did once get mail from someone who really only had one name. I advised him to use "No really, I only have one name" as his last name.

> **BTW**
> Prince has legally changed his name to a single character that looks like a little stick figure person. Such characters are called dingbats in the publishing world, so I vote that we simply refer to him as Dingbat, or perhaps Prince Dingbat to be unambiguous. Needless to say, there's no way to subscribe to a mailing list using a single non-alphabetic character as your name.

There's an alternate method of subscribing to some Majordomo lists that you might see. Instead of sending email to the `majordomo@domain.com` address, you instead send it to a `listname-request@domain.com` address (replace `domain.com` with the appropriate domain). By specifying the name of the mailing list in the address, you can eliminate it from the body of the message, and include just the command **subscribe**.

> **FYI**
> Some LISTSERV-based mailing lists might require you to confirm your subscription request by replying to a message they send you after you send in the request. Although it's annoying, this technique cuts down significantly on the amount of work it takes to administer a list.

I mentioned previously that ListSTAR has enabled more flexibility in dealing with mailing lists. This flexibility breaks down the traditional methods of working with mailing lists, but it also can make subscribing much easier. For instance, on one list I created, called DealBITS, I set up ListSTAR to accept subscription via the traditional method, but the main way that people subscribe is by simply sending email to `dealbits-on@tidbits.com`. This method of enabling people to subscribe without worrying about typing a command correctly has proven far easier and I hope to see it continue to gain acceptance.

One way or another, any time you see a mailing list mentioned, there should be instructions on how to subscribe, so whether it's traditional or nontraditional shouldn't matter too much. In addition, it's becoming increasingly common to provide a Web interface to a mailing list, so you could subscribe by filling in a form and clicking a button on a Web page.

Mailing lists almost always return a welcome note after you have subscribed successfully. After you've read the welcome message, keep it! It lists various useful commands, such as how to sign off or unsubscribe from the list, and it usually provides the address of the list administrator. You can contact the list administrator to handle any problems that the automated program chokes on.

I really mean what I just said about keeping the welcome message! I can't tell you how irritating it is to have people post to the list asking how to sign off when it would have been trivial if they'd just kept that welcome message. Actually, I can tell you how irritating this is, because after the 10th or 100th person does, it's tremendously exasperating! Sorry, I'll quiet down now, but please keep that message. Store it in the mailbox in which you plan to store messages from that list, or perhaps in a special mailbox where you put all the administrative messages from mailing list managers. Never delete a welcome message, because you will eventually need the information contained in it.

Unsubscribing from Mailing Lists

Unsubscribing from a mailing list is even easier than subscribing with the traditional mailing lists managers, but there are a few catches that can prove irritating. As with all commands, your unsubscribe or signoff command must be sent to the mailing list manager address. In the body of the message (not the Subject line), you type a command, as outlined below for the three traditional list managers:

- LISTSERV: unsubscribe listname or signoff listname
- ListProcessor: unsubscribe listname or signoff listname
- Majordomo: unsubscribe listname or signoff listname

In each of the commands above, you replace **listname** with the name of the list, say "SCOUT-REPORT." Note that you do not enter your name anywhere. The mailing list manager software figures out who you are by the email address that your message comes from, and in fact, if you include your real name in the command, at least LISTSERV will consider it an error.

There's an alternate method of unsubscribing from some Majordomo lists that you might see. Instead of sending email to the `majordomo@domain.com` address, you instead send it to a `listname-request@domain.com` address (again, use the appropriate domain). By specifying the name of the mailing list in the address, you can eliminate it from the body of the message, and just include the command **unsubscribe** or **signoff**.

Now, who's been clever and discovered the flaw in this scheme? Unfortunately, it's all too common that your email headers will contain slightly different versions of your email address, depending on how your Internet provider runs its mail server. Sometimes an organization might even rename machines without warning, forwarding all mail sent to the old address, but making it impossible to send mail from the old address. Or, what if you switch providers and get a new email address?

If the email address in the header of your signoff request does not match the address with which you subscribed exactly, the mailing list manager software will refuse to remove you from the list. As far as it knows, you're someone else now.

The reason for this seemingly irritating feature is that mailing list administrators realized early on that it would be way too much fun to sign a friend or enemy up for mailing lists. This is much like signing someone up for all the wacky special offers in the back of The National Enquirer. Some friends of mine once had a war with that game, but one was declared the loser when he received bronzed baby shoes and a free subscription to a white supremacist newsletter, or some such nonsense. I'm sure it would be great fun to sign Bill Gates up for a far-out mailing list, but it gets old after a while and is generally considered abuse of the networks.

Remember how I said that almost all mailing list managers send you a welcome message listing useful commands? And remember how I emphatically stated that you should save that message? Good, because that's the only place you can turn for help now. Read that message again, and somewhere in it there should be an address of the list owner or moderator or List Mom or someone who can help remove you from the list. Send that person polite email asking to be removed, and he or she will help you. I emphasize "polite" above because all too many people are rude about demanding when asking to be removed from a list when in many cases, they simply can't follow the simple instructions to remove themselves. It doesn't help anything to be rude to someone you're asking for help.

Whatever you do, don't send email to the entire mailing list with a signoff command. It irritates everyone else on the list and does no good as far as getting you off of the list. And as I said, it makes you look at best careless, if not thoroughly foolish.

ListSTAR and the Web interfaces that have started to appear for mailing lists are beginning to solve this knotty problem. For instance, my DealBITS list has a special address for people who want to sign off. They can just send email to dealbits-off@tidbits.com and ListSTAR automatically unsubscribes them from the list. There are no commands to remember, and nothing that can be mistyped. Even this system can't solve the problem of a change in email address, though, and that's what the Web is good for, since a Web page can have a form into which you enter your old address before clicking a button to remove it. These Web forms require you to know exactly what your old email address was, but you're the person most likely to know that fact. It's also possible, although not particularly common at the moment, to create a Web form that enables you to search for your entry in a mailing list in case you can't remember your old address or in case it was added in a weird format that you hadn't known.

Changing Your Address

Unfortunately, none of the mailing list managers have a simple way of changing your address on a list. The reason is that they like to pull your email address from the header of your message, but it's hard to pull two different email addresses from the header of a message. (How would it know both the old and the new address otherwise?)

As a result, there's only one way to change your address on a mailing list. You must first send email from the old address, unsubscribing from the list, and then switch to the new address, and send another message, subscribing anew.

Of course, you may run into the problem of not being able to send email from your old address. If that's true, read what I said previously about contacting the list owner or moderator for help with unsubscribing. No matter what, you should always subscribe yourself if at all possible to make sure the mailing list manager software has what it thinks is the proper address (as opposed to what you think is the proper address).

Confirming Subscriptions

After you've been on a list for some time, a mailing list manager might ask you to confirm your subscription in order to clean the deadwood from the list. Students graduate, employees move on, bulletin boards close, and those addresses don't always go away, so the mailing list manager wastes network resources sending to a nonexistent person. It's much like talking to a politician.

Of all the mailing list managers, I've seen this feature implemented only by LISTSERV, but based on discussions on the mailing list that talks about ListSTAR, I expect to see it being set up to require confirmations more frequently in the coming year.

After you have received some mailing lists for a year from a LISTSERV, it might send you a message asking you to confirm that you still want to receive the list. If you don't respond within seven days, the LISTSERV removes you from the list, assuming that you don't want to continue receiving email from it. If you respond, you must respond with a command, and you send the command to the LISTSERV address, not the mailing list address. The command is simply CONFIRM listname (the name of whatever list you are asked to confirm).

A portion of the time this confirmation process fails because of changes in email addresses. When you confirm a subscription, if that confirmation comes from an address the LISTSERV doesn't recognize, poof, it doesn't work. You may even still receive mail to the original address if the new address is merely a variant on the original, so many people sit helplessly by as the LISTERV asks for confirmation, rejects it, and then calmly deletes them from the list.

> **BTW**
> This situation is a perfect example of why computers should never be given direct control over human lives. If you don't properly match for some reason, you're just another file to be deleted.

There is a simple fix. Just resubscribe as soon as the LISTSERV sends either the confirmation rejection or the message saying that it has deleted you from the list. You may get duplicates of everything for a few days, but eventually the LISTSERV will delete your old address.

Toggling Digest Mode

Many mailing list managers support a digest mode for the lists they run that mail out a single large message once a day rather than 20 or 30 individual messages each day. Many people find the single large message easier to deal with, although I suspect that those people don't have filtering capabilities in their email program, since I find individual messages filtered into a specific mailbox much easier to deal with.

The welcome message you receive from the mailing list manager should provide instructions for switching to digest mode, but here are the basic commands for the LISTSERV and ListProcessor. Majordomo generally handles digests by providing a different mailing list for you to subscribe to, usually called `listname-digest@domain.com`.

- LISTSERV: **SET *listname* DIGEST**
- ListProcessor: **set *listname* mail digest**

In each of the commands above, you replace ***listname*** with the name of the list, say SCOUT-REPORT. Of course, if you can get into digest mode, you probably want to get out of digest mode as well, and here are the commands for that action (for Majordomo, just unsubscribe from `listname-digest@domain.com`).

- LISTSERV: SET listname MAIL
- ListProcessor: set listname mail ack

Getting Help

There are quite a few things that the traditional mailing list managers can do that I haven't discussed here because most people don't care. However, to explore those features further, or if you lose the welcome message, you can get additional help by sending a command in the body of the message to the mailing list manager address. In each case, the program returns a message listing commands and generally providing useful information. You should notice a marked similarity between the help commands.

- LISTSERV: **help**
- ListProcessor: **help**
- Majordomo: **help**

It's time now to look in detail at the email programs that you're likely to use to participate in mailing lists and for private email.

Email Program Reviews

Considering that email is the ubiquitous application on the Internet, you should use the best email program available; otherwise, you will slowly (or quickly, in my case) go stark raving mad. I've looked at many email programs in my time, and although a number of them are becoming more and more impressive, none compete with Steve Dorner's Eudora. Simply put, Eudora does most everything right.

More fully functional email programs are appearing in the Macintosh world, finally, and I'll discuss the main other one, Claris Emailer, in detail here as well. Web browsers such as Netscape Navigator and Internet environments such as Cyberdog also support email now, and I'll talk about their features in Chapter 16, "All About the World Wide Web."

Eudora

Steve Dorner first wrote Eudora while working at the University of Illinois. Because of its academic heritage, Eudora was made freely available on the Internet. Its clean interface and full feature set helped Eudora quickly become the Internet email application of choice for Macintosh users. In July of 1992, Steve left the University of Illinois and went to work for a company called Qualcomm, where he continued to enhance Eudora. Because Steve and Qualcomm wanted to give something back to the educational community and taxpayers who made Eudora possible, and because free software is the best advertising for commercial software, Eudora has remained freeware and is now known as Eudora Light. Qualcomm also has released a commercial version of Eudora, called Eudora Pro, that adds some nice touches and features that are essential for email users who get a ton of mail every day.

> **BTW**
> To answer the question that almost everyone always asks, Steve named his Post Office Protocol program "Eudora" after Eudora Welty, the author of a short story he had read called "Why I Live at the P.O." And for those thinking of the TV show Bewitched, the name is not "Endora."

Eudora Light will continue to exist and will be developed in conjunction with Eudora Pro, but it is unlikely to receive many new features, other than those Steve deems necessary for basic email usage. For example, he added support for MIME (Multipurpose Internet Mail Extensions), an Internet standard for transferring nontextual data via email, and support for Apple events, so that both versions of Eudora can work more closely with other programs on the Macintosh. In addition, both versions have Power Mac-native code, significantly increasing their speed in certain instances.

FYI

Using Eudora to transfer files in email back and forth between Macs and PCs works well if your recipient uses PC Eudora or another MIME-compatible mail program. If you're sending the files from the Mac, use AppleDouble encoding (which puts the Mac data fork in one file and the resource fork in another, unlike AppleSingle, which combines both forks into a single file, like MacBinary). If you're sending from PC Eudora, choose MIME before attaching the file. Both versions of Eudora automatically recognize MIME attachments and decode them automatically upon receipt.

Eudora Pro 2.1.4 is extremely similar to the freeware Eudora Light 1.5.4. It looks about the same, and for the most part, works the same. Perhaps the most apparent additional feature in Eudora Pro is its ability to filter messages. Eudora Pro can automatically annotate the subject of messages, change their priority, or put them in specific mailboxes based on information in their headers or bodies. You can have as many filters as you want, and they can apply to incoming, outgoing, or selected messages. In addition, Eudora Pro also supports spell checking in messages via the Word Services suite of Apple events. You can even buy Eudora along with Spellswell, an Apple event-aware spelling program.

BTW

As of this writing, Qualcomm has released a beta version of Eudora Pro 3.0 that adds some extremely welcome features on top of the basic set of features in Eudora Pro 2.1.4. Qualcomm hasn't yet decided what will end up in the corresponding version of Eudora Light, but when appropriate, I'll note when Eudora Pro 3.0 improves on the current versions.

Other useful features that exist only in Eudora 2.1 include uuencode support; automatic opening of attachments encoded in MIME, BinHex, or uuencode; multiple nickname files for organizations; support for System 7 drag-and-drop for attaching files to outgoing messages; stationery for frequently sent messages; menu sharing for Frontier users; and multiple signatures.

In my opinion, if you use Eudora heavily, as I do, Eudora Pro offers an extremely attractive set of features above and beyond the basic set in Eudora Light. For those just starting out, try Eudora Light for a while, and if you decide you like it, consider purchasing the full Eudora Pro version for about $60 from online retailers such as Cyberian Outpost and software.net. I can't recommend Eudora Pro highly enough, and it's the program that I use more than any other on my Mac. Frankly, I encourage people to buy it, because that sends the message to Qualcomm that the community appreciates free software and is willing to support commercial software to keep free versions available. However, for the following discussion, I'll concentrate primarily on Eudora Light because that's the version on the Internet Starter Kit CD-ROM. All of Eudora Light's features exist in Eudora Pro, and when appropriate, I'll mention Eudora Pro's added features.

Installation and Setup

Although powerful and flexible, Eudora has a surprisingly simple setup. First, from the Special menu, choose Settings (see Figure 13.3).

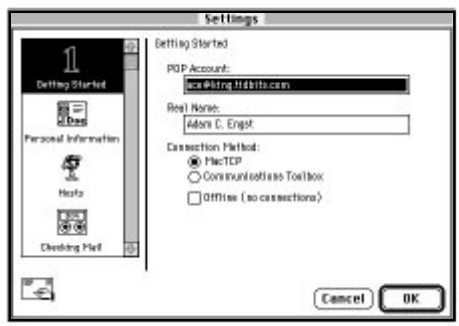


Figure 13.3 Eudora Settings dialog box.

The scrolling list on the left-hand side of the dialog box provides access to a large number of Eudora's settings. Despite all the available fields, only the two in the Getting Started panel are absolutely necessary (although some Internet providers might require some additional settings). The POP Account field holds the full address of your POP account. The best way to find out what to put here is to ask your Internet provider or system administrator. The next field, Real Name, should be obvious. Lastly, click the MacTCP (or TCP/IP, if you're using Open Transport and a newer version of Eudora) radio button located below the Real Name field.

For most people, that's all there is to the setup process. If you want to enter a different return address from the address of your POP account (my return address is `ace@tidbits.com`, whereas my POP account is `ace@king.tidbits.com`), click the second icon in the list, Personal Information, to bring up that panel.

> **FYI**
> If you fill in the Return Address field, be very careful to get it right; otherwise, all your incoming email will go to an incorrect address and you'll never know it. Many people mess up their configurations by slavishly copying the screenshots in this book—I know because I get replies to their messages since they use my return address!

If you need to tell Eudora that your SMTP server is on a different machine from your POP account (it usually isn't), click the third icon in the list, Hosts, to bring up the Host Settings panel. Once you've entered the names of your various servers as given to you by your Internet provider, scroll down to see the icons that enable you to modify how Eudora works, such as Checking Mail, Sending Mail, Attachments, and Fonts & Display (see Figure 13.4).

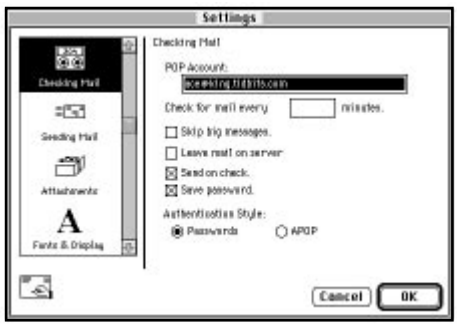


Figure 13.4 More Eudora settings.

These options enable you to configure Eudora quickly and easily in order to handle many different situations. When I'm traveling and connecting via a modem, I generally don't want to receive large messages, so I turn on the Skip big messages checkbox. I also sometimes use the Leave mail on server option to ensure that if something happened to my PowerBook while I was traveling, I wouldn't lose any of the mail I'd received while away. I seldom have Eudora check mail regularly, but that's because I get so much that it would be a constant distraction; however, many people appreciate knowing when new mail has arrived.

Eudora has so many settings that I don't want to get into showing them all to you, and its Balloon Help is among the best I've used. However, the other important options that I always use are in the Sending Mail panel: Send on check, Word wrap, Fix curly quotes, Keep copies of outgoing mail, and Use signature. In the Attachments panel, stick with BinHex encoding for most files you send to other Mac users and you'll be fine. Use AppleDouble for files you send to PC users whose email programs support MIME (especially PC Eudora). In the Replying panel, I recommend that you use the Reply to all when Option key is down setting, rather than Reply to all by default. The problem is that it's not difficult to send something personal to a mailing list or to unintended recipients if you normally use Reply to all.

> **FYI**
> If you select text in the message you're replying to and then hold down Shift while you choose Reply (or press Command-Shift-R), Eudora quotes only the selected text in the reply.

When you've finished browsing through Eudora's many settings and have configured the program to your taste, click the OK button to save your changes. Eudora stores its settings in the Eudora Settings file that it creates in the Eudora Folder in your System Folder (or in the settings file that you used to open Eudora, if you've created more than one settings file).

FYI
I mentioned creating more than one Eudora Settings file. You can do this by making a copy of the Eudora Settings file in your Eudora Folder, renaming it, and double-clicking it to launch Eudora. Then, any changes you make to the settings apply only to that Eudora Settings file. Also, if you put a copy of the Eudora Settings file in a new folder and double-click the file's icon, Eudora creates a new set of mailboxes for you. This can be handy if two people share the same Mac but have different email accounts and want to keep their email separate.

Commands for accessing three of Eudora's features—Mailboxes, Nicknames, and Signature—live in the Windows menu. The Mailboxes window enables you to create, rename, move, and maintain your mailboxes (remember that you can have hierarchical mailboxes for organizing the email you receive—the mailboxes in Figure 13.5 with triangles to the right of their names are hierarchical). The Nickname window enables you to create, modify, and remove nicknames, which enable you to avoid memorizing email addresses. Clicking just to the left of the name adds or removes a bullet; this means the name will appear as a recipient in Eudora's hierarchical New Message To, Reply To, Forward To, and Redirect To menus. You can put multiple addresses in a single nickname to create a small distribution list.

FYI
You can't include spaces in a Eudora nickname, but if you don't like using underscores, you can use an Option-space instead.

Finally, Eudora's Signature window is a simple text window in which you can enter a signature to be appended automatically to outgoing messages.

Basic Usage

You're most likely to use Eudora for simple tasks such as creating new messages, reading incoming mail, replying to messages, and the like. Creating a message is the first thing to do. From the Message menu, choose New Message, or—to use the shortcut—press Command-N (see Figure 13.6).

Eudora opens a new window with three parts. At the top of the window is a row of switch icons, which you use to toggle items (such as automatically appending a signature) on a per-message basis. Point at the icons with Balloon Help turned on in order to see what the icons mean. Below that is an area for the header. At the bottom of the window is the message area. Tabbing takes you from one header item to another, and finally to the message window.

Figure 13.5 Eudora Mailboxes, Nicknames, and Signature windows.

Figure 13.6 Eudora New Mail window.

You can select email addresses that appear in headers or messages and add them to a Recipients menu (choose Add as Recipient from the Special menu). The people you add as recipients show up in a hierarchical New Message To menu under the Message menu. If you select someone from that hierarchical menu, Eudora opens a new message with the To line already filled in (the From line is always filled in for you). When you create nicknames for people (Nicknames from the Special menu), you're given the option to add that nickname to the recipient list for quick access.

Eudora has a good text entry environment and wraps paragraphs as you write and edit (which is not true of all email programs, so don't laugh). In fact, Eudora can do some neat things with text, as shown by the commands in the Edit menu (see Figure 13.7).

Figure 13.7 Eudora Edit menu.

I especially like the capability to Insert Recipient and Paste as Quotation. I often want to send an email address to a friend for which I have a recipient defined; it's nice to be able to just Insert Recipient in the text where I'm typing. Paste as Quotation also is useful when you're pulling several messages together in one reply.

The only major fault of Eudora's text entry environment is that it doesn't accept more than approximately 32K of text; if you want to send a message longer than that, you must attach a text file to the email message.

> **FYI**
> Eudora Pro 3.0 eliminates this 32K text barrier, both on incoming and outgoing messages, which is extremely welcome. It also supports different fonts and styles like bold and underline in email, which some people will like.

In any event, back at the New Mail window, clicking the Queue button queues the message for delivery (this is because I didn't select the Immediate Send checkbox when configuring Eudora's Sending Mail panel). If you work on a network that's constantly connected to the Internet, you might want to send all of your mail immediately, at which point that Queue button changes to Send. Even with my direct connection, I stick to queuing messages. It's simply less distracting, and I can always send messages manually if I want.

With the Send on Check switch turned on, I go to the File menu and choose Check Mail. Eudora connects to my POP server to receive any waiting mail; it then connects to my SMTP server to send my queued mail.

FYI

If Eudora is interrupted while receiving mail, it can sometimes leave your POP mailbox on the server in a locked state, preventing you from receiving any more mail until it's unlocked. You can fix this by telnetting to your account and killing a specific process, which sounds bad, but it is quite easy. It's explained well in the Eudora Q&A stack, available in <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/mail/>. If you use the same provider I do, Northwest Nexus, you can telnet to your account and at the Unix command line, type pop-lock to solve this problem. Other providers may have similar custom solutions.

If you only want to send mail, choose Send Queued Messages, also from the File menu. At this point Eudora connects only to the SMTP server to send messages and ignores any messages that might be waiting to come in.

If the In mailbox isn't open already (another preferences switch makes it open when new mail arrives), open it from the Mailbox menu by choosing In (see Figure 13.8).

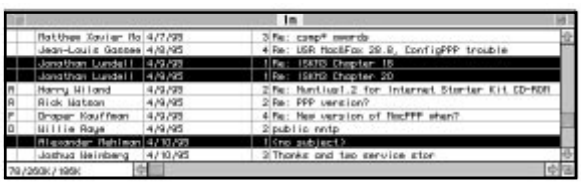


Figure 13.8 Eudora In mailbox.

Eudora's mailboxes, which all look the same, provide a clean display of your mail. A status and priority column at the left edge of the window displays various characters to indicate which messages you haven't read, which you have replied to, which you've forwarded, redirected, and, in your Out mailbox, which have been sent. Some programs mark deleted messages in this way too, but Eudora instead moves deleted messages to a Trash mailbox available in the Mailbox menu. The commercial version of Eudora adds a column for label and uses the Finder labels (use the Labels control panel to change the colors and names) to mark messages.

BTW

Eudora Pro 3.0 adds several more columns that indicate whether or not a message has an attachment and whether or not it has been downloaded from the server. It also supports more labels than 2.1.4 does.

The next column is the name of the sender, followed by the time and date, size of the message in kilobytes, and subject of the message. In the lower left corner of the window is an indicator that shows the number of messages in the mailbox, amount of disk space that it takes up, and amount of space that is wasted. You can recover the wasted space by choosing Compact Mailboxes from the Special menu, although Eudora also does it automatically after the ratio of wasted space to space on disk gets too high.

Double-clicking any message opens the message window (see Figure 13.9 for an example).

Figure 13.9 Eudora Message window.

The Eudora Message window shows the Subject at the top and a Priority pop-up menu that you can use to mark messages for your own reference, which is a good way to sort them. You can select, copy, and find text in the window, but you cannot change it. Again, my only complaint about the way Eudora currently handles incoming messages is that it cannot display more than approximately 32K of text in a window, so it chops longer messages into two or more pieces. This limitation goes away in Eudora Pro 3.0 and is worth the cost of the program alone for me.

> **BTW**
> Like many other settings in Eudora, you can modify the size at which Eudora splits messages with a plug-in that goes in your Eudora Folder. I've created a plug-in specifically so issues of TidBITS aren't split—to receive a copy automatically in email, send a message to `tidbits-plug-in@tidbits.com`. Don't use this plug-in with Eudora 3.0 or later.

Luckily, Eudora can save multiple selected messages to a single file, removing the header information in the process so that there's no header garbage in the middle of the file. Simply select all the messages you want concatenated into a single file. Choose Save As from the File menu, making sure that the Include Headers and Guess Paragraphs (which wraps lines in paragraphs) checkboxes aren't selected if you want the file exactly as it was sent to you.

With a message open, you can use the items in the Message menu to Reply, Forward, Redirect, or Delete the current message. Most of those functions are self-explanatory, but Redirect is an interesting and useful command. When you forward a message to someone else via Eudora, your address becomes the Reply-To address. However, if you want the original sender's address to remain as the Reply-To address, you use Redirect. That way, when the person you're redirecting to receives the message and replies, the reply goes to the original sender, not back to you. Eudora adds a tag that indicates that you redirected the message to the header of the redirected message so the recipient can see what's happened.

After you're done reading a message, you generally want to either delete it or file it. Eudora makes deleting messages easy (the Delete key, Command-D, or the Delete option in the Message menu) because it merely moves them to the Trash mailbox, from which you can recover them later, if necessary. I leave a lot of mail, sometimes up to 4,000 messages, in my Trash so I can easily go back and retrieve something afterwards. You can set Eudora to empty the Trash every time you quit if you're not as retentive about old email as I am.

Filing messages in one of an arbitrary (or at least large) number of hierarchical mailboxes is also easy. With the message or messages selected, select the destination mailbox from the Transfer menu. I save a lot of messages for future reference, so I appreciate the ease of filing messages.

Special Features

Eudora's clever touches abound. If you choose About Eudora from the Apple menu, Eudora tells you the minimum amount of memory it should have. Should your In, Out, and Trash mailboxes fill up to the point at which Eudora needs more memory, it's good about warning you ahead of time and suggesting a size that will support the new requirements.

Steve must have had fun writing Eudora's dialog boxes. Many of them are, shall I say, less than serious. For instance, I started typing with a mailbox window open in Eudora (I'd forgotten that I hadn't switched over to Nisus Writer on my second monitor), and Eudora beeped at me a couple of times and then opened a dialog saying, "Unfortunately, no one is listening to keystrokes at the moment. You may as well stop typing." I far prefer such human touches like this to dialog boxes that say, "Text entry not allowed," or some such terse phrase.

Eudora can sort mailboxes on status, priority (which you generally set), sender, date, and subject. This is a helpful feature for anyone who receives a significant amount of email. Eudora 2.1.4 makes sorting even easier than in 1.5.4 (in which you must use a menu) by letting you click mailbox column titles to sort the contents of a mailbox. Eudora Pro 3.0 will add two even better features. You'll be able to type a few letters with a mailbox window open to select the first message that matches those letters, and you can also Option-click any cell in a mailbox window to select all messages in that mailbox with the same size, subject, sender, or whatever you clicked.

Eudora supports a number of Apple events, and many people have used Frontier and AppleScript to add functionality to Eudora through scripting. You can peruse some of those scripts in either <ftp://ftp.qualcomm.com/quest/mac/eudora/scripts/> or <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/mail/>.

If you create multiple settings files, different people can use the same copy of Eudora to send and receive their personal email. This setup is handy if a number of people all share the same computer but don't want to share the same email account ("Hey, no poking about in my email!"). I use this feature as well because I have multiple accounts, but I want all my email to end up in the same In mailbox. Eudora's capability to launch using different settings files is also the secret to how it's used in large universities. Students are given a POP account and a Eudora Settings file that's configured for them on a disk. Whenever they use a public Mac hooked to the campus network, they double-click their Eudora Settings file, which launches a copy of Eudora over the network (saving the space on the disk). All of their mail comes down to the disk, which they can then read on any other Mac that has Eudora on it.

> **FYI**
> If you create an empty text file called Eudora Folder with SimpleText and place it in your System Folder (say you have multiple people using the same Mac, each with their own personal Eudora Folders), then Eudora will prompt you for a Eudora Settings file when you start it up. This helps prevent accidentally using the wrong Eudora Settings file.

Finally, although official technical support comes only with Eudora 2.1.4, expert Eudora users provide good support online in the newsgroup comp.sys.mac.comm. Eudora now has its own newsgroup at comp.mail.eudora.mac as well, so if you have a simple question, ask there before anywhere else (but use the Balloon Help and the manual before that). Eudora's manual is also excellent. Look for it in <ftp://ftp.qualcomm.com/quest/mac/eudora/documentation/>.

Evaluation and Details

Eudora may not be perfect, but it remains the best email program I've seen. That's why I've included it on the CD-ROM. Its main limitation is the 32K limitation on message size, and since Eudora Pro 3.0 eliminates that limitation, I'd mainly like to see more powerful searching capabilities. However, any such quibbles are easily outweighed by Eudora's significant capabilities. Eudora simply is the way to go for Internet email.

Eudora 1.5.4 is free, and comes courtesy of Qualcomm. You can retrieve the latest versions from either <ftp://ftp.qualcomm.com/quest/mac/eudora/1.5/> or <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/mail/>.

Eudora 2.1.4 costs between $50 and $90 for an individual copy, depending on where you buy it. Prices drop quickly from there, depending on how many copies you want to buy, so if you're outfitting a couple of people in an office, look for volume discounts. You can get more information from Qualcomm via email at `eudora-sales@qualcomm.com` or by phone at 800-2-EUDORA.

Claris Emailer

Emailer is strong email contender marketed by Claris and programmed by a company called Fog City Software, which Guy Kawasaki founded. Guy no longer has anything to do with the development of Emailer because he's an Apple Fellow, but he had a strong hand in its design. Like many people in the industry, Guy has a large number of email accounts on different services, and checking mail on each one is a royal pain. Enter Emailer, which Guy and the folks at Fog City Software designed to be your central email program. Emailer 1.0v3, the current version, can connect to a number of services, including America Online, CompuServe, RadioMail, and the Internet. Emailer also supports Apple's now-defunct eWorld online service, and support for additional email services such as AppleLink, Apple's elderly online service, will appear in the next version.

Although Emailer is a perfectly good email client for use with Internet email, it shines when you use it to replace the horrible email clients most people have to use with America Online and CompuServe. That's how I use Emailer—to read my AOL and CompuServe mail (actually, I usually filter it back to the Internet so I can read and file it in Eudora).

Installation and Setup

Emailer requires a bit of setup, not surprisingly, because it works with so many different services. After you set up a service (see Figure 13.10) by choosing Services from the Setup menu and double-clicking the service name in the list, you can enter your account and connection configuration information.

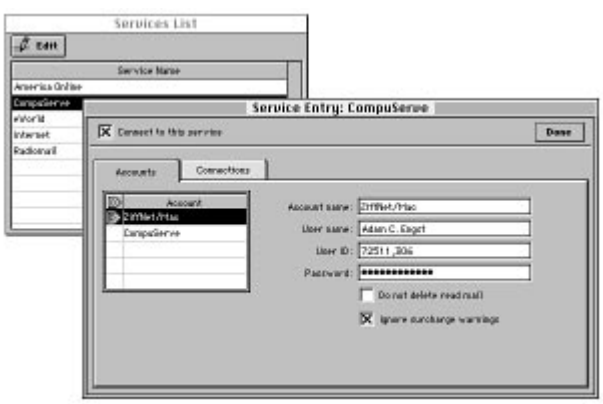


Figure 13.10 Emailer's Services CompuServe Setup window.

Guy recognized that people might have multiple accounts on multiple services. For instance, I have multiple accounts on CompuServe—a straight CompuServe account and my main ZiffNet/Mac account—as you can see in Figure 13.10. (See Chapter 19, "Commercial Services," for more information on America Online, CompuServe, and ZiffNet/Mac accounts.

The configuration for each service is tailored to that service, so when you configure your Internet account, you enter things like your POP account, SMTP server, and return address. In a nice touch, Emailer supports Internet Config, which holds all of these sorts of pieces of information for use by any Internet program that wants to support Internet Config. Internet Config won't make configuration any easier for any of the commercial services, of course, but it can eliminate almost all of the configuration for your Internet email account.

Of course, many people travel and need to connect to the different services using different phone numbers, depending on their location. In the past, it's been a pain to reconfigure different programs, such as CompuServe Information Manager (CIM) or America Online, for the local phone numbers in the places you regularly visit. Emailer turns this task into a one-time event with its Locations feature (see Figure 13.11).

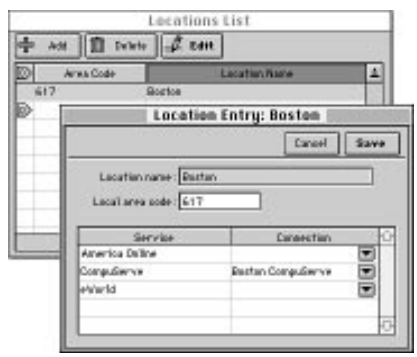


Figure 13.11 Emailer Locations configuration windows.

But Emailer's clever design doesn't stop there. Anyone who uses a number of different services doesn't want to connect to each of them manually throughout the day. It's much more convenient to have the program connect automatically at a preset time, and in fact, CIM and AOL can both do this. Well, so can Emailer, and it's more flexible than either (see Figure 13.12).

Figure 13.12 Emailer Schedules configuration.

All right, so we have a program that can connect to multiple services using multiple accounts in many different locations at prespecified times. Emailer has to know how to send mail from one service to another, and as you might expect, it relies on the Internet, which can connect to all of these different services. You can, of course, reply to CompuServe mail back through CompuServe, but if you'd rather use a cheaper connection through the Internet, for example, you can also set Emailer's Destinations settings to send mail back through a different service than it was received from (see Figure 13.13). I especially like this feature because I can have all my CompuServe mail come in from CompuServe and go out through the Internet. In addition, if I want to send new mail to someone on CompuServe, Emailer uses this information to address the message properly so it's delivered to CompuServe via the Internet.

There's quite a lot more configuration that you can do in Emailer's Preferences (it's telling that Emailer has an entire Setup menu), but most the defaults should work well, and Internet Config provides a number of the entries as well.

Basic Usage

Using Emailer is easy. If you've set up some timed connections along with a timed shut-down using something like QuicKeys or AppleScript, you might have email waiting for you automatically when you turn on your computer in the morning, or, if not, you can always invoke a connection manually, specifying which of the services you would like to connect to each time (see Figure 13.14). When you click the Connect button, Emailer connects in turn to each of the services you've checked, sending and receiving messages (although you can set it to just send or just receive). The Connection Status window displays status messages as the connections proceed.

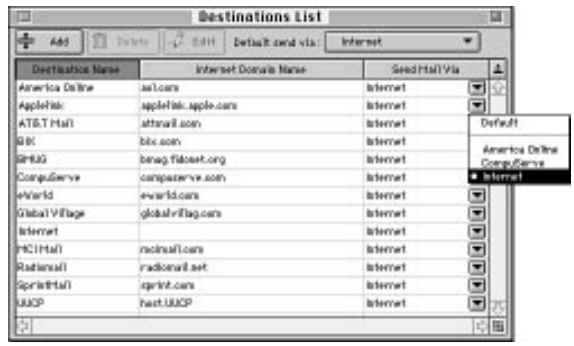


Figure 13.13 Emailer Destinations configuration.

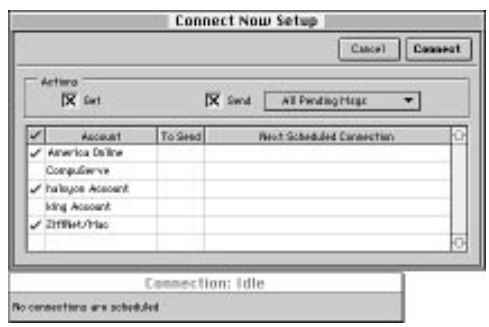


Figure 13.14 Emailer Connect Now setup.

Mail comes into your In Box, accessible via a tab from the Emailer Browser window, and double-clicking a message opens it for reading (see Figure 13.15).

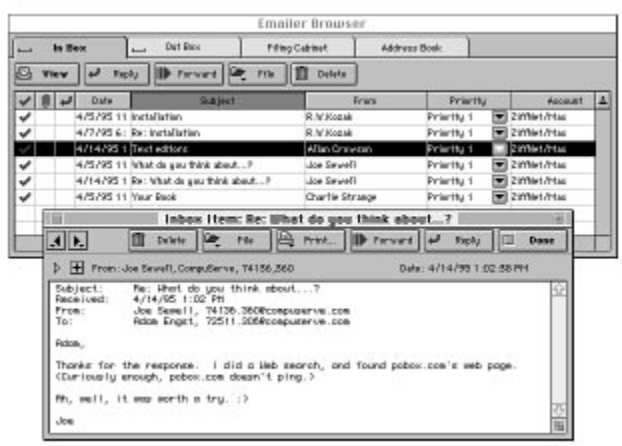


Figure 13.15 Emailer Browser In Box and message window.

As you can see from the buttons available, almost anything you could want to do with a message is available here, including deleting it (Emailer moves it to a Deleted Mail mailbox in the Filing Cabinet part of the Browser for later deletion), filing in a separate mailbox, printing the letter, forwarding it to another person, and replying (and Emailer quotes the selected text when you reply, a great feature). You can also move back and forth between the messages in the current mailbox, and Emailer can automatically move read messages to a Read Mail box in the Filing Cabinet if you want. If you want to see who a message was sent to, the triangle in the upper left-hand corner flips down to display that header information, and clicking the plus button next to the sender's name adds that person to your Address Book.

Speaking of the Address Book, it's excellent (see Figure 13.16). You can store multiple addresses for users easily (including multiple addresses at the same service), you can create groups of users, and you can filter the list on text strings once it gets large so that it becomes easy to find people. I could go on for some time, but that would spoil the fun. Suffice it to say, it's easy to create new messages for people from the Address Book, and if you have it and a message open at the same time, you can drag an entry to the message from the Address Book to include that person in the message.

Other useful features in Emailer include a search capability within saved mail, multiple mailboxes for filing mail, support for enclosures, and even support for enclosures from CompuServe to other services—something that isn't possible any other way.

Emailer has one other extremely notable feature that many people would appreciate—full filtering capabilities that can auto-forward or auto-reply to a message, as I've done in Figure 13.17. You can set priorities, file messages, and filter on basically any piece of information in an incoming mail message. Emailer's filtering capabilities, mostly thanks to the auto-forward and auto-reply features, are among the best I've seen.

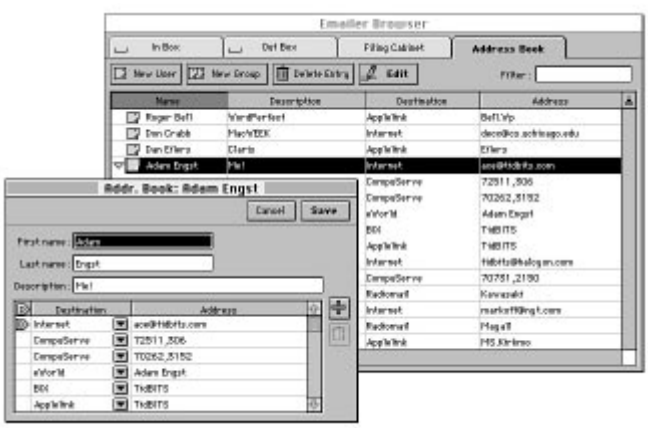


Figure 13.16 Emailer Address Book.

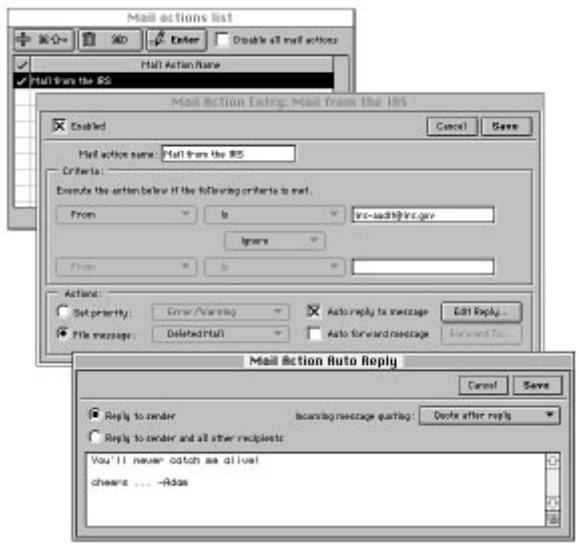


Figure 13.17 Emailer Mail Actions setup.

Special Features

Emailer has many nice touches, if perhaps not so many as Eudora Pro. For instance, if you press the Command key in any Emailer window, all of the buttons show their Command-key equivalents. It's often difficult to remember the many shortcuts in a program, but a mnemonic like this helps a lot.

In any of the mailbox windows, and many of the others, if there are columns, you can generally click a column header to sort the entire list by that column. That's especially handy for large mailboxes; unfortunately, Emailer's sorting is quite slow because of the way it stores each message as an individual file in the Finder.

One of the major complaints about many Internet email programs, and Eudora is no exception, is that they aren't good at unattended email that comes in automatically without requiring manual intervention. This problem is actually quite reasonable because Internet email programs know nothing of the connection. One person may use FreePPP, another InterSLIP, and a third person might have a dedicated Internet connection. Emailer isn't much different when it comes to Internet email, but Fog City added a feature that should help. When you're setting up connection schedules, you can set up an event that doesn't create an email connection, but instead runs an AppleScript. For example, you could write a simple AppleScript that would connect to the Internet and then make sure FreePPP was set to hang up after a few minutes of idle time.

Along with the Connect Now item in the Mail menu that enables you to set up a manual connection, there's another entry, Connect Again, which connects using exactly the same setup you used the last time. I use Connect Again all the time, since I generally want to connect to the same places each time, but I don't always want to use a scheduled connection.

Unlike most other email programs, Emailer includes the capability to import and export addresses (in tab-delimited form), which can be handy on occasion. I could also see keeping addresses in a contact database and periodically exporting a text file of them that you could then import into Emailer. Emailer can also import Eudora Nicknames files.

> **BTW**
> A free program called Eumorpha can help you convert mail stored in Eudora format to Emailer format, easing the transition between the two programs. See the review of Eumorpha later in this chapter.

Evaluation and Details

There's one big reason why I'm not currently using Emailer in favor of the commercial version of Eudora. In a killer design mistake, Emailer stores each message as a separate file on your hard disk (in comparison with Eudora, which stores multiple messages in a single mailbox file in Unix mailbox format).

As much as Emailer has many strong points, it does have some other rough spots besides the separate file problem. You can have any number of mailboxes in your filing cabinet, but you can't create hierarchical mailboxes, as you can in Eudora. Anyone who receives and stores lots of mail will miss hierarchical mailboxes.

Emailer's Browser bothers me because it forces me to keep all my mailboxes and my address book in the same window, ensuring that I can't have my In Box and Out Box showing at the same time, as I can and do often in Eudora. I feel constrained by that single window; in Eudora I often have twenty windows open and tiled up, one for each mailbox. Sometimes I arrange two right next to one another to compare them or to move stuff back and forth. That's harder or impossible in Emailer.

Finally, one feature has yet to appear in Emailer that missed the 1.0 release—redirect. Eudora pioneered the redirect capability, which enables an email program to forward a message to another user without making it seem as though the message came from you. For instance, if I get a message in Eudora that Tonya should deal with, I redirect it to her rather than forwarding it. That way, when she gets the message and replies, the reply goes directly

to the original sender, not to me. Once Emailer has a redirect feature, I plan to use it to redirect all mail from CompuServe and AOL straight back out to my Internet account, so they come in via Eudora and can be stored with the rest of my mail.

Overall, Emailer is simply a very good program, and I strongly recommend that anyone who must rely on different multiple email accounts on the commercial services check it out. There is a demo version on the CD-ROM, and the real version of Emailer lists for $49. You can also get the latest demo version from <ftp://ftp.fogcity.com/pub/Emailer/Trials/> and Fog City's Web site at <http://www.fogcity.com/>. Claris's Emailer Web page is at <http://www.claris.com/products/ClarisEmailer/index.html>. You might also consider subscribing to the Emailer-Talk mailing list—check out the signup page at <http://www.eskimo.com/~ravensys/emailer-talk.html>.

Other Email Programs

Although I prefer Eudora, and Emailer is excellent for people with AOL and CompuServe accounts, you can try out a number of other email client programs. Most of the following programs are available in <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/mail/> and if not, I've listed Web pages or home FTP sites where they are available as well.

BlitzMail

http://www.dartmouth.edu/pages/softdev/blitz.html

I didn't intend to talk much about email programs that use nonstandard protocols, but given Dartmouth College's outstanding record in developing Macintosh software, I should briefly mention BlitzMail. Over 90 percent of Dartmouth's students use email, in large part because of BlitzMail, which reportedly has an excellent interface. BlitzMail also supports Apple events and AppleScript recording, which is still uncommon. I haven't seen it in action, mostly because it requires that you run the BlitzMail server software on a NeXT workstation or a DEC Alpha workstation. I thought this limitation was a little ridiculous, but BlitzMail can support a tremendous number of users and a huge volume of mail per day. If you're a system administrator type and you're interested, take a look at BlitzMail.

Cindy's Newsmailer

`http://www.accessnow.com/`

Cindy Carney's $40 shareware Newsmailer 1.1 does both email and news, and although it's based on HyperCard, it's one of the slickest stacks I've ever seen, and it presents an excellent interface. The program works in an offline mode, so you can read and write mail offline and then send and receive it once you're connected. Newsmailer has capabilities not only to filter messages, but also to reply to letters automatically and even execute HyperCard scripts when the filters trigger. Newsmailer encourages and aids archiving of messages, helps automate connections, and provides a variety of glossary-type tools for adding taglines and variables like the date to your messages. Perhaps the only complaint I can make about Newsmailer is that I found its response time a bit slow and it doesn't support Command-W to close windows. Otherwise, all I can say is that it's an amazing effort.

LeeMail

`http://www.tiac.net/users/fyock/leemail.html`

Lee Fyock's $25 shareware LeeMail solves one major problem for some users—it's primarily an SMTP mailer. It's ideal for use with the few Internet access providers, like Demon Internet in the United Kingdom, that use SMTP instead of POP for sending mail to SLIP and PPP dialup users. (The other solution for such systems is AddMail, reviewed later.) That aside, LeeMail is a simple program that sports several nice features such as multiple users, aliases, automatically decoded attachments, and audio notifications of new mail. LeeMail can hide its windows when you send it to the background, auto-quote text when replying to messages, and support multiple mailboxes. The current version of LeeMail, 2.0.4, has minimal support for POP, although the documentation admits that it's not ideal as of yet. Lee plans to beef up the POP support in the future, and 2.0.5 should include Command-clicking to launch URLs, text drag-and-drop, live scrolling, and PowerPC-native code.

MacSOUP

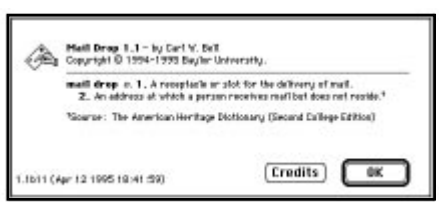
http://www.inx.de/~stk/macsoup.html

Like Cindy's Newsmailer, Stefan Kurth's $20 shareware MacSOUP 2.1 does double duty for both offline email and news. MacSOUP's interface is clean and responsive, and it has some high-end features such as a filtering capability that moves messages into mailboxes automatically based on header items. MacSOUP enables you to show or hide messages based on whether or not they're read or unread, along with a few other variables. You can sort messages by Date, Author, Subject, and Incoming Order. An especially neat feature is the way MacSOUP displays how old the message is, rather than when it was sent. MacSOUP is definitely worth a look, and if you're switching from another email program, check to see if MacSOUP's Import Mail or News feature can import stored mail from your old program.

Mail Drop

http://ackmo.baylor.edu/files/Mail_Drop/info.html

POPmail (reviewed next) and Baylor University's free Mail Drop are the main two email clients for the Mac that support IMAP (Interactive Mail Access Protocol) for retrieving email. The main difference between POP and IMAP is that IMAP prefers to store mail on the server, whereas POP prefers to download it to the Mac. Both have their uses in different environments, and as more IMAP sites appear, clients like MailDrop might increase in popularity. Reports from friends at large organizations indicate that IMAP is becoming increasingly popular. Mail Drop 1.1 is a relatively simple program at the moment, but the version now in beta testing adds significant new features. Mail Drop is available for noncommercial use, but remember, you must have access to an IMAP sever to use Mail Drop.



POPmail

gopher://boombox.micro.umn.edu/hh/POPmail/macintosh

Created by programmers at the University of Minnesota, POPmail 2.2 is a free email program that provides much of Eudora's feature set and a few extra features. Unfortunately, POPmail lacks Eudora's clean interface. POPmail has many nice touches, though, including the capability to double-click URLs, a message browser mailbox window with command icons and good sorting, the capability to create groups of users for simple distribution lists, and support for multiple users through multiple settings files. POPmail sports compatibility with the old POP2 protocol (the same programmers wrote MailStop, a POP2 server for the Mac), the standard POP3 protocol, and the IMAP protocol. POPmail's killer feature is a preview that enables you to peruse only the header and first few lines of the message. I'd love that while travelling. If you aren't enamored of Eudora, give POPmail a test run, and if you have access to an IMAP server, definitely try out POPmail, since it and Mail Drop are your only two free alternatives.

VideoMail Pro

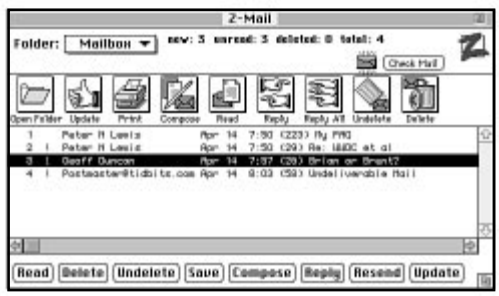
Darald Trinka's VideoMail Pro 1.0 is a MIME-compliant program for sending audio and video messages in email. It uses the audio and video capabilities present in some Macs to create QuickTime movies and to send them to other people via SMTP—the standard protocol for sending Internet email. When I sent myself a sample movie (you can have just sound or both sound and video), it came into Eudora as an attachment that I then opened in MoviePlayer. VideoMail doesn't attempt to read email or do anything other than create and send these movie messages, and it does that well, although even its email-sending capabilities are limited in comparison to most other email programs.

Until you register VideoMail Pro using its registration application, you must enter your settings each time you launch the program.

Z-Mail

`http://www.ncdsoft.com/ZMail/24_3.html`

The $165 Z-Mail is a commercial email client from Network Computing Devices (NCD). Its main claim to fame is that versions of it run on Windows, Unix, Mac, and even character-based terminals. From what I can tell, Z-Mail has some powerful features such as rule-based filtering, sorting, and searching. Using its Z-Script, you can completely configure how the program works, customize every part of the user interface, and automate repetitive tasks. Z-Mail strikes me as very powerful in the limited use I've given it, but it also feels as though it was ported from Windows or Unix. The interface is confusing and clumsy, and every now and then you even hit a place, such as the Z-Script window, where you type commands. You can download an evaluation copy of Z-Mail from NCD's Web site, but you must get a demo key from NCD before you can try it out.



Email Utility Programs

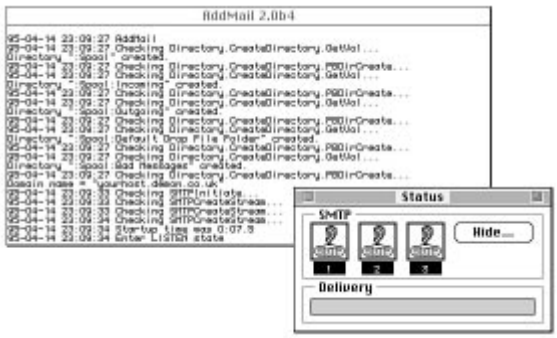
Along with the various different programs that enable you to send and receive email, there are a number of programs that work with the client programs or your stored email to perform some specific task. I cover a few of them in this section. Most of the following programs are available in <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/mail/> or <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/> and if not, I've listed Web pages or home FTP sites where they are available as well.

AddMail

`ftp://ftp.demon.co.uk/pub/mac/internet/mail/`

Alan Staniforth's free AddMail 2.0b4 is an odd beast, an SMTP gateway that can receive mail from an SMTP server and save it in UUCP format for use by Eudora. Why would anyone want such a thing, you ask? If, for some reason, a POP account isn't available, as it isn't for the dialup users of Demon Internet in the United Kingdom, AddMail is perhaps the only reasonable way you can use Eudora, which otherwise

requires POP at all times. LeeMail would work in this situation as well, but many people prefer Eudora. So, if you're in a similarly unusual situation where you need AddMail's talents, check it out.



Autograph

Signature-watching is a favorite pastime on the Internet, and the people whose signatures are the most interesting generally customize them for each message. Assuming you don't have that kind of time, a utility like David Kabal's free Autograph 2.0.1, which enables you to change your signature easily in Eudora, might be just the ticket. Autograph supports random signatures, multiple signatures, and multiple random signatures. It's a touch tricky to set up random signatures, and changing signatures with Autograph isn't as automated as you might like (you do have to open a document each time), but if you want the multiple random signature capability, Autograph is where it's at.

Easy View

`ftp://ftp.tidbits.com/pub/tidbits/tisk/util/`

For most people, Eudora is a sufficiently good email reading and searching environment. However, Eudora's searching capabilities aren't ideal, and it currently has that pesky 32K text limit that splits large digests. The answer, if those two problems haunt you, is Akif Eyler's free Easy View, which uses a unique technique for viewing large text files in certain formats. Easy View creates an internal index to one or more text files and breaks them up by message (if

continues

Easy View, *continued*

it's a Eudora mailbox or a digest in a specific format) or by article (if it's a file like an issue of TidBITS in the setext format). Easy View has good searching capabilities and can extract all the found items to a separate file, making it easy to create subsets of a large amount of data. With the included GetURL extension, Easy View supports Command-clicking on URLs to go to them using Anarchie or MacWeb.

Eudora Scripts & Preferences

<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/mail/>

Due to Eudora's flexibility, both in configuration and in scripting, a large number of scripts and plug-in settings files for Eudora have appeared on the Internet. Their functions range from increasing the message chunk size in Eudora to creating droplet applications that automatically send files to prespecified users. I couldn't hope to cover each of them, but if you want to do some exploration, check out the various listings of them at ftp.tidbits.com in the directory listed above. The files ending in "-as" are AppleScripts and many others are plug-in files that you drop in your Eudora folder to modify one of Eudora's standard behaviors.

Eumorpha

You may find Richard Shapiro's free Eumorpha 1.5b6 utility extremely useful if you decide to switch from Eudora to Claris Emailer. Eumorpha takes a Eudora mailbox or a folder of mailboxes and converts them into Emailer message format, saving them into the Emailer folder that you specify. Keep in mind that if you convert a lot of Eudora messages into Emailer messages, your messages will use a lot more disk space.

MacPGP Control

`http://www.deepeddy.com/pgp/`

PGP stands for Pretty Good Privacy—it is an encryption method that you can use to ensure that your mail is not read by anyone other than the intended recipient. The U.S. government restricts the export of PGP because cryptography, like PGP, is classified as munitions—I won't get into the debate here (see the previous section on cryptography for some references) other than to note that because of this, getting MacPGP is a royal pain. Raïf Naffah created the free MacPGP Control in AppleScript to simplify using MacPGP, specifically within Eudora. I consider MacPGP still too difficult for standard use (mostly in the getting and setting up phases), but if you're serious about secure email, check out MacPGP Control. MacPGP Control cannot go on the Internet Starter Kit CD-ROM because the State Department now considers software with hooks to PGP as munitions as well, and won't allow it to leave the country (which this book certainly will).

MacPGP Kit

`http://www.io.com/~combs/htmls/crypto.html`

Gregory Combs's AppleScript-based MacPGP Kit also aims to bring together a number of the resources available to make MacPGP (once you get it) easier to use. Perhaps the best part about MacPGP Kit is that it comes built into an installer that puts things in the right places. I still don't think PGP encryption will become commonplace until getting and installing all of this stuff becomes much easier. But if you're serious about keeping your email private, MacPGP is the way to go. Greg's Web page listed above should get you started with

continues

MacPGP Kit, *continued*

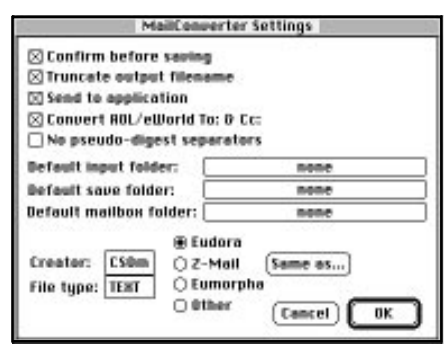
MacPGP and the various related utilities, and has links to instructions on how to download both MacPGP Kit and MacPGP itself. Neither can go on the CD-ROM with this book because Greg heard that the State Department now considers software with hooks to PGP as munitions as well, and won't allow it to leave the country. Complain to your elected representative about this.

Mail Processor

Mail Processor is a good idea in need of a better program. It's a stand-alone SuperCard stack that reads in a Eudora mailbox, which you can then use to generate lists of messages that contain a certain string. I often want to find information in large mailboxes of old mail, but I encountered various errors when using Mail Processor. Because it isn't particularly quick, it probably wouldn't work well with my extra large mailboxes. Although Jim Allison is distributing Mail Processor as shareware for $24, it feels much more like a tool he built for himself than for use by others.

MailConverter

Richard Shapiro's free MailConverter 2.1.8 can create Eudora mailboxes from messages in a number of mail formats, including America Online, LeeMail, cc:Mail (limited support), VMS mail (limited support), Pine, Elm, and files saved from various newsreaders, including NewsWatcher. MailConverter also will break up mail digests into individual messages. MailConverter supports drag-and-drop and is rather flexible in terms of dealing with strange headers.



MailKeeper

`http://www.nisus-soft.com/mailkeeper.html`

Nisus Software's $35 MailKeeper 1.0.2 (with a 75-record limited demo) stores and indexes text of any sort, and includes functionality to handle email addresses and URLs automatically. Storing text requires first copying the text, and then pressing a hotkey to move the selected text to your MailKeeper database. Drag-and-drop of text into MailKeeper also works, and you can drag URLs from MailKeeper to a drag-aware Web browser to launch them. As an added bonus, ICeTEe also works within MailKeeper if your Web browser doesn't support drag-and-drop. MailKeeper's most innovative feature is its method of helping you find items. Called Guided Information Access, it provides you with four user-defined columns of categories. Clicking a category in a column narrows the list of items shown to those that match that category. Clicking another category in the same column or in a different one narrows the list to items that contain both categories. This process enables you to work easily through a large sets of data, and you can supplement it with date restrictions. You can define additional categories for MailKeeper to index automatically when an item is first saved to your database, although the method of getting MailKeeper to do that categorization after the fact is clumsy. I'd like to see MailKeeper add automatic recategorization when categories are added or deleted and the capability to index and then search an entire Eudora mailbox.

MailSniffer

The free MailSniffer from William Leshner is actually a POP client like Eudora or Emailer, but unlike them, it doesn't download mail for you to read. Instead, MailSniffer can count the messages in your mailbox, list the subjects and senders of messages, and optionally run a script when

continues

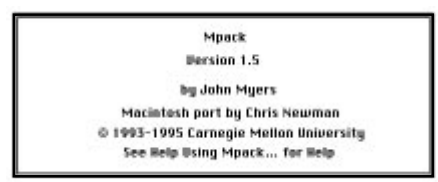
MailSniffer, *continued*

your mailbox contains more than a user-specified number of messages. I could see MailSniffer having quite a bit of utility in specific situations, and I might use it next time I travel to check up on my email without having to read it all.

Mpack

`ftp://ftp.andrew.cmu.edu/pub/mpack/`

Although most modern email programs automatically understand and decode MIME attachments that contain nontextual information, sometimes you need to do it manually. There's a free stand-alone MIME utility, called Mpack, which can pack and unpack MIME files. You're most likely to need Mpack if you don't use a MIME-compatible mailer. Mpack has worked fine the few times I've had an excuse to use it.

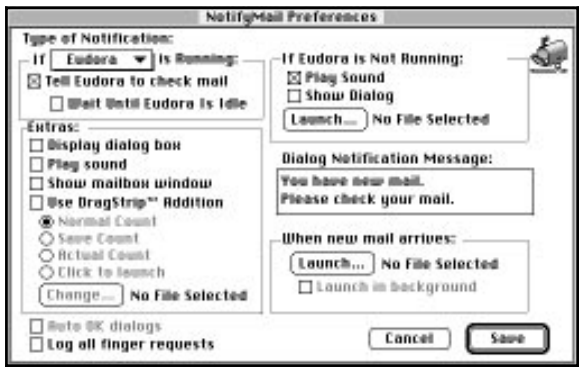


NotifyMail

`http://www.notifymail.com/`

If you're interested in being notified automatically when you receive new mail, check out the $18 NotifyMail 3.0.3 from NotifyMail Software, written by Scott Gruby. NotifyMail works with Eudora, Emailer, TCP/Connect II, and Z-Mail. NotifyMail uses an extension to listen for Finger connections from the server (it works with Unix and VMS mail servers, and the Apple Internet Mail Server, although it may not work with all Unix or VMS servers), and when it hears one for

the appropriate person, it notifies you in any one of a number of ways. You could set Eudora to check mail every so often, but NotifyMail is much less obtrusive. NotifyMail works over dedicated connections and dialup connections; often it's most useful over a dialup connection so you make sure you've downloaded all the mail that's come in during the time that you're connected.



Signature Randomizer

`http://www.centers.unh.edu/jdb/Development/`

Some people dislike using the same signature all the time, but it's a pain to create them manually or continually swap signature files in and out of your Eudora Folder. Jonathan Baumgartner's free Signature Randomizer 1.0 might be just what you need in this case. It randomly picks a signature file from a set you create each time you run the program, and it can optionally pick one and then quit, making it an ideal candidate for your Startup Items folder (since then it would pick one on each restart, then quit).

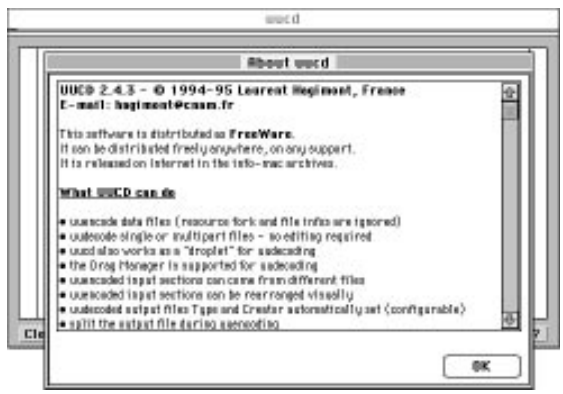
SignatureQuote

`http://www.opendoor.com/Rick/SQ.html`

Although most decent email programs have the capability to add a signature to your messages, it's uncommon for the commercial services to support signatures. In addition, none of the commercial services make it easy to quote text from a message in a reply. Rick Holzgrafe's $10 shareware SignatureQuote 1.0 is the answer to such problems—just configure it with your signature and then you can add your signature to an email message with a single key press. To quote text, just copy it, activate SignatureQuote, and click one of the two Quote buttons to use one of two quoting styles. I highly recommend SignatureQuote if your email program doesn't support signatures well.

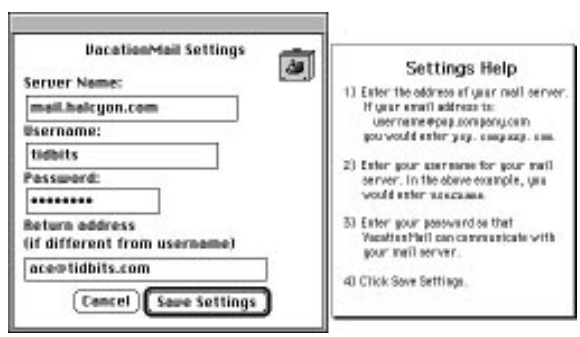
uucd

Mpack may be the best-known MIME decoder, but Laurent Hagimont's freeware uucd 2.4.3 has garnered a reputation as being able to decode some types of MIME enclosures that Mpack can't handle. I've never received a MIME enclosure that Eudora couldn't handle, so I don't have anything to test uucd on. Reportedly, it's especially useful for users of America Online who receive MIME attachments.



VacationMail

I try to avoid talking about Mac programs that rely specifically on a Unix shell account because it adds a level of complexity that frustrates many people. However, MR Mac Software's $25 VacationMail 1.1.3 is so well done that I couldn't resist. When you go away on vacation, you use VacationMail to set up an autoreply to all mail on your account, and VacationMail configures a common Unix program called Vacation for you. VacationMail is smart enough not to reply to mailing lists and only sends one message per week to any address, so people won't be bothered by your vacation message if they're just trying to leave mail for when you return. VacationMail is elegant, so if you have a full Unix shell account (not all will work) and are interested in a vacation message capability while you're away, check it out. You can even register by email.



Things that Go Bump in the Net: Email

Welcome to the latest installment of "Things that Go Bump in the Net." As with anything, things can wrong in sending and receiving email, and with email, problems can be more irritating because you might not know that they've happened right away. The most common problem that you're guaranteed to experience at some point are bounces, or

messages that come back essentially marked "Return to Sender." You might also have troubles in sending email to or receiving email from your Internet provider, and I look at some of the common solutions to those problems as well.

Bounces

In a perfect world, all email would reach its destination quickly and reliably. But just as with snail mail, which can take one to five days (or even weeks) to appear, and which sometimes never appears at all, email isn't perfect, and sometimes it will bounce back to you. At times the machine that bounced the mail back will provide a hint as to what went wrong, but more often you're on your own.

Q: An email message I sent bounced back to me. What did I do wrong?

A: The most common reason for a bounced message is a typo somewhere in the address. That's one reason that short email addresses are good—they're easier to type and thus less likely to be mistyped. The first thing to do when you get a bounce is to look through the header of the original message (the full headers are usually returned to you) and make sure you typed the address properly. Everyone makes this mistake on occasion.

Q: The bounce says "User unknown." What does that mean?

A: It means more or less what it says. The email arrived at the proper machine, which searched through its list of users and decided that it didn't have a user with the name that you used. Again, this is most commonly due to a typo in the userid, although sometimes there are problems on the destination machine that have caused it to forget about a user, possibly temporarily. After checking the address, try resending the message, especially if you've successfully sent mail to that address before.

Q: I have a bounce that says "Host unknown." Is that more serious?

A: Yes. "Host unknown" is more difficult to work around if it's not simply a typo. The basic problem is that for some reason one machine, perhaps your host machine or perhaps one further along in the path to the destination, was unable to contact the destination machine. There's not much you can do in this case other than try again a little later, in the hope that the machine you're mailing to has come back up.

FYI

Sometimes the header provides an incorrect address to your email program, but the person includes the proper one in their signature. If you have trouble replying to a message, and the address you're replying to is different from an address listed in the signature, try using the signature address instead. I find this trick especially useful if the address in the signature is simple, whereas the address from the header is long and convoluted. Simple addresses seem to be more reliable, on the whole, although that's not a hard and fast rule.

Q: My mail bounced, and the error message at the top said that it hadn't been delivered for five hours, or two days, or some length of time. It claimed that it would continue to try and that I shouldn't resend the message. Should I anyway?

A: No, when a bounce comes back from an SMTP server saying that the server will continue trying to deliver the message, just wait. If it fails to deliver the message in a reasonable amount of time, such as a few days, it will return the message again. Most of the time this sort of bounce means that there's a communication problem along the way, and nothing you can do will solve the problem. If the message is urgent and you have a different email address for the recipient, you might send it again to the secondary email address.

Connection Problems

The most frustrating problems that you're likely to encounter with email are those that prevent you from sending or receiving your email, especially since email is probably the primary way that people ask for and receive help on the Internet. Since I recommend you use Eudora for email, the questions and answers below concentrate more on Eudora than other programs. If you use something other than Eudora but experience a problem similar to a Eudora problem mentioned below, see if there's some way the solution might apply to your program.

I also recommend that you check out Qualcomm's list of frequently asked questions, available from its technical support page on the Web at `<http://www.qualcomm.com/ProdTech/quest/techsupport/techsup.html>`.

Q: Eudora crashes, either at launch or when I try to send or receive email.

A: It's not entirely uncommon for your Eudora Settings file, located in the Eudora Folder in the System Folder, to become corrupted. You can always throw out that file and let Eudora rebuild a new one, but current versions of Eudora save a copy of that file in the Eudora Folder with a .bkup extension. Try throwing out Eudora Settings and changing the name of Eudora Settings.bkup to Eudora Settings. Then try launching Eudora again.

Q: When I launch Eudora, it complains that memory is tight and recommends a new setting. I don't have much more memory—how can I reduce the amount of memory that Eudora wants?

A: If you keep your In, Out, and Trash mailboxes relatively small, you shouldn't run into this problem. If those mailboxes get too large, try archiving mail out of those mailboxes every month by transferring the messages to new mailboxes. Also, be good about filing incoming mail that you want to keep into other mailboxes.

Q: I can't send email. Any ideas why?

A: The most common reasons for not being able to send email are either that you've typed the address for the SMTP server wrong or that the SMTP server address is correct, but the server is

down. Check the SMTP server address in your settings and make sure it's right, and if so, try again a little later when the server might have come back up.

Q: Sometimes when I try to send mail, Eudora tells me it's having trouble and asks if it should keep trying. What's wrong?

A: Usually the problem is a temporary glitch with your SMTP server. I generally tell Eudora to keep trying once, and if that doesn't work, I click the Cancel button and try again a bit later.

Q: I often have trouble sending mail. Can I use my friend's SMTP server?

A: Yes. There's no reason you're limited to the SMTP server your Internet provider runs, other than basic manners. I don't recommend relying on some other SMTP server, but in a pinch, using one can help get urgent email messages out.

Q: I can't seem to receive any mail.

A: Make sure you've entered your email password properly when Eudora asks for it. Your email password is not always the same as the password you use to connect, but if it is, and you change your login password, you'll need to change your email password as well. It may seem obvious, but many people forget this step. Also, I've been told that spaces in a password are an extremely bad idea, and systems should never allow them.

Q: I can connect to receive mail, but the connection keeps timing out. What's happening?

A: It's possible that your server is having trouble (try again in a short while) or your POP mailbox on the host might be way too large. Try contacting the tech support folks at your provider or download the Eudora plug-in that increases the time-out value (drop it in your Eudora Folder and relaunch Eudora). It's at `<ftp://ftp.qualcomm.com/quest/mac/eudora/plugins/2min-recv.hqx>`.

Q: When I check for mail, I get a message that says something such as "Connection came up halfway then failed." What does this mean?

A: It could mean that your Internet service provider isn't running a POP server, but that's unlikely. It's more likely that your POP server is currently down. Alternately, you might be experiencing trouble with your dialup connection. Check back to Chapter 5, "Things that Go Bump in the Net," for more information on connection trouble.

Q: When I try to get mail, I see an error message that says something like "Maildrop lock busy." What can I do about it?

A: This problem generally rears its head when you crash while Eudora is receiving email. The short answer is that you should ask your system administrator for help. The long answer is that you should look in the Eudora Q&A stack, but to save you the time, I'll show you a screenshot of the relevant section in Figure 13.18.

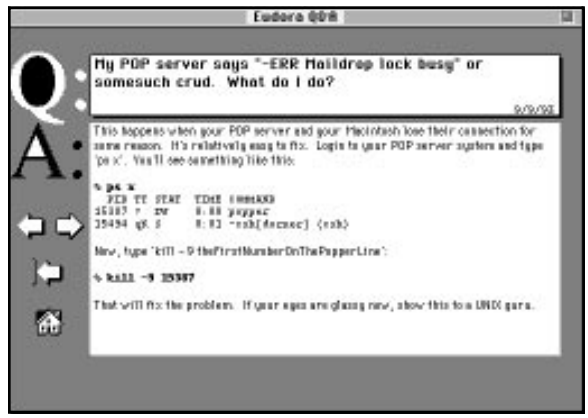


Figure 13.18 Eudora Q&A Stack advice.

Q: I get weird errors when receiving mail. Any suggestions?

A: If you have a lot of mailboxes open and a lot of mail in each one of them (especially In, Out, and Trash), Eudora might be running out of memory. Try quitting and giving Eudora more memory by selecting its icon in the Finder, choosing Get Info from the File menu, and increasing the Preferred size by 1,000K.

Q: I think I'm losing outgoing mail. What can I do?

A: I'd try two things. First, make sure, if you're using an email program like Eudora Pro that can filter outgoing mail, that you don't have any filters set for outgoing mail. Such a filter could perhaps reroute certain messages to other mailboxes and prevent them from being sent. Second, try switching to a different SMTP server. If you have a friend who uses a different Internet provider, ask her what her SMTP server setting is and try it for a while. It will probably be slower, and you shouldn't rely on it, but it will help you determine where the mail is being eaten.

Q: I think I'm losing incoming mail. Any suggestions?

A: Tough one. In all likelihood, there's nothing you can do, although it's worth checking any filters you might have to make sure the messages aren't accidentally being transferred to a mailbox you don't expect. The best course of action is to report the problem to the support staff at your Internet provider and see if it can track down any problems with its POP servers. Of course, if the problem continues for too long, the only solution may be to switch Internet providers.

Other Problems

Q: I want to switch Internet providers, but it's going to take a while for everyone to get my new address. Can I sign up for mail forwarding, as you do with the post office when you move?

A: Quite possibly, yes. This solution requires a number of things to be true, and if the things I talk about here are totally unfamiliar to you, contact the support staff at your provider. If your Internet provider uses Unix on its servers, as most do, you can create a file called .forward in the root directory of your account (this requires telnetting to your account and using a Unix editor to create the file—use the second method I suggest if you don't know how to telnet or use a Unix editor). That file should contain a single line, your new email address. As soon as that file is in place, all mail will be forwarded to the address in the .forward file.

A second method is to use SimpleText to create that .forward on your Mac, and then use Anarchie or Fetch to connect to your Unix account via FTP and upload the file. To do this you must enter the name of the machine you wish to access, your userid, and your password in Anarchie's Get window or Fetch's New Connection dialog. Normally you don't have to enter userid or password if you're just retrieving files from an anonymous FTP site.

Q: How can I tell if someone has received an Internet email message I sent them?

A: For the moment, you can't. There's no standard method of handling return receipts, as they're called. However, Eudora Pro 3.0 supports a forthcoming standard, so at some point in the future this might become possible. Keep in mind that all a return receipt tells you is that the user received the message, not that he read it, understood it, acted on it, or anything else.

Q: My Mac crashed while I was transferring mail using Eudora, and now it's complaining about the table of contents being out of date. It wants to know if I should use the old one or create a new table of contents. Which should I do?

A: It depends. First, however, click the Cancel button in that dialog box. Then open your Eudora Folder in your System Folder and find the mailbox in question. Copy it and the file right below it with a .toc extension to your desktop pressing the Option key while dragging them to the desktop. Those copies can serve as a backup in case you do something wrong.

Next, go back into Eudora and try to open that mailbox again. You should see the same error message. Click the Use Old button to use the existing table of contents for that mailbox. When the mailbox appears, check it carefully to see if it looks right. If you were receiving mail and there aren't any new messages in it, that's an indication that the old table of contents is corrupted. If it looks fine, you're done and you can throw out your backup copies.

If you fear that the mailbox doesn't reflect reality, quit Eudora and move that mailbox and its .toc file to another folder (never throw anything out until you're sure of what you want). Copy the backup you made on the desktop back into the Eudora Folder, again pressing the Option key while you drag them in. That way you still have the original backup. Launch Eudora again, and open the mailbox in question. You should get the same error dialog as before, but this time

choose Create New to create a new table of contents file. The downside of creating a new table of contents is twofold. You lose the markings that indicate whether each message has been read, replied to, forwarded, or whatnot. That's a major loss for me if it happens in my In box, for instance, since I need to know what I have and have not replied to. You might also see messages that you had deleted previously. Eudora doesn't compact mailboxes to reclaim the space taken up by deleted messages until certain ratios are met, and the table of contents file keeps track of which messages were deleted but not yet reclaimed. You can delete them again, but it takes time.

Q: I think I've received an attachment, but I can't find it.

A: In Eudora's Settings dialog, check the Attachments panel to see where Eudora saves attachments by default. The most likely place is the Attachments folder inside your Eudora Folder in the System Folder. Of course, you can always use Find File to find the attachment as well.

Q: The attachment isn't there! I know I received it, so where did it go?

A: Check to make sure you don't have Eudora set to delete attachments when you delete the message. If you do, and you deleted the message, the attachment is gone. Ask the sender to resend the message and attachment.

Q: I received an attachment but I can't figure out what to do with it. When I double-click it, I get a message that the application couldn't be found.

A: It's likely that you haven't decoded the attachment yet. Drop the attachment file on StuffIt Expander, which should decode it. If the file is decoded, you might have to open the file manually in an application, or you might simply not have an application that can open that sort of file. Ask the person who sent you the attachment what program you should use. See Chapter 10, "File Formats," for more information on StuffIt Expander and weird file formats.

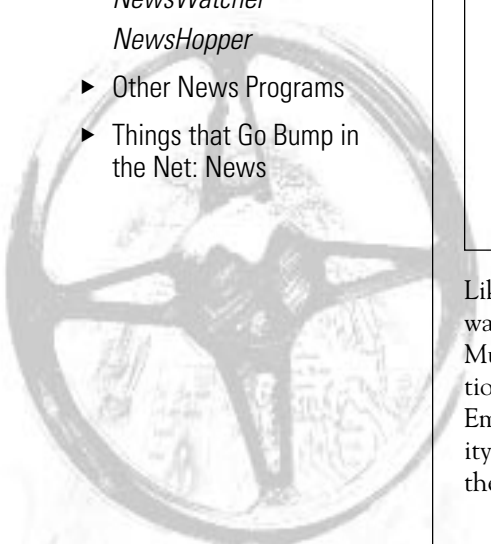
Q: I tried to subscribe to a mailing list that I read about in this book (or that a friend told me about, or that I saw mentioned in Usenet, or…) and it didn't work. What went wrong?

A: It depends a bit on the error message that you get back. Many people type the address of the mailing list manager program wrong, so their mail bounces. Make sure you're not confusing the number one and the letter "L" (or the number zero and the letter "O").

If you get a message back saying that there is no list by that name, it's most likely, once again, that you typed the name of the list wrong. Check and try again. Finally, it's entirely likely that the list has either moved or simply folded, at which point I'd recommend that you look for a different list.

Chapter 14 All About Usenet News

Contents:



In Chapter 7, "What Can You Do on the Internet?," I talked generally about the thousands of Usenet newsgroups that hold fast-moving discussions on every imaginable topic. My host machine, for example, carried over 6,700 of them at last count, and that's nowhere near the entire list, which is probably well over 20,000 by now. Hundreds of thousands of people read Usenet every day. It's certainly one of the most interesting, although strange, parts of the Internet.

> **BTW**
> Prompted by a problem posed by Nicholas Negroponte, head of the MIT Media Lab, Eric Jorgensen of MIT did a survey in early 1994 to determine the average age and gender of Usenet readers. Jorgensen received 4,566 responses to his survey. He figured out that the average age of the Usenet reader is 30.7 years old (with a standard deviation of 9.4). Eighty-six and a half percent of the replies came from men, and 13.5 percent came from women. Although most newsgroups surveyed were heavily male-dominated, `misc.kids` (71 percent female), `rec.arts.tv.soaps` (91 percent female), and `rec.food.sourdough` (50 percent female) were notable exceptions.

Like email-based discussion groups, Usenet news provides a way for groups of people to communicate over the Internet. Much if not all of what I said about electronic communications and virtual communities in Chapter 13, "All About Email," applies to Usenet news as well. This marked similarity may prompt you to wonder how Usenet is different from the mailing lists. To be honest, the differences used to be

more clear-cut; these days the two are quite similar. I see two primary differences, neither of which has to do with the information that flows through them.

First, although mailing lists may be faster to propagate because they go directly to the subscriber, they can be less efficient than Usenet news. If only one person on a machine reads a mailing list, one copy comes in. If, however, 100 people with accounts on that machine all read the same mailing list, then 100 identical copies of each posting must come in, wasting disk space and slowing down other tasks. In contrast, only one copy of every Usenet message goes to each Usenet news server, and any number of people on that machine can read it.

You may be somewhat confused at this point, since most people don't share their Macs with hundreds of people, if anyone. Remember that Usenet news arose back in the days when the only way to access the Internet was via a command-line Unix account on a powerful multi-user computer. In addition, although disk space was expensive then (all of Usenet news must be stored on each of the many thousands of computers that carries Usenet), the network connections were also expensive and were much slower than those in common use today. In other words, I think Usenet news was designed to solve a set of problems that no longer exist. That's not to say that Usenet doesn't have a place in today's Internet, although I don't believe anyone would invent Usenet today.

Second, many people (including me) prefer mailing lists to Usenet news because they always read their mail but may not always run a separate newsreading program. This situation actually works in favor of news as well. Most email programs are designed for a relatively small number of messages, each completely different and unrelated. In contrast, most newsreaders concern themselves with large numbers of messages, many of which are related, or in what's called a thread. So, if you read news and come across an interesting posting, reading the next posting in that thread is easy (or should be), whether or not the posting is the next one in the list. Following threads in an email program is more difficult.

Given those advantages, let's look at how Usenet postings are constructed, how it works, and how you generally interact with it. First, though, allow me to offer some advice on things you should and shouldn't do in Usenet news.

Usenet Manners

Email and Usenet news share many attributes, but they also differ in a number of ways. Those differences have given rise to a set of unwritten rules, sometimes called "netiquette," that offers guidance on what sorts of behavior are and are not acceptable in Usenet.

Perhaps the most significant problem that Usenet faces is that of overwhelming volume. There are often too many postings in any given newsgroup for an average person to read in

her spare time. That's a shame, because often the information in Usenet newsgroups is quite valuable. In response to this problem of volume, I'd say that the most important rules to consider are those that help you avoid clogging a newsgroup even further.

Use email replies, for instance, whenever the rest of the group won't give a hoot about what you have to say. Most of us feel that our words are pearls of wisdom and should be distributed to the widest possible audience. Try to step back and think about whether your reply is best directed at the individual making the posting or the group as a whole. Most newsreaders make it equally as easy to reply via email as to post a follow-up message, so please, take advantage of those email features when possible.

Another volume-related problem is that even useful information is often repeated a number of times, as different people chime in with the same answer to some question. Summaries can help solve that problem, since people often ask questions, asking for direct replies and promising a summary. Pay attention to these requests. Those people want replies only via email, and because they've promised to post a summary of the replies, you don't need to ask for a copy personally (unless perhaps you don't stand a chance of seeing the summary in the newsgroup; even then, ask nicely). If you ever post a question and promise a summary, live up to your promise, even if you receive only a few responses.

If you do plan to reply to postings on Usenet, remember what I said about how to write in Chapter 13, "All About Email." The same rules apply here, and above all else, if you must carry out a flame war, do it in email; if possible, don't do it at all.

Just as repeated answers and flames are a waste of bandwidth, so are postings that include all of another post with little new content. When you reply to messages, either in Usenet or in email, you often want to quote some of the original message so that readers can understand the context of your reply. However, don't overdo the amount of quoted text in a Usenet posting. No one wants to read a two-screen quoted letter only to see at the bottom a few words from you: "I agree with all this." Try to edit out as much of the quoted text as possible. Most people have already seen that message in its original form, so you're simply jogging their memory. Always remove signatures and unnecessary previously quoted text in your replies.

FYI

Using Usenet as a method of sending a message to a specific individual is considered extremely bad form, even if you can't seem to get email to that person. Imagine, everyone's discussing nuclear disarmament, and they suddenly see a message you sent to a college friend. Your note discussing old times at Catatonic University will hold absolutely no interest for the rest of the group. If you find yourself being flamed, suffer, and don't do it again.

In general, you should avoid posting a few things to Usenet. Avoid copyrighted works such as magazine articles or newspaper stories. Although it's unlikely that anyone could sue the Internet (it would be a bit like boxing with a dense mist), you might be sued for copyright infringement. Besides, posting copyrighted work is not polite. Simply post the complete reference to the article or whatever, along with a summary or selected quote or two if you want to pique some curiosity. Posting references has become much easier with the rise of the Web and the massive increase in information on it, since much of what you might want to refer to probably exists on the Web, and if it does, you can provide a full URL to that original information. Providing references rather than copying text is not only more in line with copyright law and ethics, it's also a good way to reduce the amount of potentially unnecessary information in a newsgroup.

> **BTW**
> Interestingly, recipes in cookbooks are not copyrighted because they are essentially lists. However, the instructions for creating the recipe may be protected if they contain anything other than the bare-bones instructions, and any preface explaining or describing the recipe is definitely protected.

Perhaps the least obvious but most important works to avoid posting are pictures scanned in from magazines or videos and sounds digitized from TV or videotape. Most of the scanned pictures are varying degrees of erotic images, and unfortunately, most are blatant examples of copyright infringement. The magazines that own the copyright on those images, *Playboy* in particular, don't look kindly on this sort of thing, and legal action might result. Besides, pictures suck up disk space, and the quality of most scanned images doesn't even begin to approach the high-quality photography and printing of magazines.

I usually recommend that you not post headline events that everyone can read about in the newspaper or possibly in ClariNet (coming up soon). I don't mean to imply that you can't talk about these events, but because Usenet news travels relatively slowly to all parts of the net, announcing the results of an election or a similar event is usually silly. People probably already know about the event, and if they don't, they'll figure it out from the ensuing discussion.

Finally, don't post personal email that you receive unless the sender gives you explicit permission. As with most things on the Internet, posting personal email is a legally murky area, but the etiquette is crystal-clear: It's rude.

BTW
For a classic piece of Usenet humor, and some sarcastic advice on how to do things on Usenet (it's a joke, folks!), check out Brad Templeton's "Dear Emily Postnews" article at <http://comedy.clari.net/rhf/jokes/88new/emily.html>. Also hilarious (and a good way to learn some Usenet history) is Alan Meiss's "101 Ways to be Obnoxious on Usenet" at <http://comedy.clari.net/rhf/curjokes/usenet.html>.

Usenet Posting Construction

On the surface, a Usenet posting looks much like an email message. It has the same basic parts in terms of having a header, a body, and often a signature. Other than the header, which has some lines that are specific to Usenet and which never appear in email, almost everything I said about the parts of an email message in Chapter 13, "All About Email," applies to the parts of a Usenet posting as well.

Let's look a the header of a Usenet posting (see Figure 14.1) so you can see which parts of it are the same and which are different. Like the header of an email message, the header of a Usenet posting is primarily for the programs that manage Usenet news, not for the people. So, just as you can learn some things from the outside of an envelope or the header of an email message, you can also learn some things from the header of a Usenet posting.

Figure 14.1 A Usenet header.

You probably recognize the From line, the Subject line, and a few of the other lines like Date that serve exactly the same purpose they do in an email message. There are plenty of header lines that you won't recognize, though, and some of them aren't at all interesting.

```
Path: news.halcyon.com!penguin.tidbits.com!user
```

The Path line, for instance, is basically meaningless these days. At one point in time, it enabled you to track the path a posting had taken in getting to your machine. It still serves

that duty, but due to the way the domain name system works, no one really cares about that path. In the old days, looking at the Path line might have told you how to reach a certain machine. Ignore it.

```
From: ace@tidbits.com (Adam C. Engst)
```

The From line is pretty much self-explanatory. As with email, it lists the name and email address of the person who posted the message. As with email, be aware that it's not all that hard for technically savvy people to forge Usenet postings.

```
Newsgroups: halcyon.test
```

Next comes the Newsgroups line. It lists, separated by commas, all the newsgroups to which the message is posted. You can post a message to more than one group at a time by putting more than one group in the Newsgroups line. At that point, an article is cross-posted. If you must post an article in several groups (which is generally frowned on as a waste of bandwidth), make sure to post via the Newsgroups line and not through individual messages. Individual messages take up more space, because a machine stores only one copy of a cross-posted article along with pointers to it from different groups.

Here I've posted to a newsgroup called `halcyon.test`, a local group that my provider runs purely for test messages. No one ever reads it, but it's a great way to avoid annoying people who read a real group when you have to test a new program or something.

```
Subject: A sample Usenet header for ISKM
```

And of course we have the ubiquitous Subject line. As much as it is courteous to provide a descriptive Subject line in an email message, it's imperative in a Usenet posting. Most newsreaders these days show the user a list of the messages and their subjects. If you don't provide a good Subject line, fewer people will even notice your message.

```
Followup-To: halcyon.test
```

The next Usenet-specific line is the Followup-To line, which usually contains the name of the newsgroup in which the article appears. Sometimes, however, you want to post an article in one group but direct responses back to another group. In this case you put the second group in the Followup-To line, because whenever anyone posts a follow-up to your article, the news software makes sure that it ends up in the proper group.

```
Date: Tue, 30 Apr 1996 15:06:42 -0700
```

The Date line displays the time and date that the message was sent, not the time you read it or even the time it arrived at your machine. It's sometimes worth looking at the Date line in the header to make sure you're replying to a message that's relatively recent. Time is displayed in military or European time using a 24-hour clock, and the "-0700" indicates the offset in hours from Greenwich Mean Time.

```
Organization: TidBITS
```

The Organization line isn't required and serves no technical purpose. It's merely there to help identify the sender of the message. As you can see, I use my real organization in this line, although many people tend to include less serious organizations here.

```
Lines: 7
```

The Lines line tells you how many lines of text are contained in the body of the message. For the most part, it's of no use on Macintosh newsreaders, since you seldom see the Lines line before you've downloaded the entire message. Older, Unix-based newsreaders could use the Lines line to calculate how long a message was and display only a set number of lines from the top of the message. They then gave the user the option of reading the rest of the message or skipping it.

```
Distribution: seattle
```

Many articles are relevant only in specific geographic areas. You have two ways to handle this situation. First, if you're selling a car in, say, Seattle, you should post to a specific group that goes only to people in Seattle (more or less, anyway), such as `seattle.forsale`. Many of these site-specific groups exist, even down to the level of the Internet provider. There's a group, for example, run by my provider called `halcyon.slip` for discussion about issues affecting Northwest Nexus's SLIP and PPP users. Many providers run their own newsgroups and if you're posting information that will interest only other customers of that provider, you should use a group specific to that provider.

The other way to handle this situation is to use the Distribution line shown previously. This line enables you to limit the area to which your message is distributed, even if the group encompasses all of Usenet. So, if you want to post a notice about a Seattle British Car Show in `rec.autos`, you should put "seattle" or possibly "pnw" (for Pacific Northwest) in the Distribution line.

> **BTW**
> You can find lists of current distributions in the Frequently Asked Question postings for `news.admin.misc`. They're also on the Web at `<http://www.smartpages.com/bngfaqs/news/admin/misc/top.html>`.

```
Message-ID: <ace-3004961506420001@penguin.tidbits.com>
```

Every Usenet posting has a unique Message-ID. They look a little like email addresses, but they're not, and if you try to use one as an email address, it won't work worth beans. For the most part, ignore the Message-ID line—I could potentially see an argument for locating a message via its Message-ID but that's generally not done.

```
Reply-To: ace@tidbits.com
```

When people reply via email to a newsgroup posting, their newsreaders use the address in the Reply-To line. A Reply-To line makes it easier for people to respond directly rather than cluttering the group with personal messages or those that aren't relevant to the group (especially any flames). Email messages can have Reply-To lines as well, but don't always.

```
NNTP-Posting-Host: penguin.tidbits.com
```

The NNTP-Posting-Host line just lists the name of the machine from which the message was posted. I can't imagine why anyone would care, for the most part.

```
Keywords: sample, test, header, ISKM, Gorgonzola
```

Sometimes you see a Keywords line as well. Although it's not universal or enforced, it's often a good idea to fill it in for your article before you post it. That way, people who use certain newsreaders can more effectively filter articles based on keywords so they see only the articles that interest them. In addition, some newsreaders show only the header and first few lines of an article, and then let the reader decide whether she wants to read the whole thing. A few well-chosen keywords can help make that decision easier.

That wraps up the common parts of a header to a Usenet posting. There are undoubtedly some other lines that you will see in the future, but because headers aren't really meant for people to read, don't worry about anything you don't recognize.

How Does Usenet Work?

For the most part, knowing how Usenet actually works isn't even slightly important to daily life. However, the basic principles may help you to better cope with some of its quirks and limitations.

The entire concept of Usenet is based on one machine transferring postings to another. Scale that up so that any one machine carrying Usenet messages talks to at least one other machine carrying Usenet messages, and you start to see how this simple idea can become an immense and powerful reality. We're talking about thousands of machines and millions of people and hundreds of megabytes of data per day.

If you post a message in a Usenet group, your Internet provider's machine passes the message on to all the machines it talks to, both upstream and downstream. Upstream loosely refers to the machines from which your machine generally gets all of its news. Downstream loosely refers to the machines that get all of their news from your machine. In either case, those machines continue to propagate your message throughout the network,

with the Usenet software that controls the system making sure that your message isn't duplicated *ad infinitum* (Latin for "a hell of a lot of times, which irritates everyone").

The actual process by which postings travel is equally simple. Let's follow a sample posting that I might post to `comp.sys.mac.comm`. First, I'd create my posting in NewsWatcher, making sure to fill in the Newsgroups and Subject lines, and possibly also the Keywords and Summary lines as well. After I'm done creating the posting, I tell NewsWatcher to send it.

Think back to Chapter 6, "What Is the Internet?," where I explained client/server computing using the dessert cart analogy. NewsWatcher is what's called an NNTP (Net News Transfer Protocol) client, and it communicates with an NNTP server run by an Internet provider. When NewsWatcher tries to send my message, it contacts the NNTP server that my Internet provider runs. Depending on how the NNTP server is set up, it may require NewsWatcher to send a userid and password so that it knows that my copy of NewsWatcher is authorized to post messages. After my NewsWatcher has logged in, it engages in what is essentially a short conversation with the NNTP server, transferring all the various parts of my posting as the NNTP server asks for them. After the NNTP server has received everything, it tells NewsWatcher that it's done, and NewsWatcher breaks the connection.

Now my posting is on my provider's NNTP server, and anyone who uses my provider can read it (there's probably a little processing that must take place first, but it's usually fairly quick). The next stage that must take place is propagation to the rest of Usenet. There are a variety of ways that machines on Usenet transfer messages back and forth to one another, so I'll describe the process somewhat generically.

First, the Usenet server software run by my provider creates a batch of postings that need to go out. It might also compress the batch to reduce transmission time, and after the batch is ready, the Usenet software sends it along to the machines with which my provider shares news. When the next machine receives the batch, it unbatches the postings and places the files in directories known to the newsreading software. After the postings have been unbatched and properly processed for use by an NNTP server, anyone on that machine can read them using NNTP client software, such as NewsWatcher.

This process of the machines that carry Usenet news sending batches of postings to one another continues for many thousands of machines, so perhaps the computers with which my provider shares news will have my posting within a few minutes, and then the machines with which those computers share news will have my posting a few minutes later yet, and so on. If you think about the ever-widening rings that appear when you toss a rock into a still pool of water, you can more easily visualize how any given Usenet posting propagates to all the other machines that carry Usenet news on the Internet.

The Newsgroup Stork

Now that you know something about how messages travel from machine to machine, you may wonder where new newsgroups come from. The basic rule is that if there isn't one that matches your interests, you can create one, although the process is not at all trivial.

> **BTW**
> Although I summarize the process below, if you want to see all the gory details, check out two periodic postings in `news.announce.newusers`. Both "How to Create a New Usenet Newsgroup" and "The Usenet Newsgroup Creation Companion" are required reading for anyone seriously considering creating a new group. These postings are also available on the Web at `<http://www.cis.ohio-state.edu/hypertext/faq/bngusenet/news/announce/newusers/top.html>`.

There are a few basic rules about creating new groups.

- Don't create a group unless you are absolutely sure no appropriate group already exists. Usually, you simply haven't found the right group. The Usenet structure lends itself to talking about almost any subject in an existing group. For instance, you can talk about anything Macintosh-related in `comp.sys.mac.misc`.
- Don't create a group until the traffic in a more general group (such as `comp.sys.mac.misc`) has grown unmanageable, and stayed that way for some time. As a rule of thumb, wait six months.
- One way or another, make sure you have a Usenet old-timer on your side, to help with the details and steer you clear of any egregious mistakes.

After you are sure the world really does need a group dedicated to your pet topic, you write a proposal. This Request for Discussion, or RFD, states what the group is called, what its purpose is, why no existing group serves the need, and so on. Then your job as agitator begins, as you distribute the RFD to groups where interested parties might hang out. Be sure to place the `news.announce.newgroups` group first in the Newsgroups line (so the moderator can correct any problems in the RFD before posting it to `news.announce.newgroups` and the others for you) and to set the Followup-To line so that the discussion takes place in `news.groups`. Then you encourage discussion of the topic for 30 days in `news.groups`, all the while collecting responses and modifying the proposal, called a charter, accordingly.

After 30 days, if people don't agree on the charter, you must start the RFD process again—with a new and improved proposal, of course. If everyone does agree on the charter, the time has come for a Call For Votes, or CFV, with clear and unbiased directions on how to vote.

The CFV goes, once again, to all the interested newsgroups, with `news.announce.newgroups` first in the Newsgroups line. It lasts between 21 and 31 days, and you must include the exact end date in the CFV. Once again, your job is to collect and tally the votes via email. (Don't even think of stuffing the electronic ballot box—there's little the Usenet community hates more than a cheat.) You must record each voter's email address along with his Yes or No vote, for later use. You can repost the CFV during the vote to keep up awareness, but only if you don't change anything from the original CFV.

At the end of the voting period, you post the results—including the total number of votes, and the vote and email address for each—to `news.announce.newgroups` and the other interested newsgroups. Then everyone waits five days, which provides enough time to correct any mistakes or raise serious objections. You must meet two separate goals to justify a newsgroup. A sufficient number of votes and, within that number, a sufficient number of Yes votes. If you have at least 100 more Yes votes (for creating the newsgroup) than No votes, and at least two-thirds of the votes are Yes votes, then the group passes the vote.

If, of course, you don't get the required number or percentage of votes, the group doesn't get created. There's no shame in not having your group created. You can even try again in six months if you want to and interest may have increased since the original failure. If you fail more than twice, give it up and form your own mailing list. You don't need anyone's cooperation to do that.

If the vote comes out positive, someone (often the moderator of `news.announce.newgroups`) can create the group, sending out the newsgroup control message. Gradually, the group is created at different sites and propagates through much of Usenet. Why not all of Usenet? Nothing says a machine must carry every Usenet group in existence. If a system administrator decides that your group is offensive, she may decide not to carry it. The machines that rely on her machine for news may not carry the group, either, unless they pick it up from some other source. Nonetheless, groups focusing on technical issues enjoy relatively complete propagation. Even those discussing topics that some people find offensive enjoy wide propagation, and often greater readership, than the technical groups.

ClariNet

Along with all the social, technical, miscellaneous, and geographic newsgroups, you may see a hierarchy that starts with `clari`. You've found ClariNet. Unlike Usenet, ClariNet doesn't carry discussions. Instead, ClariNet is dedicated to distributing commercial information, much of it the same stuff that you read in your newspaper or hear on the radio. ClariNet claims over 1.3 million subscribers, which is an impressive circulation figure.

Also unlike Usenet, ClariNet isn't free. A site must pay a certain amount to receive the ClariNet news feed, which uses the same transport protocols and newsreaders as Usenet. Sites that receive the ClariNet feed cannot redistribute that feed to other machines unless those machines pay for it as well. Because of ClariNet's commercial nature, I can't predict whether you even have access to it. It's strictly up to each site.

Much of the ClariNet information comes from press wires like UPI, along with NewsBytes computer articles, and various syndicated columnists such as Miss Manners. Although you can probably find much of the same information in a standard newspaper, ClariNet organizes it well, making reading about a single topic much easier. For instance, some groups carry local news briefs for each state, some carry news only about Apple Computer, and there are groups with tantalizing names such as `clari.living.goodnews`, which indeed includes only articles that are good news. (Depressingly, that newsgroup sees little traffic.)

ClariNet was founded some years ago by Brad Templeton, who is also well known as the creator of the moderated group `rec.humor.funny`, which accepts only jokes that he thinks are funny (someone else does the selection now). ClariNet is important because it is specifically commercial traffic flowing via the same methods and pathways as Usenet, perhaps the most anti-commercial part of the Internet. I don't know the business details of ClariNet, but it has been around long enough that I suspect it's a financial success, and the news that it brings is certainly welcome.

Using Usenet Newsreaders

No matter what software you use to access Usenet, you should be aware of some basic concepts, tasks, and features. When I evaluate different newsreaders such as NewsWatcher and NewsHopper in the latter parts of this chapter, I discuss whether or not the newsreader in question includes these features.

Subscribing to Groups

When you first invoke a newsreader, you must subscribe to the groups you want to read. Occasionally, the newsreader automatically subscribes you to a couple of basic groups, such as `news.newusers.questions` and `news.announce.newusers`. For the most part, however, the thousands of available newsgroups are in the unsubscribed category.

> **BTW**
> Most machines don't carry all of the Usenet groups. If your machine doesn't carry a group you want, you can either ask the system administrator to get it, or go to a machine that lets anyone read news on it. These sites are called public NNTP sites. Be forewarned, however, that few if any of these sites still exist, and whenever a public NNTP site becomes known, so many people try to use it that it often stops being public. To find these sites, try searching on "public NNTP sites" in a search engine like Alta Vista at <`http://altavista.digital.com/`>.

Generally, the first time you try to read news it takes a long time because you must go through all the groups and figure out which ones to subscribe to. The better newsreaders enable you to browse through the list whenever you like, so you don't have to make your decisions immediately. In the past, you had to sit for an hour or more just unsubscribing

from all the groups that you didn't want to read. It was a major hassle. Even now, allot plenty of time to your first session if you're doing it interactively.

FYI
One of the most frequently asked-for programs for years was an offline newsreader, a program that enables you to save articles to disk and then read them when you aren't connected to the Internet. There are a few offline newsreaders now, and I discuss them later in this chapter.

Reading and Navigation

After you subscribe to a group, it's time to read the articles. Obviously, the first time you read, all the articles are new to you. After that, you want to make sure that you read only previously unread articles. Most newsreaders are good about keeping track of what you've read so you don't see messages more than once.

After you start reading a set of messages, you need tools for navigating among them. Navigation tools were more important back in the days when character-based Unix newsreaders were all we had. Today, most Macintosh newsreaders replace the navigation commands with mouse actions. However, many people (myself included) find the keyboard to be more efficient than the mouse for navigating through news, so perhaps there's still room for some of the old ways.

A brief aside: Usenet discussions are grouped into threads, which are collections of related articles, generally with the same or very similar Subject lines. Threads are important because they group both discussions that you want to read and those you don't want to read.

The most common navigation capability takes you to the next unread message, whether or not it is in the same thread as the message that preceded it. Closely related is the capability to move to the next unread message in the same thread, even if it's not next to the message you were just reading. In a well-designed newsreader, these two capabilities are closely intertwined, so you don't have to know whether or not you're in a thread.

FYI
Often, these navigation features are encapsulated in a single command linked to the Spacebar, which essentially says to the newsreader, "Do whatever makes the most sense right here." Computers hate those sort of commands, but the concept works extremely well in a newsreader. First, the Spacebar scrolls down the page. When you hit the bottom of the article, you probably want to read the next article in the thread, so the Spacebar takes you there. When you finish all the articles in that thread, you probably want to read the next thread, so the Spacebar takes you back up. Finally, after you read everything in a newsgroup, the Spacebar assumes that you want to read the next newsgroup.

Despite the fact that people should include descriptive Subject lines in their postings, they don't always. If you see a long thread called "Cool Stuff," you have no idea what it's about. It may pique your curiosity, though, so you start reading, only to find out that it's another "my computer is better than your computer" flame war. Now you need a way to kill the entire thread. Good newsreaders make that effort easy, since there's far more chaff than wheat in both Usenet and the real world.

An even more useful feature that some newsreaders offer is the capability to create a list of Subject lines or topics that you never want to read. This capability usually applies to anything in the header and sometimes to information in the body of the messages, too. It's extremely useful for customizing your Usenet reading experience. I detest, for instance, dealing with fax software and fax modems, but since faxing is a communications topic, it tends to pop up in newsgroups such as `comp.sys.mac.comm`. I'm utterly uninterested in those posts, however, so I welcome being able to read that newsgroup without ever seeing the discussions of fax software.

To go one step further, a few newsreaders provide a feature to read only articles that match certain topics. These are ideal for the truly busy user. In the future, I think we'll see more of this sort of filtering because it's the only way that many people can deal with the volume of traffic involved in Usenet. I'd like, for instance, to be able to set a newsreader to look for messages from specific people whose opinions I trust and whose knowledge is extensive. That's possible now, but what I can't yet do with any existing program is have it automatically bring in the entire thread surrounding that specific person's post. After all, I may need the context, and getting it manually is often too much work.

> **BTW**
> What I'd really like to see is a newsreader that utilized modern pattern matching and neural network technology to produce weighted listings of messages in a group, perhaps not even displaying those that don't rate highly enough. That would ensure that the messages at the top would be the most interesting and from the most knowledgeable people.

After you have read all the messages that interest you, it's a good idea to mark the rest of them as read (even though you didn't read them). This way, you don't see them again the next time you read news. Some newsreaders automate this task, whereas others make you mark them manually. Sometimes, especially if you have just returned from a vacation, you may want to mark everything as read without even trying to read the waiting messages. Marking everything lets you start with a clean slate and with a manageable number of messages the next day, and is generally referred to as catching up. There's no difference between a "catch up" feature and a "mark all as read" feature, but you may see both terms.

rot13

You might occasionally run across completely unreadable articles. They may be in a newsgroup specific to a language that you don't understand, but a newsreader can't help with that problem. However, it should be able to help you with messages coded in the rot13 format. Rot13 is a simple coding scheme that assigns a number to each letter of the alphabet, starting with 1 for A, 2 for B, and so on, for every character in a message. It then adds 13 to each number (wrapping around at 26, of course, so N, the 14th letter, would become 1 in the scheme, and would be rotated into an A) and converts back into letters. The result is an utterly unreadable message, which the poster usually intended because some people might find it offensive. If you see such a message and are easily offended, don't read it. No one forces you to use the rot13 decoding features that exist in most newsreaders. If you do, you can't complain about the contents. I see most rot13-encoded postings in joke newsgroups, protecting the innocent from truly sick jokes (see Figure 14.2).

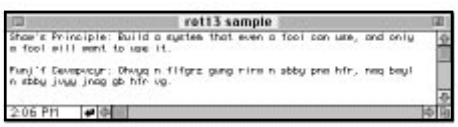


Figure 14.2 Normal text versus rot13.

Extracting Binary Files

In the days of yore, when true Internet connections were less common, files were often passed around the world by being posted in special binaries newsgroups, and even today you'll see groups such as `comp.binaries.mac`. Files are still posted to Usenet, although the majority of them seem to be copyright violations of dirty pictures. A good newsreader makes it easy to download binary files posted in Usenet, although I strongly recommend that you use FTP to get files if you have a choice.

One of the problems with transferring files in Usenet is that large messages tend to become corrupted or not propagate well, so most large files posted to Usenet are broken into a number of segments and posted separately. Some newsreaders are capable enough to recognize and combine the many different parts of a single file (assuming they all get through, which is by no means guaranteed, and if just one segment is missing, the file is toast).

FYI
FTP works much better than a newsreader for downloading files and saves a ton of bandwidth since the files aren't being transferred to sites where no one will download them. If possible, avoid using Usenet to retrieve files.

Replies, Follow-ups, and New Posts

In the course of reading Usenet news, you may see messages to which you'd like to reply. Having read the previous section on "Usenet Manners," you know that you should try to reply via email if possible, and luckily, most newsreaders support sending mail replies.

The only problem with sending email from within a newsreader is that it's a different environment from your normal email program, and the newsreader may not offer all the features you're used to. For people like me, there's another problem, since I like to save everything I send in email for future reference, and sending email from within a newsreader won't work with my standard archiving system in Eudora. A simple solution is to copy the email address from the Usenet posting and paste it into a new email message—it's clumsy but it works fine if you don't need to do so often.

Discussions are the entire point of Usenet, of course, so you will eventually want to post to a newsgroup. For most people, the easiest way to post a message is to reply to another message, an action called following up. Posting a follow-up is easier for the novice than posting a new message because the newsreader fills in most of the lines in the header for you; the lines for Subject, Newsgroups, Distribution, and so on are generally determined by the message you reply to.

When you post a follow-up, your newsreader should let you quote the original message, but it should also make it easy to quote only a small part of the original message, perhaps by selecting the part to quote before choosing a Follow-up menu item. Editing the text and entering new text should work much as it does in any word processor, although there's actually quite a range of capabilities among the different newsreaders. If, like me, you're rather particular about the workings of programs in which you write, that might sway you to one newsreader over another.

Finally, if you have something new to say, or a new question to ask, don't insert it into an existing thread just because it's easier than starting a new one. Posting a new message should be simple enough in any decent newsreader, and the better ones will help you by making it easy to fill in the Usenet-specific header lines properly, most notably the Newsgroups line, since sending a posting to the wrong newsgroup can be very embarrassing.

BTW
If you cannot post from a newsreader for some reason, you may still be able to send messages to a Usenet newsgroup, using an email-to-Usenet gateway. Make sure to ask for replies via email. Check this Web page for a list of email-to-news gateways: <http://students.cs.byu.edu/~don/mail2news.html>.

If you do send a post of any sort and regret that you've done so immediately, look for a cancel feature. Some newsreaders enable you to cancel an article that you've posted (but not ones that other people have posted), and cancelling inappropriate postings is an extremely good thing to do.

You must experience Usenet to truly understand it, though, so I do recommend that you find a few groups that interest you and lurk for a while. Now, however, let's look at some of the newsreaders that I've mentioned in passing.

Usenet Newsreader Reviews

I know of a number of excellent newsreaders, including NewsWatcher, NewsHopper, Nuntius, and InterNews. Of the freeware and shareware entries, I prefer NewsWatcher, developed by John Norstad of Disinfectant fame. In the commercial arena, I'm quite fond of NewsHopper, which is the best offline newsreader these days. In the end, I think you must decide for yourself which of the newsreaders you prefer, because each one brings a different interface philosophy and design to the task of reading news.

FYI
Since you can try all the main newsreaders for free, I recommend that you form your own opinion and don't clog discussion groups with questions asking which newsreader people like best. Newsreaders are personal programs, and only you can decide which is right for you.

NewsWatcher

The major challenge that the newsreaders face is presenting a clean and quick method of navigating through gobs of information. Interface is all-important (and a purely personal choice, of course), but raw speed doesn't hurt either, and NewsWatcher feels fast. Steve Falkenburg of Apple first created NewsWatcher, and John Norstad later picked it up to continue development. John has gone nuts with NewsWatcher and made the current version, 2.1.2, into one of the best Internet programs available today.

Installation and Setup

When you launch NewsWatcher for the very first time, it asks if you plan to use NewsWatcher on your own, on a shared Mac with others who will also use NewsWatcher, or in lab situation. The answer to this question determines how NewsWatcher sets up your preferences. If you click the Private button, NewsWatcher creates your preferences in the Preferences folder. If you choose Shared, NewsWatcher prompts you to name a folder in which it will store your personal preferences. And finally, if you click the Lab button, NewsWatcher prompts you to insert a floppy disk on which it will store your preferences.

> **BTW**
> Because NewsWatcher supports Internet Config, if you have already configured Internet Config completely (and it's included on the CD-ROM so you can do this), you won't have to fill in the basic settings discussed below—they'll already be present. Internet Config is a good thing. (See Chapter 4 "Step-by-Step Internet," for instructions on configuring Internet Config and see Chapter 18, "Utilities and Miscellany," for more advanced Internet Config usage information.)

After you've determined how you will use NewsWatcher, the program prompts you for five pieces of information, three of which are required and two of which are optional. First, it asks for the addresses of your news server and your mail server (see Figure 14.3), which are required.

Figure 14.3 NewsWatcher Server Addresses configuration dialog box.

The only way to figure out these addresses is to ask your system administrator. After you fill them in and click the OK button, NewsWatcher presents another similar dialog box that asks for your full name, your organization, and your email address. It requires only the last of the three, but there's no reason not to input the others (see Figure 14.4).

After you enter all that information, NewsWatcher goes out to your server and downloads the full group list, the huge list of all the newsgroups available on your site. Downloading this list can take a long time over a modem. Be prepared to wait, but don't worry. As long as you don't throw out the NewsWatcher Prefs file in your Preferences folder, NewsWatcher never again has to download all the groups. If NewsWatcher does try to download the full group list on future launches, check to make sure an anti-virus program or something else hasn't prevented NewsWatcher from properly creating its NewsWatcher Prefs file.

Figure 14.4 NewsWatcher Personal Information dialog box.

FYI

Some people report NewsWatcher crashing or having other problems as it attempts to sort the full group list. In many cases, this is caused by NewsWatcher not having enough memory to deal with so many newsgroups. If you have this problem, in the Finder select the NewsWatcher icon, choose Get Info from the File menu, and increase the Preferred memory size by a few hundred kilobytes.

Scroll through the Full Group List (if you accidentally close it or want to add groups again later, look for Show Full Group List under the Windows menu) and drag interesting groups over to the small, empty window. Don't worry about the order; you can drag groups within that window to put them in the right order after you're finished subscribing to groups. Eventually, you have a nice set of groups to read. From the File menu, choose Save and then name your group list whatever you want (see Figure 14.5).

Figure 14.5 NewsWatcher group list.

That's about it. You're ready to read news, although you may want to configure some more preferences first. If you select Preferences from the File menu, NewsWatcher presents you with a dialog box containing some general options (see Figure 14.6). At the top of the

dialog box is a pop-up menu that lists other types of preferences you can set, such as the location to save files, your signature for postings, the font and size for viewing articles and lists, and various other settings. Some of these match the settings from Internet Config; others are specific to NewsWatcher.

Figure 14.6 NewsWatcher's many preferences.

Basic Usage

To read a newsgroup in your list, double-click it or use one of the keypad shortcuts (if you have them enabled from the Preferences dialog box). NewsWatcher opens another window containing the subjects of all the articles in the group, and alongside each subject is either a dash or a triangle and number (see Figure 14.7).

Figure 14.7 NewsWatcher newsgroup and article windows.

The dash indicates that the article is the only one in the thread, the triangle indicates that there are more than one, and the number indicates how many articles are in that thread. You can click the triangle to show the other articles, just as you click a triangle in the Finder to display a folder's contents. I sometimes leave the option that displays author names turned off because NewsWatcher draws windows much faster that way. If you choose not to download author names, there's no reason to expand a thread with the triangle control, since all the articles have the same subject and thus look identical.

Double-clicking an article subject in the newsgroup window opens a window (see Figure 14.7 again) that NewsWatcher sizes to the article to prevent unnecessary scrolling. However, if you click the little lock icon in the lower left-hand corner of the window, NewsWatcher uses that window size until you unlock the icon. With an article window open, you can go to the next article, next thread, or next group (marking the current group as read) with keyboard shortcuts or, if you have them turned on in the preferences, a keypad shortcut. I prefer the keypad shortcuts because reading news should be an easy process, and using a Command-key combination is too hard for hundreds of repetitions. That's especially true for those of us with repetitive stress injuries.

In NewsWatcher, you also can reply to an article via email or post a follow-up to the newsgroup using commands in the News menu. Useful icons at the top of the reply window let you specify if the reply should go to the newsgroup, to the poster or another email address that you can enter, or to your email account if you wanted to save a copy yourself (see Figure 14.8).

Figure 14.8 NewsWatcher reply window.

When you're back in a newsgroup window, you also can quickly mark articles as read or unread, which can be handy for getting through a group quickly. That's about all there is to reading news with NewsWatcher—it's an elegant program.

FYI

Here's a technique I sometimes use. Select all the articles in a group with Select All from the Edit menu, then press the Command key and click the ones you want to read to deselect them. Then, from the News menu, choose Mark Read, which puts a check mark next to each of the still-selected uninteresting articles. Now you can select the first article in the group and read straight through without being bothered by any of the uninteresting stuff.

Special Features

NewsWatcher feels fast, clean, and easy to use, which is the result of nice touches at every level. I cannot live without keypad shortcuts or the Spacebar shortcut that moves you to the next screen and then to the next unread message, just as in a Unix newsreader.

John has removed the capability to move through the massive full group list by typing the first few characters of each part of the newsgroup name, replacing it with a more generic Find function that's more useful and easier to use (since most newsgroups start with the same letters anyway).

FYI

NewsWatcher has an interesting feature to open referenced articles, which theoretically enables you to go back in a thread even if you have already marked earlier articles as read. To search back for an older article, Command-click on a message-ID if one exists at the top of any article. Unfortunately, many people edit out the message-ID.

Command-clicking an email address also opens a new mail window set to send email to that person. Even better, if you Command-click on an FTP URL that someone has included in a posting, NewsWatcher calls either Anarchie or Fetch and retrieves the file or directory. But of course, many non-FTP URLs are passed around in Usenet news, so NewsWatcher can also pass HTTP URLs to a Web browser such as Netscape Navigator, Gopher URLs to TurboGopher, and so on. Other URLs that John supports include WAIS, Telnet, tn3270, Finger, Whois, and Ph, and you can set the programs to help out in each case.

NewsWatcher has automatic extraction code that enables it to automatically download and decode binary files that are posted—usually in BinHex or uuencoded form. Even better, NewsWatcher supports Apple's Drag Manager, so you can just drag the icon linked to a binary file to a folder in the Finder, and NewsWatcher downloads it and calls the appropriate programs to decode it.

Drag Manager support extends beyond just downloading binary files, though, so you can drag the contents of any NewsWatcher window to the Finder to create a text clipping, or to another Drag Manager-aware program window to copy the text into that document. Drag Manager support requires System 7.5.

For those of you who read news on a Unix machine using rn or nn at work and perhaps use NewsWatcher at home to read news on that same Unix machine, NewsWatcher has a feature that enables you to use the same .newsrc file so that you don't have to duplicate reading effort.

BTW

The Remote Host Information preferences control this feature for retrieving the .newsrc file from a Unix shell account. Don't worry about those preferences if you don't also read news under Unix and wish to share the .newsrc file.

Evaluation and Details

The main complaint I can think of in regard to NewsWatcher is that the text window limits prevent you from posting messages larger than 32K. Chalk up another one for Apple's limited TextEdit routines. You can read messages larger than 32K, though, since NewsWatcher displays only 32K at a time and provides a horizontal slider bar to reach additional 32K chunks of the same message. Additional missing features include full filtering and the capability of posting attachments to messages. Both of those limitations are addressed in a variant of NewsWatcher called Yet-Another NewsWatcher (which is otherwise basically the same). See the review coming up for more information on YA-NewsWatcher.

Overall, though, what can I say? John Norstad has once again provided the Macintosh community with a great freeware program. John's free Disinfectant is wonderful, but I certainly hope that people have more occasion to read news than to search for viruses.

However, I shouldn't imply that NewsWatcher is perfect or, more accurately, complete. John has big plans for NewsWatcher, but because it's a labor of love, he works at his own pace and implements features that he wants or feels that the program needs in order to be complete. Because of this, I always enjoy reading the To Do document, which lists all the wishes and requests for future versions, including my big favorites, offline reading and message filtering based on the contents of the messages or headers.

NewsWatcher 2.1.2 is free, and you can retrieve the latest version from either `<ftp://ftp.acns.nwu.edu/pub/newswatcher/>` or `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>`.

NewsHopper

NewsHopper is the only stand-alone commercial Usenet newsreader, and although it may seem as though it would have difficulty competing with the many excellent freeware and shareware newsreaders, NewsHopper provided the first good solution for reading Usenet news offline. That feature alone would be a sufficient selling point for many people, but NewsHopper also has excellent filtering capabilities, which, when combined with its offline capabilities, make it one of the most accomplished newsreaders available for the Mac.

Installation and Setup

NewsHopper doesn't force you to work through any immediate setup upon startup; instead, after you launch the program and enter your name and company name, you must create a new newsfile by choosing New from the File menu. At that point, NewsHopper starts asking configuration questions, but if you've previously configured Internet Config, NewsHopper can retrieve all of your settings from Internet Config's database. One way or another, you first see a dialog box asking for the name of your news server (see Figure 14.9).

After that, NewsHopper presents you with a standard file dialog box so you can name and save the folder that contains all of your settings. After you've saved that folder, NewsHopper opens your News window and another dialog box asking for your real name, your organization, and your email address (see Figure 14.10). Enter your information and click OK.

Figure 14.9 NewsHopper news server configuration.

Figure 14.10 NewsHopper User ID configuration.

NewsHopper has several other sets of preferences in the hierarchical Settings menu under the Edit menu which aren't governed by Internet Config—things like whether or not you want to use an external text editor, if you want to ignore confirmation alerts, and if windows should avoid hiding the Finder's icons. Also included are options for saving window positions, showing complete addresses for the senders, and marking articles as "not new" automatically. Needless to say, none of these settings is necessary—worry about them after you've used NewsHopper a bit.

After working through the required settings—which is as easy as accepting the existing settings if you've configured Internet Config—you're left with a News window. At this point, there are two basic ways of subscribing to newsgroups. If you know the exact names of the groups you want to read, choose Subscribe from the Groups menu (see Figure 14.11) and enter the name of a newsgroup. I usually set NewsHopper to fetch all new items, to fetch subjects and authors only (since that's the beauty of NewsHopper's offline capabilities), and to sort the threads alphabetically. However, with very low-volume groups such as `comp.sys.mac.announce` and `rec.humor.funny`, I sometimes have NewsWatcher bring in the articles themselves on the first pass, since it's easier.

Figure 14.11 NewsHopper Group Settings window.

When you click the OK button, NewsHopper enters that newsgroup in your News window. Frankly, this is all I've done for the way I use NewsHopper, because I know full well which groups I want to read by now. However, if you don't know which groups you want to read, you must tell NewsHopper to fetch the list of all groups, which requires making a connection.

From the File menu, choose Connect, and in the dialog box that appears, check the Fetch List Of All Groups checkbox (see Figure 14.12). Make sure you have a connection to the Internet established if you're using SLIP or PPP, and then click the OK button. NewsHopper goes out to your news server and brings in the full list of newsgroups (on my server, with almost 7,000 groups, NewsHopper brought in about 310K of data during that time).

Figure 14.12 NewsHopper Connect dialog box.

There's not much that you can do in NewsHopper while the full group list comes in because you don't have any groups configured yet, but if you did, you could be reading or replying to articles. NewsHopper is extremely good about establishing connections and working in the background, so you can keep reading. After NewsHopper has finished bringing in the list of all the groups, you can hang up your Internet connection if you wish, and then choose List Of All Groups from the Windows menu to bring up the window showing all the groups (see Figure 14.13).

Figure 14.13 NewsHopper List Of All Groups.

You can scroll around and select multiple groups, or you can type a search string in the text field at the top and click the Find button. When you click on the Subscribe button, NewsHopper adds the selected groups to your News window.

> **FYI**
> NewsHopper makes you choose the options for all of the selected groups at the same time; however, you can easily change the settings for how many articles to bring in or whatever later by selecting the group in the News window and choosing Settings from the Groups menu.

Basic Usage

So now that you've subscribed to a number of groups, let's fill them with articles. From the File menu, choose Connect again. This time, Fetch List Of All Groups will have changed (since you've already retrieved the list) to Check For New Groups. Leave that selected if you like, but also check Fetch New Articles. Make sure you're connected to the Internet and click the OK button. NewsHopper connects to your news server and retrieves the subjects and authors for the articles in the newsgroups to which you've subscribed (see Figure 14.14).

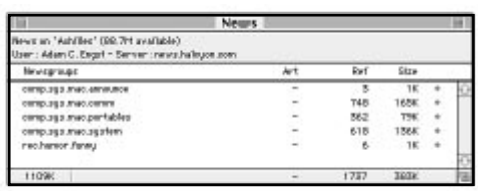


Figure 14.14 NewsHopper News window.

After it's done, you can again disconnect from the Internet—keeping your bills low if you're charged by the hour or calling long distance. Even though NewsHopper moves right along, if you've selected several high-volume groups, it can still take a while to download just the subjects and authors. Be glad you aren't trying to download all of the articles as well.

To look at the articles in a newsgroup, simply double-click the newsgroup in your News window. NewsHopper brings up a window listing all the articles (see Figure 14.15). Remember that we don't yet have any of the articles themselves yet, just the subjects and authors. The next step is to mark the articles you want to read. Double-clicking an article marks it with a checkmark, or you can select a number at a time and from the Articles menu, use the Attributes hierarchical menu to choose Marked (Command-M is a lot easier).

FYI

NewsHopper lacks a "Mark Entire Thread" command, so I simulated one using QuicKeys. I created a macro that first presses Option-Return, which is a NewsHopper shortcut for selecting the thread around a selected message. It then presses Command-M to mark the selected messages. Now all I do is click a message in a thread to select it and press Control-M, the hotkey I defined for my macro. NewsHopper selects and marks all the items in that thread.

Figure 14.15 NewsHopper Articles window.

That's still a bit of work, though, so let's create some filters to do this for us. For instance, I want to read everything that Laurent Humbert posts, because he's likely to say interesting things about NewsHopper, being the author. So, select an article from him, if you happen to see one. Or, you could use the Find command from the Edit menu to search for his name, at which point NewsHopper would display just the articles that match (you can use the Display pop-up menu at the top of the window listing all the articles to switch back to viewing all the articles).

After you have an article from Laurent selected (you can do this manually as well, if you can't find a message from Laurent), from the Articles menu choose Add Filter For Author. NewsHopper brings up the Filter dialog box, mostly filled in for you (see Figure 14.16).

Figure 14.16 NewsHopper Filter window.

As you can see, you can search in the various parts of the article and either in specific newsgroups or in all newsgroups via the pop-up Search In menu. Most important, though, are the Delete, Highlight, and Mark For Download checkboxes. If you never want to see anything from Laurent, you could check Delete. If you just want to see which articles he's posted, you could just check Highlight and then, when you were browsing, it would be easy to see his articles. However, if you want to read everything he posts, check Mark For Download so his articles are automatically downloaded for you on the next NewsHopper run.

FYI

You can create filters that work on variables other than the name of the poster, although I find filtering on the posters' names to work well for me. Keywords in the Subject lines always seem to bring in too much garbage for my tastes—perhaps I'm just not good enough at creating them.

To apply the filters you've created (you can have NewsHopper do it automatically for future runs), close the articles window, select one or more newsgroups in the News window, and from the Groups menu choose Apply Filter.

After you've selected all the articles you want to download, either manually or through filters, choose Connect from the File menu again, select Fetch Marked References (deselect the others for the fastest run), connect to the Internet, and click the button to make NewsHopper go out and get the articles you marked. When it's done, disconnect from the Internet and double-click a group that has articles in it in the News window. You probably still have all the article references listed that you didn't download; to hide those, choose Articles from the Display pop-up menu at the top of the window. Finally, double-click an article in the list to bring up the article reading window (see Figure 14.17).

Figure 14.17 NewsHopper Article Viewer window.

NewsHopper has a spartan reading interface, and I hope Laurent adds some additional navigation features in future versions. As it stands, the up and down arrow button in the upper-right corner of the article window moves you to the previous or next article, and the Spacebar also takes you to the next article. There's no way to move to the next thread if the current one proves boring, but you can delete it instantly with the Delete Thread command in the Articles menu.

If you want to reply by email or forward the text to another person, those commands in the Articles menu send the proper email address, the Subject, and the quoted text of the article (or just the selection, if you don't want to quote the entire article) to Eudora (or, in the latest release, Claris Emailer). I think it makes sense to use Eudora or Emailer for email rather than trying to duplicate the functionality in NewsHopper. In addition, that way all my outgoing replies end up with the rest of my saved outgoing mail in Eudora.

Creating a follow-up is similar, but NewsHopper retains control, first asking you about the Subject, newsgroup, and distribution, and then creating the follow-up in a separate text window (see Figure 14.18).

Figure 14.18 NewsHopper follow-up windows.

Of course, as you would expect from an offline newsreader, any follow-ups or new articles that you write are placed in an Outbasket to wait until you make another connection.

Special Features

It's a little hard to point to special features in NewsHopper, because its main features, offline newsreading and filtering, are so incredibly useful that they overshadow plenty of other nice touches. For instance, NewsHopper is excellent about quoting only a selection when you reply, forward, or follow up to an article, something that other programs such as NewsWatcher and Eudora can do, but only as a modified command (to be fair, Emailer works as NewsHopper does, quoting selections by default).

I appreciate the little Bytes Received status line at the bottom of NewsHopper's status window because it gives me an idea of how much data I'm getting myself in for. Also, since I use a dedicated Internet connection, I can't see the modem lights flashing to indicate that things are working, so I appreciate the constant reminder.

As I said before, NewsHopper is excellent about multitasking, so you can continue to read and reply to articles even as it's going out to retrieve more or to send your replies. This is probably due to its support for Apple's Thread Manager, and folks with Power Macs will appreciate the native code when filtering or performing other CPU-intensive tasks.

For people like me who are constantly seeing little useful bits of information, NewsHopper has an Add To Clippings File command in the Edit menu. Choosing Clippings File from the Windows menu brings up a small text editing window that shows your clippings, separated by three bullets on a line.

If you want to save an entire article, consider clicking the little padlock icon in the lower left-hand corner of the article window. That locks the article and prevents it from being deleted later on.

Speaking of deletion, since you're downloading all these articles to your hard disk, you will want to recover disk space at some point, and for that NewsHopper has a Purge command that gets rid of uninteresting article references, articles you've read, articles that you've extracted, archives, or just articles that have hung around for too long (see Figure 14.19). Also, even purging the messages doesn't actually remove them from your newsfile for efficiency reasons. For that, you should choose Compact from the File menu or let NewsHopper do it when you quit.

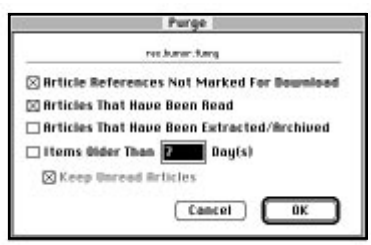


Figure 14.19 NewsHopper Purge dialog box.

NewsHopper's Find command, which presents a restricted view of the messages available in a newsgroup, works well for the way I read news, since I often want to do some ad hoc queries. It's too easy to be overwhelmed by several hundred messages in a window.

Evaluation and Details

Overall, I'm impressed with NewsHopper. Even though I use a dedicated Internet connection now, I still read news with NewsHopper, mostly because of the filtering and searching capabilities.

That's not to say that there isn't room for improvement, though. NewsHopper could still use a more streamlined interface for reading news, with keyboard shortcuts for moving around in the threads. I'd especially like to see the filters have an option for selecting an

entire thread around an article that matches a filter, since otherwise it's hard to retain context sometimes. Finally, I'd like to see the Find functionality move right into the article list window itself, rather than be separated out in a different dialog. That way it would be even easier to perform ad hoc searches for specific topics or posters.

NewsHopper's documentation is good, although I can't say that I've read most of it because the program is fairly easy to figure out after you get the hang of the procedure for doing something, connecting, disconnecting, doing something else, and repeating the process all over again.

NewsHopper is commercial software (£39, with 20 percent educational discounts) from SW15 Software, who you can contact at nh@sw15.demon.co.uk or by phone in the U.K. at (+44)-181-813-6027 or (+44)-181-561-2879 (fax). Orders other than from the United States and Canada should go to SW15 Software. In the U.S. and Canada, NewsHopper is distributed by LandWare for $59 (plus $4.50 shipping and handling via Priority Mail). You can contact LandWare at info@landware.com or at 800-526-3977, 201-347-0031, or 201-347-0340 (fax). It also has a Web site at <http://www.landware.com/>. However, you can download a demo of NewsHopper 1.2 that runs for 30 days and is limited by being restricted to five newsgroups and not running in Power Mac-native mode. It also lacks the full online manual. You can get a copy of the latest version of the demo from SW15's Web site at <http://www.demon.co.uk/sw15/> or from <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>.

Other News Programs

Despite the power and popularity of the preceding programs, several other newsreaders might be worth checking out, most notably MacSOUP 2.0 and Cindy's Newsmailer 1.1, both of which go beyond just news and provide email support as well. All of the following programs are available in <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/> and if not, I've listed Web pages or home FTP sites where they are available as well.

Cindy's Newsmailer

http://www.accessnow.com/

Cindy Carney's $40 shareware Newsmailer 1.1 does both email and news, and although it's based on HyperCard, it's one of the slickest stacks I've ever seen, and presents an excellent interface. It does work in an offline mode, and has capabilities not only to filter messages, but but even to execute HyperCard scripts when the filters trigger. Newsmailer encourages and aids archiving

continues

Cindy's Newsmailer, *continued*

of messages, helps automate connections, and provides a variety of glossary-type tools for adding taglines and variables like the date to your messages. Perhaps the only complaints I can make about Newsmailer is that I found its response time a bit slow, and it doesn't support Command-W to close windows. Otherwise, all I can say is that it's an amazing effort.

InterNews

`http://www.dartmouth.edu/~moonrise/`

Roger Brown's $20 shareware InterNews 2.0 provides yet another interface for reading news, presenting you with a three-paned window that displays a list of newsgroups, a list of subjects in the selected group, and the articles in a selected thread, all at the same time. Perhaps the most unique feature in InterNews, though, is its concept of subscriptions, which are groups of related newsgroups that you might want to read at the same time. Subscriptions help break up the overwhelming amount of news into more manageable chunks. InterNews supports Command-clicking URLs in order to launch them, uses Internet Config, has article filtering, and in an unusual and welcome feature, does not limit messages to 32K like many other programs do. InterNews is a fine effort, and is on a par with the best of the Usenet newsreaders.

MacSlurp

Tom Davies's free MacSlurp works by connecting to a specified NNTP server and downloading all the articles in the groups that you specify in your slurp.sys file, a specially formatted file that must live in your MacSlurp Files folder in your MacSlurp folder. After MacSlurp has downloaded all the messages in a newsgroup, you use a UUCP program called ToadNews to unbatch them, and after ToadNews has unbatched the news articles, you can use rnMac or TheNews (reviews coming up) to read the news. The major problem with MacSlurp (other than that it

doesn't currently work with news servers like mine) is that it's indiscriminate. It downloads all the articles in specified groups, regardless of whether or not it could take two hours because of all the new messages. You must spend the downloading time and have the disk storage space for all the articles, which isn't efficient if you wanted to read only a few in that group.

MacSOUP

`http://www.inx.de/~stk/macsoup.html`

Like Cindy's Newsmailer, Stefan Kurth's $20 shareware MacSOUP 2.1 does double duty for both offline email and news. For news, it most resembles NewsHopper, with its method of downloading article subjects and then getting the articles you select in a second run (although you can grab the articles directly as well). MacSOUP's interface is clean and responsive, and it has some high-end features such as a sophisticated kill capability and the capability to interact with Eudora. MacSOUP provides an innovative graphical view of a message thread that simplifies moving between message in the thread, and the Spacebar takes you to the next unread thread. You can easily show all messages in a newsgroup, just message headers, or just messages that have been downloaded, and you can sort by author, date, subject/thread, or incoming order. An especially neat feature is the way MacSOUP displays how old the message is, rather than when it was sent. MacSOUP is definitely worth a look if you want an offline newsreader that gives NewsHopper a run for its money.

Marconi

Roberto Ferrara's $15 shareware Marconi is an offline newsreader based on HyperCard, and comes in three versions: a stack that requires HyperCard or HyperCard Player, and two stand-alone versions, one for Power Macs and the other for 68K Macs. Like many HyperCard-based applications,

continues

Marconi, *continued*

Marconi's interface is a bit clumsy, but it seems essentially functional. Unlike NewsFetcher, Marconi also displays the articles for you, but otherwise it works much the same, downloading the list of subjects in a newsgroup, then downloading those articles that you've selected from the subject list. A future version of Marconi may do email as well.

NewsFetcher

NewsFetcher is a free HyperCard-based news transport agent from Jörg Shäffer. It's quite limited and a bit clunky in terms of interface, but it provides a way of reading news offline. NewsFetcher first retrieves subject lines in specified groups. You then select the subjects you wish to read, and it goes out and retrieves those articles. NewsFetcher doesn't attempt to read the articles on its own at all, but instead saves them in a special format that Akif Eyler's Easy View text browser (see the review in Chapter 13, "All About Email") can read. Easy View is great for browsing text, although it would be nice if NewsFetcher had an option for not downloading the complete headers of the messages.

NewsFetcher, although it does have minimal posting abilities, doesn't work well if you post frequently. I won't pretend that NewsFetcher is an ideal offline newsreading solution, but it is free.

NNTP Sucker

`http://www.netaxs.com/~ferrari/nntpsucker.html`

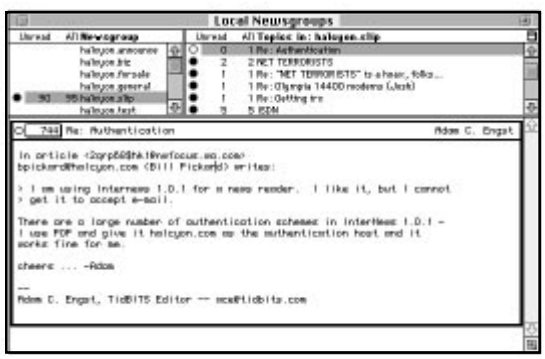
Darrell Turner designed his $10 shareware NNTP Sucker program to be almost exactly like MacSlurp, in that it reads a Group file to see which groups you want to download, and then it goes out and downloads messages from those groups. You can't specify which messages to get, but you can set a maximum percent or number of

messages to retrieve. When NNTP Sucker is done, it can quit, restart the Mac, or shut down the Mac. Like MacSlurp, NNTP Sucker creates output files for use with ToadNews and then rnMac. If you register NNTP Sucker 1.5, it can work with Easy View, an excellent text browser that's much easier to set up than ToadNews and rnMac.

Nuntius

`http://www.inch.com/~aaron/nuntius/nuntius.html`
`ftp://ftp.ruc.dk/pub/nuntius`

Peter Speck's Nuntius newsreader is definitely one of the heavy hitters along with NewsWatcher, InterNews, and NewsHopper. Nuntius differs from the other newsreaders in one especially interesting way. Like Web browsers, it relies on helper applications to edit postings and to send email. Also unusual is Nuntius's ability to bring in newsgroup article listings and the articles themselves while you're reading something else—a big time-saver. Nuntius uses a Finder-like method of displaying messages in threads with a triangle that you can flip down to view the rest of the thread, and you can use the Spacebar to read through the messages easily. You can click URLs in postings to launch them in the appropriate helper application. Nuntius is free, and well worth checking out.



rnMac

Roy Wood has brought his $25 shareware rnMac over to the TCP world from its start as a UUCP newsreader (although it still works with ToadNews and a UUCP feed). rnMac 2.0 is still in development and has a ways to go, but is a basic offline newsreader that works much as others do, enabling you

continues

rnMac, *continued*

to download the headers to messages in a group and then download only the articles that interest you. rnMac can work with Eudora for email replies or forwards, and it has an interesting feature for archiving messages permanently in separate Archival Groups, which are much like mailboxes for messages.

TheNews

Bill Cramer's $25 shareware newsreader, TheNews, works by default in MacTCP mode, although it also works with less-common UUCP connections and with Unix shell accounts. TheNews is a basic newsreader, with support for threads and the capability of using Eudora to email responses and forwarded messages. Unfortunately, I always seem to have various problems with TheNews whenever I try to test it, and its interface simply doesn't compare to the main freeware and shareware newsreaders. Feel free to try it out, but I suspect you'll prefer NewsWatcher or Nuntius or one of the shareware newsreaders like MacSOUP or Cindy's Newsmailer.

YA-NewsWatcher

Since John Norstad makes the code for NewsWatcher available for anyone who wants it, there have been various modified versions of NewsWatcher in the past. One current popular modification is Brian Clark's free YA-NewsWatcher (YA is a common Internet abbreviation for "Yet Another"), which adds support for posting binary files, extended support for extracting binary files, support for anonymous remailers, full article filtering, and full article sorting. The last two of these

features are likely to be extremely useful to many people, so I recommend you check out YA-NewsWatcher if you're intrigued by the features that the base NewsWatcher offers. Do make sure you have the latest version and that it's in synch with John's official version, if possible, to avoid missing out on any new features or bug fixes in the base code. Unfortunately, because YA-NewsWatcher is governed by the same distribution restrictions as NewsWatcher, I can't put it on the Internet Starter Kit CD-ROM either.

Things that Go Bump in the Net: News

Thanks for tuning in once again to this compendium of problems and what I hope are the solutions to those problems. Usenet news presents a different set of problems than any other Internet service, because, for the most part, everything is out of your control. It's sad, but true. With that in mind, here are some common questions and answers.

Connection Problems

Q: When I start my newsreader for the first time, it claims that it's downloading the full group list, but takes forever and then crashes. Is there anything I can do?

A: Try giving it more memory in the Finder. Select the icon for the program and from the File menu choose Get Info. Increase the Preferred size in the Get Info window by 1,000K or so. There are so many newsgroups that the newsreader might not have enough memory to process the full group list.

Q: I tried your suggestion above and now I'm getting different crashes. What's up?

A: I suspect that the first crash corrupted the settings file for the newsreader. This is a relatively common occurrence when you crash during a setup phase. Go to the Preferences folder in your System Folder and throw out the settings or preferences file for your newsreader. Then try again.

Q: When I try to connect, I get an error message saying something like "You have no permission to talk." What did I say to offend it?

A: That error message generally means that for some reason you aren't allowed to use the news server you have entered into your preferences. Most Internet providers limit use of their news servers to their customers, so if you're trying to use a different news server, it probably won't work.

If you are a customer, try asking the technical support folks at your Internet provider. Perhaps they've configured something incorrectly and need to fix it before you can read news.

Q: Why does my news server claim that I'm not authenticated?

A: Some news servers require that you enter a userid and password to be able to read and reply to postings. The reason is simple—authentication limits forgeries and fake postings. If you aren't sure how to authenticate yourself in the newsreader you're using, check out InterNews, since it supports a number of methods of authentication. Make sure you're entering the right userid and password as well.

Reading and Replying Problems

Q: Why doesn't alt.sex.small.furry.critters show up in my full group list? My friend said it was a rockin' group.

A: There's no guarantee that any Internet service provider will carry all the Usenet newsgroups, and many of them limit their selection in some form or fashion. Also, so many newsgroups are created all the time that they may not add new groups in the alt hierarchy automatically. Try asking the technical support folks if they'll add that group (if you're not too embarrassed).

Q: I was reading some Usenet newsgroups and all of a sudden, one of them stopped carrying any messages. What happened?

A: It's possible that the machine from which your Internet provider gets the news stopped carrying that group. If the problem persists, check with the technical support staff at your provider.

Q: What happened to rec.arts.startrek? It disappeared?

A: Actually, the group split into a number of other, more focused groups. This tends to happen to high-volume groups, so if a group that you read occasionally suddenly disappears or has the traffic dry up, check for new groups that contain the discussions.

Q: I want to download a picture called samantha.gif from a pictures newsgroup, but it was broken into 15 parts and part 13 is missing. What can I do?

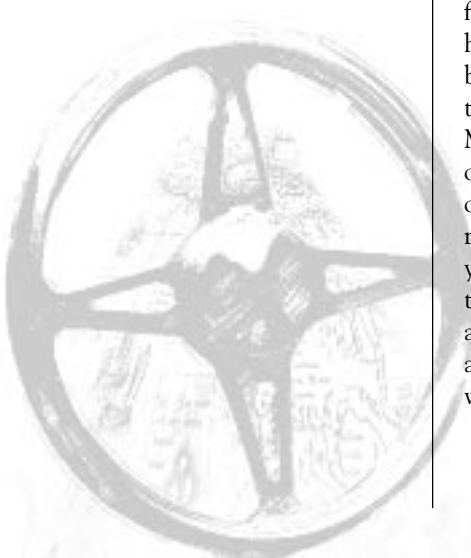
A: Nothing. If you're missing a part, the file is hosed. First off, those pictures are generally copyright violations (meaning, they're illegal). Second, downloading files from Usenet is a pain and generally isn't worth the trouble. Use FTP or the Web instead.

Q: I posted a follow-up to a message on Usenet, but my friend at another site says he never saw it in the newsgroup. What happened?

A: It's possible that postings aren't making it out of your Internet provider's machines, assuming of course that you can see the message you posted. Ask the technical support folks at your provider if they're seeing problems with news propagating out of the site. I suppose it's also possible that you put something in the Distribution line that prevented the message from getting to your friend's site.

Chapter 15 All About FTP

Contents:



FTP, which stands for File Transfer Protocol, is one of the oldest and simplest of the Internet services, and it provides an essential service: file copying. That's right, when you use FTP, you're doing nothing more interesting than when you drag files from one disk to another on your Macintosh.

Of course, copying files on the Internet is a bit more complex than copying them on your Mac, which is why I devoted all of Chapter 10, "File Formats," to the many different file formats you may run into on the Internet. Despite these file format issues, once you're familiar with FTP, using Anarchie or Fetch to retrieve files from an FTP site on the Internet is almost exactly the same as retrieving files from an AppleShare server over a normal Mac network or even from a floppy disk that you've just stuck in your Mac.

If you think about it, FTP is only slightly clumsier. Let's say you want to look at a file that lives on one of your many floppy disks. You probably know more or less which disk holds the file, but unless your organization scheme for disks is better than mine, it might take a few minutes to track down the specific disk you need. Then you put the disk in your Mac and wait a couple of seconds for the disk's icon to appear on your desktop. Then you have a choice. You can either open the file on the disk, which will be much slower if you need to work with it much at all, or you can copy the file to your hard disk, work with it there, and then copy it back to the disk after you've modified it. The second method has the added advantage of providing a backup of the original file. I almost always copy files to my hard disk because I find working from disk frustratingly slow.

Now consider the same task, except that this time the file lives on an FTP site on another continent. First, you make sure you're connected to the Internet. You may know the name of the FTP site, or, ideally, you've been given the URL to the file. Either way, you run Anarchie or Fetch and enter the machine name or URL in a window (or, depending on the software you use, accessing a file by its URL may be as simple as double-clicking, Command-clicking, or selecting the URL and pressing a hotkey). In the worst case scenario, you might have to open a few folders on the remote FTP site, just as you might have had to do on your floppy disk. After you find the file, you have only one option—you must copy it to your hard disk. The Internet isn't fast enough currently to enable you to work on files as though they were on drives connected to your machine. Copying takes longer than it does with a disk, generally, and after you've copied the file, it may need to be debinhexed and unstuffed, but StuffIt Expander should do that automatically for you, if you use Anarchie or Fetch. After the decoding is done, you can work on the file, and after you've made your changes, you might copy the file back to the FTP site, perhaps stuffing and binhexing it first with DropStuff.

As you can see, there aren't many differences between using FTP to copy a file to or from the Internet and using the Finder to copy a file to or from a disk. The main difference is that most FTP sites are "anonymous," which means that you can download files, but you cannot upload back to the site. They're only one-way, and if you want a real-world analogue, think about a CD-ROM, which is read-only, just like an anonymous FTP site. You can copy files from a CD-ROM to your hard disk, but you cannot copy files back to the CD-ROM. No matter how fast your Internet connection, FTP is also quite a bit slower than copying files from disk or almost any other drive connected to your computer, if only because of the decoding that generally takes place.

Despite the occasionally confusing way people use the term "FTP" both as a noun and as a verb, most people don't have much trouble using FTP. In the past, you could use only an FTP client such as Anarchie or Fetch to access files stored on FTP servers. Today, however, Gopher and World Wide Web clients can also retrieve files on FTP servers, and although Gopher clients aren't in vogue any more, many people do use Netscape Navigator or Microsoft Internet Explorer to download files via FTP. The major advantage that the Web browsers have over Anarchie and Fetch is that if you're designing a Web page, you can make any link on the page download a file. In contrast, Anarchie and Fetch can at best emulate the Finder in Name view. As a result, Web pages have become popular ways of creating catalogs of files, complete with descriptions and a link (which might even be a graphic "Download Now!" button) that retrieves a specific file stored on an FTP server.

You might wonder why anyone would bother to use Anarchie and Fetch if Web pages can offer so much more information. There are a couple of reasons. First of all, Web pages that offer a significant amount of information about a file must be built manually, which works fine for a small number of files. However, a large FTP site might carry thousands or even tens of thousands of files, and in that situation, a simple listing of the files such as Anarchie and Fetch provide is a heck of a lot easier to create and to use.

If you remember back to Chapter 10, "File Formats," you might remember my brief description of the MacBinary file format. One nice feature of Anarchie and Fetch that no Web browsers share is that Anarchie and Fetch decode MacBinary files on the fly—they don't require help from StuffIt Expander or MacBinary II+. If you regularly download files that other Mac users upload but don't binhex, you'll find using Anarchie or Fetch to be quite a lot easier.

Web browsers aren't generally well designed for FTP. For instance, when you're downloading a file, the only thing that can conceivably happen on-screen is that you might see a progress bar fill. Only some Web browsers recognize this and open a small window containing only a progress bar; others just display the standard progress bar in the normal large browser window. It's not a big deal, but it feels clumsy and badly thought-out.

Finally, Web browsers can (at this point in time) only download files via FTP. They can't upload at all, which makes them useless for, say, copying a new version of a file to a Web server somewhere else on the Internet. FTP is the primary method of copying files to Internet machines, and to create a Web page, you must copy the files that it uses up to the Web server that serves the page. For that, you usually need Anarchie or Fetch.

To summarize then, you can put a screw in the wall with a hammer if you like, but it's not the right tool for the job. Even worse would be trying to get that screw out of the wall with a hammer. A screwdriver works better for putting the screw in the wall, and is the only tool that can get the screw out of the wall. The same applies to Web browsers and FTP. FTP clients are designed to simplify the process of downloading and uploading files, whereas Web browsers can download, although not as well, and cannot upload at all. I don't want to scare you away from downloading files via a Web browser, though. If someone has gone to the effort to make it easy for you, by all means take advantage of his or her work. However, if you know you're going to have to use FTP to look for and download a file, use a real FTP client program.

I hope the previous discussion gave you a better idea of what FTP is good for; now, here are a few salient facts to keep in mind regarding FTP.

FTP Manners

The Internet does a wonderful job of hiding geographical boundaries. You might never realize that a person with whom you correspond lives on the other side of the globe. When using FTP, however, try to keep the physical location of the remote machine in mind.

First, as with everything on the Internet, someone pays for all this traffic. It's probably not you directly, so try to behave like a good citizen who's being given free access to an amazing resource. Show some consideration by not, for example, using machines in Australia when one in the same area of your country works equally well. Because trans-oceanic traffic is

expensive, many machines mirror others; that is, they make sure to transfer the entire contents of one machine to the other, updating the file collection on a regular, often daily basis.

Here's an example. Because the Info-Mac archive site at `info-mac.org` is popular and kept up-to-date, other sites carrying Macintosh software don't want to duplicate the effort. It's much easier to set up a mirror to `info-mac.org` so that machines in Australia and Scandinavia can have exactly the same contents as `info-mac.org`. Mirroring not only saves work, it enables users in those countries to access a cheaper, local site for files. Everyone wins, but only if you, the user, utilize local sites whenever possible. You can usually tell where a site is located by looking at the two-letter country domain at the end of the address.

> **BTW**
> The reason local mirrors in other countries can be cheaper as well as faster for users in those countries is that a few countries, such as New Zealand and Australia, charge for Internet use by the byte. Such usage charging generally applies only to Internet traffic out of the country, so local mirrors enable users to avoid being charged for downloading a file.

Sometimes, of course, the file you need exists only on a remote site in Finland, for example, so that's where you must go to get it. Another point of etiquette to keep in mind, wherever the file may be, is sensitivity to the time of day at the site from which you retrieve it. As with most things in life other than universities during exams, more people use the Internet during their daytime hours rather than at night. Thus, it's generally polite to retrieve files during off hours.

Notice that I said "their daytime hours." Because the Internet spans the globe, it may be 4:00 A.M. where you are, but it's the middle of the day somewhere else. You can figure out the local time by using the Map control panel that comes with your Mac.

To be realistic, worrying too much about being polite about FTP usage has more or less fallen by the wayside in today's modern Internet. In the past, the Internet connections between countries, particularly across oceans, were quite slow, as were the machines that served files via FTP. The end result was that a machine in another country that served popular files could be overwhelmed at times when it was truly problematic for users in that country to have that machine or their Internet connections slowed down for frivolous reasons.

Now that we have much faster Internet connections and FTP servers, the problem has definitely abated, if it hasn't gone away entirely. These days the problems you're most likely to encounter involve large files that are tremendously popular, such as a System Update from Apple or a new version of Netscape Navigator. Many thousands of people want to download these files as soon as they appear, and many companies don't like to let just anyone mirror their FTP sites to reduce load. Getting one of these files can be an exercise

in frustration, and sometimes the only solution is to wait a week or two. Other solutions include trying when it's the middle of the night in the United States, using a script to try repeatedly until it gets through, getting the file from a friend, or using a non-Internet method of getting the file (Apple's System Updates are generally available on CD-ROM as well, and they're so large that buying a CD-ROM for $15 is often much easier than downloading 20 MB of files over the Internet).

FYI
Apple's System 7.5 Update 2.0 is on the Internet Starter Kit CD-ROM; just look in the Cyberdog folder.

The reasons for the problems in downloading popular files are numerous. FTP servers often have a set limit of people who can connect simultaneously, generally no more than 250 for the most powerful servers. A less powerful server might be able to serve only 25 to 75 people simultaneously. That user limit problem can make it difficult to connect to the FTP server at all, and it's exacerbated by the fact that many people now download to their Macs and PCs directly, using modems. Even if the FTP server has its own fast Internet connection, each transfer can run only as fast as the slowest end of the connection, which is almost always your modem.

BTW
If you can quickly retrieve large files to a Unix shell account using a command-line FTP client, and then slowly download to your Mac, you may get the file more quickly and you're being kinder to all the other people trying to get the file as well.

The eventual solution to the problems that FTP faces are specialized programs that go out and figure out which FTP server is closest to you and which ones are the least busy. Such programs will arrive soon, and initially they'll probably work by providing an FTP or Web interface to existing client programs.

So how does FTP actually work, then?

How Does FTP Work?

Unlike email and Usenet news, which process your messages without you having to be online, FTP is inherently a real-time service. You must be connected to the Internet for the entire time that you're looking for and retrieving a file. Let's look at a common situation so you can see how simple FTP really is.

Let's assume for the moment that I want to retrieve a copy of NewsWatcher from the FTP site at `ftp.tidbits.com`. If I'm lucky, someone will have given me a URL to that file and I can use either Anarchie or Fetch to retrieve it with little fuss. However, for the purposes of argument, assume that all I know is that the machine name is `ftp.tidbits.com` and I'm looking for NewsWatcher.

The first step in using FTP is always to make sure you're connected to the Internet. After I'm connected, I launch Anarchie (Fetch works equally as well). I have to tell Anarchie where to go, so I open the Get window and enter `ftp.tidbits.com` in the Machine field. Because `ftp.tidbits.com` enables anonymous logins, and because Anarchie knows to fill in the proper userid and password for anonymous FTP sites, that's all I have to fill in. When I click the List button, Anarchie first looks up the IP number that goes with the name `ftp.tidbits.com` (remember, the programs always use numbers; people always use IP names). After Anarchie knows where to go, it contacts `ftp.tidbits.com` and checks to see if an FTP server program is running on that machine.

Of course, `ftp.tidbits.com` does run an FTP server and does enable anonymous logins. Next Anarchie actually makes the connection with the FTP server, which asks for a userid and then a password. Anarchie knows that because I didn't enter a specific userid or password, it should use the defaults for an anonymous FTP site, which means **anonymous** for the userid and my email address for the password.

Now Anarchie is in, and the next thing it does is request a listing of the files in the default directory. Here's where the tricky part for the user comes in. There's no guarantee that the names of the directories at the default level of an FTP site will make much sense—much of the time the files are stored down several directories. My site is no exception, for historical reasons, so to continue on my search for NewsWatcher I'd double-click the pub folder, since "pub" stands for "public." When I double-click a folder, Anarchie sends a command to the FTP server to change to the new directory, and having done that, it sends another command to list the files in the new directory.

The next window that lists files isn't much better, since the two folders in it are called tidbits and tiskwin. Since the tidbits folder contains Mac stuff and the tiskwin folder contains Windows files, I double-click the tidbits folder again, telling Anarchie to open that folder and list the files therein. I have to repeat the same process, going into the tisk folder and then the inet folder, before I see a list of files that includes a file called newswatcher-212.hqx.

So, in the navigation that just took place, all Anarchie did was continually send commands to switch directories and to list files. Now that I've found the file I'm looking for, I want to download it. I can double-click it to download it, and then Anarchie sends a command to the FTP server, telling it to retrieve the file I double-clicked.

After the file has come down and a certain amount of time has passed, Anarchie automatically disconnects from that site, which enables someone else to use it. It may not seem as though Anarchie has disconnected, because it leaves the windows open, but if you try to

open another folder or download another file, Anarchie actually has to connect and log in again, which it does very quickly so some people never even notice.

Anarchie places the file in the folder that you've specified in Internet Config's preferences and uses StuffIt Expander to debinhex and expand the file if necessary. Fetch works similarly.

As you can see, there's not much to FTP, and even the programs such as Anarchie that make FTP easy don't have to do much to communicate with the FTP server. The hard part about writing a good FTP client such as Anarchie is making it fast and easy to use for the user. Interface is paramount to something as simple as FTP, and on that note, let's look next at the features that an FTP client should provide.

Using FTP Programs

FTP is inherently simple to use, but there's plenty of room for FTP client software to make your life miserable. The following sections, therefore, describe several benefits and features to look for in an FTP client.

Connecting

Most of the time, people use an FTP client program to connect to an FTP site, find a file or two, download them, and then disconnect. As such, a disproportionate amount of your time is spent connecting and navigating to the desired files.

A good FTP client enables you to define shortcuts for frequently used FTP sites, along with the userid and password necessary for connecting to them. This benefit is minor but makes a big difference when repeated numerous times. Most FTP sites that you're likely to visit are "anonymous," which means that anyone can connect and download files. When you're connecting to an anonymous FTP site, the userid is always **anonymous** and the password is always your email address. FTP clients can make the process of connecting to anonymous FTP sites easier by filling in the proper userid and password for you if you don't specify them.

Navigating

After you're on, the FTP client program should make it easy to move between directories (or folders, in Mac jargon). Some programs do this by emulating the Standard File Dialog used on the Mac to open and save files, which is a good start (although the Standard File Dialog is one of the most confusing parts of the Macintosh interface). It's especially helpful when the client program remembers the contents of directories. That way, if you go back to one you've already visited, you don't have to wait for it to refresh.

Other programs such as Anarchie take the navigational aspect of FTP one step further, and actually emulate the Finder. The utility of emulating the Finder is that everyone who uses a Mac is used to the Finder, and that makes it a lot easier to use FTP. Emulating the Finder has its problems as well, since the Finder can be a rather clumsy metaphor when working with lots of windows or lots of files.

A useful variant of shortcuts (also known as bookmarks) to FTP site names is the addition of directory information to the site name. Say, for instance, you want to retrieve something from `ftp.tidbits.com`. Not only do you have to enter the host name, userid, and password, but you must also go to the proper directory, which is `/pub/tidbits`. A further step, which is even better (and should be required these days) is full support for URLs. Bookmarks should store URLs and all FTP clients should enable you to paste a URL into a dialog box to go to the site referenced by the URL. URLs are simply too ubiquitous to ignore.

Listing Style

Not all the Macintosh FTP clients are good about showing you the entire filename, size, or date in a listing of files. I think this failure is inexcusable because you need to know how large a file is before you spend an hour retrieving it—especially if you're connecting at a slow speed. Make sure the program you use provides this information. In addition, a truly useful feature is the capability of sorting the listing by date or file size.

Another potentially useful feature for the programs that can open multiple windows includes being capable of refreshing the window to reflect a file you've just uploaded, for instance, or being able to choose between always opening a new window and reusing the one you already have open (much as you can click a triangle in a Finder list view to open a folder without opening a new window).

Downloading

Needless to say, the action that should be the easiest in an FTP client is downloading a file. Ideally, downloading a file should be no more difficult than copying a file in the Finder by dragging it from one window to another. Some FTP clients support this sort of drag-and-drop from their windows to a window in the Finder, and some take it even a step further and enable you to double-click a file to download it.

When you use a double-click shortcut for downloading a file, you haven't specified where the file should end up on your hard disk, and good FTP programs let you specify a default folder where everything goes automatically.

FYI
I keep a folder called Downloads on my desktop, and set all Internet programs, including Anarchie and Fetch, Eudora, and all the Web browsers I use, to put downloaded files in that folder. That keeps everything I download together in a single place.

Recognizing File Type and Decoding

Much of the time, an FTP client can figure out what sort of file you're retrieving by looking at the extension to the filename. This being the case, the client can make sure it transfers the file in the proper format. If you're lucky, it even decodes some of the common formats that you see on the Internet.

It doesn't make much sense for every program to understand how to decode every format that you might find on the Internet, and as a result, most of the FTP clients resort to asking StuffIt Expander to decode the files they download. This process should be transparent to you, and at the most you should notice that after the file finishes downloading, StuffIt Expander automatically launches in the background and decodes the file.

Uploading

Although you're likely to use an FTP client to download files much more frequently than to upload files, the FTP client should make it equally as easy to place files on an FTP site. FTP sites that let you upload to them always require a specific userid and password, so you'll want some sort of shortcut or bookmark feature to make it easy to connect to the site and enter your userid and password automatically.

After you've connected to the remote site, uploading files should work much like copying files does in the Finder, and indeed, some FTP clients support dragging files from the Finder into the window you have open for the remote FTP site. You shouldn't have to rely on drag-and-drop, though, and the FTP client should provide some method of uploading by selecting one or more files in a dialog box. Since you're likely to want to upload multiple files at the same time, the FTP client should make that easy as well.

File format issues are as important when uploading as when downloading. For instance, if you upload a GIF or JPEG graphic file in text format, it will be corrupted. Some programs, such as Fetch, enable you to select manually how you want to upload files, whereas Anarchie and others use a database of filename extensions to match the file format to how the file should be uploaded.

FTP by Email

A problem with FTP is that it requires your attention—in fact, pretty much your full attention. In addition, you must have a TCP/IP connection to the Internet, which you may not necessarily have; for instance, you might work at an office where you have email capabilities but cannot use most Internet clients, such as FTP clients.

There is a solution, although it's a lousy one. You can retrieve files remotely, using only your email program, in several different ways. The most generic way is by using one of the FTPmail servers. The other way is to use a specific mail server program that knows only how to serve a specific site, sometimes as part of a mailing list manager such as LISTSERV, ListProcessor, or Majordomo.

Using FTP by email services isn't particularly difficult, but it can be extremely frustrating. The problem is twofold. First, FTPmail servers are generally overloaded, which means it can take a week for your file to come back. I've even had requests seemingly disappear into the ether. Second, talking to an FTPmail server is like playing 20 Questions—unless you know precisely what you're looking for and where it is, and are able to enter the commands perfectly, you'll get an error message back. And, if that message comes back a week later, you may not even have the original information with which to correct your mistake.

> **BTW**
> When you use email to retrieve files stored on FTP sites, the files often are split into chunks. Usually, you can control the size of the chunks, but manually joining them in a word processor can be difficult. Some email programs, such as Eudora, and various utilities make joining file chunks easier. If you don't use Eudora, check out ChunkJoiner and BinHqx (if the file is a BinHex file) in <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/>.

Talking to an FTPmail server feels much like logging into an FTP site using a command-line Unix FTP client, changing directories, and finally retrieving the file. In other words, it's nasty, and to make it worse, you must type in the commands all at once. There are a few different FTPmail servers, and they have somewhat different command sets. See Table 15.1 for a list of the more common ones.

Table 15.1 FTPmail Servers

Server Address	Comments
ftpmail@decwrl.dec.com	The main FTPmail server
ftpmail@doc.ic.ac.uk	Best for users in Europe
bitftp@pucc.princeton.edu	Only use it if you're on BITNET
mserv@ieunet.ie	Best for users in Ireland
mac@mac.archive.umich.edu	Provides access to the Umich Mac Archives only

For information on how to use any one of the FTPmail servers, send a message to the server address with the word **help** alone in the body of the message. The FTPmail server will send you a help document back that explains how to use the service, along with any restrictions. I strongly discourage you from using these services if you can use FTP for real—they're a relic from the days when many people didn't have FTP access, and should not be abused.

Enough about FTP by email. It's like playing Pin the Tail on the Donkey but not nearly as much fun. Let's talk next about how you find files via FTP. The answer is, or at least used to be, Archie.

Archie

In a nutshell, Archie uses normal FTP commands to get directory listings of all the files on hundreds of anonymous FTP sites around the world. It then puts these file listings into a database and provides a simple interface for searching it. That's all there is to Archie.

> **BTW**
> Archie isn't an acronym for anything, although it took me half an hour searching through files about Archie on the Internet to determine that once and for all.

Unfortunately, and for reasons I don't fully understand, Archie servers have become less and less useful over time. They're almost impossible to connect to, and much of the time they don't seem to know about certain large FTP sites that I know have the file for which I'm looking. In other words, Archie simply doesn't work that well any more. Feel free to try the Archie feature in Anarchie, but don't worry about it if it doesn't work. There are other methods of using Archie, but given how badly it works these days, I don't recommend even bothering to try them. If Anarchie's Archie search fails, try using one of the Web search engines and see what it turns up. See Chapter 20, "Finding Things on the Internet," for more information.

FTP Program Reviews

As in the previous chapters, I cover the top two applications in this area, and then address other utilities and such that might ease your use of FTP. There are a number of FTP clients available, ranging from an early HyperCard stack (which I remember as being astonishingly cool at the time) to Anarchie and Fetch, which are the *de facto* standards in the Mac world and some of the best FTP programs on any platform. Also, I've included Anarchie 1.6 on the Internet Starter Kit CD-ROM, complete with all sorts of bookmarks for interesting places and files.

Anarchie

For most people, Peter Lewis's $10 shareware Anarchie is quite simply the best FTP client available for any platform. Not only is it fast, easy to use, and cleanly implemented, but it can also search Archie servers for files stored on anonymous FTP sites, and after it has found those files, it can retrieve them via FTP with merely a double-click. If only Archie servers worked better these days! The Internet Starter Kit Installer installs Anarchie for you from the CD-ROM since I think so highly of it, but it is shareware, so if you continue to use it, please pay the shareware fee using the Register application that's in Anarchie's folder.

> **BTW**
> The name "Anarchie" is pronounced like the word "anarchy," not like the phrase "an archie." That's the word direct from Peter.

Installation and Setup

You can place Anarchie anywhere on your hard disk, but its folder of bookmarks of popular sites should stay in the same folder as the Anarchie program.

> **BTW**
> The first time you launch Anarchie, it will ask you if you want to let it use something called "Simple Internet Version Control" to alert you to updates. I recommend that you do, since it will make it easier to stay up-to-date with new releases of Anarchie.

If you're using PPP, make sure you're connected, and then launch Anarchie. First, go to the Edit menu and choose Preferences. Notice that there are hardly any preferences (see Figure 15.1). That's because Anarchie relies entirely on Internet Config, another one of Peter's programs, for all of its common preferences. Since the Internet Starter Kit Installer also installs Internet Config for you and since you walked through configuring Internet Config in Chapter 4, "Step-by-Step Internet," that shouldn't be a problem. You can find more detailed information on Internet Config in Chapter 18, "Utilities and Miscellany."

Figure 15.1 Anarchie Preferences window.

I recommend that you keep Post Process Files selected, since that option enables Anarchie to use StuffIt Expander to debinhex and expand files that you download automatically. In Internet Config, you must set your email address, because Anarchie uses your email address as the password when you connect to any anonymous FTP site.

Unless you know that you're behind a firewall (an Internet machine that makes entry into, and often out of, a domain difficult), you shouldn't have to mess with the Firewalls item in the Edit menu. If you are behind a firewall, contact your system administrator and ask about how to work with your organization's firewall.

Basic Usage

There are a number of ways to use Anarchie, depending on what you want to accomplish. If you want to browse around a site listed among Anarchie's bookmarks, choose List Bookmarks from the File menu and double-click one of them. As you can see, Peter included a large list of the most popular FTP sites for various pieces of Macintosh software (see Figure 15.2). The list scrolls on for some time—there was no way to show all of the bookmarks Peter includes.

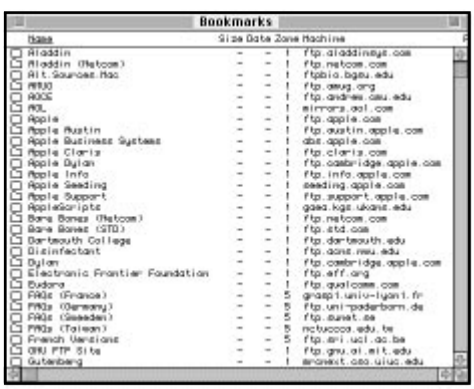


Figure 15.2 Anarchie Bookmarks window.

If you double-click one of the bookmarks, Anarchie connects to the remote site and displays the directory listing. If you double-click names with folders next to them, Anarchie takes you into that directory, and double-clicking a file retrieves the file. In this respect, Anarchie resembles the Finder in Name view.

But what if you want to retrieve a specific file that someone has told you about? Go to the FTP menu and choose Get. Anarchie opens the Get via FTP window, which provides fields for the name of the FTP host and the pathname of the file. If you don't know the name of the file but do know the pathname to it, you can click Get Listing instead of Get File, at which point Anarchie connects to the FTP site and displays the directory listing you've asked for. If you provide the full pathname of the file (including the filename),

select Get File, and click on the Get button, Anarchie retrieves the file with no fuss (see Figure 15.3).

Figure 15.3 Anarchie Get via FTP window.

> **FYI**
> If you have a full FTP URL, you can paste it into Anarchie's Get via FTP window. Be aware that if the file you want has been updated, Anarchie won't be able to retrieve it (since the filename will have changed). At that point, simply remove the filename from the end of the pathname and ask Anarchie to get a listing of the directory that file originally lived in. Chances are good that the updated version of the file will be in the original directory.

If you want to connect to a "nonymous" FTP server—that is, an FTP server that requires a username and password—enter them in the appropriate fields in the Get via FTP window. Anarchie does not display your password in clear text, nor does it ever store your password in a URL or in the log. Peter implemented this for safety because it's all too easy to copy a URL from your home site and send it to someone, and if the password were stored with the URL, you might accidentally hand it out to the world at large.

If you're retrieving a directory list instead of a file, select the Get Listing button and click the List button in the Get via FTP window. This brings up an Anarchie directory list window in which you can double-click files to retrieve them and on folders to open them (see Figure 15.4).

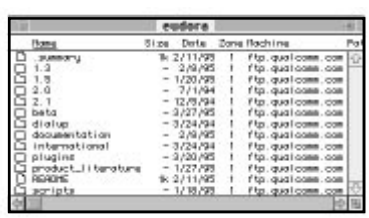


Figure 15.4 Anarchie listing window.

You can have multiple listing windows open to multiple sites simultaneously, and from them you can even download multiple files simultaneously by double-clicking them one after another. You can also select several files at once and choose Get from the FTP menu or hit Return, and Anarchie will download them one after another.

FYI
Downloading multiple files at the same time often doesn't work well with overloaded FTP sites, since Anarchie tries to log in once for each file you want and many sites won't allow that.

If you don't know where the file you want lives but you have an idea what it might be called, you can try using an Archie server to find it. Archie servers are becoming less and less reliable and useful as time passes, but they can still be worth trying. Go to the File menu and choose Archie. Anarchie brings up the Find window with a field for the Archie server you want to search (with a pop-up menu of all the known servers) and a field for the search term (see Figure 15.5).

Figure 15.5 Anarchie Archie window.

You can set how many matches Anarchie asks for, and a checkbox forces the search to be case-sensitive. Case-insensitive searches generally work better than case-sensitive searches because you never know how the filename might be capitalized on an FTP site. Leave the number of matches relatively low, certainly under 100. If you go above that, not only are you stressing the Internet unnecessarily, but the search takes a lot longer to process.

Lastly, you have the choice of three types of searches: Sub-string, Pattern, or Regular Expression. A Sub-string search is a simple search—if, for instance, you want to find the Macintosh Internet game Bolo, type **bolo** into the Find field. However, because there are a lot of files out there with the word "bolo" in their filenames, you'll find far too many files that aren't what you want.

If instead you switch to Pattern searching, you can enter a wildcard such as **?** (meaning "any character") or ***** (meaning "any string of characters"). This would enable you to search for **bolo*.hqx**, which would find any BinHex files whose names start with "bolo" and end with ".hqx".

Most people will never need anything more powerful than Pattern searching, but if you're not most people, you can switch to Regular Expression searching. Regular expressions are tremendously powerful, but they're also terribly confusing and hard to write. If you want to find out more about them, Peter recommends looking at the man pages for ed, a Unix text editor. For this you must log in to a Unix machine and type **man ed** at the prompt, so don't worry about it if you don't know how to do that. I mostly stick to Sub-string searches.

You'll spend most of your time in Anarchie looking for and downloading files, but you're also likely to want to upload files at some point. Uploading in Anarchie is trivially simple. First, open a window to the destination directory on your FTP site. You will almost certainly need a userid and password to do this. Assuming that you're using System 7.5, after you've opened the window to that directory, simply drag the file you want to upload from the Finder into that window and Anarchie will upload it.

> **FYI**
> Anarchie sometimes changes the names of files that you upload. If they contain characters that are illegal in URLs (see Chapter 9, "Addressing and URLs," for more information), Anarchie automatically replaces the offending character with the appropriate replacement. I recommend giving files to be uploaded short names using only lowercase letters, numbers, dashes, and periods.

If you can't or don't wish to drag files into an Anarchie window to upload them, you can also choose Put from Anarchie's FTP menu and select a file manually in a Standard File Dialog. Dragging is much easier.

Special Features

Although using Anarchie is simple (when in doubt, double-click something), Peter added lots of neat features that come in handy—that's why this section is so long. For even more information on Anarchie, System 7.5 users should check out the Anarchie Guide file available under the Guide menu in the upper right corner of your screen, next to the Applications menu. Peter's friend Quinn wrote the Anarchie Guide, and it's not only excellent, it may have been the first AppleGuide support outside of Apple when Peter shipped it with Anarchie 1.4.

When you have a directory listing window showing, you can copy one or more of the entries in URL format. This may seem minor, but if you've ever wanted to send someone a list of files in a specific directory, you'll love this feature. If you hold down the Option key when you choose Copy or press Command-C, Anarchie copies the selected entries in URL format but without the angle brackets at the beginning and end of the URL. Needless to say, I used this feature heavily while writing this book, and I use it every week in preparing *TidBITS*.

Of course, if you use one of the main newsreaders, you can simply Command-click an FTP URL in those programs to have Anarchie retrieve it automatically. This too is tremendously useful, and this feature will migrate to Eudora in the near future as well.

If you hold down the Control key before selecting the File menu, you see that some of the menu items change. Most notably, Retry changes to Edit Retry, and Open Bookmark changes to Edit Bookmark. This is handy, but what's even handier is that Control-clicking an item in any Anarchie list window displays a Get via FTP window with the information

from that item in it, ready for editing. Anarchie also supports many of the same shortcuts that work in the Finder, so you can move up a directory level with Command-up arrow, for instance.

In another feature copied from the Finder, if you hold down the Command key and press on the name of an Anarchie listing window, Anarchie shows you the full path to that window.

I mentioned Anarchie's Bookmarks window earlier, but didn't note that you can create your own bookmarks. They can point to an FTP site, a specific directory, or any file. So, if you find yourself visiting the same site or directory frequently, simply select the appropriate entry in a directory listing window and choose Save Bookmark from the File menu. If nothing is selected, Anarchie sets the bookmark to the directory referenced by the window itself. Anarchie's bookmarks are extremely useful for providing simple access to files on an FTP site, because double-clicking the bookmark file to open it automatically retrieves the file that the bookmark references.

If you visit the same FTP sites over and over again, as I do, you may find Anarchie's Log window useful. Anarchie records every action in a log file. Choosing Show Log from Anarchie's Window menu displays the listing of all of these actions, and double-clicking one works just like double-clicking any item in an Anarchie window. So, if you retrieve a file from a certain directory and want to go back there later on for another file, try the Log window.

Also under the Window menu is Show Transcript, which shows precisely what you would see had you used a Unix shell account for FTP. The main advantage of this is that Anarchie's normal error messages are terse, so if you want the full error (which usually tells you that the FTP site in question cannot handle any more users at that time), look in the Transcript window (see Figure 15.6).

Figure 15.6 Anarchie Transcript window.

If you run System 7.5 or later, you can use what Apple calls the Drag Manager with Anarchie. The Drag Manager enables you to drag files from an Anarchie window to a Finder window or to your desktop to download them. I've already mentioned that you can drag files into an Anarchie window to upload them, but the neat part of this feature is that Anarchie uses the suffix mappings from Internet Config to guess at how to upload files. Finally, if you want to delete a file from an FTP site to which you have access, drag the file to the Trash icon on your Finder's desktop (there's also a Delete command in Anarchie's FTP menu).

If you can upload and delete files, you might also want to use some of the other commands in Anarchie's FTP menu, New Directory and Rename. The only trick is that Anarchie doesn't update the window you're looking at after creating a new directory or renaming a file (the same applies to deleting a file), so you must choose Retry from the File menu to get a new look at what's in the window. I'd like to see Anarchie refresh its windows automatically, as Fetch does, but it's not a simple issue, and Peter prefers to have a window reflect the state of the FTP site when you opened the window.

Anarchie is scriptable and recordable via Apple's AppleScript and UserLand's Frontier; this opens up Internet file retrieval to some extremely necessary automation. Anarchie supports Frontier's Menu Sharing and includes some Frontier stuff from Leonard Rosenthol to get you started if you already own Frontier. Also included are sample AppleScript scripts for automating file downloads and the like.

By clicking the column names, you can sort any list in Anarchie by name, date, size, host, and so on. Sorting by zone enables you to see which hosts are probably closest to you and best to use if a choice exists.

Finally, Anarchie's About box (try clicking on various parts of the About box) displays the number of searches you've made, the number of files you've transferred, and the number of kilobytes you've transferred. Anarchie translates this into a rating. I don't know how many levels there are, but I recently hit the Wow! level (complete with a spoken congratulations from Anarchie) after doing 41 searches and 5,350 transfers for 481.1MB of files. Some folks are higher, but I suspect they're padding their totals. When he read that last comment, Peter accused me of just being jealous. He's probably right.

Evaluation and Details

Anarchie is essential for your Internet toolkit. Despite the flakiness of Archie servers, Anarchie's FTP features are best of class. The program has proven itself time and time again for me in the years I've used it. Do read the documentation because there are a number of tips and tricks that you won't otherwise discover.

Anarchie costs $10. I strongly encourage you to pay for Anarchie if you find yourself using it. It's an essential Internet tool, and we need to keep Peter happy so that he keeps writing great programs and releasing them as freeware or shareware. Peter now works with Kagi Shareware, a company that accepts shareware payments in a multitude of forms for shareware authors and then pays the authors all but a small handling fee. You can use the Register application, which Peter also wrote and which comes with Anarchie, to pay for Anarchie through Kagi.

Anarchie is included on the Internet Starter Kit CD-ROM, and you can retrieve the latest version of Anarchie in either `<ftp://ftp.share.com/pub/peterlewis/>` or `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>`.

Fetch

Fetch comes to the Internet community from Jim Matthews of Dartmouth College, whose programmers have been notably active in developing and distributing Macintosh software over the years.

Fetch is one of the most long-lived Internet applications, and Jim continues to update it, adding features and bringing Fetch up to speed with Power Mac-native code. Fetch's most recent upgrade adds such useful features as multiple simultaneous connections to different sites (or to the same site with the Allow Duplicate Connections preference selected), a new interface, drag-and-drop support, a new bookmark list reminiscent of Anarchie's list, better firewall support, Internet Config support, and AppleScript support.

Installation and Setup

When you first launch Fetch, it presents you with a New Connection dialog box, and in fact, if you want to enter things such as userid and password manually, you can use the program right away. I recommend that you configure the preferences first, though, since they do some of the work for you. From the Customize menu, choose Preferences to see a tabbed dialog box that enables you to set all of Fetch's preferences. However, you can satisfy your basic needs by simply selecting the Use Internet Config button in the General tab of the preferences. Click the OK button to close the Preferences dialog box, quit Fetch, and launch it again. When it comes back up, look in the Preference dialog box again, and you'll see that Fetch has snagged a bunch of preferences from Internet Config, such as your email address and the location where you want downloads to be saved (see Figure 15.7).

Figure 15.7 Fetch Preferences dialog box.

Of course, if you don't use Internet Config (but I strongly recommend that you do use it), you must go through and set all of Fetch's options by hand.

Basic Usage

When you launch Fetch, it opens a New Connection dialog box that enables you to pick an FTP site from a Shortcuts pop-up menu or type in the necessary information to connect to a new one (see Figure 15.8).

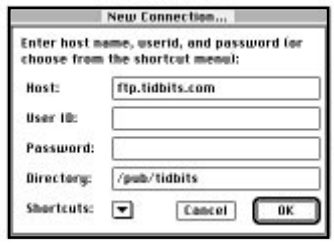


Figure 15.8 Fetch New Connection dialog box.

In this dialog box, you can enter the machine name to which you want to connect, your userid (which is usually just anonymous, and which can be left blank if so), your password (which should be your full email address, and which can be left blank if you've entered it in Fetch's Preferences dialog box), and the directory in which you want to start on the remote machine. Of course, if you use Fetch to connect to a personal account on an Internet machine, the userid is your userid and the password is whatever you've set it to. Although many people use Fetch with their own accounts, anonymous FTP is by far the most common usage.

> **FYI**
> Some sites are finicky about your email address when it's used as an anonymous FTP password. A workaround might be to use your userid along with the @ sign (for example, ace@)—and nothing else. That forces the remote FTP server to figure out the machine name and domain on its own, which sometimes works better.

Fetch 3.0 now has a bookmark list window feature, and at launch Fetch automatically opens a special bookmark list window called Fetch Shortcuts (see Figure 15.9) that contains the same items that are in the Shortcuts pop-up menu in the New Connection dialog box. Although the two features may seem redundant, Jim wanted to add a new way of displaying shortcuts, but didn't want to rip out the New Connection dialog box that Fetch users have been used to for years. You can create more of your own bookmark list windows that don't show up automatically or have their contents in the Shortcuts pop-up menu—it's a handy way of organizing infrequently used bookmarks.

Figure 15.9 Fetch Shortcuts window.

You could enter connection information in the New Connection dialog box each time you connect to an FTP site, but that would be silly. Fetch enables you to add your own shortcuts to the Shortcuts pop-up menu by creating a new bookmark in the Fetch Shortcuts file with the New Bookmark command in the Customize menu. New Bookmark brings up a dialog box for creating new bookmarks in whichever bookmark file is in front; to get a bookmark into the Shortcuts pop-up menu and the ubiquitous Fetch Shortcuts window, that window must be in front. If another bookmark list window is in front, the New Bookmark menu item adds a bookmark to that window instead.

To edit an existing shortcut, select it in the bookmark list window and choose Edit Bookmark List Item from the Customize menu—I prefer the shortcut, which is to Option-double-click the bookmark (see Figure 15.10).

Figure 15.10 Fetch Bookmark Editor.

You can connect to a site either by choosing a site from the New Connection dialog box's Shortcuts pop-up menu and clicking the OK button or by double-clicking on the new site in a bookmark list window. Fetch then displays its main window, where you do most of your work uploading and downloading (see Figure 15.11). Fetch also displays a message window for any automatic messages that the administrator of that server wants you to read. You can leave the messages window open in the background, as I've done in the figure, or you can close it to clean up your screen.

Figure 15.11 Fetch main window.

The main element in Fetch's window is the list of files and directories on the left side of the window. Above it and to the left is a little open folder icon that you can drag over to a bookmark list window to save the current directory as a bookmark. To the right of the file listing are two buttons that enable you to download (Get) or upload (Put File) a file. Under that are two radio buttons, Text and Binary, with which you can indicate what sort of files you are transferring. A third button, Automatic, lets Fetch try to determine the file type for you based on the file extension. I stick with Automatic almost entirely and haven't had any trouble, but you might need to switch manually at some point if files are named strangely.

FYI

The main problematic file types for Fetch are graphics in the GIF or JPEG format destined for a Web server. For them, make sure that you upload using the Raw Data format in Fetch. Anything else won't work.

To the right of all the buttons is the status area. At the top of the feedback area under Status, Fetch reports precisely what it's doing, such as "Connecting," "Changing dir," "Getting file list," and so on. Then comes the File section, which lists which file Fetch is working on, what format it's in, and how large it is. Below that is the Transfer feedback section, where Fetch reports how many bytes it has transferred along with the rate at which it is transferring the file, along with a graphical pie display of how large the file is and how much of it has been transferred. You can resize Fetch's main window or place it anywhere on the screen.

If you've used the Mac for any length of time, you'll know how to use Fetch immediately. You double-click a directory (they have little folder icons) in the list to enter that directory. Double-clicking a file does the same thing as selecting the file with a single click and then clicking the Get File button. You can select contiguous multiple files by Shift-clicking them or multiple discontiguous files by Command-clicking them, at which point clicking the Get File button snags the lot of them. After you click the Get File button, Fetch figures out what sort of file you're getting and either asks you to save it with a Standard File Dialog or automatically places it in a folder you've defined in your Preferences.

Fetch now fully supports Apple's Drag Manager, so if you have System 7.5, you can drag files from Fetch's window to the Finder to download them, to the Trash to delete them (assuming the site lets you do that), and from the Finder to Fetch's window to upload them. The Drag Manager also provides an easy way of making shortcuts—just drag a file or a folder from a Fetch window into a bookmark list window.

After downloading a file, Fetch can launch StuffIt Expander to process it (or launch the downloaded file itself, if it's a self-extracting application). If you've used Internet Config, Fetch gets its post-processing settings from Internet Config.

Special Features

The main place where Fetch overshadows Anarchie is in its handling of entire directories. Anarchie cannot upload or download directories at all, whereas in Fetch you can do both. If you're setting up a Web site, for instance, being able to upload an entire folder by dragging it into a Fetch window is easier than creating a new directory and then dragging a lot of files into it.

I especially like Fetch's View File command in the Remote menu because it displays text files, which is useful for browsing through the Read Me files that are ubiquitous on FTP sites. Anarchie has a similar feature, but actually downloads a file and then opens it in the word processor you choose, which works fine but leaves lots of files called Read Me lying around.

In the Directories menu, Fetch lists all the directories you have visited, not only in that session, but also in the past, for the current site. This is tremendously useful because you tend to go back to the same places over and over again.

Fetch supports Anarchie bookmarks so you can save and open them, which makes for a nice interaction between the two. You can even drag an Anarchie bookmark file from the Finder into one of Fetch's bookmark list windows to add it. Fetch accepts URLs pasted into its New Connection dialog box, and if you select a file or folder and choose Copy from the Edit menu, Fetch places the appropriate URL in the clipboard.

Fetch supports multiple connections to different sites at the same time, and although it does support multiple connections to the same site, it will reuse idle windows if possible rather than opening new ones.

You can sort items in Fetch's listing windows by clicking the titles of the various columns. I use this a lot for seeing which files have been uploaded to a site most recently.

If you have access to your own account via FTP, you can use Fetch to create and remove directories, rename files, and even issue raw FTP commands. These features won't help the average user of anonymous FTP, but for people managing their own account, this kind of control is useful. I especially like being able to have Fetch issue a **LIST -R** command that lists the entire contents of a site under the current directory.

Finally, although this feature is hard to quantify, Fetch seems to be the most solid of all the FTP clients at connecting to and working with strange FTP servers. Every now and then I hit one that Anarchie won't handle, and Fetch always works fine, especially when uploading.

Evaluation and Details

How does Fetch compare to Anarchie? I like and use both programs on a regular basis, but at this point I mostly use Fetch for maintaining files. I use it exclusively to manage

ftp.tidbits.com, and it's been a godsend. However, I find that when I'm looking for a file or browsing FTP sites, I prefer Anarchie, mostly because of its multiple windows to the same site and ease of use. Even though Fetch has multiple connections, it's not as slick and intuitive as Anarchie. In general, Fetch performs admirably, especially if your work involves a fair amount of uploading. Of course, one of the best parts about Fetch is its running dog cursor, but that you must see for yourself.

Educational institutions and nonprofit organizations may use Fetch free of charge, and everyone else can license it from Dartmouth for $25. Read the Fetch Help or the Fetch Home Page for more information about licensing. You can find the Fetch Home Page and links to the latest version of Fetch at <http://www.dartmouth.edu/pages/softdev/fetch.html>. Copies are also available in <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>.

Other FTP Programs

Because Anarchie and Fetch are the acknowledged standards for FTP clients on the net, basically no other stand-alone FTP programs exist any more. Several of the integrated programs have FTP clients built in, but almost universally they're lousy.

However, there is another related category of programs that may interest you. These programs enable much the same functionality as FTP, but without using the FTP protocol. They're good for transferring files between two Macs but can't download files from an FTP site at all.

EasyTransfer

ftp://mac-ftp.cs.strath.ac.uk/macstuff/EasyTransfer/

Although Christopher Reid's $20 shareware EasyTransfer 3.4.3 is not exactly an FTP program because it doesn't use the same protocols as FTP and cannot be used as a client, I thought I'd mention it for those who want to transfer files between two Macs, both of which run MacTCP or Open Transport and are on the Internet. EasyTransfer works as both a server and a client, and enables you to set up specific folders that only certain users can access. If all you want to do is send files back and forth between Macs on the Internet, EasyTransfer is far simpler and safer than attempting to set up a full FTP server.

Recent versions come with a "drop-box" application, support the Drag Manager, and have the capability to control the remote Mac to some extent.

FreeTP

`ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/`

Edward Peterlin's FreeTP solves basically the same problem as EasyTransfer. If you want to transfer files between two Internet-connected Macs, setting up an FTP server is too much of a pain. Like EasyTransfer, FreeTP is not an FTP client. Although EasyTransfer is a bit more complex than FreeTP due to its security features and screen control options, the programs seem fairly similar in ease of use. EasyTransfer has been around longer and is more polished, but FreeTP is quite a bit simpler and doesn't require any preconfiguration at all. FreeTP is also Power Macintosh-native and includes settings for different connection speeds.

Things that Go Bump in the Net: FTP

In the past, using FTP was a bit more of an error-prone process, mostly thanks to typing mistakes when trying to enter all the information necessary to connect to a site, navigate around in it, and retrieve the file you wanted. Also problematic in the old days were issues surrounding file formats and methods of uploading and downloading. Happily, most of those problems have fallen by the wayside thanks to programs such as Anarchie and Fetch and the use of URLs. Problems still exist though, and I try to cover the common ones below. You might also check the Fetch Home Page at <`http://www.dartmouth.edu/pages/softdev/fetch.html`> to see if its FAQ answers your specific question.

Connection Problems

Q: When I launch Anarchie, it complains about MacTCP not being present or something like that and quits. What should I do?

A: This error message usually means that you have MacTCP turned off, or perhaps that you have configured it wrong. Check your setup and try again. Also, Anarchie doesn't like to launch unless an Internet connection is already in place, so make sure you're connected to the Internet first.

Q: When I try to open a connection with Fetch, I get a -3221 or a -3264 error. What does it mean?

A: Those are Open Transport errors. Make sure you're running Open Transport 1.1 (available with System 7.5 Update 2.0) or later. If they persist, try checking the "Don't make Open Transport calls" checkbox in the Misc. section of Fetch's preferences. If all else fails and you're not using a PCI-based Power Macintosh, consider going back to MacTCP.

Q: When I try to connect to an FTP site, I get an error message saying that the program couldn't find the site.

A: There are two likely problems here. First, you may have typed the name of the site wrong. Check that and try again. Second, if you can't connect to any Internet site using any program, you probably have a connection problem or a configuration problem with MacTCP or Open Transport. Read Chapter 5, "Things that Go Bump in the Net," for how to troubleshoot a connection problem.

Q: When I try to connect to a specific site, I get the message "User anonymous access denied."

A: There are two possible problems here. First, look at the messages window in Fetch or Anarchie's Transcript window. They'll have more verbose information that will probably tell you that too many users were logged in at that moment. The solution is to try again. Since large sites support hundreds of simultaneous users, go ahead and try again right away. There's a good chance someone else will have disconnected. Second, if you've never connected to this site before, it might not allow anonymous logins. If so, ask the person who told you about the site for a userid and password.

Q: I've gotten into an anonymous FTP site before, but I'm getting weird error messages every now and then when I try to connect.

A: I've seen some FTP servers that send out strange errors when they really mean that there are too many users logged in at that moment. I'd just try again.

Q: I'm trying to connect to a site with my userid and password and it won't let me in.

A: The most common reason for being denied access to a non-anonymous site is that you've typed your userid or your password wrong. Try again, and if that fails, check with the person who gave them to you to make sure they're correct.

Q: I was browsing happily through a busy FTP site that I've had trouble getting into in the past, and in the middle of browsing I suddenly started getting rejected. Why?

A: Because of how Anarchie works by logging in multiple times if necessary, you may be able to enter an FTP site but then be rejected when you try to retrieve a file because too many other people have logged in while you were navigating around.

Downloading Problems

Q: I feel stupid, but how do I download in Anarchie or Fetch?

A: Navigate to the file you want to download and double-click it. It's often easiest to paste URLs into Anarchie's Get window or Fetch's New Connection dialog box to retrieve files that have been referenced in an email or news message.

Q: Can I download multiple files at the same time?

A: Absolutely. Just do it.

Q: I'd like to download an entire folder of files. Can I do this?

A: Yes, but only in Fetch. Anarchie can't download entire folders at once. In Fetch, you must either drag the folder to the Finder or select it and click the Get button; double-clicking a folder will merely open it.

Q: When I drag a file from Anarchie or Fetch to the Finder and let go, it just springs back. What's wrong?

A: You're probably not running System 7.5, and if you are, you probably don't have the Macintosh Drag and Drop extension in your Extensions folder. You need System 7.5 (not entirely true, but putting together all the extensions necessary for System 7.1 is tricky), and if you have it, you might consider reinstalling the System software from your disks or CD-ROM.

Q: When I try to download a file, my computer freezes. How can I prevent this problem?

A: This is almost certainly a problem with the configuration of your modem connection. Check your settings in FreePPP, and make sure that you're using a flow control setting of CTS Only or CTS & RTS (DTR) and that your modem initialization string turns on hardware handshaking and turns off software handshaking, also known as XON/XOFF.

Q: I tried to double-click a file, but I got a message back saying something such as "Permission denied." What happened?

A: This problem is unusual, because most sites that don't let you download certain files also don't let you see them. There's nothing you can do, so just get on with your life. If you think you should be able to get that specific file, try asking the person who told you about it or who runs that FTP server.

Q: I copied a URL from an email message and pasted it into Anarchie and Fetch, and both complain that they can't find the file. Where is it?

A: Somewhere else. To find the file, lop the filename off of the end of the URL and try getting the list of files in that directory. If that fails, knock off the last directory name and try again. Eventually you should get to the machine name, which should work if the machine runs an FTP server at all.

Q: I started downloading a file, but shortly after it started, the throughput speed started to drop and eventually stopped entirely. What went wrong?

A: Hard to say, actually. If you're using Anarchie, just choose Retry and try again. It's possible that the remote FTP server flaked out for some reason. It happens. If this problem occurs all the time, though, it's probably not related to FTP at all, and would occur in any Internet program. I've seen a number of extensions cause this sort of symptom—flip back to Chapter 5, "Things that Go Bump in the Net," for information on those extensions and how to test with them off. In particular, suspect CD-ROM extensions from companies other than Apple, PowerBook utilities, fax software, and network utilities.

Q: I was in the middle of downloading a long file and Anarchie was zipping right along when all of a sudden my modem hung up. Why?

A: The problem is unrelated to Anarchie, but happens in periods of high transfer rates. Basically, the Mac's internal buffer fills up, and it asks the modem to pause briefly. The Mac does this by doing something called "making DTR go low." Unfortunately, due to the Mac's serial port architecture, DTR going low can also mean "hang up immediately." The solution is to make sure you don't have &D2 in your modem initialization string in FreePPP. Try adding &D0 instead (that's a zero, not a capital O).

Of course, another possibility is that someone picked up another extension or you got a call on call waiting.

Q: I can download files, but they don't seem to come in as fast they should with my 28,800 bps modem. Did I get a bum modem?

A: No, probably not. The speeds that Anarchie and Fetch report will always vary from the top modem speeds for a number of reasons. The remote server might be slow, you might not have connected at 28.8 Kbps, the file might compress well or compress badly, and so on. In general, I'd expect a 14.4 Kbps modem to get speeds between 1,000 and 1,600 bytes per second (modems use 10 bits to send 1 byte of data) and a 28.8 Kbps modem to get speeds between 2,400 and 3,000 bytes per second.

Q: I downloaded a file, but I don't know where it ended up on my hard disk. Can you help me find it?

A: Of course. First off, keep in mind that Anarchie and Fetch have default download folders where they store downloaded files by default. That folder is set in Internet Config, and if you haven't set one, you can. (In general, things will end up on your desktop by default if you don't set a specific download folder.) After you've figured out your default download folder, if the file isn't there, on the File menu in the Finder, choose Find, type part of the name of the file, and press Return. That should find the file, assuming that you've typed part of the name right.

Q: When I download a file with Anarchie, I end up with this file with a .hqx extension on my desktop. What do I do with it?

A: You need to decode the file (it's in BinHex format) with StuffIt Expander (which is installed for you by the Internet Starter Kit Installer and which is also available loose on the CD-ROM). Flip back to Chapter 10, "File Formats," for more information.

Q: When I download a specific file with Fetch, it complains that "This is not a proper BinHex format file." What should I do?

A: Fetch tries to decode BinHex files on its own, and if it can't do so, that means that either the file is corrupted or you've found a bug in Fetch (if StuffIt Expander can decode the file). If the file is corrupted, let the source of the file know, and if you think you've found a bug in Fetch, send a note to fetch@dartmouth.edu.

Q: When I download a file, StuffIt Expander doesn't automatically launch and decode the file.

A: Try rebuilding your desktop so Anarchie and Fetch know where to find StuffIt Expander. To do this, reboot your Mac and hold Command-Option as it boots. After you get to the Finder, the Mac will ask if you want to rebuild the desktop on your hard disk. Answer yes. Then see if the problem still exists.

Q: When I try to get a specific file with Anarchie or Fetch, it seems to download properly, but StuffIt Expander won't decode the BinHex file.

A: The fault here lies with the people who uploaded that file. BinHex files must be uploaded as the text files that they are, and if the people doing the uploading somehow use binary format, the file may be corrupted. The problem usually shows up in the BinHex file losing the hard return at the end of each line. There are three solutions.

- Using Anarchie, instead of downloading the file, use the View Selection command in the FTP menu. That forces Anarchie to download in text format.
- Try downloading using Netscape Navigator or another Web browser. Web browsers are sufficiently stupid that they always download files with a .hqx extension as text, eliminating this specific problem.
- Send email to the people who uploaded the file and ask them to upload the file again using Anarchie or Fetch or to make sure to upload in text format. Failing that, have them make sure to use an option that exists in most programs that can create BinHex files to add linefeed characters to the BinHex file. Normally the FTP program adds those as necessary, but they're obviously not being added properly in this case.

Q: For every file I download, StuffIt Expander complains that the file is corrupted. What am I doing wrong?

A: Probably nothing. There are several reasons why this might happen. One person had this trouble because he had an old version of StuffIt Expander around that was being used. If you

have a really noisy phone line, data error might creep into the transmission as well, corrupting the data. If that's true, you probably have trouble in other Internet applications as well, and you should call the phone company repair people and see if they can help (look on the first page of the phone book for the repair phone number).

Q: I downloaded a file, but I wasn't sure if it had started to download, so I double-clicked it again. Now I seem to have two copies of the folder called Folder and Folder.1. Which one should I keep?

A: Either—they should be identical. You'll see this same problem if you accidentally decode a file twice using StuffIt Expander. I usually just throw out the folder with the .1 extension.

Uploading Problems

Q: I feel stupid, but how do I upload a file in Anarchie or Fetch?

A: If you're running System 7.5 or later, just drag the file to the window that points at the place where you want to upload. If you aren't running System 7.5, click the Put Files button in Fetch's main window or choose Put from Anarchie's FTP menu, again when you're looking at the place where you want to upload the file.

Q: When I drag a file to Anarchie or Fetch and let go, it just springs back. What's wrong?

A: You're probably not running System 7.5, and if you are, you probably don't have the Macintosh Drag and Drop extension in your Extensions folder. You need System 7.5 (not entirely true, but putting together all the extensions necessary for System 7.1 is tricky), and if you have it, you might consider reinstalling the System software from your disks or CD-ROM.

Q: I want to upload a file into a folder inside the active window that's showing in Anarchie. Can I do that?

A: Sure, just drag the file onto to the icon of that folder in Anarchie's window. Fetch can't do this.

Q: Can I upload multiple files at the same time? What about multiple files to different folders at the same time?

A: Yes, and yes. Just try it. I find working with multiple windows much easier with Anarchie than with Fetch.

Q: I want to upload an entire folder of files all at once. Can I do this?

A: Yes, but only in Fetch. Anarchie can't do that.

Q: When I try to upload a file in Fetch, my computer freezes. What am I doing wrong?

A: This is probably a problem with your modem configuration, not with Fetch. Check your flow control settings in FreePPP and make sure they're set to CTS Only or CTS & RTS (DTR). Also make sure that your modem initialization string enables hardware handshaking and turns off software handshaking, also known as XON/XOFF.

Q: When I try to upload a file, I get an error message saying something such as "Permission denied." Why?

A: You need "write access" on an FTP server to be able to upload files. In almost all cases, this means that you'll have been given a userid and password to access the FTP server. Make sure to enter those properly in Anarchie's Get window or Fetch's New Connection dialog box. You cannot upload to anonymous FTP sites. If you're sure you did everything right, talk to the people in charge of the FTP server; they might have inadvertently changed the permissions settings.

Q: I've uploaded a file via Anarchie and it didn't appear in the window. Why not?

A: Remember, Anarchie doesn't update the window automatically. Choose Retry from the File menu to refresh the window after uploading a file, renaming a file, deleting a file, or creating a new directory. Fetch doesn't have this problem.

Q: When I upload a GIF or JPEG to my Web site with Fetch, it doesn't display in my Web browser.

A: That's because Fetch guesses wrong at how to upload GIFs and JPEGs. They must be uploaded using Fetch's Raw Data option, and not MacBinary.

Q: Every now and then when I upload a changed file to my Web site, it doesn't replace the original, but gets a slightly different name instead. Why?

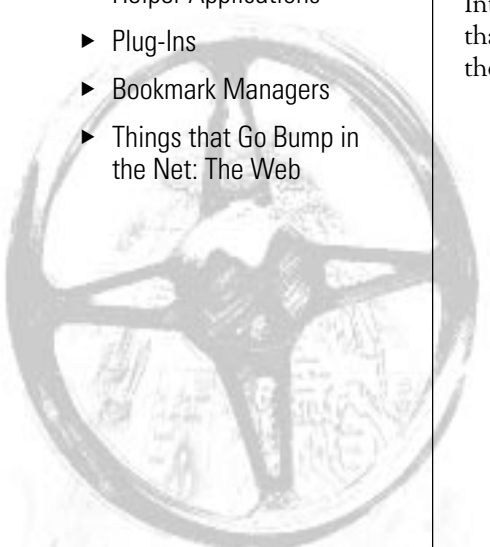
A: This problem happens when the file that you're replacing is in use at the exact moment that the FTP client tries to replace it. The exact results probably vary by FTP server, but on my Macintosh server, NetPresenz won't let me overwrite a file that someone else is accessing via WebSTAR, so it creates the secondary file. Always check your work.

Q: I uploaded a file with Fetch, and Fetch changed the name on me, adding .bin to the end.

A: Fetch has a setting to do that—it's a way of identifying MacBinary files. If it bothers you, shut that option off.

Chapter 16 All About the World Wide Web

Contents:



The World Wide Web, generally abbreviated to "the Web," is the most recent and ambitious of the major Internet services. The Web started at CERN, a high-energy physics research center in Switzerland. Its creators, Tim Berners-Lee and Robert Cailliau, intended the Web to be an academic project whose goal was to make it easier for high-energy research physicists to share information. Ah, how far it has come since then.

In today's Internet, the Web is the primary place to find most types of information, and it has become the medium of choice for making information available. The information available on the Web ranges from pictures of pets to charts of stock performances to online versions of many major newspapers and magazines. For many people who first connect to the Internet now, the Web seems to be the Internet (although that's a mistaken impression, given the ubiquity of email and the popularity of Usenet news).

What Is the Web?

At its base, the Web is a method of sharing information. Just as I write this book and many people can go to a bookstore or library and read it, so I can put up a Web page and many people can use their Web browsers to come to my site and read my Web page.

The World Wide Web introduced four new concepts to the Internet. The first one was the capability to accept and distribute data from any source, to act as a gateway. In many ways, this gateway capability is one of the most compelling features of the Web. Because of it, the Web can act as a front end to almost anything you can imagine. Say you have a database in Claris's FileMaker Pro. With a proper gateway program, called a CGI (Common Gateway Interface), a Web server can enable people from anywhere on the Internet to search your database. You may not have a database in FileMaker Pro that you want the world to use, but consider the utility of databases of movie reviews, or CDs for sale, or even of programs that help you make graphics for Web pages or clever ASCII art for your email signature. As long as the data can be transmitted via the Web's HTTP protocol (HyperText Transfer Protocol), a Web server can serve anything that can be gatewayed.

I'm making a big deal of this feature, although it might seem esoteric, because in many ways, it is the feature of the Web that's the most radical in concept and the one that offers the most flexibility for the future. Without this feature, everything would have to be turned into static HTML documents before being served; with it, a Web server can use a CGI to communicate with a variety of programs and build those HTML documents on the fly from whatever data the user has requested.

Second, the Web introduced the concept of rich text and multimedia elements in Internet documents. Previous Internet services such as email and Usenet news could display the text in a document, but they couldn't display it with fonts and styles and sizes and sophisticated formatting.

On the Web, the HTML language that is used for every Web page contains special tags, or codes, that tell a Web browser to display the text in various different fonts and styles and sizes. Web pages also can contain inline graphics—that is, graphics that are mixed right in with the text, much as you're used to seeing in books and magazines. And finally, for something you're not used to seeing in books and magazines, a Web page can contain sounds and movies. In the past you had to follow a link to hear the sound or see the movie, but the latest crop of Web browsers support sounds and movies more directly. This capability to display text in different fonts, sizes, and styles, along with graphics, sounds, and movies, has attracted publishers to the Web in droves, because suddenly they don't have to make nearly as many compromises to distribute their content electronically. Artists and musicians joined the rush, because people enjoy downloading art and music, even over the slow Internet connections that most people have.

I mentioned links previously. What's a link? It's the third main feature of the Web. The concept of links between information on the Internet started with an older Internet service for providing information called Gopher, which predated the Web by a few years. In Gopher, you could have a menu of choices, and picking a choice would display a document. That's not all that different from FTP, though, and the trick that Gopher added was that any menu item could point at any document on any Gopher server on the Internet.

Think for a moment about the flexibility this feature provides. Assume I'm creating a list of information about penguins. Some of that information is on my machine, and some of it lives on several other computers on the Internet. I can include links to my own information in the list by pointing at the files on my machine, but I can also include links to the information on the other machines by pointing first at that other machine, and then at the file on that machine. I've just created a virtual list—virtual in the sense that although it appears to be a coherent collection of information in one place, in fact I have pieced the list together from information that comes from all over the Internet. Now back to the Web.

Just as an item in a Gopher list can point to a file on another Internet machine in a different country, so can Web links. The difference is that any Web page can have a large number of links, all pointing to different files on different machines, and those links can be embedded in the text of the page. For instance, if I were to say in a Web page that I have an excellent collection of penguin pictures stored on another Web page (and if you were reading this on the Web and not in a book), you could simply click the underlined words to jump immediately to that link. The advantage should be obvious. No longer are you limited to stilted lists—you can have links attached to words, phrases, or even graphics. You can make a link out of whatever makes the most sense to be a link. Hypertext has arrived on the Internet.

Hypertext is a term coined by Ted Nelson years ago that refers to nonlinear text. You normally read left to right, top to bottom, and beginning to end, but in hypertext you follow links that take you to different places in the document, or even in other, related documents, without having to scan through the entire text. Assume, for instance, that you're reading about wine. There's a link to information on the cork trees that produce the corks for wine bottles, so you follow that link, only to see another link to the children's story about Ferdinand the Bull, who liked lying under a cork tree and smelling the flowers. That section in turn links to a newspaper article about the running of the bulls in Pamplona, Spain. A hypertext jump from there takes you to a biography of Ernest Hemingway, who was a great fan of bull fighting (and of wine, to bring us full circle). This example is somewhat facetious, but hopefully it gives you an idea of the flexibility a hypertext system with sufficient information, such as the Web, can provide.

Fourth, the final new concept the Web introduced to the Internet is forms. Forms are just what you would think, online forms that you can fill in, but on the Internet, forms become tremendously powerful since they make possible all sorts of applications, ranging from

surveys to online ordering to reservations to searching agents to who knows what. Forms are extremely useful, and are heavily used on the Web to gather information in numerous contexts. Before forms appeared on the Web, the Web was primarily a one-way information medium from which you could retrieve information. There was no way of sending information back to a Web page, though, and without that capability, the Web wasn't nearly as flexible since it couldn't easily react to information from Web users.

In a nutshell, then, these four features set the Web apart from the other Internet services. Gateways, rich text and multimedia, hypertext links, and forms for gathering information were all either new to the Internet or implemented in a new and unusual way, and together they changed the face of the Internet.

Web Evolution

How has the Web evolved? Dates are hard to pinpoint because everything has moved so fast, but the Web probably first appeared sometime around 1991. Momentum built slowly until the release of the first version of NCSA Mosaic, written by Marc Andreessen, a student working at the National Center for Supercomputing Applications (NCSA). That first version of NCSA Mosaic ran only on Unix workstations, but versions for the Macintosh and Windows weren't far behind, reaching the public toward the end of 1993 (about the time the first edition of this book came out).

Mosaic was an eye-opener. It wasn't the first Web browser, and in fact Robert Cailliau had written a simple one for the Mac called, alternately, MacWWW or Samba. But, without the programming resources at NCSA, MacWWW never made it to stability, and is notable today by virtue of being the only Web browser to work at all under System 6.0.8, the precursor to System 7. But Mosaic worked quite well, and it worked on a number of platforms. For the first time, people started to see the promise of the Web. Most notably, the media started to take notice.

The role of the media in the acceptance of the Internet cannot be underestimated. The Internet had grown at a tremendous rate before the media particularly realized what we were all doing, but for the most part, the world of the Internet wasn't that interesting to reporters. The Web changed all that because it didn't take a genius to realize that the Web had the power to hurt circulation and viewing figures for print and broadcast media. People spent time browsing the Web rather than watching television, and with services such as ClariNet around, you could get even local news on the Internet rather than wait for the pressed dead tree to appear on your doorstep every morning.

So the media was scared, and the requisite negative reports appeared alongside the gushingly stupid ones. However, the media, like all groups, is made up of people, and many of them are extremely smart and know how to become well-informed on any given topic. Gradually, the media as a whole decided that there was no way to beat the Internet, so the only course left was to join it. Nowadays, most major publications and many major broadcast outlets have Web sites that reflect some, or, in a few cases, all of their content.

Meanwhile, back in the browser world, a few companies realized that although NCSA Mosaic literally owned the market for Web browsers (and it was free), there was room for other entries. MacWeb appeared and stole some users from Mosaic. But then Jim Clark, CEO of Unix workstation maker Silicon Graphics, left the company to form a new company with Marc Andreessen, Mosaic's developer, originally called Mosaic Communications Corporation (MCC). They enticed a number of the programmers from NCSA to MCC, many of whom had experience working on Mosaic and a Web server NCSA also released. After a relatively short while, since these people had written Mosaic and could do it again from scratch, they released a new Web browser codenamed Mozilla and officially known as Mosaic Netscape. Somewhere in all of this, NCSA expressed its displeasure about the name, and the company was renamed Netscape Communications Corporation and product became simply Netscape (some time later the Web browser's name expanded to Netscape Navigator).

Just as those first versions of NCSA Mosaic had changed the world, so did the first versions of Netscape Navigator. Programmers often say that they would welcome the chance to start from scratch on a program, and Mosaic's developers had been given that chance with Netscape Navigator. Netscape Navigator rectified many of the problems in NCSA Mosaic and added some welcome features. Most notable among these was the capability to open four simultaneous connections to a Web server, which enabled Netscape Navigator to bring in text and graphics at the same time, making it seem much faster than Mosaic or MacWeb. Netscape Navigator also debuted a hierarchical bookmark management feature that, although mediocre, was worlds better than those in MacWeb or Mosaic. Finally, Netscape Navigator introduced and supported some new tags in HyperText Markup Language (HTML), the language in which all Web pages are written. These tags, although nonstandard, became instantly popular, and the only way you could see them was if you had Netscape Navigator. Using a different Web browser might render the page ugly or even unreadable.

While Netscape was gaining steam (and it didn't take long for Netscape Navigator to take over the Web browser market—at points estimates have placed its market share at between 60 percent and 90 percent), NCSA decided to distance itself from the increasingly commercial world of the Web. To that end, NCSA made a deal with a company called Spyglass such that Spyglass would develop an improved version of Mosaic, to be called Enhanced Mosaic. It also fell upon Spyglass to license the source code for Mosaic to companies that wanted their own Web browser, but didn't want to take the time to program it themselves. Foremost among the Mosaic licensees was industry giant Microsoft, which was late in even acknowledging the Internet. Apple also licensed Mosaic code from Spyglass for use in Cyberdog, its paradigm-shifting approach to the Internet. A few other companies, such as long-time Internet developer InterCon Systems, took the time to write their own browsers. InterCon's Web browser was faster than Netscape Navigator, but didn't support as many of these new HTML tags. It first appeared in TCP/Connect II, and then became the default Web browser for America Online Mac users and for Apple's now-defunct eWorld online service.

Life continued on for some time in this vein, meaning a few months, given the speed at which things change on the Internet. Netscape continued to enhance Netscape Navigator, and it seemed as though no one would ever challenge Netscape's supremacy. In August of 1995, Netscape went public in the most astonishing initial stock offering in history. The stock price opened around 28 and rose to about 75 before closing at 56, if I remember correctly. Volatile wasn't the word for Netscape's stock in the first six months, as it could easily rise or drop 20 points in a day. At one point, the stock price was around 170, and was destroying all the standard methods of valuing stocks, given that the company had barely earned any money at all, but was still worth billions of dollars.

Then Microsoft, the sleeping giant, woke up. It had taken several years and the failure of its own proprietary online service, called Microsoft Network (or MSN), but Microsoft finally admitted that the Internet was here to stay and that nothing Microsoft could do would lure people away from it. In a short time, Microsoft revamped MSN as a way to access the Internet and had put some significant development resources towards its own Web browser, Internet Explorer. Needless to say, the Mac version came out well after the Windows version, but Microsoft broke some of its own rules with Internet Explorer. It was written by a team of ex-Claris and Radius Macintosh programmers in Silicon Valley, not at Microsoft's main campus in Redmond, Washington. They used a Macintosh development environment and didn't port the code over from the Windows side, as Microsoft generally does. Finally, the Internet Explorer team implemented a number of standard Apple technologies that even Netscape Navigator lacked.

So it's come down to a battle between Netscape and Microsoft, the young upstart of the Internet and the aging young upstart of the microcomputer industry. Hardly a day goes by now without one or the other of them announcing some strategic alliance or another, and in an amazing feat of public relations, the two main online services, CompuServe and America Online, managed to sign deals with both Netscape and Microsoft. Even a scorecard won't help you keep track of all these players.

There's one major wildcard still in the game. Sun Microsystems, maker of Unix workstations, came up with a programming language called Java that works over the Internet. I'll talk more about it shortly, but suffice it to say that it promises to extend the Web far beyond what we see today. On the Mac, neither the release versions of Netscape Navigator nor Microsoft Internet Explorer support Java on the Mac yet, although the test releases of the next versions already do. Only time will tell how adding Java to the Web will cloud the water, but Java is here to stay, with Apple announcing that it will build Java into a future version of the Macintosh operating system.

New Web Technologies

Perhaps the most exciting part of the Web are the ways that it's constantly being used in new and interesting ways. Three of the most interesting technologies that you'll start seeing used soon are Java, JavaScript, and VRML.

Java

In the future, I might have to include Java as one of the basic advantages of the Web, because Java offers almost limitless promise to the Web, and via the Web, to the Internet as a whole.

Java is a programming language developed by Sun Microsystems. Programming in Java is reportedly much like programming in a more common language called C++, and major development companies such as Metrowerks and Symantec now support Java in their development environments.

You're probably not all that excited about Java from the preceding paragraph because I described Java in terms of what it is, not what it can do. Unless you're a programmer, you won't be creating Java programs, generally called applets, any time soon. And, until Netscape and Microsoft release versions of their Web browsers that support Java, we Mac users can't even use it. Luckily, I expect this to change quickly, perhaps even by the time this book hits the shelves.

Earlier I talked about CGIs helping Web servers communicate with other programs on a server. In that situation, data you receive comes from a program that runs on the server. What's unusual about Java is that its applets run on your machine, not on the server. When you access a Java applet (which might happen automatically whenever you visit a Web page, or when you click a link), the instructions that make up the applet, its bytecodes, are sent to your Web browser by the Web server, just as Web servers send graphics and text to your Web browser normally.

After your Web browser has received all the bytecodes of the Java applet, it runs the applet in something called a virtual machine. Of course, after the applet is running, it does whatever it was programmed to do. The virtual machine is extremely important to Java; let me explain why.

Almost all programs are written to run on a specific type of computer: a Mac, a PC running DOS, a PC running Windows 95, a Unix workstation, whatever. In addition, no programs written to run on a Mac, for example, can run on another machine. The company might make two versions, or you might have an emulator such as SoftWindows that pretends your Mac is really a PC, but in general, Mac software cannot run on PCs and vice versa.

Java avoids this problem by making its applets run in a virtual machine, which is itself a software program. The virtual machine is programmed to run Java applets just as a Mac would run Mac programs. Since the virtual machine is just another program, programmers can write versions of Java's virtual machine for almost any type of computer, and once there's a virtual machine for a specific type of computer, such as a Mac, then that computer can run all Java applets.

In short, then, Java applets are small programs that download over the Internet and run in your computer, no matter what type of computer you might have. Programmers love this

cross-platform capability because they can write one program and have it run on a number of types of computers, something that wasn't possible before.

Just so you see the full potential of Java, consider for a moment that there's no reason why Java programs must be small and must download over the Internet. Programmers can write full-fledged applications in Java if they so wish. Add that to the fact that Java support (meaning virtual machines) is likely to appear in operating systems in the next year or two. The result is that if the Mac OS and Windows 95 (or Windows 97 by then) both include Java virtual machines, then programmers can write one program in Java and have it work equally well on both the Mac and Windows with little or no extra work. Compared to the effort of creating versions of popular programs for both Macs and PCs, Java must seem like a godsend to some programmers.

What will Java applets generally do? That's a good question, and not one that I can answer well, mostly because I haven't seen many Java applets. Those that I have seen haven't been particularly impressive. Some people are doing animations in Java, and there are a ton of calculators and other little utilities. I saw one fairly extensive Java applet that helped PC buyers figure out what PC they might want based on a number of variables, but the interface was awful. Java applets might replace a number of forms, because Web forms right now are stupid—they can't tell you that you've typed your name in the ZIP code field, for instance, until you submit the form. A Java-based form could help prevent data entry errors and could, for instance, fill in your city and state automatically when you enter your ZIP code. We'll just have to wait and see what sort of Java applets innovative programmers dream up. For other examples of Java applets, check out `<http://www.gamelan.com/>`.

There is one major issue with Java applets that worries me, and that's security. Think about it for a moment. If the mere act of visiting a Web page can run a Java applet on your computer, what's stopping it from erasing your hard disk, or stealing files from your machine? Sun claims that it has built safeguards into the Java language to prevent any sort of virus or Trojan horse or anti-social behavior in general, but I have faith that the scum of the computer world will figure out some way around Sun's safeguards. To be fair, and more accurate, the job of security falls also to the company producing the environment in which the Java programs run, which might be Netscape, Microsoft, or Apple.

Just as software pirates always figured out how to break copy protection schemes, and just as virus authors have always discovered ways around the anti-virus protection programs, so will some programmers figure out ways to steal or damage data via Java. I believe it's inevitable, and short of avoiding unknown Web sites or disabling Java altogether, I don't see any way around the problem. Of course, 99.9 percent of the Web sites on the Internet won't contain dangerous Java applets, but that's no guarantee that you won't come across a site that does. Beware, and stay on top of what the major Web browser companies say they're doing to protect users from rogue Java applets.

JavaScript

Along with Java, you might have heard of JavaScript. JavaScript is a scripting language that only Netscape Navigator supports currently, and the reason for that limited support is that JavaScript started out life with a different name as Netscape Navigator's scripting language. In other words, Java and JavaScript don't actually have much in common other than their names.

The history of JavaScript has been muddied by public relations and marketing efforts (an early public relations person: "We would just like to state for the record that Napoleon did not lose, per se, at Waterloo…"). It was originally called LiveScript, and was designed to offer added functionality for users of Netscape Navigator.

JavaScript's code is text that lives in the HTML code of a Web page itself, which means that you can view the document source of a Web page and read the actual code of a JavaScript. In contrast, Java applets are sent to your Web browser as binary bytecodes, which means that even if you could look at the bytecodes (which you can't since they're not embedded in the HTML) you wouldn't be able to read it.

My impression of JavaScript is that it's not all that much easier than Java itself, but a major difference is that you need a development environment to create Java applets, whereas anyone can write (or more likely copy) JavaScript source code inside their HTML. I suspect that most people copy other people's JavaScripts because the most common JavaScript I've seen is one that scrolls some text in the status message field at the bottom of Netscape Navigator's window. I doubt that so many people would have written the same code independently.

JavaScript isn't nearly as powerful as Java, because all it lets you do is control the Web browser, whereas Java applets are independent programs that aren't limited to the Web browser's functions. JavaScripts might detect if a Web browser has a certain plug-in loaded and send different data depending on the result, or they might help coordinate navigational elements in Web pages.

Despite their differences, Java and JavaScript share the same serious problem. As I noted previously with Java, it can be used for nefarious purposes, and the same is true of JavaScript. For instance, until Netscape fixed this security hole, it was trivial to "steal" someone's email address from their Netscape Navigator preferences if he or she went to a certain Web page. A friend of mine set up a page that sent you mail, telling you that it had noticed you visiting its Web page. That might seem innocuous, but how long would it be before such a capability was used for all sorts of legal and illegal sting operations? Put up a page with child pornography on it, then capture all the names and email addresses of the people who visit. If that's not enough of a gray line for you, imagine a page that provides information against the ruling party in some country. That page could easily turn out to be a trap designed to flush out people who disagree with the government so they can be thrown in prison. The word "chilling" comes to mind.

Netscape did block that particular security breach in JavaScript, but there are no doubt many others, both those that have been discovered and are being used, and those that no one has yet found. Luckily, the most recent release of Netscape Navigator offers the option to disable JavaScript (and future versions that support Java will offer an option to disable Java as well). Since I have yet to see anything interesting done via JavaScript, I turned it off in my copy of Netscape Navigator. That way I also don't have to put up with those awful scrolling messages that block the status messages that I find useful.

VRML

Although Java has garnered most of the attention on the Web recently, another new technology has appeared and might prove interesting at some point in the future. VRML, which stands for Virtual Reality Modeling Language, is a language somewhat like HTML. Instead of creating pages of text and graphics, though, VRML creates virtual three-dimensional worlds. If you've ever used a 3-D modeling program to create a 3-D room, complete with furniture and windows and doors, and then used the program to "fly" around the room and look at it from different angles, you should understand what VRML attempts to do.

The major difference with VRML is that it attempts to display these 3-D worlds via the Web, so you would go to a Web page with a special VRML-enabled Web browser and the Web server would send your browser the appropriate codes to create a 3-D world. It might be as small as a single room or as large as a planet (although you probably wouldn't be able to download such a large 3-D world, since the code for describing the planet would be immense). After you've downloaded it, you can move around within the world, looking at different aspects of it from different angles and under different lighting conditions. Parts of the world might be links, just as in normal Web pages, and following those links might take you into different worlds, change the one you're in, or perhaps even send you back to a normal Web page.

There isn't much use of VRML on the Web yet, probably because creating a 3-D world is quite a bit harder than creating a Web page with text and graphics. In addition, few Web browsers support VRML.

How Does the Web Work?

Like FTP, the Web works via a fairly simple direct connection between your Web browser and a Web server somewhere on the Internet. Let's look at a sample Web session of a few pages so you can see how it all fits together.

Assume that I want to see if *TidBITS* is listed in Yahoo, one of the main catalogs of Web sites. First, I launch my Web browser. All Web browsers have the option of setting a home page, which in the context of a Web browser is the page that it loads automatically on

launch. My home page is set to <http://www.tidbits.com/>, so my Web browser first uses a domain name server to look up the name www.tidbits.com. After it knows the IP number that goes with that name, the Web browser contacts the computer at www.tidbits.com to see if it's running a Web server, since the http part of the URL tells the Web browser to open a Web connection, rather than an FTP or Gopher connection. www.tidbits.com responds, saying that yes, it is running a Web server.

Now that the basics of the connection have been established, my Web browser requests the rest of the URL. As you can see from the URL, <http://www.tidbits.com/>, there's no specific file mentioned. When that's true, the Web server decides that I want the default file, so it transmits the HTML code of that file to my Web browser. It also sends along any graphics that are referenced in the HTML code. My Web browser receives the HTML and the graphics files and stores them in memory (and in the cache on the disk). HTML is text-only, of course, so it's up to my Web browser to interpret the HTML and figure out how to display the text and graphics. Most Web browsers these days interpret HTML on the fly, so the text appears to flow in, filling up the page, and the graphics gradually fade in as well. In the past, Web browsers waited until they had received all the text and all the graphics before displaying the page, but people hated that method.

As soon as it has finished sending the HTML and graphics files, the Web server breaks the connection so it can serve another connection. Notice that unlike FTP, Web servers don't require the user to log in with a userid and password. That significantly speeds up the process of setting up and breaking down the connection.

Since I want to check Yahoo, I click in the location field in my Web browser and type the URL for Yahoo, <http://www.yahoo.com/>. As soon as I press Return, my Web browser repeats the process with the Yahoo Web server, looking up its name, checking to make sure there's a Web server on that machine, establishing a connection, and receiving the default page and graphics sent by the Yahoo Web server.

On the Yahoo default page, though, there's a search form. I don't want to browse through Yahoo manually; instead I want to search quickly to see if they have *TidBITS*. So, I type **TidBITS** in the search form and click the Search button. Here's where things change somewhat.

Clicking the Search button sends the contents of the search form to the Yahoo Web server in the form of a URL that points at a CGI program and that contains the string that I typed in. The Web server receives the URL, but instead of returning a Web page right away, it runs the CGI program (or more likely, just calls it, since it's likely to be running all the time). The Yahoo Web server passes the search string to the CGI, which, in turn, does whatever it was programmed to do with that string. I don't know how Yahoo is set up specifically, but I suspect that the searching CGI sends the search string to a powerful database program that can quickly search through the entire contents of Yahoo. That database program finds all the entries in Yahoo that contain the word "TidBITS" and sends that information back to the CGI, which turns it into HTML and relays it back to the Yahoo Web server, which sends it on to my Web browser for display.

So, using a form to activate a CGI, perhaps coupled with a database program, enables the Web server to serve the HTML code for dynamic Web pages that are generated on the fly in response to searches. An increasing number of large Web sites use techniques such as this to keep their pages fresh, interesting, and customized to the needs of their readers.

There are many other types of CGI programs, because the capability to work with other programs via CGIs is one of the most interesting and flexible parts of the Web's design. CGIs can enable you to maintain a "shopping basket" of items in an online bookstore, create and download graphics, participate in bulletin board-style discussions, and a host of other things.

Despite the flexibility provided by CGIs, the basics of how the Web works remains the same—a Web browser requests a URL from a Web server, which returns the HTML code and graphics that the Web browser must then interpret and display. Java will probably change this process somewhat, but just substitute Java bytecodes for HTML and think of the interpretation not as a method of displaying text and graphics but as the execution of a program, and you'll see that even Java uses the same basic model of operation.

Using Web Browsers

Web browsers used to be quite simple. They displayed text and graphics on a page, and identified links so you could travel between Web pages. Nowadays, though, modern Web browsers are monstrous programs that attempt to include every feature under the sun, along with some that should never have been allowed to see the light of day. Here then are some of the variables to consider when evaluating Web browsers.

Speed

Perhaps the most important feature of a Web browser is its speed. Whenever you browse the Web, there are a number of variables that combine, and often seem to conspire, to affect the speed at which text and images appear. Some of these variables you control, such as the speed of your Internet connection, and some lie outside of your control, such as the speed of the Web servers in question. It might not seem that the Web browsers themselves would play much of a part in this, but in fact, they do.

Look for three methods of increasing the speed, or at least the apparent speed, of your Web browsing experience. First and most important, Web browsers should enable you to click links before an entire page has loaded. This feature enables you to move on to a new page instead of waiting for some large graphic to load. Most Web browsers such as MacWeb enable you to cancel a connection manually with Command-period and then click a link, but there's no reason you should be forced to cancel the connection manually.

Second, and almost equally as important, a Web browser should open multiple simultaneous connections to a Web server. This feature enables the Web browser to bring in the text of the page, for example, along with the first three graphics, all at once. If you think about it, assuming that your connection is the real bottleneck, this method won't be any faster in the long run than making a single connection at a time. In practice, though, using multiple connections means that the page starts to fill in faster, and it seems as though the connection is working faster. Netscape Navigator and Microsoft Internet Explorer both use multiple connections.

Third, Web browsers should provide sophisticated caching of text and graphics. Caching is a method of storing information on your hard disk so it can be retrieved quickly later without retrieving from the Web site again, and good caching mechanisms are most obvious when you go back several pages in a Web browser. Since you've just visited those pages, there's no reason to download them again in most cases, and they should appear instantly.

HTML Support

There are several different levels of HTML—the most basic level is HTML 2.0, but there's also now HTML 3.2 which includes a number of tags not present in HTML 2.0. In addition, Netscape and Microsoft have both created nonstandard extensions to HTML.

When you evaluate a Web browser, you should consider what level of HTML it supports, and if it can handle any of the more common Netscape extensions (Microsoft's extensions aren't yet in common use from what I've seen). It's hard to tell exactly what level of HTML a browser supports, since the companies that produce the browsers say only what they do support, not what they don't support. The best test is the empirical test. Use a browser for a while, and see if you run into Web sites that display badly for whatever reason. Then, when you try another browser, visit those sites again to see how the second browser displays them.

In general, Netscape Navigator is the standard to which all the other browsers must measure up. This fact of life on the Web is due to Netscape's early release of popular HTML extensions that enabled the alignment of graphics and the centering of text, for instance. Many people created Web sites that looked good only in Netscape Navigator, and although most other browsers have done well in playing catch-up, Netscape still holds the lead.

Display Flexibility

One of the principles of HTML is that it's a structural language, not a display language. For the most part, tags in HTML work to define how a document should be laid out logically, not how it should specifically appear. Graphic designers hate this fact about the Web,

because they can't necessarily predict how their pages will display on any given computer and in any given Web browser. See Chapter 22, "Create Your Own Web Site," for more information about these issues.

I see their point, but I personally fall into the opposing camp. I believe that users should have the power to determine to some extent how Web pages will display. If my eyesight isn't that good, and I want to read text in 18 point New York, that's my business, not the designer's. Similarly, if I'm doing a presentation, I might need to bump the text up to 24 point Helvetica Bold to make it readable on an LCD projector. If designers had their way, the Web might look better overall, but it would be a good bit less useful to many people with special needs.

> **BTW**
> One of the subtle features of HTML as a structural language is that Web browsers don't even have to display text on a computer monitor. It's quite easy to imagine one that could read aloud to sight-impaired people, for instance.

Web browsers should enable you to change some of the display options such as the base text font and size. Ideally, the Web browser would enable you to set how all the various HTML styles would display so you could really customize the look of the Web pages you visit. MacWeb comes the closest in this respect, and both Netscape Navigator and Internet Explorer are quite poor.

Data Type Flexibility

The Web distinguished itself from the rest of the Internet services that preceded it with its handling of text and graphics. However, as I've noted at various points, the Web isn't limited to any set of data types. Anything you can pump through a Web server can live on the Web.

Of course, this flexibility poses a problem for Web browsers. They must be able to handle a wide variety of data types, ranging from sounds to movies to animations to Java applets. There are three common solutions to this conundrum, each with its own advantages and disadvantages.

The first way that Web browsers dealt with unknown types of data was with helper applications. The Web browser doesn't know what to do with a QuickTime movie, for example, but it does know (from the MIME type of the movie file, if you were curious) that it can call Apple's MoviePlayer application to play the movie. All the Web browser has to do, then, is download the file and send an Apple event to the Finder to launch MoviePlayer with the downloaded file. Helper applications work well, and let Web browsers get on with the task of browsing the Web. However, less technical users often find the myriad of necessary helper applications confusing, and keeping up-to-date with all of them is a pain.

The second and most obvious way that Web browsers handle different types of data is to support them internally. If InterCon's TCP/Connect II runs across a QuickTime movie, for instance, it doesn't have to call a helper application because it knows how to play QuickTime movies on its own. This method is easy to use and works well, but suffers from ballooning the size and RAM requirements of the Web browser, and from requiring an update to the browser every time the programmers add support for a new data type.

The third and final solution to the problem is probably the best. It separates the code for playing QuickTime movies from the Web browser itself, like helper applications, but it also can display those movies inside the Web browser window. The programs that make this possible are called plug-ins and both Netscape Navigator and Microsoft Internet Explorer support the same type of plug-ins (as does the forthcoming Adobe PageMill 2.0, a graphical HTML editor—see Chapter 22, "Create Your Own Web Site," for more about PageMill).

Plug-ins solve some of the problems I mentioned, but not others. For instance, some require that the Web browser be allocated a lot of RAM (8MB, in the case of Netscape Navigator and the Shockwave plug-in), and unlike helper applications, you lose that memory all the time, not just when you're viewing a movie with Shockwave. Although they're easier to manage than the many independent helper applications, you must still stay on top of the different versions to make sure you have the latest.

In addition, although plug-ins aren't separate programs, they can still crash, and when they crash, they can crash the Web browser as well. I've found it more difficult to troubleshoot problems with buggy plug-ins because it's not as obvious what is crashing at any given point. Finally, there are so many plug-ins that some utility programs such as Plug Master have appeared to help you manage which ones are loaded.

Stability

Here's a stupid piece of advice. Of course you want your Web browser to be stable. That applies to any program that you use! The problem is that most of the Web browsers are fairly unstable, and the variables that make them unstable vary widely. Some people have no trouble with one Web browser, whereas others have nothing but trouble with the same program. All I can say is that you shouldn't worry about switching between Web browsers if one proves unstable on your Mac. Don't put up with buggy software.

System Requirements

Web browsers might seem to be relatively simple applications, because they mostly display text and graphics in a window. Despite that appearance, Web browsers have become increasingly sophisticated and feature-laden, and as time has passed, their system requirements have gone through the roof.

You may or may not be able to run any given Web browser depending on what Mac you have and how much memory you have (although these programs are large, disk space shouldn't be an issue). For instance, the next version of Netscape Navigator, version 3.0, will reportedly require at least 7MB of free RAM and will prefer 9MB. That's more memory than many Macs have installed!

Unfortunately, the RAM bloat trend among Web browsers only stands to get worse, so pay attention to that when looking at the different programs. You might also check into how much RAM costs and get some more if it's reasonable.

Bookmark Management

All Web browsers have some method of storing links to your favorite sites so you can easily visit them at any time. These features are generally called hotlists or bookmarks. I'm going to go out on a limb and claim that the internal bookmark or hotlist management features in Web browsers don't matter any more. They used to matter, and for the most part, they used to be truly awful. What's changed is that there are now a lot of independent bookmark management programs, and the best of them do a much better job of handling bookmarks than the best of the Web browsers.

I personally depend on an independent bookmark management program because I often switch back and forth between Web browsers. Most people aren't likely to switch as often as I do, but if you don't have to worry about losing your bookmark list, you're more likely to switch to what might be a much better program. You usually can manually transfer bookmarks out of a Web browser, but that's often more trouble than you want to go to when you're testing a new Web browser.

Email

Email? Why would email be a feature of a Web browser? Good question, and the answer is that the companies that produce Web browsers want to provide a complete solution (preferably one that locks the user into their software). To that end, Netscape Navigator 2.0 now sports a full email client, and I suspect that Microsoft will add one to the next version of Internet Explorer (right now, Microsoft gets big points for distributing Eudora Light with Internet Explorer).

I'm going to come down hard on the inclusion of email in a Web browser. Apart from perhaps the capability to send messages by clicking a `mailto` link (a link in a Web page that sends email to a specific address), I don't think email and the Web should be in the same program. (An even better approach is to use Apple events to ask Eudora or another real email program to handle the `mailto` link.) You as the user deserve more choice than that, and if you do intelligently choose a better email client than Netscape's, for example, then you must suffer even those RAM and disk space requirements of Netscape Navigator that are related only to email.

BTW
What I would like to see is a gateway program that enabled me to read selected messages in a Web page without downloading them. When I'm travelling, I often just want to glance at the messages and see if there's anything interesting. I don't want to download them or anything else.

Usenet News

My opinions about reading Usenet news in a Web browser are quite similar to my opinions about reading email in a Web browser. I'm not offended by looking at the occasional article, but the effort and code that has gone into the newsreading capabilities in some of the Web browsers is ridiculous. If these companies feel the need to write a newsreader, they should make it a separate program so I can use it or another program as I choose.

The problem with combining email and Usenet news in a Web browser is that there aren't really any synergies between email, Usenet news, and the Web other than the capability of clicking links in email or news to go to a Web page. That already works in all the good email and news programs, so we shouldn't have to put up with massive programs that contain features that we not only don't want, but that we've duplicated.

FTP and Downloading Files

I'll step down from my soapbox somewhat in regard to the inclusion of FTP capabilities in Web browsers. Since clicking a link to download a file makes sense, and since there's no inherent reason to use a different program to download files via FTP as opposed to the Web, I don't inherently have a problem with the Web browsers knowing how to do FTP. I do think they should provide the option of working with a real FTP client such as Anarchie or Fetch, since those programs offer additional features, such as MacBinary support, that are often welcome.

When looking at how Web browsers download files, the main features to look for are a default folder for storing downloads and a separate download window. The default folder is useful because if you're like me, you want all your downloads to end up in the same place, no matter what program was responsible for bringing in the download. Otherwise you have to search all over your hard disk to find the files you've downloaded. You definitely want a separate download window because it's a more efficient use of space (why waste an entire big browser window on a tiny progress bar) and because it more readily enables you to continue browsing the Web while your download proceeds.

Web Browser Reviews

Over the last few years, a number of Web browsers have come and gone, in large part because the Internet community has proven fickle. If someone comes out with a better Web browser, Internet users will beat a path to that person's Web site. Almost all Web browsers these days are free or free to evaluate because anyone can download Netscape Navigator to evaluate it, and it's impossible to compete with that sort of charging scheme in any other way.

Many programs that I include here offer features beyond just Web browsing, including support for email, Usenet news, FTP, and Gopher, and although an argument could be made for separating them out from the programs that concentrate on the Web, the Web features of the integrated programs are likely to be the most interesting part for most people.

In the section that follows, I review Microsoft Internet Explorer and Netscape Navigator, since those two are the main Web browsers of choice available on the Macintosh today. There are others, and I provide short reviews of them, but for the most part they serve niche markets and don't compete with Internet Explorer or Netscape.

Microsoft Internet Explorer

In what must seem unusual for such a large and dominant company, Microsoft has ended up as the dark horse of the Web browser market. Netscape controls some vast percentage of the market share, but Microsoft's Internet Explorer 2.0.1 is making some inroads, particularly on the Windows 95 side of things. Internet Explorer for the Mac hasn't been out as long, and although it has some of the rough edges of a first-generation product (2.0 was the first release, because it's comparable to the 2.0 release of the Windows version), Internet Explorer performs admirably, and we've chosen it for the Internet Starter Kit CD-ROM because of this.

> **BTW**
> Internet Explorer 3.0 is likely to add a ton of new features, including a full email client and newsreader, limited style sheets, new layout features, and support for Java. Maybe it will even come with some RAM so we can all run it.

Installation and Setup

Installation is one of the places where Internet Explorer easily outperforms Netscape. The main reason for this is that Internet Explorer can pick up your preferences from Netscape, if you've installed a version of that program previously, or from Internet Config. Microsoft

deserves points for supporting Internet Config like so many other Macintosh Internet products.

> **BTW**
> I haven't been able to reproduce anything, but my impression is that picking up preferences from Internet Config is safer than picking them up from Netscape.

To modify Internet Explorer's settings, from the Edit menu choose Options. Internet Explorer brings up its extensive Options dialog box (see Figure 16.1).

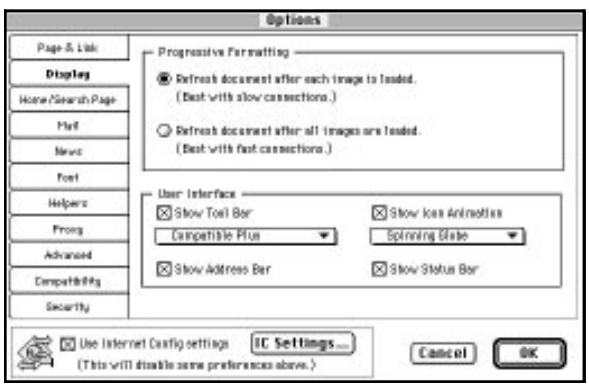


Figure 16.1 Internet Explorer Options dialog box.

If, as I recommend, you have already configured everything in Internet Config, most of the configuration has been taken care of for you. Selecting the Use Internet Config settings checkbox has the same effect if you didn't let Internet Explorer pick up its settings the first time you launched it. Of all of the tabs on the left side of the Options dialog box shown in Figure 16.1, only four or five of them enable you to change anything while the Use Internet Config settings checkbox is selected, and none of those settings is essential.

In other words, if you use Internet Config, you don't have to do any configuration in Internet Explorer at all, although you might wish to tweak a few of the remaining settings. For instance, in the Home/Search Page tab, you can set a specific page to use when you click the Search button in Internet Explorer's toolbar. I set mine to Alta Vista.

Speaking of toolbars, Internet Explorer garners more points by enabling you to choose between three different toolbar styles, Netscape Navigator Compatible, Compatible Plus, and Internet Explorer. The first toolbar mimics Netscape's toolbar, which is fine, and the second mimics Netscape's toolbar but adds some additional buttons. I recommend you choose one of those two options, because Internet Explorer's native toolbar is lousy. My main gripe is that it buries the all-important Back button in the middle of the toolbar rather than putting it on either end, where it would be easy to click. The arrangement of the other buttons isn't particularly good either.

BTW
In a snide move, Internet Explorer gives you the option of choosing Flying Windows as the progress animation that appears in the upper right corner. Why would a Mac user ever want to look at Windows logos flying by?

Basic Usage

At the base level, using Internet Explorer is as easy as using any Web browser—you just click the links to move among pages. Of course, there's more power beneath the surface. You can go to a specific Web page either by typing the URL into the Address field or by choosing Open Location from the File menu (see Figure 16.2).

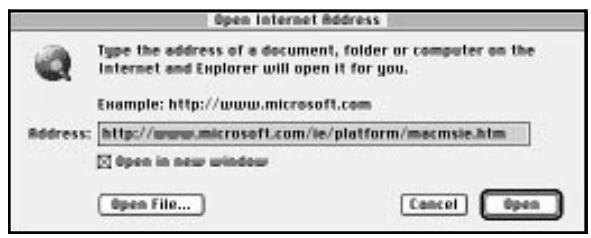


Figure 16.2 Internet Explorer Open Location dialog box.

You can open multiple windows and have them going to different locations on the Web, which is useful when you're doing research over a modem, since you don't have to wait for one page to come in before viewing another (see Figure 16.3).

When you're viewing a window, you can click and hold on any link (or even on the background of the page, and Internet Explorer pops up a menu of commands that can be extremely useful (see Figure 16.4). I especially like the options for Copy Link to Clipboard (I used this frequently to copy FTP URLs and use them in Anarchie) and Open Link in New Window (which is useful if you want to download a file and keep browsing in your original window).

When you find a site that you want to revisit, you can add them to your Favorites list, which you can access via both the Favorites menu and the Favorites window (see Figure 16.5). Selecting a bookmark from the menu takes you to that site, and in the Favorites window you can launch bookmarks by double-clicking them, move bookmarks around, rename them just as you would rename a file in the Finder, and delete them by pressing the Delete key while they're selected. Since Internet Explorer supports Apple's drag-and-drop technology, you can also drag bookmarks to the Finder to turn them into stand-alone bookmark files, or you can drag them to the Trash to delete them.

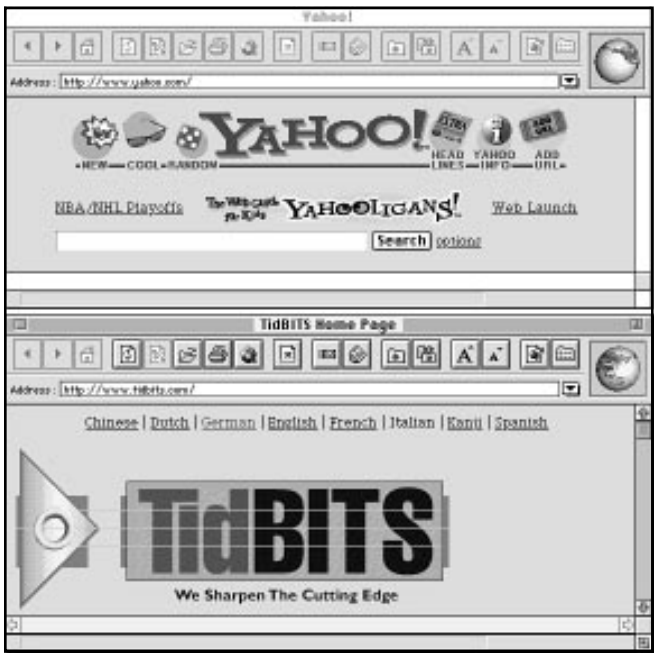


Figure 16.3 Internet Explorer browser windows.

Figure 16.4 Internet Explorer pop-up menu.

BTW

If you use Aladdin's CyberFinder (see the review coming up), you can also drag CyberFinder bookmarks into Internet Explorer's Favorites window, although you cannot create CyberFinder bookmarks by dragging items from the Favorites window to the Finder or to a CyberFinder library.

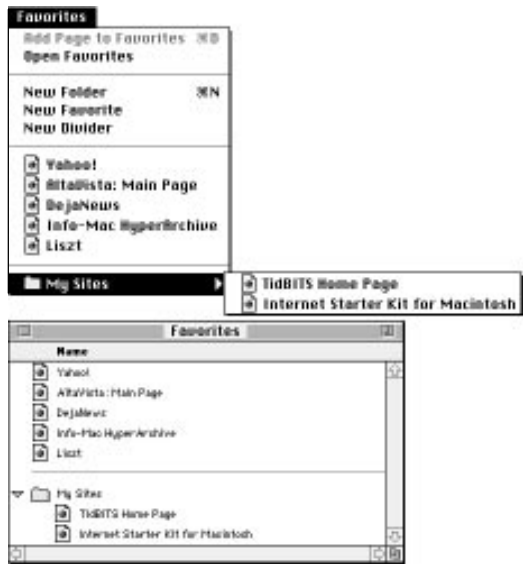


Figure 16.5 Internet Explorer Favorites.

Internet Explorer's Favorites list is one of the best implementations of bookmarks that I've seen in a Web browser. It's fast, flexible, and easy to use. However, I still feel that an independent bookmark manager such as CyberFinder or URL Manager Pro is the way to go for people with many bookmarks.

One place where Internet Explorer currently fails to compete on the feature checklist with Netscape Navigator is in its handling of email and Usenet news. Unlike Netscape, which can both send and receive email, Internet Explorer can only send mail using a simple email window (see Figure 16.6). Internet Explorer 3.0 will probably address this limitation, if you consider it to be one.

I'm not bothered by Internet Explorer not being able to receive mail, in large part because Microsoft had the good sense to bundle Qualcomm's Eudora Light with Internet Explorer. Microsoft is highly unlikely to be able to create a better email program than Eudora Light, and I don't think it should waste its time trying.

Internet Explorer does support Usenet news a bit better than it does email, although its Usenet news capabilities are still rudimentary. If you choose Read Newsgroups from the Go window, Internet Explorer downloads the full list of newsgroups from your news server (see Figure 16.7).

Figure 16.6 Internet Explorer Email window.

Figure 16.7 Internet Explorer full group list.

When you click a newsgroup name, Internet Explorer displays a two-column list of about 20 articles in the group (see Figure 16.8).

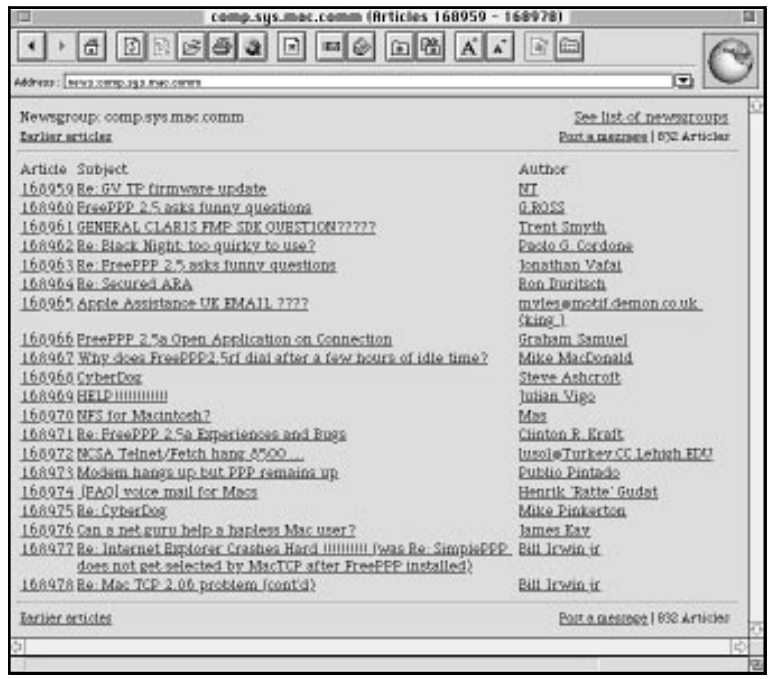


Figure 16.8 Internet Explorer article list.

Clicking any article title displays that article, but as you can see, Internet Explorer offers no threading options and doesn't even group articles with the same subjects. The only good thing about it is that all the URLs and email addresses are automatically made into links.

I can see the utility of providing support for Usenet news in case someone provides a link to a specific Usenet news article and you don't want to launch a newsreader client to go read it. However, I can't imagine anyone wanting to use Internet Explorer to read news in place of almost any of the newsreaders reviewed in Chapter 14, "All About Usenet News."

I don't recommend bothering with Usenet news in Internet Explorer at all, and I'd like to see Microsoft use Internet Config more seriously, passing off not only news URLs, but also `mailto` and FTP URLs to the helper applications defined in Internet Config. Frankly, Internet Explorer doesn't do a great job with any of those Internet services, so why not use programs that do?

Special Features

Perhaps the most important special feature about Internet Explorer, and one of the most surprising ones, is that it supports more of Apple's technologies than any other Web browser. Internet Explorer supports QuickTime movies (and Windows-standard AVI movies), rudimentary VRML via Apple's QuickDraw 3D, and AppleScript. Internet Explorer also makes use of temporary memory, which is a method that Mac programs can utilize to request more memory than is allocated to them. The problem with this technique is that Internet Explorer can use too much temporary memory—from the Apple menu in the Finder, choose About This Macintosh and check the amount of RAM used by System Software to see how Internet Explorer uses memory without telling you. To free this memory, just quit Internet Explorer and launch it again.

My favorite Internet Explorer feature is the way it tracks all the Web pages you visit and lets you access them quickly. Internet Explorer lists the most recently visited pages at the bottom of the Go menu (just choose one to go to it), and the History window (see Figure 16.9) provides the full list of past pages. By default, Internet Explorer tracks the last 500 pages—you can change that number in the Advanced tab in the Options dialog box.

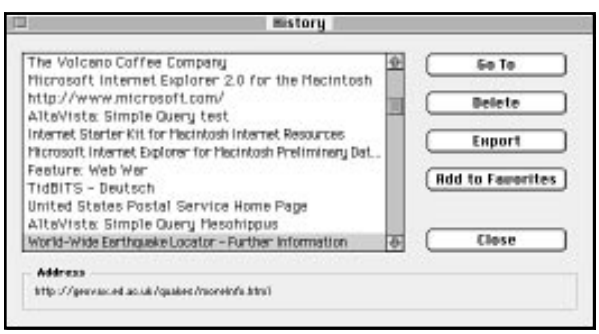


Figure 16.9 Internet Explorer History window.

Internet Explorer provides a more constrained variant on the Go menu with the pop-up menu to the right of the Address field at the top of the browser window. That menu contains not the full contents of the Go menu, but instead just the first page in a site that you've visited during that session. As a result, this menu doesn't get nearly as full, which makes it especially useful for flipping between sites.

A nice touch is the way that Internet Explorer provides a brief description of each of the toolbar buttons in its status line at the bottom of the window. I often have trouble remembering what any given button does, and the reminders help immensely.

The Internet Explorer and Compatible Plus toolbars add two buttons that I find quite useful on occasion. The buttons, labelled with a big A and a little A, increase and decrease the font size of the page you're reading. Every now and then you may run into a page that needs a larger or smaller font size (perhaps increasing the font size makes the page easier to read, or decreasing it uses less paper if you're printing the page).

It's hard to put a finger on this, but Internet Explorer feels much faster than Netscape when going back to previous pages, which is important, and a little faster when loading new pages, although the difference is much less marked when loading new pages.

Rather than invent its own proprietary plug-in format, Microsoft engineered Internet Explorer so it can use the same plug-ins as Netscape Navigator. That's great, because it means you don't have keep track of two different sets of incompatible plug-ins. To add plug-ins, just drop them in the Plug-ins folder in the Internet Explorer folder.

> **FYI**
> You can even share plug-ins between Netscape and Internet Explorer if you like. Just put all your plug-ins in Netscape Navigator's folder, for instance, make aliases to them, and copy the aliases into Internet Explorer's folder.

Trying to follow in Netscape's footsteps, Microsoft has come up with its own special HTML tags that only Internet Explorer understands. This may or may not be a good thing overall, but it does offer some added flexibility to HTML if you know people will view the page with Internet Explorer. You can get a taste of these HTML extensions at Microsoft's demo page at `<http://www.microsoft.com/ie/showcase/howto/iedemo.htm>`. Be prepared for some sounds—Internet Explorer can play them without the help of another application or a plug-in.

Evaluation and Details

Right now, I'd have to say that it's something of a toss-up between Internet Explorer and Netscape Navigator as to which one is better. Internet Explorer suffers mainly from a few rough edges that will no doubt disappear in the next version, and with the speed that Web browsers appear on the Internet, you will probably be able to download a new version of Internet Explorer by the time you read this.

Some of the rough edges that I refer to include Internet Explorer's inability to zoom the browser window to the proper size when you can't see everything. Clicking the zoom box zooms the window to the full size of the monitor, which is almost never correct. Although Internet Explorer enables you to enter URLs without the leading `http://` part, it doesn't go as far as Netscape, which can guess at the `www` and `com` that surround most company names on the Internet. Internet Explorer doesn't support arrow key navigation, and its screen display is often jerkier and somewhat more random than Netscape's. You also cannot view the HTML source of a page using the helper application defined in Internet Config—instead you must view the source in the window that Internet Explorer provides and copy and paste the text out to a different application if you wish to modify it.

Other than these nits, Internet Explorer's main fault, though, is that it doesn't open a special download window when you're downloading a file, as does Netscape. The lack of a special download window means that you must be careful to open a new window if you

wish to continue browsing while downloading a large file. If you forget to do this and then go to another URL, you'll interrupt your download and have to start it over.

Microsoft provides Internet Explorer for free, which is another advantage over Netscape Navigator, which you can try for free but which you must purchase after evaluating. However, after 90 days, Microsoft does require you to register your copy for free at <http://www.microsoft.com/ie/ie_reg.htm>. You can download the latest version of Internet Explorer only from Microsoft's Web site at <http://www.microsoft.com/ie/platform/macmsie.htm>.

Netscape Navigator

Netscape Navigator (generally just called Netscape) is the undisputed leader of the Web browser world. It took the Internet by storm and has barely looked back since, keeping our attention with constant updates and beta versions. Although Netscape continues to add major new features to each revision of Netscape Navigator, the main advance in each, in my opinion, is an increasingly smooth interface. The current version is 2.02, although Netscape has already released a feature-incomplete version of 3.0 for beta testing. I review 2.02 here, since I refuse to buy into Netscape's "beta of the week" approach to marketing. These early releases seldom have all their features active and are usually extremely buggy.

Installation and Setup

Netscape has the most preferences of any of the Web browsers, but luckily, you need not mess with anything past the mail and news preferences. From the Options menu, choose Mail and News Preferences and click the Servers tab to see the most important settings (see Figure 16.10).

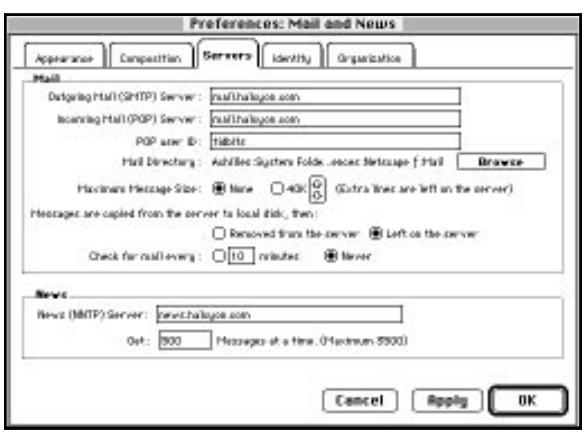


Figure 16.10 Netscape Mail and News Preferences.

The settings ought to be familiar to anyone who's configured other Internet programs: things such as your POP and SMTP servers, your news server, your email address, and so on. After you're done with the Servers tab, click the Identity tab and fill in your name, email address, and organization as well. I'd like to see Netscape use the basic Internet Config settings for this information—there's no reason to make the user enter these addresses yet again.

Although you have minimal control over the fonts Netscape uses, it's nowhere near as customizable as MacWeb or Mosaic. I recommend you change the default proportional font from Times to something more readable on-screen, such as New York. Times was never meant to be a screen font (it was designed for printing) and Netscape should never have made it the default. You can change the font and a variety of other settings in the General Preferences dialog box that appears if you choose General Preferences from the Options menu and click the Fonts tab (see Figure 16.11).

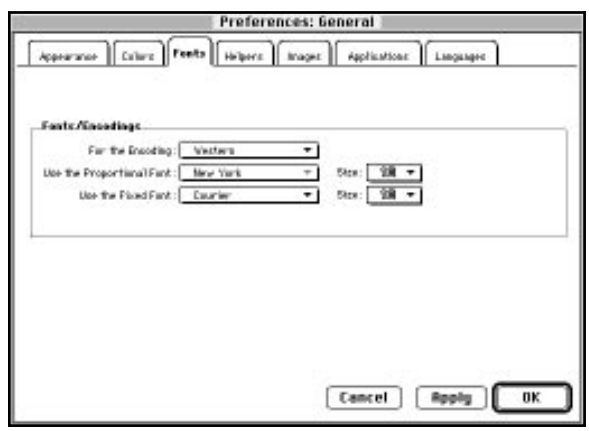


Figure 16.11 Netscape General Preferences.

It's worth spending some time working your way through the many different settings in the four dialogs accessible from the Options menu (General Preferences, Mail and News Preferences, Network Preferences, and Security Preferences). The defaults will work fine for you, but you might wish to tweak certain settings.

Also in the Options menu are items that enable you to hide or show the toolbar, the location field, the directory buttons, and images (should you not want to auto-load images). I prefer a mix of the various buttons and controls Netscape can place at the top of the window, so I usually turn off the directory buttons, but leave the toolbar and location field on. I also leave the toolbar style at text and images because that makes the all-important Back button larger and easier to click.

When you're done messing with the settings, choose Save Options from the Options menu to make sure Netscape remembers your settings for the next session.

FYI
If you resize and position your browser window before choosing Save Options, Netscape also remembers its size and position.

Basic Usage

When push comes to shove, using Netscape is almost exactly like using any other Web browser. When you launch Netscape, you see its main window displaying whatever the default home page is (see Figure 16.12).

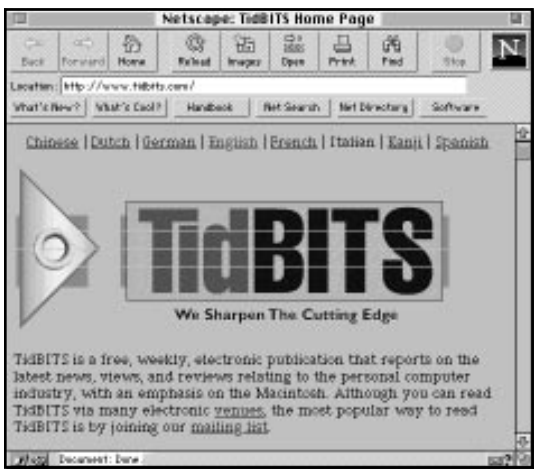


Figure 16.12 Netscape main window.

Although I generally run with the Directory buttons for What's New?, What's Cool?, Handbook, Net Search, Net Directory, and Software turned off, I think they're handy for new Internet users who may launch Netscape and then ask, "How do I search the Internet?" Well, if you're running Netscape, the simple answer is "Click the Net Search button." In fact, each of these buttons takes you to another constantly updated Web page that Netscape maintains. The Net Search and Net Directory buttons in particular point you to good search engines and directories.

You can of course jump directly to Web pages by typing their URLs in either the Location field at the top of the browser window or by selecting Open Location from the File menu and entering the URL there. One of my favorite features in Netscape 2.0 and later is the way it enables me to go to `www.apple.com` by just entering the `apple` part of the full URL in the Location field. This trick works only for companies whose Web sites' names start with `www` and end with `com`, but many do, and it's an easy way to navigate the Internet.

After you've found a page you want to revisit in the future, you can add it to Netscape's Bookmarks listing by choosing Add Bookmark from the Bookmarks menu. Like Internet Explorer, Netscape enables you to access your bookmarks from the Bookmarks menu and from the Bookmarks window, which you open by choosing Bookmarks from the Window menu (see Figure 16.13). Selecting a bookmark from the Bookmarks menu takes you to that page, as does double-clicking one in the Bookmarks window.

Figure 16.13 Netscape Bookmarks menu and window.

You can move bookmarks around in the Bookmarks window, and you can delete them by dragging them to the Trash in the Finder (or by selecting Delete Bookmark from the Edit menu), but renaming a bookmark requires choosing Edit Bookmark from the Item menu that appears when the Bookmarks window is in front (see Figure 16.14).

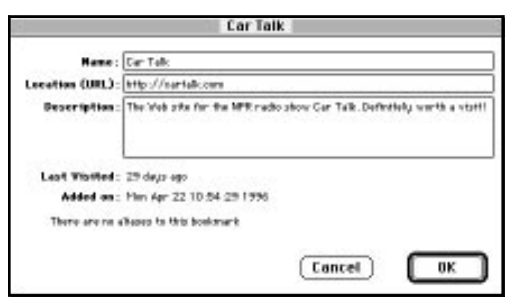


Figure 16.14 Editing a Netscape bookmark.

Other commands in the Item menu enable you to sort selected bookmarks alphabetically, create an alias to a bookmark (rather than creating two bookmarks for better organization), create new folders, and create separators for the Bookmarks menu. You can also set which folder of bookmarks in the Bookmarks window appears in the Bookmarks menu (they all do by default), and you can set another folder where new bookmarks go when you choose Add Bookmark.

Netscape Mail

In a major move for a program that started out as a relatively simple Web browser, the latest version of Netscape Navigator has a full email client built into the program. You open the Netscape Mail window by choosing Netscape Mail from the Windows menu. Alternately, you can click the little envelope icon in the lower right corner of every Netscape browser window to bring up the Netscape Mail window and check for new messages. Either way, the Netscape Mail window contains three panes that list your mail folders, the individual messages, and the text of a message (see Figure 16.15).

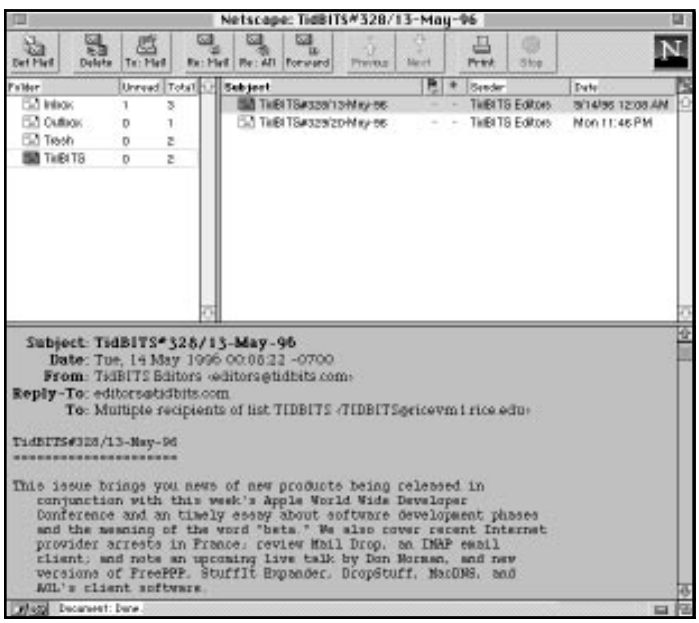


Figure 16.15 Netscape Mail window.

If you select a message and click the Reply button or press Command-R, Netscape brings up a message editing window for you (see Figure 16.16).

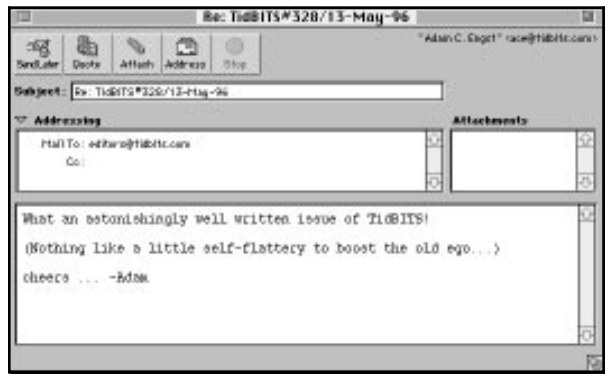


Figure 16.16 Netscape Mail message window.

It's a fairly basic message window with buttons at the top for sending the message (you can send immediately or later), quoting the original, attaching a file (you can also drag a file into the Attachments area) and for bringing up the Address Book window. You can send a message to one or more people by putting addresses in the Mail To line and the Cc line, but Netscape Mail has no Bcc line for blind carbon copies. You can add a signature to your messages—there's an option for selecting a signature file in the Mail and News Preferences dialog box's Identity tab. If you have Netscape Mail set to defer outgoing messages, you can send messages either by choosing Send Mail in Outbox from the File menu or by simply closing the Netscape Mail window and agreeing to let it send your mail when it asks.

Netscape has most of the necessary features for a decent email program, including multiple folders for storing mail (and they use a single file rather than individual files for each message), an option for deferred delivery (accessible only from the Options menu while you're editing a message), an address book for storing nicknames and lists of users, and the capability of sorting columns of messages by clicking the column title. You can move or copy messages between mailboxes by dragging them or using the Move or Copy hierarchical menus in the Message menu, and Netscape doesn't delete messages immediately, but instead copies them to a Trash mailbox.

In fact, Netscape would appear to have most of the features that Eudora Light has. So why shouldn't you use Netscape instead of Eudora? Aside from the fact that Eudora Light is free and Netscape isn't, when you look beneath the surface a bit, you see how much more usable Eudora really is. For instance, Netscape Mail is slow, really slow. It takes almost eight seconds to display an issue of *TidBITS* (and it's merely loading it from the hard disk, not downloading from the Internet), and replying to a 30K message like an issue of *TidBITS* requires that you wait for over 20 seconds for Netscape to quote the original. Netscape Mail has no facility for quoting only the selected text in a message as Eudora does if you press Shift while choosing Reply, and even if it did, selecting text in the Netscape Mail message display window is so clumsy that you wouldn't bother. I'm also not fond of the way Netscape's menus change so radically depending on what window is in front—you

have to pay attention to figure out where all the options are. Finally, I find single-window mail interfaces extremely constricting—I often like to have multiple message windows open at the same time, and since Netscape has implemented Netscape Mail as a special case of Netscape Navigator's frames capability, it is limited to a single window.

Overall, I'd say that Netscape Mail isn't bad, but it's just not as good as Eudora Light, and it's nowhere near as good as the commercial Eudora Pro (remember, Netscape Navigator isn't free). If you like doing everything on the Internet in a single program, Netscape Mail will work for you (although I fear it might slow down if you get a lot of mail). For more information on Netscape Mail, open a browser window, make sure Show Directory Buttons is on in the Options menu, and click the Handbook button.

Netscape News

Netscape has added a full Usenet newsreader to the latest version of Netscape Navigator. You bring up the newsreader by choosing Netscape News from the Window menu or by clicking a news link, at which point Netscape presents you with a three-pane window very similar to the Netscape Mail window (see Figure 16.17).

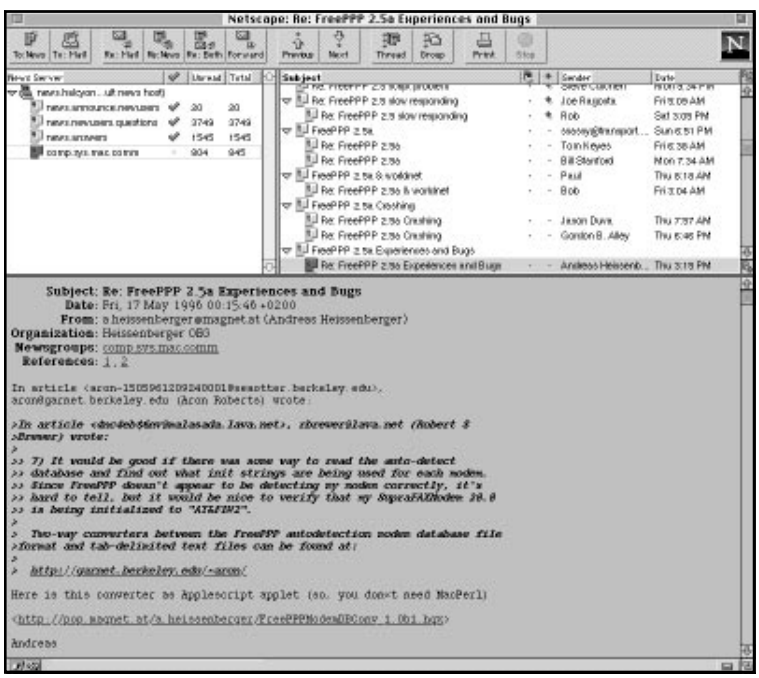


Figure 16.17 Netscape News window.

The lefthand pane on top shows newsgroups, and you can limit the set shown by selecting one of the following from the Options menu: Show Subscribed Newsgroups, Show Active Newsgroups, Show All Newsgroups, and Show New Newsgroups. Selecting Show All Newsgroups downloads the full group list from your news server (which you entered in the Mail and News Preferences dialog's Servers tab, remember?). Subscribing to groups is a matter of clicking in the checkbox column next to the newsgroup name. You can also add a newsgroup to your list manually by choosing Add Newsgroup from the File menu.

The righthand pane on the top shows the subjects, authors, and dates of the messages in the selected newsgroup. You can sort the list by clicking any of the column headers. Clicking an article title displays the article in the bottom pane, and here's where you see what I consider to be the major problem with Netscape News. Notice that in Figure 16.17 I have sized the window so it has no extra space in the top two panes, but even still, the bottom pane is way too wide for the message. Any three-pane interface will suffer from this wasted screen space, since it's unlikely that the top two panes will be exactly as wide as the bottom pane.

Netscape is good about styling the text in the message pane so you can easily distinguish the header from the body of the message and any quoted text from the response.

The main Netscape News window has a row of buttons at the top that provide all the main features of a newsreader, including various methods of replying to a posting, and navigation commands that enable you to move forward or back one article, forward to the next thread, or forward to the next group. You can also use the Spacebar to scroll within a long message, and the up and down arrow keys to move through messages from the keyboard, which I consider essential for a newsreader.

Overall, my opinion of Netscape News is fairly similar to my opinion of Netscape Mail. It's not a bad implementation of a newsreader, but it doesn't compare to many of the stand-alone newsreaders such as NewsWatcher (and certainly not YA-NewsWatcher, with its filtering capabilities), and it provides no offline reading capabilities like NewsHopper or MacSOUP. If you plan to read only a few low-volume newsgroups, Netscape News will probably work fine for you, but if you find it clumsy for more groups or high-volume groups, as I did, then I encourage you to check out one of the dedicated newsreaders.

Special Features

Perhaps my favorite special feature in Netscape Navigator is its capability to zoom the browser window to the proper size. Some Web sites are wider than the default size of my browser window, and being able to resize the window to exactly the right size with the zoom box is a godsend.

Another killer feature for Netscape over Internet Explorer is Netscape's little download windows. Whenever you download a file, be it via the Web or via FTP, Netscape opens a small download window that shows the size of the file, the percent downloaded, the

approximate throughput, and the time remaining. There's no reason to waste a full browser window on this information, and the download window enables you to keep browsing in the main window (see Figure 16.18).

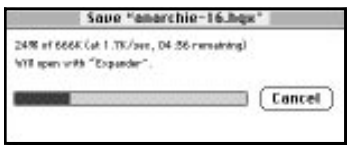


Figure 16.18 Netscape Navigator download window.

Although Netscape places downloaded files in a default folder that you specify if you just click the link to them, you can also drag the link to a specific folder in the Finder to download the file to that location. The only liability of doing this is that Netscape seems to be incapable of calling StuffIt Expander to decode files downloaded this way.

Netscape is also good about deleting partial files if you cancel a download in the middle. Any interrupted download would result in a hosed file, so there's no reason to save the file, and by deleting it automatically, Netscape saves you the trouble.

Although Netscape won't tell you this anywhere that I've seen, you can "register a protocol" with Netscape Navigator so that it uses different applications for non-Web links. For instance, you could register Anarchie as Netscape's FTP helper, and when you click an FTP link, Netscape would use Anarchie instead of downloading the file itself. For example, if you enter the following script into the AppleScript Script Editor and run it, you'll set Netscape to use Anarchie for FTP. You might have to modify the script with a new name for Netscape if the version has changed by the time you read this, and you can also modify the script to support other helper applications by replacing `Arch` below with the creator code for the application you want to use and by replacing `ftp:` with the type of URL to link to that application. (To set things back to normal, delete the `Arch` below, leaving the double quotes, and run the script again.)

```
tell application "Netscape Navigator™ 2.02"
    activate
    register protocol "Arch" for protocol "ftp:"
end tell
```

Unlike most other Web browsers, Netscape provides keyboard navigation for people who prefer it. Press Command and the left or right arrow keys to move back or forward one page. Although I see the utility of this feature and some people love it, I find that I usually have my hand on the mouse (trackball, actually) because I'm generally clicking links with it.

Finally, although I almost never run into pages that use them, there are a large and increasing number of Netscape plug-ins that enable Netscape to display additional types of

data in the main browser window. See the reviews of plug-ins following for more information on what these plug-ins can do. To use plug-ins in Netscape, just drop them in the Plug-ins folder in the Netscape Navigator folder and launch Netscape again.

Evaluation and Details

Overall, Netscape Navigator is one of the best Web browsers available. If you like its implementations of mail and news, you'd probably say that it's better than Internet Explorer. I don't, and I find that I use both browsers about equally. I think the main difference is that Netscape's programmers have had more time to smooth out some of the rough edges in Netscape's interface.

This is not to imply that Netscape Navigator doesn't have its rough edges as well. As I've noted, there are plenty in the mail and news clients that are built in, and the other major source of rough edges is in Netscape's implementation of what it calls frames. Frames enable a Web author to divide the browser window up into several panes, just like Netscape Mail and Netscape News. Only Netscape Navigator supports frames, so not all that many sites use them, and most of those that do, do so badly. The sharpest edge in Netscape frames is that you cannot use the Back button to go back to a previous frame; instead you must click and hold in the frame (not on a link) and select Back from the pop-up menu that appears. Clicking the Back button takes you to the last page you visited without frames. This will reportedly be fixed in Netscape Navigator 3.0.

The main problems that Netscape has are related to all of its features. Frankly, the program is a RAM hog. The current version prefers 4MB of RAM allocated to it, and if you use certain plug-ins, you might have to increase its RAM allocation to as much as 8MB. The next version reportedly requires even more RAM, which is ludicrous. If Netscape eliminated the mail and news features and provided just a Web browser, which is what many people want, it could probably reduce the RAM requirements as well.

All these features also increase the size of the program itself (to about 4MB for version 2.02), and although I'm not particularly bothered by file size, the larger the program, the more likely it is that there will be bugs in the code. Netscape Navigator has never been a particularly stable program, and some people find that it crashes constantly on their systems. None of the Web browsers is a paragon of stability, to judge from reports on the Internet, and that's a shame. If Eudora or Nisus Writer crashed as often as Netscape does on my machine, I'd go mad from losing work.

You can download copies of Netscape Navigator only from Netscape's site, which often proves difficult when Netscape releases a new version, since the FTP machines quickly become overloaded. After you have a copy, read the license agreement, which basically says that you can use Netscape Navigator for free if you're at an educational institution or a charitable nonprofit. Everyone else can evaluate the program for free, and evaluation for use by a commercial entity can last only 90 days. There's no time limit on how long you can evaluate the program for personal use. I'll let you read the license agreement and see

where you fit in. If you do decide to purchase Netscape Navigator, it costs between $39 and $69, depending on what options you buy. Check Netscape's Web site at <http://home.netscape.com/> for links to ordering online and downloading new evaluation versions. You can also go directly to its generally overloaded FTP site at <ftp://ftp.netscape.com/> to download copies of the program. I don't dare give more specific URLs because Netscape often moves things around.

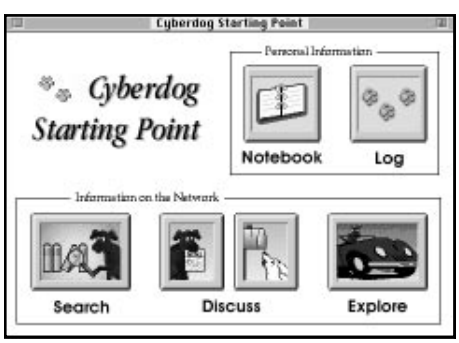
Other Web Browsers

Although I believe you'll be happiest with either Internet Explorer or Netscape right now, the world of Web browsers changes fast. There are a number of other contenders that don't compete with the two leaders well currently, but might pass them in the near future. In addition, some of the browsers I mention following might serve a specific need better than either Internet Explorer or Netscape. These Web browsers tend to be available only on their home Web sites, which I've listed for each one.

Cyberdog

`http://cyberdog.apple.com/`

Apple's free Cyberdog is a tightly integrated set of Internet tools for email, Usenet news, FTP, Gopher, Telnet, and of course, the Web. Because it is based on Apple's OpenDoc environment (which is free, but which you must install before installing Cyberdog), which enables programmers to create small, focused applications that interact with one another, Cyberdog is, in my opinion, a look at the future of how Mac users will use the Internet. Cyberdog 1.0 suffers from speed problems even though it runs only on Power Macs, and some of its parts don't match up to the stand-alone programs I've discussed in this and other chapters. However, the whole is much greater than the parts, and thanks to OpenDoc, other programmers can easily replace Apple's parts with more full-featured versions. Cyberdog features that stand out include its tight integration (better than any other integrated program I've seen), its Cyberdog-wide log of places you've visited, its Notebook for storing bookmarks, and the fact that its Web browser makes selecting text easier than any other browser I've tried. If you have a Power Mac and enough RAM for Cyberdog (8MB minimum, more recommended), I strongly recommend you explore its capabilities. In the future, when OpenDoc is more common, you will be able to create "living documents" composed of information from the Web.



MacWeb

`http://galaxy.einet.net/EINet/MacWeb/MacWebHome.html`
`ftp://ftp.tidbits.com//pub/tidbits/tisk/inet/web/`

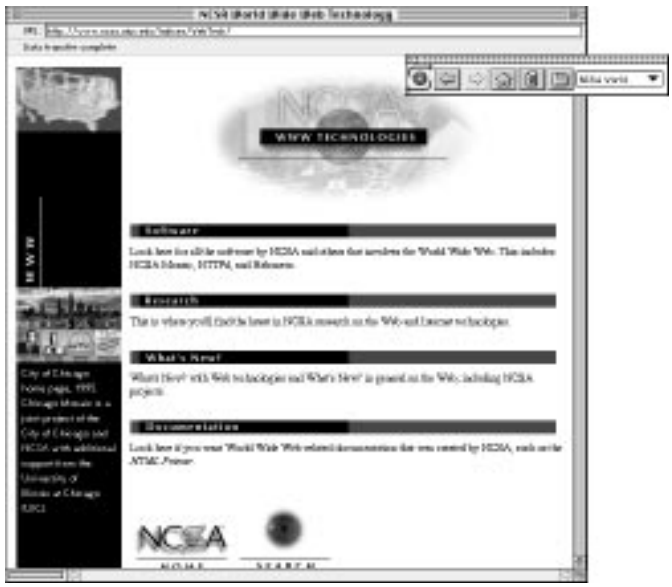
MacWeb was the second major Web browser to appear on the Macintosh, and has always differentiated itself by being small and efficient. Many useful features, such as a pop-up menu that appears if you click and hold on a link, appeared in MacWeb first. Areas where MacWeb still stands out are its font display options and low memory requirements. Because of its small size and low memory requirements, MacWeb is the browser of choice for people with older Macs or not much memory. Unfortunately, MacWeb 2.0 won't enable you to select text for copying and uses only a single connection at a time, unlike most other Web browsers, making it slower than the rest. MacWeb 1.1.E (which is same as MacWeb 1.00A3.2) is still available on the Internet. TradeWave won't say if MacWeb 2.0, although finished, will ever be available to the Internet community (it's part of some other product TradeWave sells now), nor has it rescinded 1.1.1E. It's currently available at the FTP URL above.

NCSA Mosaic

`http://www.ncsa.uiuc.edu/SDG/Software/MacMosaic/`

Although the free (for personal use) NCSA Mosaic originally popularized the Web, it has drastically declined in popularity. NCSA Mosaic 3.0 (currently in beta) has a few unique features. It enables you to make personal annotations to any document on the Web, either in text or using the audio input features of your Mac. Mosaic also includes a Kiosk mode that removes some functionality from the program to make it better for public use. Mosaic supports Internet Config and Netscape frames and sports a floating palette that contains the common toolbar buttons that other browsers put in the window itself. If you have Apple's speech synthesis software installed with System 7.5.3, Mosaic can speak the contents of a page. It also passes non-Web URLs to other programs for handling—a handy feature I'd like to see in

other Web browsers. Finally, Mosaic enables you to create custom menus containing links to your favorite sites. Drawbacks include slow speed, a mediocre hotlist feature, and a general lack of stability, along with fewer shortcut features than Netscape or Internet Explorer.



TCP/Connect II

`http://www.intercon.com/products/tcp-connect-mac.html`

InterCon's $495 TCP/Connect II 2.3.1 is one of the oldest Internet programs available for the Macintosh, although it has added a Web browser to its large set of integrated Internet capabilities relatively recently. TCP/Connect II's email and Telnet modules are excellent, and although its Usenet news and FTP modules don't match up to Anarchie or NewsWatcher, its Web browser is pretty good. Written entirely from the ground up, unlike most other Web browsers, which use Mosaic's code, TCP/Connect II's Web browser is extremely fast and has excellent support for drag-and-drop. It doesn't support as many HTML extensions as Netscape or Internet Explorer, and its hotlist capabilities are more limited, but it's quite good. Since TCP/Connect II has so many other modules, the Web browser can easily pass off email, news, FTP, and Gopher URLs to the appropriate other module. TCP/Connect II is far too expensive for me to recommend for individual use, but companies might inquire about volume discounts for site licenses. There's also a version called TCP/Connect II Remote that costs only $195, but it works only over InterPPP II (which is included) or its built-in SLIP or PPP modules.

WebSurfer

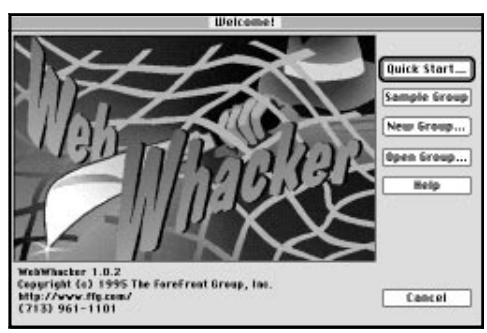
`http://www.netmanage.com/netmanage/products/macapps.html`

NetManage's free WebSurfer for the Macintosh is one of the company's first Macintosh products, since NetManage is primarily known as a developer of Windows Internet tools. Nonetheless, WebSurfer is a credible Web browser. It has relatively low RAM requirements, and in a definite nod to Macintosh technologies, it uses Internet Config. It has a decent hierarchical hotlist, a log of server messages, and supports multiple connections. Unfortunately, like MacWeb, WebSurfer does not enable you to select text for copying to other applications. There's nothing (other than not being able to select text) particularly wrong with WebSurfer—it simply isn't as good as either Netscape Navigator or Internet Explorer. You can download it for free from the Web page above, and it also comes bundled with NetManage's Chameleon for Mac OS package, which includes connectivity and terminal emulation software as well.

WebWhacker

`http://www.ffg.com/whacker.html`

The $49.95 WebWhacker 1.0.2 from the ForeFront Group isn't exactly a Web browser, but it pretends to be one. WebWhacker serves a potentially useful purpose—it can browse through and download all of the files on a Web site (or at a specific level of a Web site). After it's done downloading all the files (graphics included), it rewrites the HTML files so that all the links work, even though the files live on your hard disk rather than on the Web. Then, at your leisure, you can read the entire Web site using any other Web browser that you choose. WebWhacker seems primarily useful to people with slow connections, such as might exist in a school, where an entire classroom could want to view the same site. I'm sure you can think of other uses for it. WebWhacker is bundled with CE Software's WebArranger (see the review coming up). You can also download a free trial version of WebWhacker from the Web site listed above, and purchase from there as well.



Helper Applications

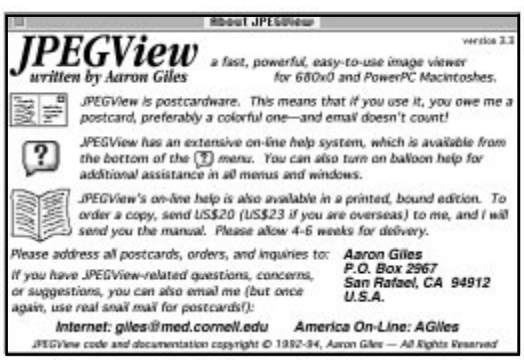
For the most part, Web browsers rely on a common set of helper applications for dealing with certain types of data. There are numerous other applications that you can use as helper applications, but these are the most popular. All are available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/> or in <ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/> unless mentioned otherwise.

> **FYI**
> If a Web browser cannot launch your helper applications properly, try rebuilding your desktop—if the desktop database is out of date, the Web browser might not be able to find the proper helper application. To rebuild your desktop, restart and hold down the Command and Option keys until the Mac asks if you want to rebuild the desktop.

JPEGView

http://www.med.cornell.edu/jpegview.html

Although most Web browsers now display JPEG graphics along with the text and GIF graphics on a Web page, not all of them can do this (1.0 versions of MacWeb particularly). Those that don't send all JPEG images and most other unsupported graphics formats to JPEGView from Aaron Giles, which is postcardware. JPEGView does an admirable job of displaying JPEG images, and is Power Mac native for a significant speed boost for Power Mac users. JPEGView can crop images, resize them, and convert between a number of different formats. It's a staple for other Internet programs that use helper applications as well, such as TurboGopher.



MacBinary II+

Making files available for download via a Web browser is somewhat haphazard, thanks to the way the Macintosh files can have both resources and data forks. The safest method is the standard, BinHex, but a much tighter format is MacBinary, which stores both forks of a normal Mac file together in a single file. (See Chapter 10, "File Formats," for details.) If you want to download a file in MacBinary format (usually indicated by a .bin extension), you

continues

MacBinary II+, *continued*

need a helper application that can decode the MacBinary format, because Web browsers, unlike FTP clients, don't do so automatically. That said, the program you need is Peter Lewis's free MacBinary II+, because it can work with the Web browsers to decode MacBinary files. MacBinary II+ has no interface; if a Web browser doesn't call it automatically, you must drop a MacBinary file on MacBinary II+ to have that file decoded.

MoviePlayer

`http://quicktime.apple.com/`

Although Sparkle (coming up), and even SimpleText, can handle QuickTime movies, Web browsers generally default to using Apple's MoviePlayer (which comes with QuickTime) to display QuickTime movies if they can't handle them any other way. Of course, you must also have QuickTime installed for any of these methods to work. There's nothing to using MoviePlayer—just click the Play button in the lower-left corner of any QuickTime movie to start it playing. In the future, most people will use QuickTime plug-ins or Web browsers like Internet Explorer that can play QuickTime movies directly in the browser window.

QuickTime VR Player

`http://qtvr.quicktime.apple.com/`

QuickTime movies are all fine and nice, but for sheer impressiveness, nothing competes with QuickTime VR, which displays 3-D scenes in which you can fly around. A QuickTime VR plug-in will no doubt appear soon, but in the meantime you need to use Apple's QuickTime VR Player to view QuickTime VR movies. It's worth checking out one or two because they're so neat. The movie files themselves are surprisingly small, given their high resolution and level of detail. To use a QuickTime VR movie, just click the mouse in the window and drag around to pan the scene. Apple plans to create a QuickTime VR plug-in as well.

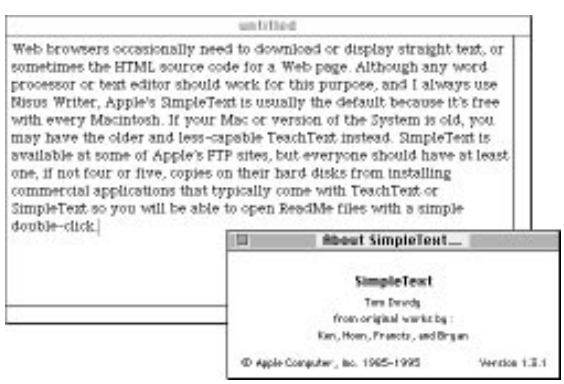
RealAudio

http://www.realaudio.com/

The free RealAudio Player 2.0 is unusual among the Internet audio tools because it can receive both live and prerecorded audio streams. RealAudio can only receive; sending RealAudio data over the Internet requires a RealAudio server, and those are commercial (and pricey). RealAudio works closely with your Web browser, and the way you play a RealAudio data file is by clicking a link in your Web browser that launches the RealAudio Player. Once an audio stream is playing, you can skip around in the audio file, with only a few seconds of silence while the RealAudio Player finds the right spot. Quality is quite good, especially with a 28.8 Kbps modem (it also works with 14.4 Kbps modems). I especially like the way that RealAudio enables me to listen to events when I want to, rather than when they happened. Check out the RealAudio Web site listed above for links to a lot of recordings. RealAudio is also available as a Netscape plug-in.

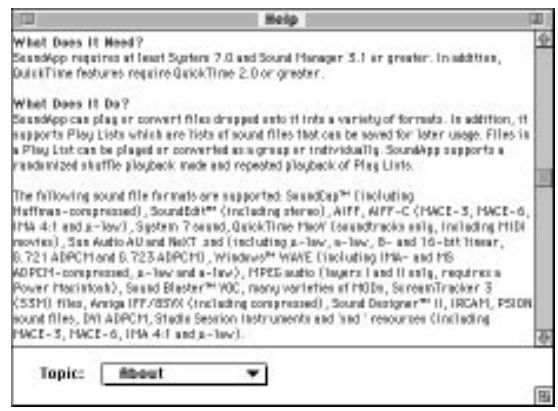
SimpleText

Web browsers occasionally need to download or display straight text, or sometimes the HTML source code for a Web page. Although any word processor or text editor should work for this purpose, and I always use Nisus Writer, Apple's SimpleText is usually the default because it's free with every Macintosh. If your Mac or version of the System is old, you might have the older and less-capable TeachText instead. SimpleText is available at some of Apple's FTP sites, but everyone should have at least one, if not four or five, copies on his or her hard disks from installing commercial applications that typically come with TeachText or SimpleText so you will be able to open their ReadMe files with a simple double-click.



SoundApp

http://www-cs-students.Stanford.EDU/~franke/SoundApp/



Although SoundMachine (reviewed next) seems to be used as the default for most audio files, the most recent version of Norman Franke's free SoundApp 2.0.2 claims to play even more sound formats, including one, the Windows WAVE format, that SoundMachine couldn't handle in the past (it can now). I haven't heard many (okay, any, but I'm not big on downloading sounds) WAVE files, but because they come from the Windows world, you're likely to hit some eventually. SoundApp can handle the Internet standard Sun au format, so you could use it for all of your audio needs.

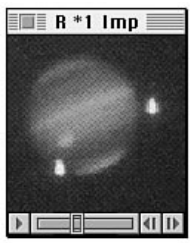
SoundMachine

http://www.anutech.com.au/tprogman/SoundMachine_WWW/welcome.html

Rod Kennedy's $10 shareware SoundMachine 2.6.2 is the most common application for playing the audio files that you run across on the Internet because of its support for the standard Sun au format along with many other sound formats. There are a variety of plug-ins that can also play sounds on Web pages, and Rod plans to create one that works with SoundMachine as well, although it will be available only to registered users of SoundMachine. To use SoundMachine, just click the Play button after a sound has been loaded by the Web browser (you can also open sounds manually).

Sparkle

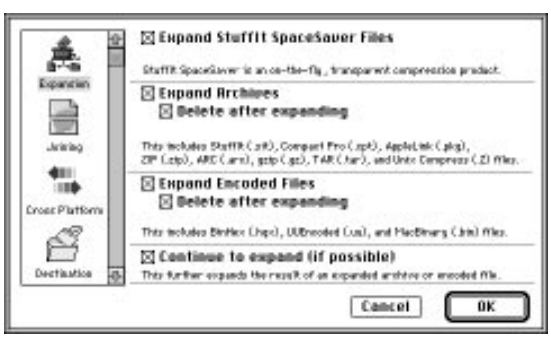
There are two video formats that are fairly common on the Web: QuickTime and MPEG. The most popular MPEG player for the Macintosh is Maynard Handley's free Sparkle. Sparkle can also display PICT files and QuickTime movies, and it contains PowerPC code for optimum movie playing performance on Power Macs. Sparkle requires System 7.5 because it needs a variety of multimedia code that's now bundled with System 7.5. Using Sparkle is just like using MoviePlayer—after you open a movie, click the Play button in the lower-left corner. Unfortunately, Sparkle does not work under System 7.5.2 or 7.5.3, and Maynard has no plans to update it since he's working to add MPEG support to QuickTime, at which point MoviePlayer and any other QuickTime-aware application will be able to play MPEG movies.



StuffIt Expander

`http://www.aladdinsys.com/`

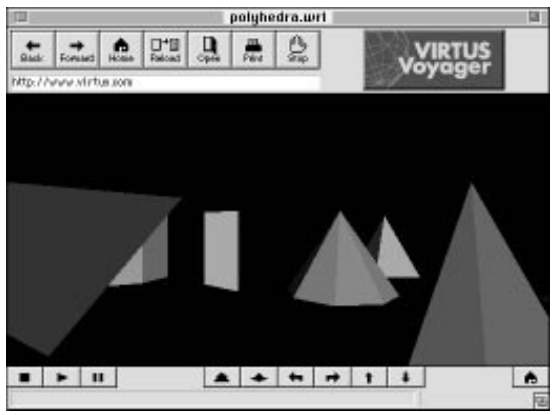
Aladdin Systems' free StuffIt Expander is a necessary part of your Internet toolkit. StuffIt Expander is universally used as a helper application to debinhex files and to expand both StuffIt and Compact Pro archives, along with self-extracting archives created by either of those two programs. If you own one of Aladdin's commercial products or register its shareware DropStuff with Expander Enhancer, StuffIt Expander gains the capability to decode many other formats, including MacBinary, Unix compress, and ZIP files. I encourage everyone to register DropStuff with Expander Enhancer if you want to decode these additional formats—it's a great way to thank Aladdin for making the basic StuffIt Expander available for free.



Virtus Voyager

`http://www.virtus.com/voyager.html`

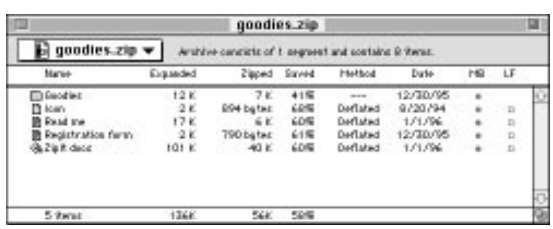
Virtus Voyager version b2 (it's an early beta) is the best-known VRML Web browser available for the Macintosh, although Internet Explorer has some VRML capabilities if you have Apple's QuickDraw 3D loaded. Voyager is more of a helper application than a Web browser—if you try to go to a non-VRML location on the Web, it kicks the URL back out to a normal Web browser. Don't expect to use Voyager much; there aren't many VRML sites on the Web, and most of the good ones are long downloads. A future version of Voyager will become a Netscape plug-in and I hope it will make using Voyager easier and faster.



ZipIt

`http://www.awa.com/softlock/zipit/zipit.html`

The ZIP format that's the standard in the PC world is one of the formats that StuffIt Expander can handle only after you've registered DropStuff with Expander Enhancer or purchased another Aladdin product. While you're getting around to registering DropStuff, you can try out Tommy Brown's $15 shareware ZipIt 1.3.5, which also can decode (and encode) ZIP files. One way or another, please support these shareware efforts. Tommy Brown modeled ZipIt's interface on Compact Pro, although you shouldn't have to interact with the interface to a helper application all that much.



Plug-Ins

If you want to surf the Web on the cutting edge of new technology (and danger), check out plug-ins. Plug-ins "plug in" to your Web browser and enable you to take advantage of nontext files embedded inside Web pages. These files might show movies, play sounds, make your computer read the page's text out loud, display rotating molecules, and more. Often, plug-ins also provide menu commands or toolbar buttons for interacting with or controlling these objects.

Many companies have invested significant resources in creating plug-ins and the tools used to create files associated with plug-ins. In their rush to release this software ahead of the competition, many companies have made available development versions (also known as public beta versions) of software, and this software typically still has bugs and rough edges that will eventually be removed. Even released versions of plug-ins tend to suffer from bugs and from making enormous demands on your connection speed and RAM. If you use plug-ins, be prepared for both thrills and chills. You'll get to try cool new software, but you might also experience frustrating crashes and related problems.

> **BTW**
> Plug-ins work by associating themselves with a particular MIME type. (To learn more about MIME types, see Chapter 13, "All About Email.") When a browser encounters an embedded file, it checks to see if it has a plug-in that supports that file's MIME type. If it does have such a plug-in, the browser loads the embedded file as well as the associated plug-in software.

To install a plug-in, you simply place it in the Plug-ins folder associated with the browser that you want to use. When a browser launches, it checks its Plug-ins folder and notes which plug-ins are installed. When you encounter a file on the Web that a plug-in can handle, the plug-in loads and starts processing the file.

Most plug-ins provide controls. For instance, a plug-in that plays sound might offer a tape-recorder-like interface with Start, Stop, Rewind, and Pause buttons. If you don't see any sort of interface, and the plug-in is displaying an image, try to bring up a control menu by clicking or Command-clicking the image.

Some plug-ins support "streaming," which is quite important. Without streaming, in order to view an animation or listen to a sound, you typically must wait for the entire file to transfer to your Macintosh (and this wait could easily take five to ten minutes). If a file streams, it starts playing as soon as the first bits of it reach your computer, and you can view or listen to the file while the rest of it loads.

The plug-ins mentioned in this section all work, at least in theory, with Internet Explorer 2.0 and Netscape Navigator 2.0, though I make no guarantee that they'll work consistently or reliably on your computer. I expect to see many new releases and increasing stability in plug-ins over the next year or so.

I recommend checking some Web sites that list all the latest versions of plug-ins to stay up-to-date. The best ones are the Hayden Books site at <http://www.mcp.com/hayden/software/plugins.html>, the BrowserWatch site at <http://www.browserwatch.com/plug-in.html>, and MacWEEK's list at <http://www.zdnet.com/macweek/plugins.html>.

Based on my experiences in trying all these plug-ins, I'd like to offer a few tips that might help you avoid crashing and crash-related problems:

- Whenever possible, don't install more than one plug-in for a particular file type (such as MIDI or QuickTime). Although this shouldn't cause problems, I found a number of troubleshooting documents that recommended against this practice.
- If a plug-in is playing something (such as a sound or movie) that you can easily stop, stop the play before you quit your browser or click a link.
- Give your browser plenty of RAM. Check the Read Me file that comes with the plug-in for RAM recommendations. If you don't see any recommendations, try giving your browser an extra 1,000K or 2,000K of RAM. During my testing for this section, I allocated 8,000K of application memory to Netscape Navigator and 8,000K to Internet Explorer.
- Wait five or ten minutes. What looks like a crash might simply be a long delay while a long file downloads.
- Save often and make backups.

Now that we've discussed how plug-ins work and how to install them, let's take a look at some of the available plug-ins. Be sure to note Plug Master especially, which helps you quickly activate and deactivate plug-ins.

A few of these plug-ins are available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/web/> but most are not. Look for them on the Internet Starter Kit CD-ROM, or check their associated Web sites.

FYI

In case you haven't realized it already, much of this software is unreliable. Please try it with care!

Adobe Acrobat PDFViewer Plugin

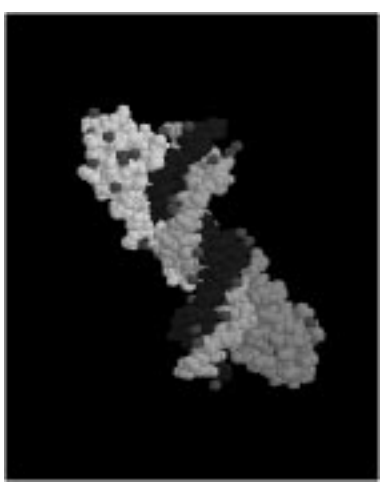
`http://www.adobe.com/acrobat/amber/main.html`

Adobe's free Acrobat plug-in is actually called PDFViewer, but it's also commonly known as the "Amber plug-in," because Amber is Adobe's code name for its associated technology. PDFViewer is currently at version 3.0a2, and it enables you to view PDF files within a Web browser. A PDF file is one that contains all the information necessary to print some other file (perhaps a PageMaker document) to a PostScript printer, or to display the file on-screen. Whether you print a PDF file or view it on-screen, you do not need to have the original software or fonts installed. PDF files can include links to normal Web pages. Similarly, Web pages can have links to PDF files. The idea of PDFs and PDFViewer is much like the idea of Tumbleweed's Envoy, reviewed later in this section.

Chemscape Chime

`http://www.mdli.com/chemscape/chime/chime.html`
`http://www.mdli.com/chemscape/chime/example/rotdna/dna_rot.html`

Having taken a number of college level chemistry classes, I found Chemscape Chime 0.8b fascinating. Like Apple's Whurlplug (reviewed later in this section), Chemscape Chime enables you to view and manipulate 3D objects within a browser window. Chemscape Chime supports a variety of file formats perhaps best known to chemists, and you can view a Chemscape Chime image using all sorts of models (ball and stick, wireframe, dot surface, and so on). You can also make certain types of bonds appear distinctly, start and stop rotations, and more. Chemists (and chemistry students) should find Chemscape Chime a valuable tool, and anyone might enjoy cruising through molecules on occasion. Personally, I enjoyed viewing the DNA molecule shown in the screen shot for this review. Chemscape Chime is free, and it comes from MDL Information Systems.



Crescendo

http://www.liveupdate.com/

Created by LiveUpdate, Crescendo 1.0 enables you to listen to MIDI sounds within the context of a browser window. On the plus side, the LiveUpdate Web site is well organized and has plenty of sample sounds to try. On the minus side, Crescendo doesn't stream MIDI, so it's a bit slow and awkward to use. LiveUpdate is working on Crescendo Plus for the Mac, which will feature streaming. To control a sound in Crescendo, after the sound has loaded, press the Crescendo icon to drop down a menu offering simple controls. Crescendo is free for personal use and inexpensive for commercial use.

Emblaze

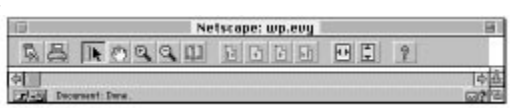
http://www.Geo.Inter.net/Welcome.html

The free Emblaze 1.17b comes from Geo Interactive. Emblaze works much like FutureSplash and Sizzler (mentioned later in this section) in that it displays streaming animations. In my testing, it took a few seconds for the animations to begin, and—annoyingly—I had to wait for an entire animation to play before I could move on to a new link. Additionally, switching out of the browser while an animation played took unexpectedly long. Emblaze plays animations created in Emblaze Creator.

Envoy

http://www.twcorp.com/

Tumbleweed Software makes Envoy 1.0, a file format that enables you to "print" documents from most any program (such as WordPerfect or Microsoft Excel) and turn them into Envoy documents which you can then share with others who don't own the original program. By turning your document into an Envoy document, you retain the document's layout and fonts. The Envoy plug-in enables you to view Envoy documents within a browser window. When you view an Envoy document on the Web, you'll also see an Envoy toolbar, which will help you get around in the document. Envoy works much like Adobe's Acrobat PDFViewer, reviewed earlier in this section.



FutureSplash

`http://www.futurewave.com/`

FutureSplash 1.0, a free plug-in from FutureWave Software, plays silent, streaming animations created for FutureSplash. In addition to viewing animations, you can control them. Controls include the ability to start and stop looping and—interestingly—the ability to zoom in and out. You can zoom in to a surprisingly large level of magnification. To access the controls, Command-click an animation.

ListenUp

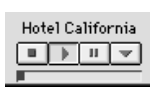
`http://snow.cit.cornell.edu/noon/ListenUp.html`

ListenUp 1.4.1, a free plug-in created by Bill Noon, requires that you be running a Power Macintosh, have System 7.5 or later, and install PlainTalk Speech Recognition software. If you meet those requirements, for a ListenUp-enabled link you can speak the link's name in order to follow it. I found this ability to be quite fun (though my Macintosh didn't always understand me), and I suspect that people who have trouble clicking links will especially appreciate ListenUp-enabled Web sites.

MIDIPlugin

`http://www.planete.net/~amasson/midiplugin.html`

MIDIPlugin 1.2b, free from Arnaud Masson, can play embedded MIDI files through a simple interface offering Start, Stop, and Pause controls as well as optional equalizer bars. MIDIPlugin's pop-up menu offers several commands, including commands for saving a MIDI file to disk and for turning off looping. Although MIDIPlugin is supposed to work in both Netscape and Internet Explorer, its controls didn't appear when I tried it in Internet Explorer.



Plug Master

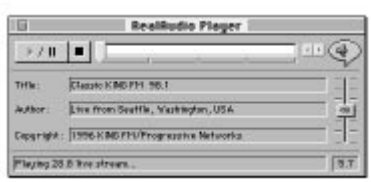
http://www.tc.umn.edu/nlhome/g019/tils0007/tadsoft.html

Mike Tilstra's $5 Plug Master 1.3 provides an easy way to manage your menagerie of browser plug-ins. Plug Master's simple interface enables you to toggle plug-ins off and on, and—after you quit Plug Master for the first time—you'll notice that your Plug-ins folder has been joined by a folder called Plug-ins (disabled). The plug-ins that you turned off will be in that new folder. Plug Master also enables you to store comments and a URL for each plug-in; just Command-click a plug-in's name within Plug Master to see the information dialog.

RealAudio

http://www.realaudio.com/

RealAudio, a recently introduced compression format for sound by Progressive Networks, enables you to hear streamed sound at approximately the quality of an AM radio. RealAudio is a well-known and widely used technology, especially for distributing recordings of radio broadcasts, speeches, and various live events. The RealAudio plug-in, version 2.0, provides on-screen controls for listening to RealAudio sounds, and also can be set up by Web authors to do "synchronized multimedia," in which RealAudio plays a bit of sound that goes with a particular Web page, and when the sound ends, RealAudio automatically changes to the next page and plays a bit of sound associated with the new page. In this way, Real Audio could read a children's story and automatically "turn" the pages. The RealAudio Home Page has links to lots of sounds you might want to listen to, including many NPR broadcasts. Currently, the RealAudio plug-in does not work with Internet Explorer, though you can listen to RealAudio sounds by setting up RealAudio as a helper application.



Shockwave

```
http://www.macromedia.com/index.html
http://www.surftalk.com
```

Macromedia's free Shockwave is one of the most RAM- and disk-hungry plug-ins around, and it's actually three plug-ins. One plug-in enables you to view FreeHand files, one Authorware files, and the last Director files. (FreeHand, Authorware, and Director are all programs made by Macromedia.) Shockwave is most commonly associated with viewing multimedia presentations. I'm afraid that I can't say much about it; although Shockwave has received a great deal of attention in the press, its movies don't stream, and I've found Shockwave to be unusable over my 28.8 modem connection. Shockwave will get even fancier in the future, what with the release of ShockTalk, a plug-in from Digital Dreams that makes it so you can talk to Shockwave-based multimedia presentations.

Sizzler

```
http://www.totallyhip.com/
```

Sizzler 1.0b4 doesn't cause your Macintosh to go up in a cloud of smoke; instead, the (currently) free plug-in from Totally Hip Software shows streaming, silent animations in your browser window. The Sizzler file format makes for reasonably small files sizes, and the small sizes combined with the streaming capability mean you don't have to wait long in order to see animations. Sizzler animations are based on paint-style graphics, and hence tend to have a chunky, computer-generated appearance. Animations first appear looking a little grainy, but they fill in over time.

Talker

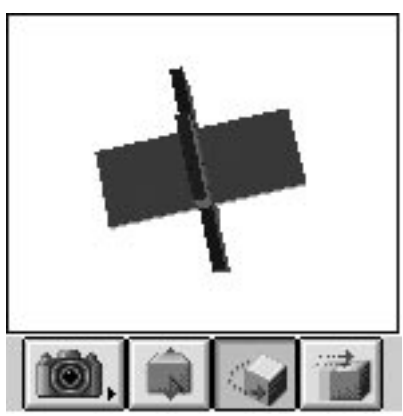
http://www.mvpsolutions.com/PlugInSite/Talker.html

MVP Solutions's Talker 2.0 is a good time. The free plug-in enables you to hear the words displayed on a Web page. A Talker-enabled Web page displays on-screen and then—if you have everything set up correctly—your Macintosh speaks the words showing in the browser window. Web authors can even create their pages such that different bits of text are spoken, or even sung, in different voices. To use Talker, you must have the English-Text-to-Speech component of Apple's PlainTalk technology installed. The Talker Read Me file explains more about how to tell if you have the right software installed, and what to do if you don't.

Whurlplug

http://product.info.apple.com/qd3d/QD3D.HTML

Whurlplug 1.0d6, a demoware plug-in from John Louch, enables you to view and manipulate images in three dimensions. Such images must be in Apple's 3DMF (Three-Dimensional MetaFile) format, a format that works on Macintoshes, Windows machines, and possibly other computer systems as well. To use Whurlplug, you need a Power Macintosh with at least 12 MB RAM and QuickDraw 3D installed. Whurlplug and QuickDraw 3D can both be downloaded from the QuickDraw 3D home page. To control a Whurlplug image, click the image once. If the image has its toolbar enabled, you can click the buttons on the toolbar to switch into different modes. After you are in a mode, drag on the actual image to see it from a different distance or angle. You can also use a number of different keyboard shortcuts, which are documented in the Whurlplug Read Me file.



We've reached the end of the short reviews of different browser plug-ins. Table 16.1 summarizes a number of plug-ins that didn't make it into the reviews section.

Table 16.1 Other Web Plug-Ins

Program Name	Developer	Home Page	Comments
ExpressVR 1.0b0	Brad Anderson	`http://www.cis.upenn.edu/~brada/VRML/ExpressVR.html`	Displays VRML files. Apparently free.
KM's QuickTime Plug 0.2.0	Kevin McMurtrie	None	Shows QuickTime and MPEG movies; supports various sound and graphic formats. Free.
Lightning Strike 1.6	Infinop	`http://www.infinop.com/`	Displays graphics saved with Infinop's wavelet compression. Apparently free.
MacZilla	Knowledge Engineering	`http://maczilla.com/`	Supports several movie and sound formats, though without streaming. Home page gets points for its attitude. Free.
mBED 1.0b2	mBED Software	`http://www.mbed.com/`	Supports streaming multimedia. Free.
MovieStar Plugin 1.0b8	Intelligence at Large	`http://130.91.39.113/moviestar/plugins/`	Plays streaming QuickTime movies and supports QuickTime VR. Free.
RapidTransit	FastMan, Inc.	`http://monsterbit.com/rapidtransit/RTHome.html`	Plays streaming audio in Netscape Navigator. Free.
ShockTalk	Digital Dreams	`http://www.emf.net/~dreams/shocktalk/index.html`	Enables speech recognition in Shockwave movies. Free.
Speech 1.0	Bill Tudor	`http://www.albany.net/~wtudor/speechinfo.html`	Makes Speech-enabled Web pages talk to you. Works much like Talker but without multiple voices. Free.
Tec Player 1.0.3	Tec Solutions	`http://www.tecs.com/`	Displays QuickTime movies. Apparently free.
ViewMovie 1.0a10	Iván Cavero Belaúnde	`http://www.well.com/user/ivanski/download.html`	Displays QuickTime movies. The XT version and ViewMovieXT 1.0a10 supports sound files as well. Free.
WebActive 1.01b6	Plastic Thought	`http://www.3d-Active.com/pages/WebWorks.html`	Displays 3D images that you can manipulate. Free.

Bookmark Managers

The bookmark or hotlist features in most Web browsers were so bad for the first few years of the Web's popularity that many programmers wrote their own programs for managing bookmarks. Most of these programs rely on Internet Config (see Chapter 18, "Utilities and Miscellany") to know what program to launch for any given URL. Other bookmark managers work only with Netscape Navigator. Many of the following programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>` or `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/web/>` and if not, I've listed Web pages or home FTP sites where they're available as well.

Keep in mind that bookmark managers change frequently, perhaps more so than any other class of program I've seen recently (with the possible exception of HTML utilities). As such, the versions I discuss here are almost certain to be out of date by the time you read this book.

Bookmark managers fall into two basic categories: those that use their own databases and interfaces and those that use the Finder.

Database Bookmark Managers

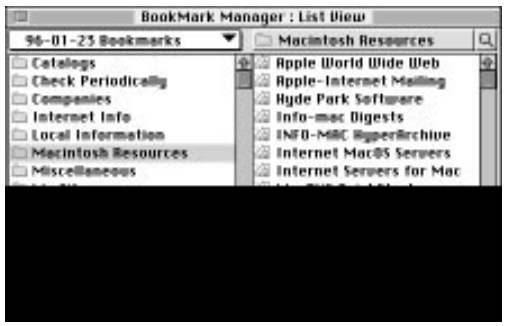
A bookmark manager is basically a database used for tracking bookmarks, and many of the programs that have appeared in this category use their own interface and own database engines to store bookmarks. The advantage of this technique is that performance is generally good and the interface can be customized to work well with URLs. The downside is that you must learn another program and have another program running whenever you're using the Web.

BookMark Manager

`http://www.walrus.com/~noyo/BMReadMe.htm`

Shinjiro Nojimi's $20 shareware BookMark Manager 1.521 is a limited-time demo application that sports a two-pane interface for hierarchical storage of bookmarks. You can go more than two levels deep, but the Find Parent command becomes necessary at that point—more panes would be useful. BookMark Manager has a Find View that enables you find text in the title (fast) or in the URL and text notes for that bookmark (slower). It seems BookMark Manager has all the basics covered in terms of importing,

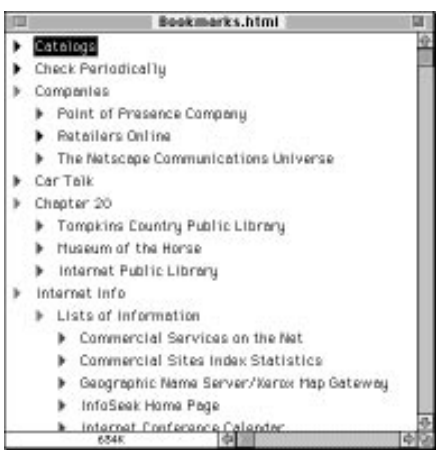
exporting, sorting, and launching URLs, but its interface needs serious work—the buttons are too small and needlessly trying for 3D, the main window isn't resizable, many of the dialogs are unnecessarily complex, and there are confusing menu commands (such as Cancel). Although BookMark Manager can launch URLs once registered, it has no shortcut for grabbing URLs from other applications.



Clay Basket

`http://www.hotwired.com/staff/userland/yabbadabba/`

Dave Winer's Clay Basket, now at 1.0b8, was one of the first bookmark managers, but in its second major incarnation added Web site management features that drove its bookmark management features into the background. Dave tells us Clay Basket's third incarnation will reverse direction. Clay Basket works only with Netscape Navigator and is essentially an outliner, like Frontier's, that displays bookmarks hierarchically. Although you can drag links from Netscape into Clay Basket's outline window, that merely creates a new outline item with the URL as the name; it doesn't make the item hot (you must manually copy the URL into the item's Location window to make it hot). You can launch the URLs associated with normal hot items by double-clicking their outline triangles. However, if you make an item with a URL into a topic heading, you can launch its URL only by opening its Location window and clicking the Send to Netscape button. Clay Basket can import and edit a Netscape bookmarks file, and it offers a Netscape recording mode. Clay Basket supports non-Web URLs, but only through Netscape. Clay Basket is not so much of a bookmark manager but an alternate editor for Netscape's bookmarks file (making it unnecessary with Netscape Navigator 2.0.x).



ClipFiler FKEY

`ftp://mirror.aol.com/pub/info-mac/gui/clip-filer-20-fkey.hqx`

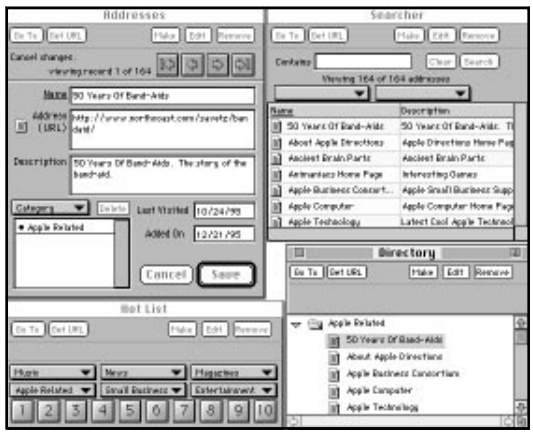
Casey Fleser's $10 shareware ClipFiler FKEY 2.0, despite being the least full-featured of any of the bookmark managers, still gets a strong vote because of its simplicity. You drop a suitcase containing the appropriate FKEY in your Fonts folder, restart your Mac, and from then on, all you have to do capture any text selection is press that FKEY (Shift-Command and a number). ClipFiler saves the selection to a SimpleText document called Clippings on your desktop, and you can use ICeTEe (see Internet Config in Chapter 18, "Utilities and Miscellany") to launch URLs by Command-clicking them. I like ClipFiler because I can easily snag more than just a URL, which makes it great for storing items to check out later. It makes a lousy bookmark manager, of course, but most bookmark managers are mediocre at storing much more than URLs and short descriptions.

DragNet

`http://www.onbasetech.com/DragNet.html`

OnBase Technology's $39.95 DragNet 1.0.6 (with a limited demo) is perhaps the most ambitious bookmark manager. Its four windows provide most any feature you could want. The Addresses window lets you enter, name, and categorize new bookmarks manually. You can search by typing words while no other text fields are selected—a handy though confusing interface. The Directory window looks much like a Finder window in Name view with categories for folders and URLs for files. The Directory window simplifies the task of categorizing URLs and browsing among the categories. The Searcher window lets you find groups of URLs containing a text string. Finally, the Hot List window contains six configurable pop-up menus that hold URLs in a category. Below the six pop-up menus are ten buttons that, much like the buttons on a car radio, provide instant access to frequently visited sites. You can drag an item from any DragNet window to a browser to launch it, or click the omnipresent Go To button.

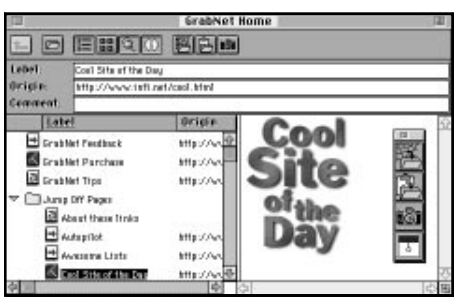
Snagging URLs is generally a matter of drag-and-drop as well, but DragNet can also get the current URL from some browsers, and there's an extension included that intercepts Netscape Navigator 2.0's Add Bookmark menu item and redirects the URL to DragNet's database. Nonetheless, in terms of the commercial database-oriented bookmark managers, DragNet's currently the best.



GrabNet

`http://www.ffg.com/grabnet.html`

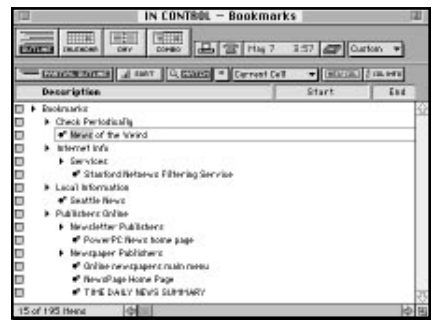
GrabNet 2.0.7, from the ForeFront Group, is a full-featured commercial ($19.95 with a 30-day full demo) bookmark manager. You can drag-and-drop URLs into your GrabNet document (it also can grab the current URL in your browser), and double-clicking an item or dragging it to your browser launches its URL. GrabNet supports hierarchical lists in both name and icon views and enables you to sort them by label (name), origin (URL), and last-visited date. Most interesting about GrabNet, however, is that you can not only create a comment for each URL, but you can also paste in some text or a graphic that displays when you have that URL selected within GrabNet. I'm not sure how I'd use this feature, and it seems like more work than I'd go to while creating URLs. I wasn't thrilled with GrabNet; its interface confused me slightly, and I'm not fond of toolbars and cryptic buttons (especially when they appear in the menus). Other than the capability to find a text string within the database, GrabNet seems to have all the basic features, including HTML import and export.



In Control

`http://www.attain.com/ic40mac.htm`

Attain's $85 In Control 4.0 information manager (with a free limited demo) recently added support for URLs. Like WebArranger, In Control enables you to snag URLs at any time (thanks to an extension) and you can drag-and-drop URLs into In Control. Also like WebArranger, you can organize bookmarks any way you like (thanks to In Control's database capabilities). In Control uses Internet Config, can import bookmarks, and can extract URLs from HTML files. Most interestingly, In Control can identify URLs even in other text that you grab, giving you the context of the surrounding text and the capability to launch the related URL.



Internet Memory

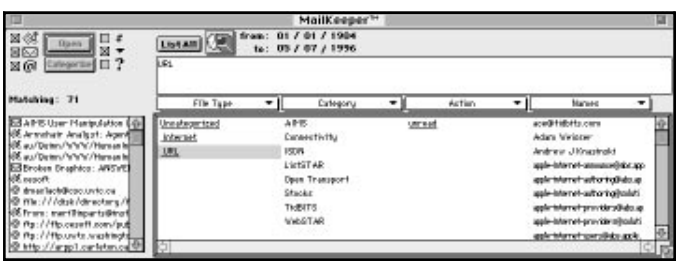
`http://www.circledream.com/inmn.html`

The $20 Internet Memory 1.5 (distributed as a locked, five-item demo) provides a clean interface for adding URLs via drag-and-drop and launching them with a double-click. It supports URLs of a variety of types, but doesn't use Internet Config to match URL types to helper applications. A neat feature is that Internet Memory can minimize its window to just its icon when you launch a URL; clicking that window maximizes it again. Unfortunately, you can't drag URLs into the minimized window. Internet Memory supports multiple address books and multiple folders for organizing URLs hierarchically, which is good, but forces you to edit everything in a dialog, including folder names and URL titles. You can search your address books, and Internet Memory has a Record mode that records URLs you visit with Netscape. Other unusual features include the capability to write-protect or DES encrypt your address books (can't say that I particularly see the need for either), and the capability to store multiple email signatures or other bits of boilerplate text to copy and paste into other applications. Overall, Internet Memory works, but doesn't have much to recommend it over other choices unless you need one of its more unusual features.

MailKeeper

`http://www.nisus-soft.com/mailkeeper.html`

Nisus Software's $35 MailKeeper 1.0.2 (with a 75-record limited demo) does much more than just track URLs. It stores and indexes text of any sort, and includes functionality to handle email addresses and URLs automatically. Storing text requires first copying the text and then pressing a hot key to move the selected text to your MailKeeper database. Drag-and-drop of URLs into MailKeeper also works, and you can drag URLs from MailKeeper to a drag-aware Web browser to launch them. As an added bonus, ICeTEe also works within MailKeeper if your Web browser doesn't support drag-and-drop. MailKeeper's most innovative feature is its method of helping you find items. Called Guided Information Access, it provides you with four user-defined columns of categories. Clicking a category in a column narrows the list of items shown to those that match that category. Clicking another category in the same column or in a different one narrows the list to items that contain both categories. This process enables you to work through large sets of data, and you can supplement it with date restrictions. You can define additional categories for MailKeeper to index automatically when an item is first saved to your database, although the method of getting MailKeeper to do that categorization after the fact is clumsy. MailKeeper suffers primarily from a confusing interface, and it's not dedicated enough to URLs to be ideal. I'd like to see MailKeeper add automatic recategorization when categories are added or deleted and the capability to index and then search an entire Eudora mailbox.



SiteMarker

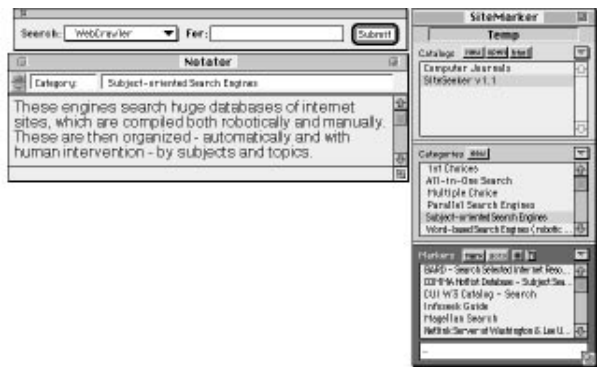
`http://www.rsphere.com/sitemarker/`

Rhythmic Sphere's $12.95 SiteMarker 1.0b5-3 works only with Netscape. It provides an unusual vertical three-pane display, known as a collection. The top pane contains multiple catalogs; the middle pane contains multiple categories within a catalog; and the bottom pane contains markers—the actual URLs within the categories. A number of windoids complete the interface. The Notator windoid lets you add comments to a marker. The Searcher windoid provides an interface to searching many of the main Web search engines and catalogs. The Stylist windoid lets you change the look of your collection window, and—finally—the Button Bar provides quick access to your eight favorite markers.

continues

SiteMarker, *continued*

SiteMarker can import and export HTML, and it has a Browser menu that can control Netscape via Apple events. An unusual item on that menu is Extract Links, which you use to suck all the links out of the current Web page (especially handy for snagging the results of a Yahoo search, for instance). SiteMarker also features a record mode that creates a marker for every page you visit. You can launch URLs by double-clicking or dragging them to Netscape, but you can't drag from Netscape to SiteMarker. Instead, to snag the current URL, you click the Mark button in the SiteMarker collection window or use the Mark command in the Marker menu. Overall, I found SiteMarker full-featured (although it lacks a Find), but sluggish and somewhat clumsy. Still, its record mode and Searcher windoid make it a useful tool.



SurfBoard

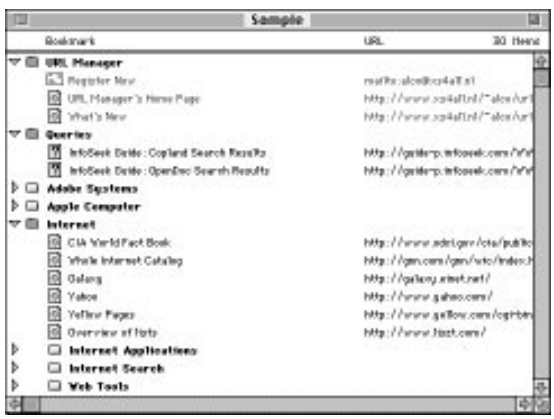
`http://www.abbottsys.com/surf.html`

Abbott Systems' $39 SurfBoard 1.0 is perhaps the most attractive of the bookmark managers I've seen, featuring an interface reminiscent of a futuristic remote control. A tall vertical green button opens the display screen to show your current list of URLs (you can have more than one list). The main list is likely to be long and hard to navigate (although you can sort by name or last access time), so nine "fast dial" buttons in the main screen provide quick access to URLs in categories you set. A blue triangle button at the top of the window lists the last 15 URLs you've visited, and a blue "plus" button grabs the current URL from your Web browser (either Netscape Navigator or Internet Explorer). You can drag links into SurfBoard from Netscape, and SurfBoard can import bookmark lists from both browsers. I haven't used SurfBoard for long, but it looks like a great effort. I'd worry about it bogging down with too many URLs, but its features for making recently accessed URLs available will help a great deal.

URL Manager and URL Manager Pro

`http://www.xs4all.nl/~alco/urlm/`

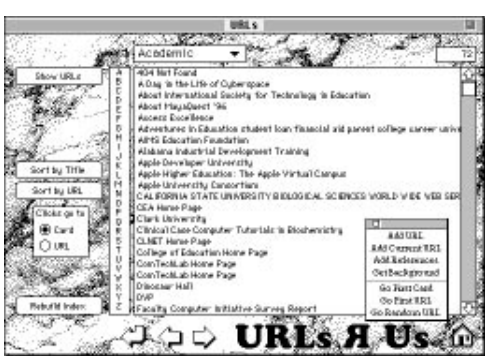
Alco Blom's $15 shareware application, URL Manager 1.1v5, is fast, slick, and easy. Its documents open as Finder-like windows in Name view, but with a faster response time. You create bookmarks by dragging them in from a Web browser, or typing Command-N and editing the bookmark name and URL in place in the list (rather than in a clumsy dialog box). You can search for text in names or URLs, and double-clicking a bookmark launches the URL in your Web browser. You can also open bookmarks in a specified (via Internet Config) helper application. A dedicated menu holds links to the main Web search engines. It's easy to get URLs into other applications, either by dragging or a simple copy and paste. URL Manager can import Netscape's bookmarks, bookmark files saved as HTML (it can even scan for URLs in normal text files), and Anarchie and Fetch bookmark files, and it can export an HTML page of bookmarks. You won't go wrong with URL Manager, and Alco appears to be updating it frequently and with powerful new features. Just as we went to press, Alco released the $25 URL Manager Pro, which is integrated with Netscape's menubar.



URLs R Us

`http://iw.cts.com/~jonpugh/hyperstuff.html`

There are a ton of HyperCard stacks that track URLs, and most of these stacks, useful as they may be for their creators, generally aren't good general-purpose solutions. However, Jon Pugh's URLs R Us stack goes beyond most other HyperCard URL managers because it uses AppleScript to grab URLs from Netscape or the clipboard, can launch them easily, and has various sorting and finding features. Even more unusual are its features to check Web pages, updating a Date visited field and Title field. Jon's stack has a variety of other features as well, so be sure to turn on Balloon Help when exploring its interface. If you use HyperCard all the time anyway, Jon's stack is worth a look.



WabbitDA

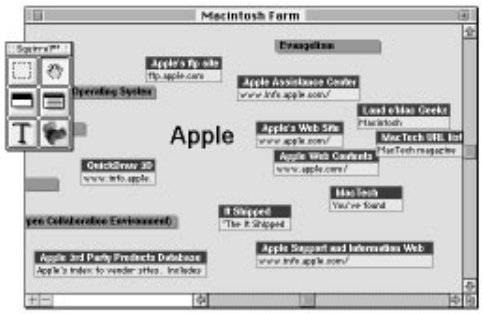
Mel Patrick's freeware WabbitDA 1.4.5 has a lot going for it. It's quick, easy to use, fully supports drag-and-drop, and has flexible search capabilities. You create new bookmarks by either copying them and clicking the New button or dragging them to WabbitDA's window from Netscape or another drag-aware application. WabbitDA can also import bookmarks from Anarchie, Netscape, or another WabbitDA file. You launch URLs by dragging them to a drag-aware application or Command-clicking them in the WabbitDA window. Unusual features in WabbitDA are the grouping of URLs by scheme and the marking of the group by color, along with a stopwatch feature for tracking how much time you spend online. WabbitDA's main drawback is that it's not hierarchical, and although you can create multiple WabbitDA files, you can have only one open at a time. I prefer The URL Manager to WabbitDA, but WabbitDA is quite good, and the price is right.

Web Squirrel

`http://www.eastgate.com/squirrel/Welcome.html`

Eastgate Systems' WebSquirrel 1.0.6 ($49 with a free demo) is the most innovative and unique of the bookmark managers. Drawing inspiration from Eastgate's hypertext editor Storyspace, Web Squirrel uses a graphical layout for storing bookmarks, simplifying navigation with a powerful Find feature and some easily accessed shortcuts. With support for pasting and drag-and-drop (from Web browsers or from other Web Squirrel documents), it's easy to get URLs into Web Squirrel, and a simple double-click launches the URL in the proper Internet Config-defined helper application. Web Squirrel suffers primarily from being somewhat unstable in my testing and from a plethora of unrelated metaphorical terms. This Web squirrel (since when do squirrels spin webs?) creates farms, which contain multiple items (bookmarks) that can be graphically grouped into neighborhoods or textually grouped into lists. You can walk or fly around your farm (what, no horse?). Agents (rather conspicuous on a

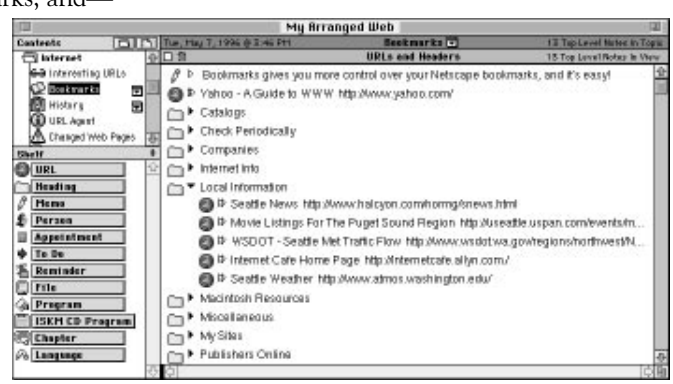
farm in their dark suits) watch the contents of your farm for keywords and continually gather up matching sites. Web Squirrel's graphical display is screen-hungry, but if it were more stable, I'd probably use it since its organizational schemes are actually fun to use.



WebArranger

`http://www.cesoft.com/webarranger/webarrangerpage.html`

CE Software's $99.95 WebArranger 2.0 (with a free demo), is astonishing in its scope, thanks in large part to its heritage as a personal information manager called Arrange from Common Knowledge. WebArranger can grab URLs with a hot key thanks to an extension called Grabber and can launch URLs with a keystroke (ICeTEe's Command-click also works). You can import Netscape bookmarks, and—in an unusual feature—your Netscape History file. WebArranger can check URLs to see if they've changed, record your path through strands of the Web, and even keep trying to get into busy FTP sites. A variety of searching and sorting features are available. On the downside, although WebArranger uses drag-and-drop internally, it doesn't accept URLs dropped into its windows. Perhaps my main criticism is that WebArranger is overkill—if you're willing to devote plenty of time to learning its features and using it constantly, it won't disappoint, but more casual users or those wishing to start using a program quickly will find WebArranger's myriad options and features confusing.



What URL?!

`http://www.panix.com/~nam/whaturl/`

Noah Mittman and Jim Correia's free What URL 1.0a4 is a simple application that accepts URLs dragged into its windows (you can also create bookmarks manually, although not directly in What URL's lists, as in The URL Manager). It's not hierarchical, but you can create multiple windows and drag bookmarks between them. Launching is a matter of a double-clicking the URL in question. There's no sorting or searching, and you can select only one bookmark at a time. One unusual feature is a little padlock icon in the lower left corner of each window, which, when clicked, locks that window against accepting more bookmarks. A second click opens it again.

What URL doesn't match up to The URL Manager currently, but it seems to be improving fast, with the addition of a useful hit counter feature (enabling you to sort sites by the number of times you visit them) in the latest version.

Finder-Based Bookmark Managers

A number of programmers realized that the Macintosh has a built-in method of storing and organizing files: the Finder. When these people wrote bookmark managers, they opted to use the Finder instead of coming up with yet another interface for users to learn. Finder-based bookmark managers have the advantage of being easy to use, but they can be a bit slower than database systems, especially when you store many bookmarks.

In addition, even though a bookmark is extremely small, every file on a Mac must take up some minimum amount of space, depending on how large the hard disk is. The larger the hard disk, the larger this minimum amount of space per file. The reason for this is that every file must use at least one "block" on a hard disk, and the minimum size of a block increases as the hard disk size increases. For instance, a file that is 1,500 bytes in size (very small) takes up 10K of space on my 300 MB hard disk and 30K on my 950 MB disk. So, if you store a lot of bookmarks as individual files, you can waste a lot of space on your hard disk.

A criticism of bookmark managers that rely on the Finder (like CyberFinder) is that they don't seem to have sophisticated searching capabilities. You can search for the name of a bookmark file, but what if you want to search for text that appears in the URL itself? You can if you have System 7.5's Find File program.

Open Find File and select the disk(s) in which you want to search. Click the More Choices button to reveal a second set of menus. From the first pop-up menu, choose creator, and in the text entry field to its right, enter **URL1**. That limits the search to files created by CyberFinder (though you could enter the creator for any bookmark manager). Now, press Option while choosing contents from the second pop-up menu (contents won't appear unless you press Option). Then, type the text you want to find in the text entry field to the right, for example **apple** to find all sites whose URLs contain the string "apple." Finally, click the Find button.

CyberFinder

`http://www.aladdinsys.com/cfintro.htm`

Aladdin Systems' $30 CyberFinder 2.0 control panel (with a 15-day fully functional demo) is completely integrated into the Finder, so your bookmarks appear to be files in Finder windows. CyberFinder can create "libraries" that look like folders in the Finder, and you can store bookmarks for all the common URL schemes in these libraries. Creating new bookmarks is a matter of either grabbing a URL from any application with a user-defined hot key, or pressing Shift and choosing New Bookmark from the Finder's File menu. Replacing Shift with Control toggles that item to New Library. You launch URLs by double-clicking the bookmarks in the Finder or by selecting a URL in any application and pressing another user-defined hot key. The actual URL is accessible if you select the bookmark and choose Get Info from the Finder's File menu.

CyberFinder's power is undeniable, since it piggybacks on the Finder's sorting and searching capabilities, and there are some nice touches, such as opening bookmark files from a variety of Web browsers as libraries (which makes moving to CyberFinder easier). CyberFinder's ease of use is very good, but it also inherits the Finder's clunkiness. In addition, some utilities, like Now Menus, don't see CyberFinder libraries as Macintosh folders, although I circumvent that problem by storing bookmarks in true folders rather than libraries, trading the larger file size of individual files in the Finder for the flexibility offered by Now Menus. CyberFinder has two notable problems: Its bookmarks aren't available unless the control panel is loaded (but see URL Clerk on the following page), and it can't grab the `<title>` tag from a Web page if you're snagging a URL from a Web browser. Overall, however, CyberFinder is my pick for the best and most flexible of the bookmark managers.

DropURL

Perhaps the simplest of the bookmark utilities that rely on the Finder for their database work, Peter Marks's free DropURL 1.4 uses Internet Config to launch a URL listed in the first line of a text file dropped on DropURL. DropURL will also change the creator of text files dropped on it to its own creator so as to facilitate future access (just double-click the file from then on).

Peter also provides a KeyQuencer extension and a SaveURL AppleScript for alternate methods of creating DropURL files.

NetSnagger

`http://rampages.onramp.net/~rmore/netsnagger.html`

Rod Morehead's free NetSnagger 1.1b3 sports only two features. It enables you to create Launchers, which are NetSnagger files you can double-click in the Finder in order to launch the URL associated with them. It also enables you to create Draggers, which are NetSnagger windows that facilitate retrieval of files stored at Info-Mac and UMich mirror sites. You open a Dragger window to a specific mirror, then drag the partial URL to a file (for example, from an Info-Mac Digest) into that window. NetSnagger works with Internet Config to retrieve the file, or, if you're using a Launcher, to launch the appropriate URL with your preferred Web browser. Creating Launchers and Draggers is a bit clumsy, but using them is relatively easy. All sorting and searching of Launchers relies on the Finder, and although it's not as useful or elegant as CyberFinder, NetSnagger is an application and it's free.

URL Clerk

Jeffrey Posnick's freeware URL Clerk 1.1 offers a few features not found in other Finder-using bookmark launchers. URLs (one per file) are stored in text files URL Clerk can create for you if you drop an appropriate text file or clipping file onto the included Bookmarker application. Another option lets URL Clerk convert text or clipping files automatically to its bookmark format after launching them. It can launch CyberFinder bookmarks, which might be handy if you normally use CyberFinder but don't have it loaded. Unfortunately, as with many of the Finder-based bookmark managers, there's no easy way to create URL Clerk bookmark files—you must do it manually in one of a few different ways. Double-clicking any URL

Clerk bookmark launches URL Clerk, which in turn launches the URL in the Internet Config-specified helper application. URL Clerk is simple, but ends up being so simple that it's useful mostly to CyberFinder users.

Web ShortCuts

`http://www.whollymac.com/wholymac.html#Web ShortCuts`

WhollyMac's $18 (with a 15-day trial) Web ShortCuts 1.0 relies on the Finder for all of its searching, sorting, and organizing. Its main claim to fame is that it enables you to create an icon for the Finder file that holds a URL. Creating the icon is as simple as selecting something on-screen, although the entire process requires copying a URL, switching to Web ShortCuts, choosing New from the File menu, pasting in the URL, clicking the Clip Image button, selecting an image to turn into an icon, clicking the Save As button, and finally naming and saving the file in a standard file dialog box. Launching a URL is far easier—you can either double-click it or, if you're running Netscape, you can simply drag the icon from the Finder into the Netscape window. Despite the clever icon-grabbing feature, Web ShortCuts just doesn't seem sufficiently easy, nor does it offer much over free programs like NetSnagger.

WebPinMaker

`http://atom.co.jp/VOYAGER/WebTools/WebPin/WebPinMaker-E.html`

Hisashi Hoda's free WebPinMaker 1.2.4 is an interesting program. At first blush it's just a way of snagging URLs, and then only from Netscape. WebPinMaker creates a small windoid that is always available, floating over all other applications. Clicking the push-pin icon in that windoid snags the current URLs in one of three formats. You set the formats by zooming the windoid and selecting Pin File (a format that CyberFinder will take over if loaded), Netscape URL, or Self Launch. A Pin file is a WebPinMaker file that launches its URL by launching WebPinMaker first. A Netscape URL is the same as what you'd get by dragging a bookmark out of Netscape 2.0's bookmark list. A Self Launch file is

continues

WebPinMaker, *continued*

the self-extracting version of a URL: Double-click it and it launches the URL itself without needing WebPinMaker around (which is true of the Netscape URL file as well, and they're smaller).

Things that Go Bump in the Net: The Web

Although using the Web is often easier than using other Internet services, there are still plenty of things that can go wrong. Many of these aren't your fault and are out of your control, a fact that's both reassuring and frustrating.

Connection Problems

Q: When I try to connect to a Web site, my Web browser puts up a dialog box saying that it can't find the site. Where did it go?

A: If you typed the URL, it's likely that you made a mistake in typing. Check the name and try again. If, on the other hand, you clicked a link to go to the site, then it's more likely that there's something messed up with the domain name of the Web site. There's nothing you can do but try again later.

If you have the problem with every site you try to visit, the problem is almost certainly with your connection. Check back to Chapter 5, "Things that Go Bump in the Net," for more help.

Q: When I try to connect to a Web site, I get a message saying that the server is busy or refusing connections. Why?

A: These messages happen for two main reasons. First, the server might be shut down, usually for maintenance. Second, the server might be totally overloaded at that particular moment. In either case, the simple solution is to try again later. If the problem persists, try sending email to the email address webmaster@domain.com (replacing domain.com with the appropriate domain name). That's a standard address.

Q: I can connect to a Web site, but I get an error message about how the file doesn't exist any more. Where can I find it?

A: It's all too common for Web pages to move, breaking the links that pointed at them. Unfortunately, there's no way to know what the name of the new page is, or even if it exists.

The way you look, though, is to lop the filename off the end of the URL in the Location or Address field in your Web browser. Press Return, and see if the Web server has a default page for that directory. If it doesn't, lop off the last directory from the URL, and try again. Continue this process until all you have left in the URL is the name of the Web server. You will get some sort of a page at that point, and you must wend your way back down through all the links to find the original page you wanted, though it may no longer exist.

Q: When I visit some Web pages, I get an error 401 or 403 instead of the page I want. What do those errors mean?

A: Error 401 is the code for Unauthorized, and 403 is Forbidden. Essentially, both indicate that you don't have permission to read those pages. If you think you should be able to read them, contact the people who run the Web server.

Q: When I load Web pages, I see icons instead of graphics. How do I see the graphics?

A: Look for an option in the preferences for your Web browser that's called something like Autoload Images. It's probably off.

Q: I get some of the graphics when I load a Web page, but not all of them. How can I see the rest?

A: Partial loading of graphics generally indicates some sort of a problem with the Web server. You can usually load any individual graphic by clicking it, but that won't work if there's something wrong with the graphic file itself. You might also try reloading the entire page—sometimes that can bring in "broken" graphics.

If you use an old version of MacWeb, the graphics that don't display are probably JPEG graphics, which MacWeb can't handle on its own. Either switch to a different Web browser like Internet Explorer or download a copy of JPEGView, which MacWeb uses to display JPEG graphics.

Q: There's a broken link on a Web page that I visited. What should I do about it?

A: You can ignore it, or, if you want, you can send email to webmaster@domain.com (replace domain.com with the appropriate domain name). Make sure to let them know the URL of the broken link and the URL to the Web page that contains the broken link.

Q: When I return to a site I've visited previously, it seems like it should have changed, but it hasn't. What's wrong?

A: For some reason, your Web browser is probably showing you a cached version of the page. From the View menu, choose Refresh or Reload. That forces the Web browser to retrieve a new copy of the page.

Downloading Files

Q: When I click a link in a Web page, my Web browser says that it doesn't know what to do with the file and asks me if I want to save it. What should I do?

A: In general, always save such files. The problem is that your Web browser doesn't know how to handle files of whatever type you've found. If you know how to handle them (the Web page containing the link usually tells you), then you can open the file manually after it has downloaded.

You might need to download a new helper application; if so, the Web page containing the offending file should provide information about what you need.

Finally, if in the case of Internet Explorer or Netscape Navigator, you might need a specific plug-in. Again, the Web page containing the offending file should provide a link to the plug-in you need. Just download the plug-in, quit the browser application, drop the plug-in into your Plug-ins folder, and launch your Web browser again.

Q: My Web browser is complaining that it doesn't know what to do with BinHex files, and it used to be able to deal with them fine. What's gone wrong?

A: I suspect you need to rebuild your desktop so your Web browser can find StuffIt Expander. If this is the case, other helper applications probably won't work either. To rebuild your desktop, restart your Mac while pressing Command-Option. When the Mac asks, tell it to rebuild the desktop.

Q: When I drag a link from Netscape Navigator's browser window to the Finder, it downloads the file properly but doesn't call StuffIt Expander to decode it. Why not?

A: I wish I knew. You have to drop such files on StuffIt Expander yourself, after they finish downloading.

Q: When I try to download a file, I get tons of ASCII gobbledygook on my screen instead. What's happening?

A: This is usually indicative of a Web server being set up incorrectly such that it doesn't realize BinHex files are files, not Web pages. There's not a lot you can do about it other than contact the people who run the Web server and let them know. You might try letting the entire page download, select all the text, paste it into a text document, and then drop it on StuffIt Expander.

Q: When I'm downloading a file in Microsoft Internet Explorer, I sometimes interrupt my download by clicking a URL in another program. Is there any way I can avoid this?

A: There isn't a great solution with the current version of Internet Explorer, but what I do is start the download in the main window, then immediately open a new window by choosing New

Window from the File menu. You can also click the file link and hold, and from the pop-up menu that appears choose Open Link in New Window. Make sure then to switch back to your main window, since any new URLs will open in the frontmost window.

Other Problems

Q: My Web browser has started crashing a lot. Any suggestions?

A: The main cause for Web browsers, including both Netscape Navigator and Internet Explorer, to start crashing when they didn't previously is a corrupted preferences file. In the Preferences folder in the System Folder, look for either the Netscape folder or the Explorer folder. Inside those folders are the preferences files; just throw out the appropriate preferences file and launch the browser again. You must reset all of your options again, but it's a small price to pay.

If the problem continues, throw out the entire Netscape or Explorer folder from your Preferences folder, run Apple's Disk First Aid (it should have been installed for you, or it may live on your original disks), and then run the Web browser again.

Q: My Web browser crashes when I go to certain pages. Why?

A: Because they're badly written. Seriously, there are some pages that use HTML that can crash certain browsers. Try to avoid those pages after you've visited them once.

It's most likely that the pages that crash browsers use a plug-in that's the culprit. Get a more recent version of that plug-in or just delete it entirely.

Q: What is Netscape Navigator doing when it says it's cleaning up the cache?

A: It's deleting tens if not hundreds of files that it has downloaded to provide faster access to those Web pages in the future. Never interrupt Netscape when it's removing cache files—some people have had it cause hard disk problems by doing that.

Q: How do I save a graphic from a Web page?

A: Just click the graphic and hold until a pop-up menu appears. One of the options should be something like Save This Image. In Netscape, you can also drag images to the Finder to save them.

Remember that graphics are usually copyrighted works, and it's not only impolite but illegal to copy them unless you have permission.

Q: Can I change the page my Web browser loads at startup? The current one is too slow.

A: Sure, just look in the preferences for an option to change your home page. You can set it to a page that your Internet provider serves, to a file on your hard disk (use Open File from the File

menu to open the file so you can copy the URL from the Location or Address field), or to nothing at all (which is what I currently use).

Q: I don't like the font my Web browser is set to. Can I change it?

A: Absolutely. Just look in the preferences for an option that controls font and font size. Many people find the default fonts too small for extended reading. I personally like New York 12 point.

Q: I think some of the backgrounds on Web pages make them almost unreadable. Can I turn them off?

A: Yes. Again, look in the preferences for options to control background color. There's generally a option that tells the Web browser to use whatever is on the page. Turn that option off, and specify a background color that you find easy to read with standard black text. I recommend plain white or light gray.

Chapter 17 Real-Time Communications

Contents:

- Text Communications
- Audio Communications
- Video Communications
- Games

For many people, the major attraction of the Internet is not that it enables them to find useful information but that it enables them to communicate with other people. That desire to connect with other individuals is what drives the popularity of email and Usenet news. As much as email and Usenet news are quick and efficient methods of communicating, they don't take place in real time, which simply means that as you type your email message to me, I'm not reading it. In contrast, if we are talking on the phone, as you speak, I hear your words.

Because the Internet spans the globe with all of its different time zones, technologies such as email and Usenet news work well, since you don't have to worry at all about the recipient being awake, at the computer, and ready to deal with you. You can send your message and the recipient reads it when she likes.

However, the same speed that enables an email message to cross the country in a matter of seconds enables a number of real-time communication technologies as well. These technologies enable you to communicate with someone on the other side of the room, the other side of the country, or even the other side of the world, and you're not likely to notice much difference.

These communication technologies aren't just for communicating with a single individual. After the basic infrastructure is in place, you can use the Internet for more interesting types of communications, including things such as IRC (Internet Relay Chat), which is the text equivalent of chat

lines, in which a number of people can all be in the same "room" at the same time. Or, if you take IRC to a higher level, you end up with a MUD (Multi-User Dimension), a virtual world described in text that exists primarily in the imaginations of the people who populate it.

The earliest forms of real-time communication had to work over a much slower Internet of days past, and as a result, they sent nothing other than text. As most of the connections to the Internet have increased in speed, though, more interesting methods of communication have appeared, including audio and video. Not only can you have the equivalent of a telephone conversation with someone over the Internet, but you can also go beyond the capabilities of today's common telephone and have a videoconference, in which you can see each other while you converse. Some companies have gone even further, broadcasting audio and even video of major events.

Before I touch on these technologies, I'd like to offer some perspective. I think many of these methods of communicating are technically impressive, but it's often more of a case that it's impressive that the bear is dancing at all than that the bear is dancing well. The quality of audio and video transmissions in particular is quite lousy, and if it weren't for the sheer sexiness of what they enable you to do, I doubt most people would ever give them a second thought.

Aside from the technical problems with many of these technologies, I question their utility in many cases. It's easy to think of perfectly valid uses for real-time communication technologies, but for the most part, I deplore the way that they bind us to a specific place, the computer, and to specific times. I appreciate technology that enables me to live my life more as I want, free of arbitrary schedules and locations. That's why I love using the VCR so much—I can set it to tape all of my favorite television shows, and then I can watch them whenever I want. I can even take the tapes to a friend's house and watch the show with my friend. The VCR enables me to determine when and where I watch television, rather than living my life by the dictates of the television conglomerates that want me to spend an hour every Saturday evening watching *Star Trek*.

If you think about Internet email and Usenet news, they've always worked like the VCR, storing messages until you're ready to read them. There's no reason you have to be connected to the Internet every Sunday at 3:00 PM just to read a newsgroup that's talking about the NBA basketball playoffs. Those messages will still be there the next time you feel like reading them.

Now, however, we're being given the capability to communicate in real time with other people over the Internet and to receive audio and video broadcasts in real time as well. All of a sudden, these technologies have the power to force us to live our lives around the whims and schedules of others. I don't know about you, but that doesn't improve my life. If I want to eat dinner at a certain time, I don't want to worry about what I might be missing on the Internet any more than I worry about what I might be missing on the television.

All I ask, then, is that when you think about using these technologies, you think about how to make them serve your needs. Don't let them force you into rescheduling your life just because it's convenient for someone else on the Internet to do something at a specific time. I'd especially caution you about live broadcasts on the Internet—there's no reason the people presenting such broadcasts can't make the information available after the fact so you can download it and experience it on your time, not theirs. We already have television—we don't need to turn the Internet into television as well.

On the positive side, real-time Internet communications can be used for some truly interesting things, such as distance learning for students in remote areas, Internet conferencing for businesses that enables them to save money and reduce the environmental waste of commuting long distances, and even simple things as members of a family getting together every week or so for a chat session.

That said, I divide this chapter into four main sections based on how the communication takes place: through text, audio, video, or some completely alternate interface (such as a game of chess).

Text Communications

For the longest time, it was only possible to communicate in real time over the Internet if you restricted the communication to standard text. All other forms of real-time communication require fast connections, whereas even the slowest modems can basically handle the textual give-and-take of most real-time communications.

In the sections below, I first want to look briefly at a class of programs, Telnet programs, that are often used to access various real-time communication services such as IRC and MUDs, and from there I'll get into the specifics.

Telnet

Using Telnet is like using a modem to connect to another computer. Telnet enables you to connect to a computer somewhere else on the Internet and to do whatever that computer enables you to do. When you telnet to another machine, you generally telnet into a specific program that provides certain capabilities, ranging from searching databases to chatting with other people on the same machine. For instance, you might be able to telnet into a online card catalog at a library in another part of the world, and use it just as though you were in that library. Taking out a book is more difficult, though. Luckily, most services that worked via Telnet in the past are being moved to the Web, which provides a much better interface.

When will you use Telnet? For the most part, you won't. You can use Telnet to access IRC and MUDs, but IRC and MUD client programs often work better. You may occasionally run into a `telnet` URL in a Web page, at which point your Web browser will try to launch a Telnet program as a helper application. Most likely, though, you'll use Telnet to access a Unix account that goes with your PPP dialup account. After you've connected to your provider's machine via Telnet, you can type Unix commands and see the results on-screen. It's a blast from the past, and if you've never used Unix, I don't recommend starting. Just remember that you use Telnet to access your Unix account if the tech support folks at your provider ever ask you to try something on it while troubleshooting.

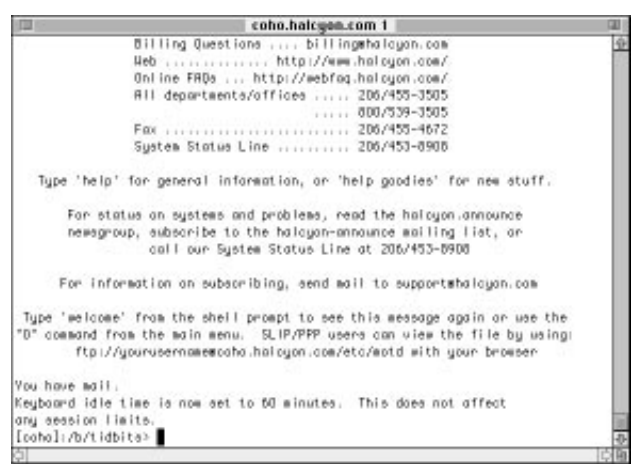
What might you look for in a Telnet program? For the most part, Telnet programs are extremely simple because they have to deal only with displaying text on-screen. Features that make that any easier are always useful, so it's handy to be able to save connection documents that handle connecting to a specific machine (but beware of security issues if they also store your password). Also, any sort of macro capability will help with automating repetitive keystrokes. You also might want a feature for capturing the text that flows by for future reference. And, a good Telnet program will support copy and paste, since you can never tell what you might want to save out or paste into a stream of text.

Most of the following programs are available in <`ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/`>, and where possible, I've listed their Web pages.

NCSA Telnet

`ftp://ftp.ncsa.uiuc.edu/Mac/Telnet/`

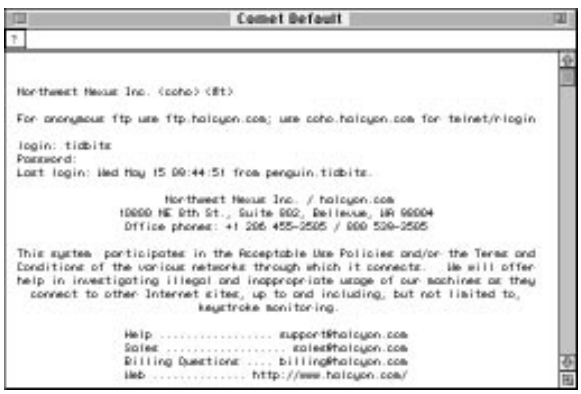
The public domain NCSA Telnet was written by the same organization that created NCSA Mosaic, although NCSA Telnet has been around a lot longer. Unfortunately, NCSA has ceased to work on NCSA Telnet, so the current version 2.7b4 is also the last. NCSA Telnet is the undisputed Telnet program of choice even given the lack of development, and 2.7b4 has some innovative features that helped give it that reputation. NCSA Telnet enables you to configure a number of features about your terminal window, including text size, font, and color. The program supports drag-and-drop, can save connection documents (and even sets of connection documents that are opened at the same time), and enables you to Command-click URLs to launch them in the proper application.



dataComet

`http://www.databeast.com/bonze/`

The $30 shareware dataComet from databeast adds a number of features on top of the basic feature set in NCSA Telnet. dataComet enables you to save session logs to disk, can create and edit text documents within the program itself, supports Command-clicking of URLs, provides macros and macro recording, supports AppleScript, and has a variety of other features. Perhaps the most important fact about dataComet is that databeast continues to support and enhance the program, which isn't true of NCSA Telnet. If you need a powerful Telnet client (it also supports TN3270, a form of terminal emulation necessary for accessing certain IBM mainframes), dataComet is a good choice.



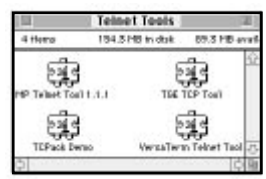
TN3270

NCSA Telnet cannot handle all the mainframe sites that you might want to explore. Some IBM mainframes use 3270 terminals, and without delving into the ugly details, let me say that if you want to telnet to one of these machines, you must use either dataComet or the free TN3270 2.5b2, which looks as though it were based on NCSA Telnet. TN3270 is similar to NCSA Telnet and now includes Power Mac-native code, support for drag-and-drop, and support for authenticated and encrypted sessions where available.

Telnet CTB Tools

`ftp://ftp.tidbits.com/pub/tidbits/tisk/ctb/`

Several Communications Toolbox (CTB) tools for Telnet also exist. These tools should work with any CTB-aware communications application, such as the free Termy, the shareware Black Night, MicroPhone II, SITcomm, or Communicate. I know of four main Telnet tools at the moment. MicroPhone Pro ships with one called the MP Telnet Tool; VersaTerm includes the VersaTerm Telnet Tool; Tim Endres has written a free one called TGE TCP Tool; and there's a demo of the TCPack Tool that AOL uses. There's not much to differentiate these tools because all they do is enable a CTB-aware terminal emulator to pretend to be a Telnet application. All provide methods of listing commonly accessed hosts—the most important user feature. I have had trouble with all of them, which may be the fault of the various applications I was using, but I've had the best luck with the VersaTerm Telnet Tool. You can get the TGE TCP Tool, along with a demo of the TCPack Tool, at the FTP URL above.



Text Chatting

One of the programs that Telnet provided access to in the old days was a simple program called Talk that ran on Unix machines and other large computers on the Internet. Talk enabled you and another person on the Internet to type messages back and forth to one another. Variants came out that split the screen in two so you could type in one half and your friend could type in the other. After some time, a Talk program finally appeared for the Mac, so you could talk with someone on the other side of the world without using a Unix machine (considering that the Mac Talk program came from Peter Lewis in Australia, it was literally used on the other side of the world).

Programs such as Talk were soon supplemented by services such as RELAY on BITNET and IRC on the Internet that enabled a lot of people to share in the same discussion. For a long time, Telnet was still the only way to access these services, but then a couple of semi-graphical Macintosh applications appeared that were dedicated to making IRC easier to use.

IRC was written by Jarkko Oikarinen of Finland in 1988 and has spread widely. People gather in IRC groups called "channels," usually devoted to some specific subject. Private conversations also are possible.

I've never messed with IRC much, having had some boring experiences with RELAY, a similar service on BITNET, back in college. The few times I've used IRC, I've found the discussions to be equally dull. I find the amount of useful, or even interesting, information

there almost nonexistent, and I have no desire to make small talk with strangers. Nevertheless, IRC is one of the most popular Internet services. Thousands of people connect to IRC servers throughout any given day. To give you an idea of how IRC discussions can proceed, my friend Bill Dickson and I met with some people he knows through a shared-fiction world called Superguy. A much-abbreviated transcript follows. Keep in mind the fact that Bill knows these people pretty well. As a result, a lot of the silliness is the product of years of practice. I suspect there was some beer involved as well.

IRC Sample Transcript

```
*** Server:    AdamEngst has joined channel #superguy
*** Server:    BillDcksn has joined channel #superguy
<BillDcksn>    All right, everybody, Adam's going to switch into grayscale and take a
               snapshot.
<AdamEngst>    Smile for the snapshot...
<the_Swede>    heh...
<Superuser>    Won't that hurt?
<the_Swede>    my, i feel so... grey...
<Rubicon>      Cheese!!!!!!!!!! <Bill's, that is>
<the_Swede>    beeeer!
<Superuser>    Prozac!!!
<AdamEngst>    OK, after a brief trip to Kansas, we're back in Oz again.
<Superuser>    Wait, my hair...!
*** Action:    the_Swede loans Superuser his hair...
<Superuser>    And just what were you doing with my hair in the first place? Wait...
               I don't want to know...
<Rubicon>      Well, you know - Prozac can be your friend.
<Superuser>    I thought that was cholesterol.
<BillDcksn>    So didn't we have some interview questions or something?
<AdamEngst>    OK, first question - perhaps stupid. Do you get anything "productive"
               done on IRC? Or is email more useful? Obviously it depends on your
               definition of productive.
<the_Swede>    what... this isn't productive?
<Superuser>    Well, we collaborate a lot on Superguy writing, and it's easier to
               discuss things live than via mail.
<Rubicon>      Productive... well, as a cowriter of Superguy, I'd have to say yes.
               It's a place where I can contact other of my Superguy authors and
               discuss upcoming events and the like.
<the_Swede>    the only time i recall ever doing something productive here is while
               the bills and i were working on a storyline back in december...
<Superuser>    In case you haven't guessed, we don't use IRC for work purposes.
<the_Swede>    i don't have net access at work, as they expect me to do actual work
               or something...
<Superuser>    The fiends.
```

```
<BillDcksn>   Well, unless we can turn Superguy into a meal ticket...
<Superuser>   I just had a meal, thank you...
<Rubicon>     Well — I can list some 'practical' applications.
<Superuser>   Go ahead: I dare you.
<Rubicon>     In my guise as a mild-mannered English Lit type person, I have had
              actual scholarly discourse on here — and therefore I have found
              productive use of IRC. Nah nah nah
<BillDcksn>   Okay, guys, this is for Adam's benefit. And don't try to lie, because
              I know the answer:
<the_Swede>   awww... telling the truth's no fun...
<Superuser>   No, you can't borrow any money.
<Rubicon>     So what's the next question, o Writer-types? :)
<BillDcksn>   Would you say your electronic persona, in an environment like IRC, is
              different from your real-life persona?
<Superuser>   What real-life persona...
<BillDcksn>   Oooooo, good answer :)
<Superuser>   Hell™, I barely have a real-life, let alone a persona...
<the_Swede>   in IRC? not really... i'm not on often enough for that... on the muck,
              yes...
<Rubicon>     Ooo... tough question...
<Superuser>   Dowh!
<the_Swede>   okey dokey...:)
<Rubicon>     I would say my electronic persona is very like my real persona — my
              friends who I have met online and then met in life say I'm a lot like
              who I say I am on the net :)
<Superuser>   Except that in real-life, he looks like a hot-dog vendor. :)
<BillDcksn>   Two points!
<the_Swede>   or, without his beard, like one of the super mario brothers...
<Rubicon>     Hey, Bill - they know what I look like. I'm on their screen, remember?
<BillDcksn>   Adopts an interviewer persona. "So then, would you say that people
              sign onto IRC to insult each other?"
<Superuser>   %^&^#&*(%*(O^*!
<the_Swede>   *^(&*^%%$#%&*(%*&%^&^$&#^!
<AdamEngst>   Seems the answer is yes.
<the_Swede>   umm... well, actually, not really...
<Superuser>   Hmm... you are going to edit all this before putting it into the book,
              yes?
<AdamEngst>   Maybe. They're going to like the insulting parts of the book, Bill.
<Superuser>   I thought we were the insulting parts of the book.
<the_Swede>   hey, readers! your mothers dress you funny!
```

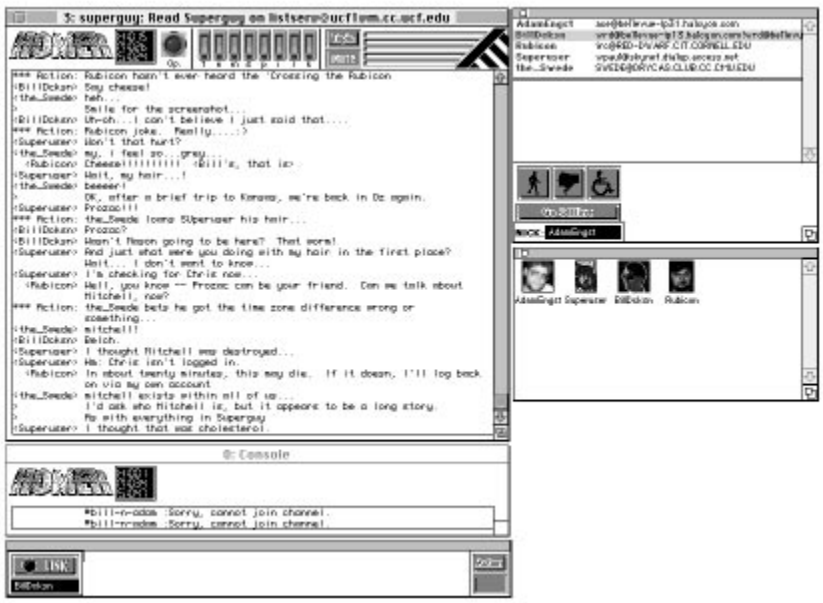


Figure 17.1 Example of an IRC conversation in Homer.

On that note…To be fair, different IRC channels carry completely different conversations, and you can't really judge IRC as a whole by what you might experience in one channel. Now let's look at some of the programs you can use to chat with other people by typing, either directly or through IRC. Most of the following programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>`, and where possible, I've also listed their Web pages.

Co-motion for Internet

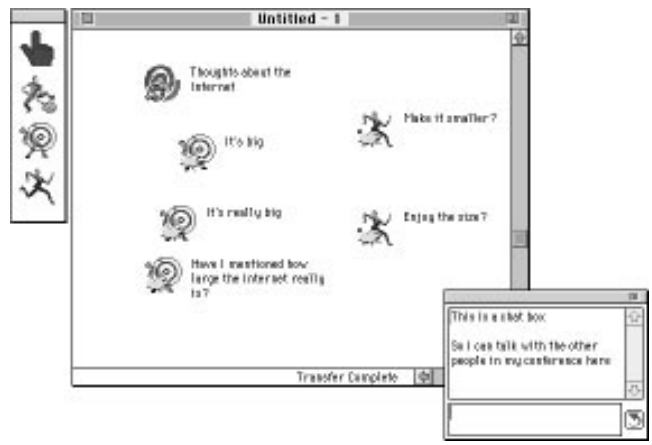
`http://www.bittco.com/`

Chatting is all fine and nice, but what about when you need to do some brainstorming? That's when you need the $30 shareware Co-motion for Internet 1.9.1. Co-motion was designed to encourage collaboration and idea generation among a group of people, and it includes tools for annotating and evaluating ideas, as well as tools for printing a variety of reports about

continues

Co-motion for Internet, *continued*

what was discussed during a session. Co-motion for the Internet isn't one of those applications you'll pick up immediately, but if it helps you avoid plane trips, it will be well worth every penny. Of all the applications that aim more for conferencing than chatting, Co-motion is the most understandable.



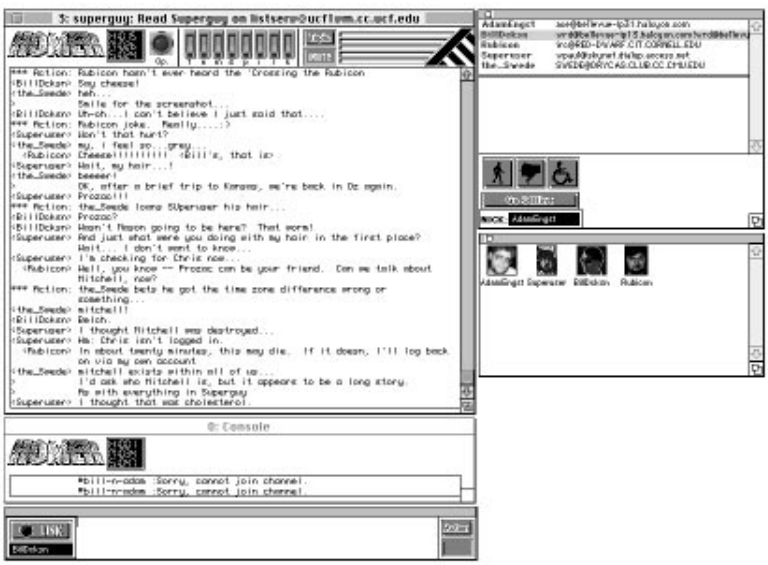
GlobalChat

`http://www.qdeck.com/chat/`

Quarterdeck's free GlobalChat 1.2.8 is a full IRC client that you can use just as you would Homer or ircle, discussed later in this section. What sets GlobalChat apart from the other two is that you can access chats by clicking a link in a Web page. Since one of the hardest parts of IRC is connecting to a server, this capability is a major improvement. However, despite this feature and GlobalChat's clean interface, it doesn't have nearly as many features as either Homer or ircle for straight IRC usage. GlobalChat also works with GlobalStage servers from Quarterdeck.

Homer

Homer .94 enables you to participate in worldwide Internet chats from the comfort of your Mac. Homer has a colorful and unique interface that makes using IRC significantly easier because it simplifies switching channels, keeping multiple discussions going, giving and taking operator privileges, and much more. The latest release of Homer added support for Apple's PlainTalk technology, so Homer can speak all or some of what goes on in your IRC discussion. With the addition of Face resources, it can even display a picture of the people with whom you're typing. Unfortunately, Homer hasn't been updated in a long time and it appears that the program may have been orphaned. If it works for you, great, if not, try ircle.



ircle

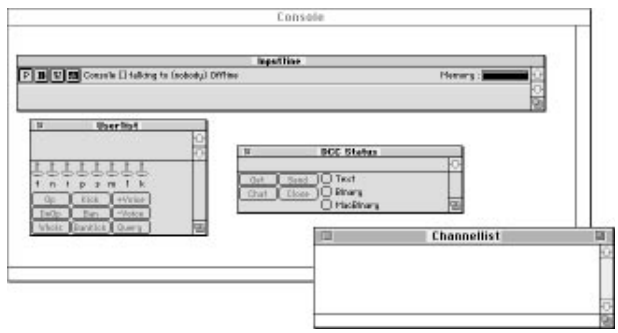
`http://www.xs4all.nl/~ircle/`

Onno Tijdgat's $15 shareware ircle 2.5 (based on code from Olaf Titz until version 1.5.6) takes a more traditional approach to IRC than does Homer (typed commands rather than buttons), although it has some nice features such as user-definable shortcuts for common phrases, the capability of capturing a conversation to a file, font and size control for different people, face support for pictures of people, color and sound support, and the capability to speak

continues

ircle, *continued*

incoming text. Considering that Homer seems to have been ignored for some time, ircle is perhaps the IRC client of choice. The ircle Web page contains useful information about ircle and IRC in general.



Palace

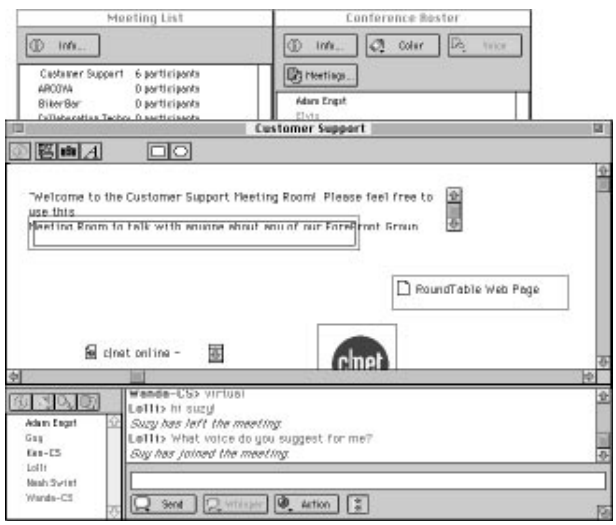
`http://www.thepalace.com/`

The $20 Palace 1.5 from Time Warner is, well, a bit hard to describe. Palace isn't much more than a chatting environment such as IRC, but it expands on the IRC concept by putting everyone in a graphical room. Each person has an associated icon (you can customize your icon if you register) and what you type appears over your icon in a speech balloon (it also appears in a normal scrolling window). You can have Palace make sounds by typing special commands, and you can add your own sounds as well. Multiple rooms are available in the Mansion, which is the main site for the Palace, but if you register you can run your own Palace server as well. Like GlobalChat, links can be made into Palace servers from the Web (Time Warner keeps a dynamic Palace Directory of all current sites), and links can also go from a Palace server out to the Web. Visit the Palace's Web site for lists of events and other information about the program.

RoundTable

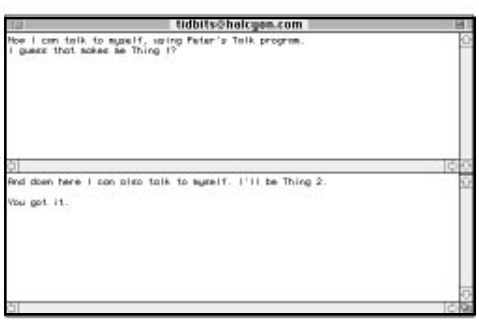
`http://www.ffg.com/rt.html`

The ForeFront Group's RoundTable (the client is free, the server is $5,000) is more than just a chatting program—it's designed for conferencing and supports sharing of graphics, Macintosh documents, URLs, audio, and video in a shared workspace. I include RoundTable in this section because it seems primarily oriented to text communication. Links on Web pages can point to RoundTable conferences, which run on the ForeFront Conference Server (RoundTable is not an IRC client). Its feature set sounds impressive—you can drag images and documents to or from the shared workspace to upload or download, for instance, but I found using RoundTable confusing. RoundTable isn't final yet, but is worth a look if you're interested in online conferencing.



Talk

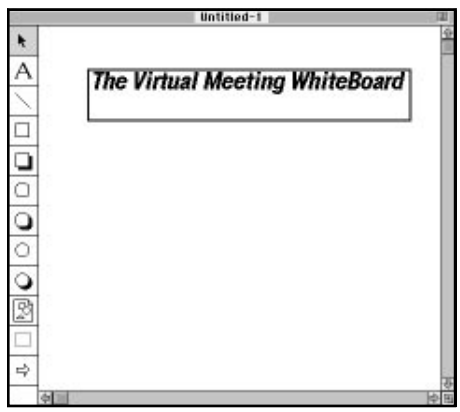
The $5 shareware Talk 1.1.1 is yet another useful program from Peter Lewis. Talk implements the Unix Talk protocol on the Mac, providing a decent Macintosh interface in the process. I've taken to using Talk all the time, not to chat with strangers on the Internet, but so Tonya and I can communicate small bits of information that aren't worth a full interruption (especially when the other one is talking on the phone). Talk provides a two-paned window—you type in the top pane and the other person types in the bottom pane. You can save a hierarchical menu of people you talk to frequently. Peter hasn't updated Talk in quite some time, but it still works fine.



The Virtual Meeting (TVM)

`http://www.rtz.com/tvmfm.html`

The Virtual Meeting from RTZ Software is a commercial electronic conferencing application along the lines of RoundTable. However, TVM is more structured to facilitate meetings. RTZ has customized versions of TVM for a variety of different uses, including classrooms, auctions, telemedicine, and electronic town halls (complete with voting capabilities). TVM supports sharing of a variety of graphic formats and video formats, although it doesn't do audio. Especially interesting is the Web conferencing feature that enables one person to take a group of other people on a live tour of the Web using TVM to keep the group together. A free demo is available at the Web page above, and prices for full versions vary by number of users.



MUDs

MUD, which stands for Multi-User Dungeon or often Multi-User Dimension, might be one of the most dangerously addictive services available on the Internet. (You may also see references to MOOs, MUCKs, or other similar acronyms—they all share the same basic idea.) The idea is somewhat like the computer text adventures of old, in which you type commands such as "Go south," "Get knife," and so on. The difference with MUDs is that they can take place in a wide variety of different realities—basically anything someone could dream up. More importantly, the characters in the MUD are actually other people interacting with you in real time. Finally, after you reach a certain level of proficiency, you are often allowed to modify the environment of the MUD.

The allure of the MUDs should be obvious. Suddenly, you can become your favorite alter-ego, describing yourself in any way you want. Your alternate-reality prowess is based on your intellect, and if you rise high enough, you can literally change your world. Particularly for those who may feel powerless or put upon in the real world, the world of the MUD is an attractive escape, despite its text-environment limitations.

After the publication of an article about MUDs, the magazine Wired printed a letter from someone who had watched his brother fail out of an engineering degree and was watching his fiancée, a fourth-year astrophysics student, suffer similar academic problems, both due to their addictions to MUDs.

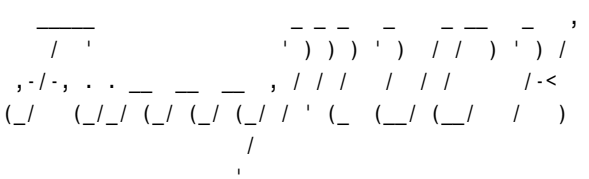
I've seen people close to me fall prey to the addictive lure of MUDs. As an experiment in interactive communications and human online interactions, MUDs are extremely interesting, but be aware of the time they can consume from your real life.

I don't want to imply that MUDs are evil. Like almost anything else, they can be abused. But in other situations, they have been used in fascinating ways, such as to create an online classroom for geographically separated students. There's also a very real question of what constitutes addiction and what constitutes real life. I'd say that someone who is failing out of college or failing to perform acceptably at work because of a MUD has a problem, but if that person is replacing several hours per day of television with MUDing, it's a tougher call. Similarly, is playing hours and hours of golf each week any better than stretching your mind in the imaginative world of a MUD? You decide, but remember: there are certain parts of real life that we cannot and should not blow off in favor of a virtual environment.

Although MUDs are text-only and generally accessed via Telnet or Telnet-like programs, rudimentary graphics will appear at some point (The Palace, discussed previously, is moving in that direction), followed by more realistic graphics, sound, and video, and perhaps some day even links to the virtual reality systems of tomorrow. I don't even want to speculate on what those changes might mean to society, but you may want to think about what may happen, both positive and negative.

To give you an idea of what participating in a MUD might be like, my friend Bill Dickson and I visited one called FurryMUCK, where everyone falls into the characters of anthropomorphized animals, creatures known as "furries." What follows is a brief excerpt that was heavily edited. (Note that "RL" stands for "real life.")

FurryMUCK Transcript



```
AdamEngst says, "We've just spent some time on IRC - how do you think the socializing
here is different? Do you use IRC at all?"
Mer'rark walks in from Sable Street.
Mer'rark says, "Slice was telling me there's some guys writing a book about this
place?"
FoxTrot yaps, "Here it is a little different then IRC because people have characters
they use to express themselves."
Triggur whickers, "This environment is much richer than IRC. Less artificial."
ErmaFelna says, "There's more of a sense of *place* here... you can move around, have
a distinct concept of rooms and objects... this is much more of a game as well."
```

Dekhyr says, "Never been on IRC. Or any 'social MUD' for that matter, except this one. And this one only two weeks ago. Used to play hack-n-slash MUDs. Got bored of it. Socializing this way for some reason seems to be better than the pot-luck I tend to get in RL."
FoxTrot yaps, "Also, IRC is highly topic oriented, here, you can go somewhere and the topic will change a lot."
Kimiko nods at FoxTrot.
ErmaFelna says, "This place is much more flexible than IRC; it's a lot easier for the players to modify the general environment. Anyone can add new commands for people to use, or reprogram portions of the setup. I've written programs to do anything from making a lock that only lets the people inside choose who can come in, to creating an object that can be used as a container."
Dekhyr says, "Probably the thing I like about Furry most of all is that you *need* a kind of extroverted imagination to even play a furry in the first place."
AdamEngst says, "What do furries generally think about the outside view of MUDs and this MUCK in specific? Is that view unrealistic or off-base?"
Triggur whickers, "Uhhhh... 'too kyoot' is a common reaction :) lots of outsiders think this place is too sticky sweet, especially from a MUD standpoint."
FoxTrot yaps, "They are quite often biased towards one activity, as WIRED illustrates."
Dekhyr says, "I think everyone latches on to the erotic sector of MUCK. Too emotionally charged."
Dekhyr says, "Some people couldn't imagine playing a MUD. They feel it's a waste of time."
Lynx purrs, "Dunno, you tell me, what's the outside view of MUDs and MUCKs?"
AdamEngst says, "Well, the addictive nature of MUDs is certainly mentioned a lot."
Kimiko nods, they ARE addictive... worlds can be created here...
Lynx nods. This is true. Stay away, AdamEngst, you'll find your free time slipping away...
ErmaFelna says, "This particular MUCK has a very general theme, which means that things tend to be extremely free-form. What big events do happen tend to be very fast versions of co-operative story-telling, with a lot of the same difficulties: one person can Deus Ex Machina the plotline and ruin it for everyone else."
Pickle declares, "Erma, is there a set of rules to guide things like that?"
ErmaFelna says, "Rules? Not really... just politesse and some general guidelines."
Triggur whickers, "thank GOD there's no rules :)"
Kratsminsch says, "I've also used the MUCK to contact experts in certain fields, when I got lost trying to fix something RL."
Kimiko does that too! (have a computer Q? @shout for an answer!)
Pickle declares, "How long has Furry been around?"

ErmaFelna says, "It's been around a little over three years, now. Of course, some of us have been MUDding since before Furry existed." She nods over to Lynx.

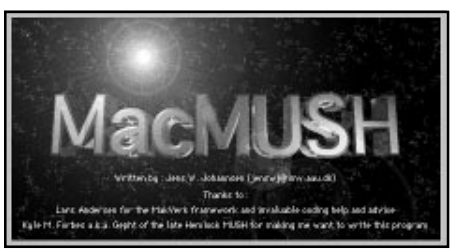
```
Lynx mumbles something about how when HE was a kit, we had to telnet 12 miles uphill
through thick snow and line noise to get to a MUD, and then we telnetted 12 miles
back the other way, also uphill, to get a response back, and we LYKED yt.
```

I hope that excerpt gives you an idea of what might go on in a MUD. Because MUDs are virtual environments, every one is different, and you can't judge one based on another. Now let's look at some of the Macintosh software that makes accessing MUDs easier. Most of the following programs are available in <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/> and where possible, I've also listed their Web pages.

MacMUSH

http://imv.aau.dk/~jenswj/macmush.html

MacMUSH 0.98, a free program from Jens Johannsen, works with MUDs of the MUSH type (including TinyMUSH, PennMUSH, and TinyMUX). MacMUSH's special features include a macro facility for typing repetitive words or phrases (a common need, unfortunately), a line editor for creating text before sending it, and the capability to mark certain words, which might make it easy to see when certain people say things or when certain objects are used. Check out the MacMUSH home page for a bunch of MUSH-related links.



MUDDweller

ftp://rudolf.ethz.ch/pub/mud/

The public domain MUDDweller 1.2, from Olivier Maquelin, is a dedicated MUD client. It has a few features that make it more useful than Telnet, such as being line-oriented (so you have an edit line to compose on before sending your command), a command history that you can use to avoid retyping commands, a logging capability, multiple sessions, and a simple file transfer tool. MUDDweller isn't receiving any updates any more, but it might still be worth checking out.

Audio Communications

Real-time audio communication over the Internet is actually quite difficult, more so than video. The standard method of pushing more data through a relatively slow Internet connection (such as a 28.8 Kbps modem) is to compress the data. As you compress sound, the quality degrades, so there's a constant trade-off between quality and size. Add in the problem that audio is linear—each sound must follow the previous one—and you start to see the problem.

So, to send audio over the Internet in real time reliably, there are three basic techniques: sophisticated compression, error correction, and buffering. Programmers are always discovering new ways to compress data, audio or other, to make it smaller with less of a loss of quality, and the more sophisticated the compression scheme, the better the quality of the audio. Error-correction schemes can actually recreate bits of the audio stream that are lost in transmission—the trick with audio is to create an error-correction system that can compensate for lost bits quickly and without a loss in quality. Finally, buffering systems store up a bit of audio before playing it in case there's a short interruption during the transmission.

There are two basic types of Internet audio applications: those that work much like telephones and those that operate more like radios (with cassette decks). The telephone-type applications require both you and the person you're talking with to be on the Internet at the same time; arranging specific times to call is important, although they generally have methods of alerting you to incoming calls as well. Both Internet Phone and NetPhone offer methods of announcing that you're online so other people can contact you even without knowing your IP address (which is important, since many people get a different IP address each time they connect to the Internet).

The second type of Internet audio application is represented solely by RealAudio on the Mac for now (more should arrive from a company called Xing Technologies). Sending audio with this sort of application requires a special server program, so most people generally use RealAudio to listen to prerecorded audio. Recent versions of RealAudio added the capability to listen to live broadcasts in real time as well.

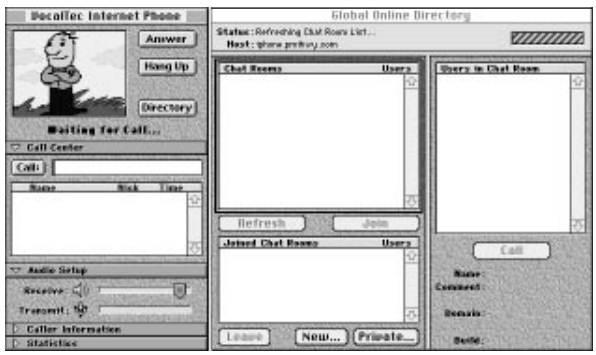
Some of these programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>` and where possible, I've also listed their Web pages.

Internet Phone

`http://www.vocaltec.com/mac/web/mac.htm`

VocalTec started the Internet telephone market, but has only just released a public beta of the Macintosh version of its Internet Phone. The current beta requires a Power Mac with 12MB of RAM (a version of Internet Phone that will run on 68040

Macs is promised), but VocalTec claims that it will work over a 14.4 Kbps modem. The main advantage of Internet Phone over NetPhone is that you can use Internet Phone on a Mac to talk to Internet Phone users who happen to use Windows machines as well—NetPhone is limited to Mac users. Internet Phone also supports public and private chat rooms. The Windows version of Internet Phone currently costs $49; I imagine the price of the Mac version will be comparable when it's released.



Maven

Maven 2.0a37, written by Charley Kline and Eric Scouten, was the first Macintosh application to carry audio in real time over the Internet. Maven's interface is minimal, and it doesn't have as many features as either NetPhone or Internet Phone, but it is free. You can use Maven in "push to talk" mode or in "free talk" mode, although the latter may not work all that well—I've had trouble with it either not picking up my voice because of the level being too low or it picking up too much ambient noise. Unlike the more full-featured Internet telephone applications, Maven has no way of alerting you to incoming calls or finding out what someone's IP number is.

NetPhone

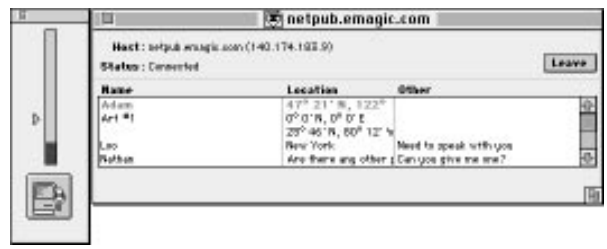
`http://www.emagic.com/`

NetPhone 1.2.3 from Electric Magic was the first commercial Internet telephone program for the Mac. NetPhone costs $59 for one copy or $99 for a pair, but it can pay for itself pretty easily if you're racking up massive long-distance telephone bills, in large part because NetPhone does work, even over a 14.4 Kbps modem connection via PPP. NetPhone also works with pretty much any Macintosh from the IIsi on up, although it prefers a faster Mac because of all the processing that goes on. In my testing, NetPhone performed well, although the sound quality wasn't amazing. NetPhone comes with a small application

continues

NetPhone, *continued*

called NetPhone Alert that alerts you when someone tries to call you with NetPhone. Another useful part of the NetPhone technology are NetPubs, which help you contact other users without knowing their IP addresses. You can try out a demo of NetPhone before buying—it doesn't include NetPhone Alert and is limited to 90-second outgoing calls, although you can use it to receive calls of any length.



PGPfone

`http://web.mit.edu/network/pgpfone/`

Not content to help keep textual conversations private, Phil Zimmerman has a beta version of an Internet telephone program called PGPfone. As you might expect from the name, PGPfone 1.0b6 uses PGP technology to ensure that your conversation is completely private, something that's hard to guarantee with a conventional telephone. Needless to say, the quality of the audio with PGPfone degrades even beyond that of the other Internet telephone products if you have its security turned on, but that's the price you pay for security. Even military secure telephones don't have great sound quality. PGPfone is available only in the U.S. and Canada because of the U.S. government's restrictions on exporting encryption technology.

RealAudio

`http://www.realaudio.com/`

The free RealAudio Player 2.0 (also available as a currently flaky Netscape plug-in) is unusual among the Internet audio tools because it can receive both live and prerecorded audio streams. RealAudio can only receive; sending RealAudio data over the Internet requires a RealAudio server, and those are expensive. RealAudio works closely with your Web browser, and you play a RealAudio data file by clicking a link in your Web browser that launches the RealAudio Player. Once an audio stream is playing, you can skip around in the audio file, with only a few seconds of silence while the RealAudio Player finds the right spot. Quality is quite good, especially with a

28.8 Kbps modem (it also works with 14.4 Kbps modems). I especially like the way that RealAudio enables me to listen to events when I want to, rather than when they happened. Check out the RealAudio Web site listed above for links to a lot of recordings.

Video Communications

In some ways, it turns out that video might be a bit easier to transmit than audio over the Internet because the human eye is extremely forgiving, more so than the human ear. The standard method of transmitting video over the Internet is to transmit only the pixels that have changed from one instant to another. Thus, if a picture is of someone talking, there's probably not much motion other than her mouth, and that makes it relatively easy to transmit a high-quality representation of what's going on.

Even still, pushing video through a modem, even a 28.8 Kbps modem, is somewhat dicey. It works, but just barely, and the overall feeling of the video is often more like a fast slide-show than a small television window.

The main problem faced by most videoconferencing applications is not the speed, in fact, since there are plenty of people who have high-speed Internet connections at work or school. The problem is more that few people have video cameras hooked to their Macs, and with a notable exception, most video cameras can connect to only certain Macs.

To accept input from a video camera, a Macintosh needs to contain video digitizing circuitry, either on the motherboard (as with the so-called AV Macs) or through an additional digitizer card. That requirement excludes most Macs. However, Connectix has created a pair of tiny video cameras that don't require special circuitry at all—instead they connect to the serial port of most Macs. These cameras, the QuickCam and the Color QuickCam, have proven extremely popular—you can find more information about them at `<http://www.connectix.com/>`.

Connectix VideoPhone

`http://www.connectix.com/connect/VPM.html`

Connectix VideoPhone isn't so much a program as a package that includes a Connectix QuickCam and software based on Apple's QuickTime Conferencing technology. Connectix VideoPhone requires a high-speed Internet connection—at least an ISDN line—so you

continues

Connectix VideoPhone, *continued*

can't use it over a modem. Connectix is targeting business users on fast networks with Connectix VideoPhone—it's not aimed at the consumer market yet. You can buy the VideoPhone software separately if you already have a QuickCam or another video camera—the price is about $150 discount for the complete package and $60 for the software alone.

CU-SeeMe

`http://cu-seeme.cornell.edu/`
`http://goliath.wpine.com/readmemac.htm`

The first Internet videoconferencing application was Connectix CU-SeeMe, written by programmers at Cornell University. To use CU-SeeMe to receive video, you need a TCP-based Internet connection, the faster the better, although CU-SeeMe does work over a modem. If you want to send video as well, you must have a video camera and a video-capable Mac, such as a 660AV, a video-input card, or a Connectix QuickCam. And of course, audio requires a microphone. You can use CU-SeeMe in either point-to-point mode with another person or with a CU-SeeMe reflector, which enables you to view multiple windows simultaneously. Cornell's version of CU-SeeMe is free, but White Pine has licensed CU-SeeMe and is selling Enhanced CU-SeeMe, which works with the old CU-SeeMe as well. Added features in Enhanced CU-SeeMe include color, compatibility with Open Transport, a phone book, and a whiteboard application called WhitePineBoard.

QuickTime Conferencing

`http://qtc.quicktime.apple.com/`

Apple Connectix has released its own videoconferencing application, the $49.95 QuickTime Conferencing. As you might expect, QuickTime Conferencing takes advantage of the video and audio compression technologies inside QuickTime to work its magic. Like Connectix VideoPhone, which is based on the same technology, QuickTime Conferencing requires at least an ISDN line and does not work over a modem. Unfortunately, it also only works on AV Macs, which limits the field quite a bit. QuickTime Conferencing does support color and sports a shared whiteboard in which you can use drawing and text tools in collaboration with up to six people at once. QuickTime Conferencing also includes a free application called QuickTime TV that enables you to watch Internet broadcasts, also called webcasts, if you have a high-speed Internet connection.

Games

The final sort of real-time communication that you can participate in on the Internet is game playing. You might think of MUDs as games, and some no doubt are, but the games I have in mind are the traditional sort—board games, arcade games, and the like. These games are designed primarily to work over the Internet—many commercial games that support multiple players can now work over the Internet as well, and there's no way I could cover all of them. Besides, I suffer from mild carpal tunnel syndrome, and testing all those games would be bad for me.

Most of these programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>` and where possible, I've also listed their Web pages.

Bolo

```
http://ResComp.Stanford.EDU/~cheshire/Bolo.html
ftp://ftp.tidbits.com/pub/tidbits/tisk/util/bolo/
```

Stuart Cheshire's $25 shareware Bolo 0.99.7 is an addictive multiplayer tank game that supports robot opponents as well. Although it's not arcade-level action, Bolo is graphical. Strategy is all-important, and Bolo makes all sorts of alliances and rivalries possible. Numerous "brains" (specially programmed robot tanks) have been created to spice up the action. Along with the brains, people have written numerous utilities for Bolo, including terrain map generators and utilities for finding Bolo games in progress on the Internet. There's even a `rec.games.bolo` newsgroup, and the FAQ for that group is a good place to start learning Bolo etiquette. Bolo prefers a fast connection (a 28.8 Kbps modem might work) and doesn't work well over 14.4 Kbps PPP connections that I've tried. The program does work over AppleTalk networks, if you want to play with friends locally. If you enjoy strategy tank games, definitely check out Bolo.

Fixation

```
http://chess.onenet.net/chess/
```

Adam Miller's free Fixation 1.3 is a client for FICS, the First Internet Chess Server. It starts out as a relatively standard Telnet-type program, but when you play a game of chess, you do so on a graphical board. You can have two games going at the same time (if you're more with it than I am), and there are neat features such as being able to see the last move visually. A few other chess clients are available for the Macintosh—check the Internet Chess Library Web page above for links to them.

MacFIBS

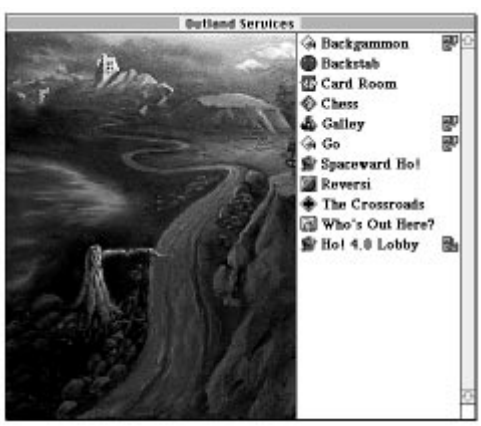
`http://www.best.com/~fergy/MacFIBS.html`

Paul Ferguson's free MacFIBS 2.0.3 is a dedicated backgammon client for FIBS, the First Internet Backgammon Server. FIBS has thousands of players registered, ranging widely in skill levels. Rather than just provide a slightly enhanced Telnet client, MacFIBS gives you a completely graphical interface, to the point where you make your moves by dragging colored checkers around on the board. MacFIBS seems well done and has extensive documentation.

Outland

`http://www.outland.com/`
`ftp://ftp.outland.com/pub/`

Outland is a nationwide commercial service solely for Macs that's dedicated to computer games. However, we're not talking just any computer games. It supports graphical multiplayer games with those multiple players coming in from all around the world. Along with a variety of standard board games, Outland offers a special version of Delta Tao's fabulous space opera game, Spaceward Ho! You must use Outland's special software, which is available for free, although playing the games costs money. Charges are $9.95 per month, flat rate, with a five-hour free test period. You can contact Outland for more information at 800-PLAY-OUT or at `info@outland.com`. You can retrieve the Outland software on the Internet.



Chapter 18 Utilities and Miscellany

Contents:

- Internet Config
- Gopher
- Finger and Ph
- Other Programs

Okay, I admit it; I've run into a completely ambiguous group of software that isn't particularly related at all. These programs do a variety of things, but most are one-trick ponies, so I've decided to lump them together in this chapter. Within the chapter, I try to create some sections for related programs.

However, before I cover any of the rest, I want to look in some detail at a very important program that doesn't fit into even any of these loose categories: the public domain Internet Config.

Internet Config

The Internet has a problem. There are simply too many details for anyone who doesn't spend all day using the Internet to remember. Pop quiz! What's your SMTP server? What's your NNTP server? The URL for your home page?

Sorry about that. The point I want to make is that there are many pieces of information that not all of us necessarily remember, and there's nothing worse than trying to configure a new program and not remembering the name of your SMTP server or something equally mundane. And besides, it's a pain to type the same information into each program.

A program from Peter Lewis and Quinn "The Eskimo!" has started to solve this problem and will continue to cement the Macintosh's position as the preeminent Internet client platform. Internet Config stores all your common Internet preferences in a single place, simplifying the process of configuring Internet programs with information such as your preferred email address, Usenet news server, and helper applications for various Internet services. Before Internet Config, configuring all the programs with the same information was almost as bad as going to multiple doctors to have health care committed on you, given that each doctor asks for the same information on a different form.

Internet Config provides a simple interface for setting these preferences and makes a database of those preferences available to other applications. In other words, after you enter your email address into Internet Config, both Anarchie and NewsWatcher can read it from the Internet Config database and do not force you to enter it again and again. This capability is so useful that I've included Internet Config on the Internet Starter Kit CD-ROM.

Internet Config manages the following groups of preferences:

- Personal: such as your real name and your signature
- Email: email address and other mail-related details
- News: news server and related details
- File Transfer: download folder and preferred archive sites
- Other Services: default hosts for other services, such as Web and Gopher
- Fonts: preferred font settings for lists, screen, and printer
- File Types: for mapping extensions to Macintosh file types
- Helpers: for matching URL types to their helper applications

Internet programs must support Internet Config in order to use the settings you create in Internet Config. Luckily, many Internet programs now support Internet Config, and more are coming along all the time.

FYI
Keep in mind that Internet Config is there to help you, not to make your life miserable. You do not have to fill in every preference immediately, or even ever.

Installation and Setup

When you launch Internet Config for the first time, it asks if you want to install its Internet Config Extension. You should do so, and you don't even have to restart (it's not that sort of extension—it's actually a shared library). If you accidentally click Cancel, you can always choose Install Extension from Internet Config's Extension menu later on.

Basic Usage

After installing the Internet Config Extension, Internet Config brings up its main window, the Internet Preferences window (see Figure 18.1). It has large buttons for each of the eight groups of preferences.

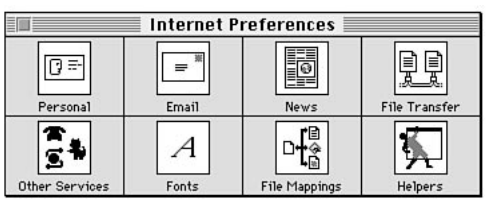


Figure 18.1 Internet Config main window.

First, click the Personal button to bring up the Personal window (see Figure 18.2).

In the Personal window, enter your real name, your organization (Peter and Quinn use the Australian spelling, of course), the string you want to use for quoting replies, and your signature and plan file. Your plan could be used by a Finger server, for instance, should a future Finger server support Internet Config. See the "Finger and Ph" section later on in this chapter.

Close the Personal window, and click the second button, Email. Internet Config brings up the Email window (see Figure 18.3).

Enter your email address in the field of the same name, and enter your POP account in the Email Account field. (Internet Config doesn't label the field POP Account because you might use IMAP or another mail protocol.) Type your password in the Email Password field and note that Internet Config protects it from prying eyes. Your SMTP server's name goes

in the SMTP Host field. Finally, if you need to include any extra headers in email sent via NewsWatcher, enter them in the Mail Headers field. Be careful here because you could screw up your email fairly seriously if you don't know what you're doing.

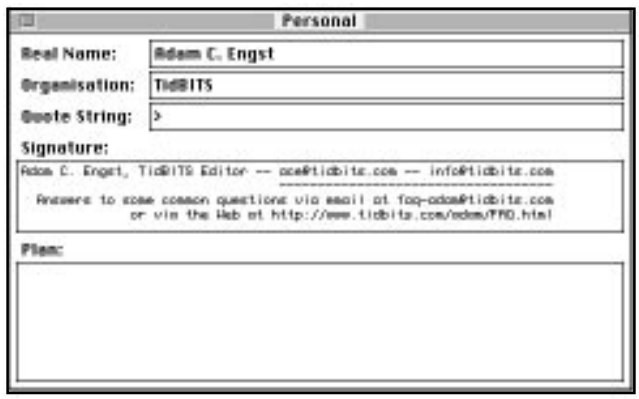


Figure 18.2 Internet Config Personal window.

Figure 18.3 Internet Config Email window.

When you're done, close the Email window and click the News button to bring up the News window (see Figure 18.4).

Just as in the Email window, enter your NNTP host name. Although many providers don't require them at all, your news username and password are usually the same as your email userid and password. But this is not always the case—you can see that mine are different because I read news on my provider's Unix machine, but run my own mail server on a Mac. Again, if you want to add some headers to your news postings, enter them in the News Headers field. Don't mess with the headers too much unless you know what you're doing—I'm not sure how well various news programs handle random headers. Close the News window.

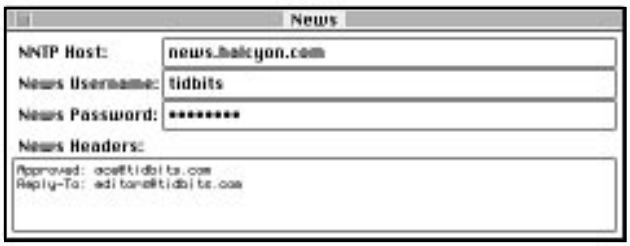


Figure 18.4 Internet Config News window.

Next up is the File Transfer window, which you get to by clicking the File Transfer button (see Figure 18.5).

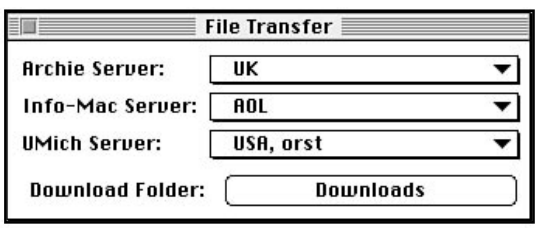


Figure 18.5 Internet Config File Transfer window.

The settings in the File Transfer window are used by programs such as Anarchie to transfer files. As with the Email Account setting, Internet Config doesn't assume much, so any program that transfers files could use the settings in the File Transfer window, whether or not it specifically used FTP.

The Archie server pop-up menu lists all known Archie servers when Peter and Quinn shipped Internet Config. Pick the one you want Anarchie to use as the default—I have the best luck with the one in the United Kingdom for some reason.

The next two pop-up menus, for the Info-Mac Server and the UMich Server, refer to the major Macintosh mirror networks of FTP sites. There are numerous possible mirrors you can choose from, and again, these are the mirrors that Anarchie uses by default.

FYI

If you copy the pathname of a file from an Info-Mac Digest, it starts with `/info-mac/`. Anarchie recognizes that string, and when you paste the path into Anarchie's Get via FTP window, Anarchie uses your Info-Mac mirror default setting to fill in the name of the host to use with that path. It's extremely handy.

I like the mirror that America Online provides for the Internet, but you can pick whichever Info-Mac and UMich mirror sites you prefer, or you can enter new ones that may appear in the future.

Finally, in this window, click the Download Folder button. Internet Config brings up a standard file dialog box in which you choose a folder for your downloads to end up in by default. I personally dump everything in a folder called Downloads that lives on my desktop. Close the File Transfer window.

Next, click the Other Services button to bring up the Other Services window (see Figure 18.6).

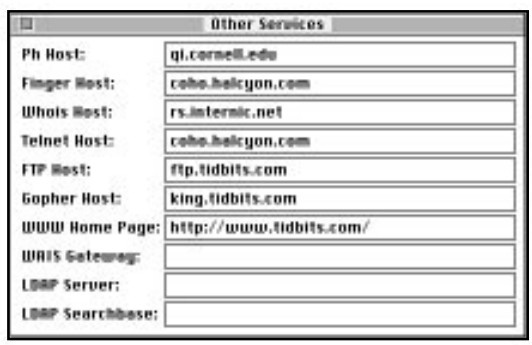


Figure 18.6 Internet Config Other Services window.

In this window, you have lots of fields for lots of different server names and gateways and home pages and all that. My advice? Don't worry about anything you don't understand. I, for instance, haven't a clue what LDAP Server I could use or what LDAP Searchbase I could put into that field, so I just left them blank. No harm done, and nothing in this window is necessary. Some programs rely on information that you would enter here (most notably Microsoft Internet Explorer, which uses the WWW Home Page field), but for the moment, just fill in what you know.

When you're done, close the Other Services window and click the Fonts button to bring up the Fonts window (see Figure 18.7).

In the Fonts window, Internet Config provides three possible default font settings. Anarchie does use them, so if you use Anarchie, you may want to set the default list font to something relatively small so you can fit a lot of files into its windows. Or, if your eyes don't like small text, increase all three settings. In theory, the List Font is used for lists, such as Anarchie's windows or NewsWatcher's article listings. The Screen Font is used for displaying large chunks of nonproportional text, such as in a NewsHopper article, and the Printer Font is used for printing that same text.

Close the Fonts window, and you're done! There are two more buttons, File Mappings and Helpers, but frankly, you don't have to mess with them if you don't want to. In pursuit of

completeness, let's look at them anyway. Click File Mappings so that Internet Config brings up the large scrolling window of file mappings (see Figure 18.8). Next, double-click one of the mappings, such as the Acrobat Reader entry.

Figure 18.7 Internet Config Fonts window.

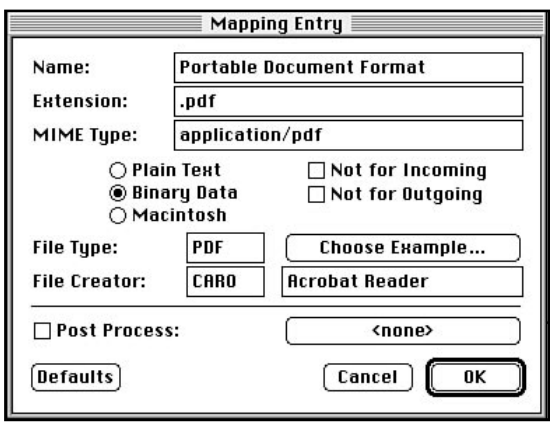


Figure 18.8 Internet Config File Mappings window.

File mappings are one of Internet Config's most useful features, because it's a pain for every program to provide an interface to file mappings. Basically, programs can use the file mappings to look at a file's extension, .pdf in the screenshot, and know that the file is a PDF file and belongs to the Adobe Acrobat Reader. File mappings are a manual method of doing for files from the Internet what the Macintosh does behind the scenes with file types in the desktop database. You can add file mappings if you like, although most of the common ones are already entered. More commonly, you might want to change some of them to use your favorite text editor instead of BBEdit or SimpleText, for instance.

Close the File Mappings window and click the Helpers button to open Internet Config's last window (see Figure 18.9). Internet Config has defined a number of types of tasks that you may want to use a helper application with, and it has set up some default entries. You

might wish to change a number of these to map to your favorite programs. As you can see in Figure 18.9, I prefer to use Nisus Writer to edit text files, Anarchie for FTP, Netscape Navigator for Gopher, and Internet Explorer for the Web.

> **BTW**
> The Eudora GURL Handler is a little application that comes with Internet Config that enables you to use Eudora 1.5.4 and 2.1.4 as the helper when you click a `mailto` link in a Web browser or another URL-savvy application. It probably won't be necessary with future versions of Eudora.

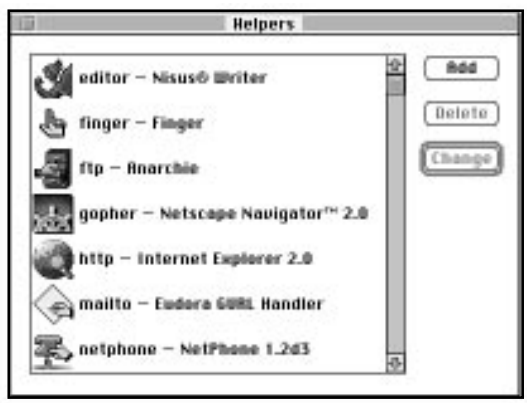


Figure 18.9 Internet Config Helpers window.

The utility of the Helpers preferences is that it provides a single place for you to say that whenever any Internet Config-aware program tries to do something via FTP, it can pass off the task to Anarchie. Or, more commonly, whenever there's a file to be edited, it can pass off the task to your editor of choice. You can add new tasks as well, although there's no point unless some new application comes out and needs a different type of helper that's not currently defined.

Well, that's about it. Close the Helpers window and quit Internet Config, saving any changes you might have made. You're unlikely to use Internet Config often—that's the point of it.

Evaluation and Details

Internet Config is a simple application, but it is well written and easy to use. It has excellent Balloon Help and decent documentation. Other than the fussy details of creating new file mappings, I can't see most people having any trouble with Internet Config.

Although Internet Config has broad-based support already, support from additional programs is critical. I *strongly* encourage all Internet programmers to support Internet Config. It's a relatively minor programming task. John Norstad (author of NewsWatcher and Disinfectant) said, "I figured this [Internet Config] would be reasonably easy to support, and it turned out to be even easier. There were no major problems or stumbling blocks—just a bunch of really easy code, and it worked with no major hassles."

Peter and Quinn have placed Internet Config and its source code in the public domain, and they encourage others to build on it to provide additional functionality. Internet Config can play a huge role in making the Mac an even better Internet platform because it can make coherent the often confusing process of configuring many different programs.

The official support address for Internet Config is `internet config@share.com`. If you find a bug in Internet Config, forward details to that address. To discuss Internet Config in general, the `comp.sys.mac.comm` newsgroup is the best place to do so, because it enables programmers to stay in touch with the discussions without being overwhelmed with email. You can retrieve the latest version of Internet Config, currently at 1.2, from `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>`, and it comes with many Internet programs as well (you need only one copy, so feel free to throw out any duplicates you may get). Internet Config's official Web page is at `<http://www.quinn.echidna.id.au/Quinn/Config/>`.

Gopher

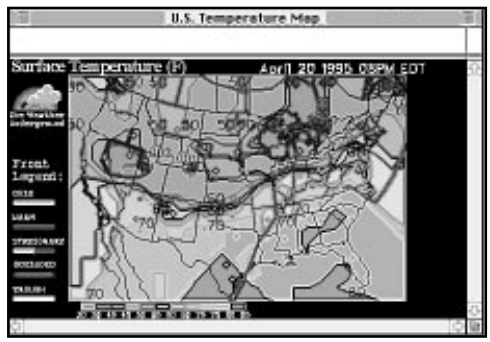
The University of Minnesota's Gopher system is an inherently list-based Internet service that provides access to large quantities of information. Because of this, Gopher maps well to separate windows of lists, between which you can switch back and forth, clicking interesting items to explore deeper in "Gopherspace." And thus, this is the technique used by the most commonly used Gopher client, TurboGopher, which was written by the same folks who created the entire Gopher system. However, with the ascendancy of the World Wide Web, more people probably access Gopher servers via the single-window Web browsers such as Netscape and Internet Explorer than via TurboGopher because it's easier not to launch another program.

Although I recommend that you use TurboGopher (or one of the Web browsers) for accessing Gopher servers, there are a couple of other Gopher-related programs out there. There were originally a few more clients, including GopherApp, MacGopher, and Sextant, but they haven't been updated in so many years that I can't even justify using space in the book on them, much less recommending that you check them out. Most of the following programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>` and if not, I've listed Web pages or home FTP sites where they are available as well.

Blue Skies

`http://blueskies.sprl.umich.edu/blueskies.html`

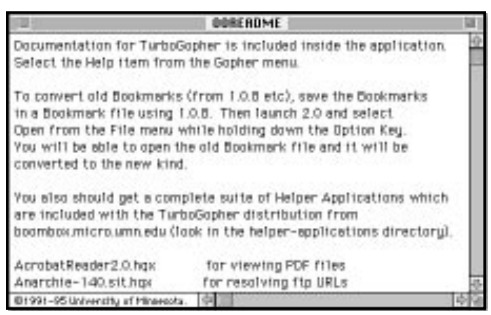
Although actually a Gopher client, Blue Skies 1.1, free from the University of Michigan's Weather Underground, is primarily a neat application for, well, interacting with the weather. You need not go outside or travel to other parts of the world, though. All you must do is launch Blue Skies and select GroundHog Server from the GroundHog menu. I especially like the interactive weather maps, which bring up a map of the United States. Moving your mouse over different locations on the map displays the weather conditions for that location. You can even zoom in and out to a few different magnifications, and in doing so gain access to more detailed weather data.



TurboGopher

`gopher://boombox.micro.umn.edu/11/gopher/Macintosh-TurboGopher`

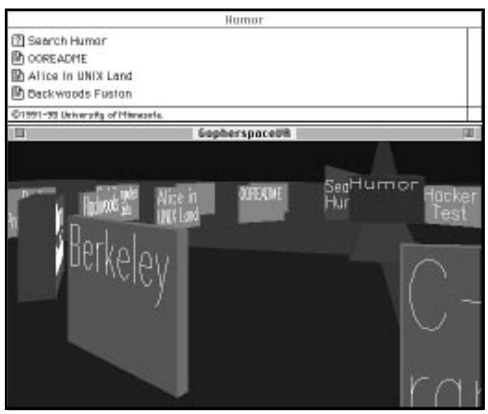
The University of Minnesota's TurboGopher 2.0.3 has suffered at the hands of the Web, since several years ago it was an essential part of every Mac user's Internet toolkit. Despite TurboGopher's speed and ease of use, most people these days use their Web browsers to access Gopher servers, which are also becoming less common. TurboGopher uses a multiple-window display that makes backtracking and working in multiple windows easy, and although it cannot display multiple fonts or styles in the same window, it can display the text of documents you find on Gopher servers. Like Web browsers, TurboGopher uses helper applications to handle protocols it doesn't understand. TurboGopher is free for noncommercial use from the University of Minnesota.



TurboGopher VR

`gopher://boombox.micro.umn.edu/11/gopher/Macintosh-TurboGopher/TurboGopherVR`

The Power Mac-only TurboGopher VR, from the University of Minnesota Gopher Team, is best described as the unholy marriage of Spectre (the 3D tank game from Velocity Development) and TurboGopher. Actually, I think TurboGopher VR is extremely cool—whenever you enter a new Gopher menu, TurboGopher VR drops you with a thud into a Spectre-like three-dimensional scene containing what look a bit like stone monoliths littering the countryside. Roll up to one and you can read its title (the same as you'd see in one of TurboGopher's normal text lists) and click it to go into it. A central spire lets you zip back up in the hierarchy. I can't say that it's useful, but if you have a Power Mac, you simply must check out TurboGopher VR.



Finger and Ph

Before the Web, people used Finger as a method of distributing information about themselves. Now we have personal home pages, then we used special "plan" files that were served by Finger servers and accessed by Finger clients. Little is done via Finger any more, with the exception of the distribution of certain types of constantly changing data—specifically, earthquake reports. Check `<http://www.geophys.washington.edu/seismobig.html>` for some Finger servers with recent earthquake data. The following programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>`.

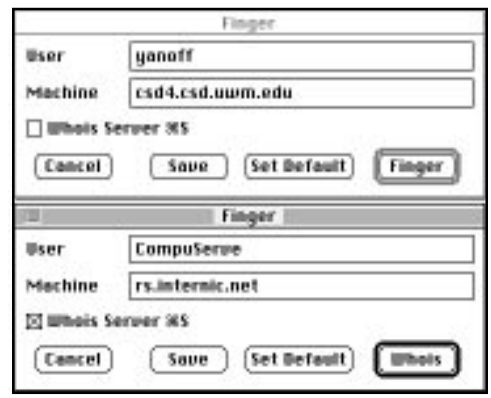
Finger

Peter Lewis's $10 shareware Finger 1.5 is the best Finger program for the Mac (and one of the few). It enables you to finger other people to see if they are currently logged on, or to read information they have put in their Plan files. I find Finger useful for accessing certain types of information over the Internet, checking to see what

continues

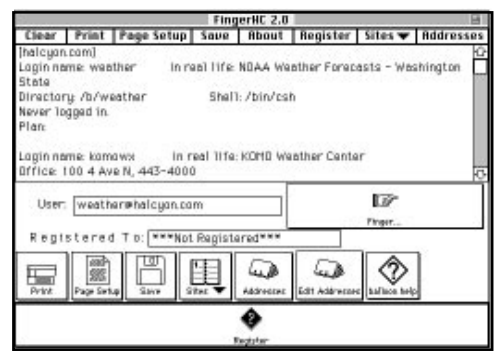
Finger, *continued*

someone's userid on my local machine might be, and checking domain name information via Finger's support for Whois. To access a Whois server (a different Unix program that looks up information about machines), check Finger's Whois Server checkbox, enter the name of the machine you want to learn about in the User field, and enter `rs.internic.net` in the Machine field. Finger saves your requests in a hierarchical menu, and if you finger the same site all the time, you can set it as a default in Finger's Preferences window.



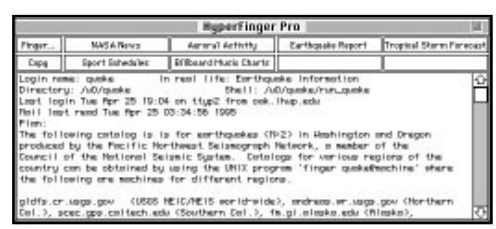
FingerHC

FingerHC 2.0 is a $5 shareware HyperCard stack from Alex Precosky that provides a simple interface for regularly fingering the same addresses. You can enter an email address and click the Finger button to finger an arbitrary address, but if you want to finger the same address later on, you can add entries to your Addresses, at which point they appear in the Sites pop-up menu. There isn't much more to FingerHC, although it has some additional features for printing and saving the text from the display field.



HyperFinger Pro

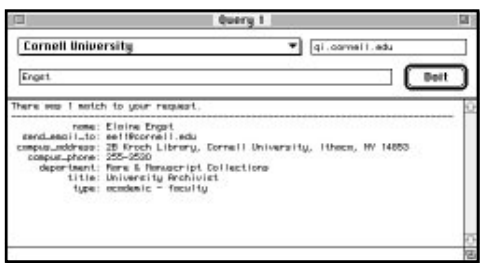
HyperFinger Pro is a HyperCard stack that provides a simple interface for regularly fingering the same addresses. You can click the Finger button to finger an arbitrary address, but if you want to finger the same address later on (and you're using a real version of HyperCard instead of HyperCard



Player), you can modify the script for one of the eight specific buttons. That's about all there is to HyperFinger, although the Copy button places the contents of the scrolling window into the clipboard for pasting into another program. HyperFinger Pro was written by Frank Tito, and I suspect it's free, since he says in the background script's comments that he modified someone else's original stack.

Mac Ph

The Ph protocol (which was created in part by Steve Dorner of Eudora fame) is in relatively wide use, especially at universities around the world, as an electronic campus directory system. It's excellent for looking up someone's email address or phone number, but you do have to know what university he or she attends or works for. The prolific John Norstad has created a free Macintosh client for the Ph protocol called Mac Ph. You can also use Eudora to look up information via Ph, but John's stand-alone client is easier to use. If you choose the Northwestern Ph server, as I did, and then make sure your site list is updated (Update Site List in the File menu), Mac Ph brings in a huge list of sites running Ph. I even found my Mom via Cornell's Ph server.



Other Programs

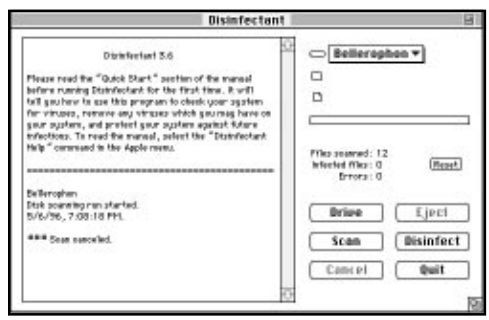
Now we've hit a set of programs that defy categorization. That isn't to say that there's anything wrong with them, and in fact, I regularly use two of them, NetWeather and Network Time. Most of the following programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>` and if not, I've listed Web pages or home FTP sites where they're available as well.

Those of you who have been around on the Internet for some time might notice that I don't mention `WAIS` (Wide Area Information Servers, a method of searching large databases of information) programs at all. Despite the fact that I talked about WAIS extensively in previous editions of this book, WAIS is essentially dead, as are the two WAIS programs for the Mac, MacWAIS and WAIS for Macintosh. Don't bother trying to use them because you'll find it extremely frustrating without any of the public WAIS servers that used to exist.

Disinfectant

`ftp://ftp.acns.nwu.edu/pub/disinfectant/`

The free Disinfectant 3.6 from John Norstad isn't an Internet application at all, but it's so important that I feel everyone should have a copy. Disinfectant is one of the best anti-virus programs available for the Macintosh, and it's also one of the least intrusive. You should keep Disinfectant on your hard disk, and you should always have the Disinfectant extension loaded, because it will protect you from known Macintosh viruses (small, anti-social programs that could potentially cause damage to your files). Don't worry about unknown viruses—the chances of you finding one before anyone else in the Mac world is essentially nil. Do make sure you download any new versions of Disinfectant, though, because they will address any new viruses that are found.



ICeTEe

`http://www.quinn.echidna.id.au/Quinn/Config/`

Part of the Internet Config package is a wonderful little extension called ICeTEe. After it is installed, ICeTEe enables you to launch URLs by Command-clicking them within any application that uses Apple's TextEdit text editing routines. Most applications other than word processors use TextEdit, so ICeTEe is quite useful. Internet Config is a necessity for all Macintosh Internet users, and I highly recommend ICeTEe as well. Many people wonder about ICeTEe's name, so I asked Quinn for an explanation. He said that IC comes from Internet Config and TE comes from TextEdit, the Mac text editing library. The name is pronounced as "ice tea" because of the drink. Quinn commented, "There are several possible explanations for the trailing 'e' vs a trailing 'a': (a) to match the first 'e,' thereby making all the lowercased letters 'e,' (b) because it works "to a tee," (c) because I like being contrary, or (d) because the first version was written in about three hours between 23:00 and 2:00 on a Wednesday when Peter and I had to get up at 9:00 the next day and go to work and neither of us was thinking pretty straight."

<http://www.tidbits.com/>

Command-click me!

Look@Me

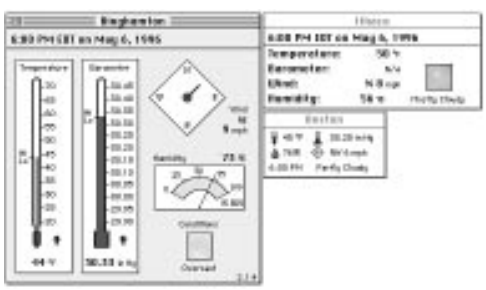
http://www.farallon.com/www/look/applets.html

Farallon's free Look@Me is an extremely cool little application/extension combination that enables you to observe the screen of another Mac running Look@Me (or Timbuktu Pro) over the Internet. You can also set Look@Me to allow other people to connect to your Mac and watch what you do. Look@Me is a subset of the functionality of Farallon's Timbuktu Pro, which enables you to observe and control other Macs over AppleTalk networks and over the Internet. As such, Look@Me is essentially a teaser for Timbuktu Pro, but hey, it's useful, so if you have a need for it in tech support operations, for instance, snag the latest version.

NetWeather

http://chemgod.slip.umd.edu/~kidwell/netweather.html

I'm extremely fond of Christopher Kidwell's $15 shareware NetWeather 2.1.5. You tell NetWeather what city you want to see the weather for, and it retrieves the current data for you, displaying it in either digital or analog form. NetWeather has preferences for each of the weather items it reports on, so you can have the temperature display in Fahrenheit or Celsius, the barometer display in inches of Hg, millimeters of Hg, or millibars, and the wind speed display in miles per hour, knots, or meters per second. You can also see the forecast, climatic data, or marine forecasts in a separate window. If you're constantly connected to the Internet from a room with no windows to the outside world, you can have NetWeather update automatically. NetWeather is way cool.



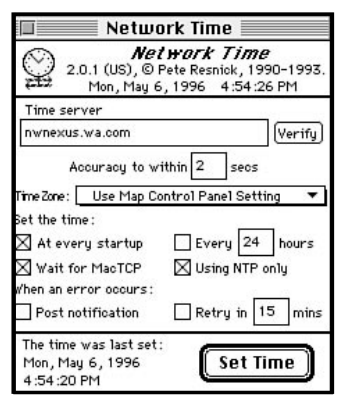
maX.500

`ftp://terminator.rs.itd.umich.edu/x500/max500/`

maX.500 2.1 is a specialized client program for searching the X.500 Online Directory, which can be thought of as a worldwide distributed electronic telephone book. X.500 stores information about people, organizations, groups of people, documents, and services, and maX.500 provides an interface for searching that information. The University of Michigan continues to update its free maX.500 program, and although in the past it hasn't proven to be an especially useful method of finding people online, this continued support is heartening.

Network Time

I'm no longer as retentive about time as I used to be, but it's still nice to know whether your VCR is accurate for taping TV shows. That's why I like Network Time 2.0.1, a $5 shareware control panel from Pete Resnick. Network Time synchronizes your Mac's clock with a network time server, which is a program running on an Internet machine that talks to other time servers. A number of hops on down, one of the machines gets its time from an atomic clock. To set your clock manually, open the Network Time control panel, enter the IP name of your network time server (ask your Internet provider, or guess at one of the machines run by your provider), and click the Set Time button. For automatic updating, drop Network Time in your Control Panels folder, making sure to set it to "Wait for MacTCP" if you use PPP. Network Time has some elegant touches, such as a note about the last time it set your clock, and excellent Balloon Help.



TCP/IP Scripting Addition

`ftp://ftp.scriptweb.com/pfterry/applescript/osaxen/`

I've muttered about AppleScript here and there, but always in the context of being able to script a program. With the TCP/IP Scripting Addition from Atul Butte, however, those of you who are fluent in AppleScript can create entire Internet applications without leaving AppleScript. Since, for most people, AppleScript is easier than languages like C or Pascal, I'm curious to see to what purposes people put the TCP/IP Scripting Addition. It comes with some impressive-sounding sample applications, including an application on which you can drop a file to have it uploaded via FTP, a simple Finger implementation, a script that can send email, and even a full Gopher server. The TCP/IP Scripting Addition is free for personal use, and if you plan to distribute a free program based on it, it's probably also free. For anything written to support an organization or for commercial purposes, there are various charges.

Chapter 19 Commercial Services

Contents:

For many people, the easiest way of accessing the Internet, although a limited one, is to use a commercial online service, such as CompuServe or America Online. The commercial online services provide their own fee-based services such as email, computer- and non-computer-related discussions, file libraries, and databases of information. And, just to ward off this question right away, no, you cannot access files or databases on a commercial service via a normal Internet account. If you could, then the commercial service couldn't squeeze any nickels from you, and what fun would that be?

> **FYI**
> You can access some of the commercial services over the Internet instead of over a modem, but this still requires you to have an account on that service.

Commercial services offer two main advantages over finding a real Internet access provider. First, because they have deals with international commercial network carriers such as SprintNet, finding a local phone number is often easier. But, you pay for that easier access, usually with the connect-time fee for the commercial service. Second, the commercial services find it easier to offer commercial-quality information because they can charge users to access that information and then pay the information provider. Hence, you find full-text databases of computer magazines on CompuServe, but you pay extra for any searches in those databases, with the revenue going to the magazine publishers. Remember, to paraphrase the Bard, "All the world's a marketing scheme."

All the commercial services have Internet email gateways, which means you can use these services to send and receive Internet email. They also support other Internet services, such as Usenet news, FTP, Telnet, Gopher, and most recently, the Web. Some place restrictions on email, such as limiting the size of files you can receive or charging extra for Internet email (as opposed to internal email on that service).

> **BTW**
> None of the commercial online services properly handles quoting for email. When offering quoting at all, they, like AppleLink, append the original letter to your reply, which makes it difficult to refer to different parts of the original in context. If you use any of these services, try Rick Holzgrafe's SignatureQuote (see the quick review later in the chapter).

In this chapter, I concentrate on the major commercial services for Macintosh users—America Online and CompuServe—and briefly look at some other, less-commonly used services. Keep in mind that rates change frequently on these services to accommodate market pressures and the marketing whim of the day, so the rates I give may not be up-to-date.

Having an account on one of the commercial services can be a good way to ease into the Internet because you can send and receive email. Being able to send and receive email enables you to request automated information from the major Internet providers, which makes finding a local connection much easier. However, a common theme in my email is hearing people complain about how much they spent on AOL or how frustrated they were with CompuServe (after which they bought a previous edition of *Internet Starter Kit for Macintosh*, got on the Internet, and are happy little campers, of course).

Before I get into specifics, take a look at Table 19.1, which summarizes the syntax for sending email between the Internet and many of the commercial online services, including some not mentioned in this section because they're not used by Mac users or because they're really ugly or expensive. If you use one of those services and want to send email *to* the Internet, type your recipient's email address using the format in the second column. If you want to send email to someone on those of those commercial services *from* the Internet, use the format listed in the third column.

Table 19.1 Commercial Online Service Addressing*

Service	To the Internet	From the Internet
America Online	user@internet.com	user@aol.com
AppleLink	user@internet.com@internet#	user@applelink.apple.com
BIX	user@internet.com	user@bix.com
CompuServe	>INTERNET:user@internet.com	77777.777@compuserve.com

Service	To the Internet	From the Internet
Delphi	user@internet.com	user@delphi.com
GEnie	user@internet.com@inet#	user@genie.geis.com
MCI Mail	user@internet.com	user@mcimail.com
Prodigy	user@internet.com	user@prodigy.com

*Note: None of these is a real address—substitute the username for `user` and the full domain name for `internet.com`, as in `ace@tidbits.com`.

America Online

America Online (see Figure 19.1), commonly known as AOL, has been around since 1989 but has always boasted one of the best graphical interfaces for browsing files and sending email. The way its software handles discussions, however, leaves much to be desired.

Figure 19.1 America Online Welcome window, set for TCP Connection.

In the spring of 1992, AOL opened an Internet gateway, and its popularity grew quickly. In early 1994, AOL added additional Internet services, including access to Usenet newsgroups and limited access to some Gopher and WAIS servers. In the summer of 1994, AOL added TCP/IP connections that enable you to connect to AOL over an Internet connection and run the America Online software at the same time as other TCP-based programs. Connecting to AOL via the Internet requires version 2.5.1 or later of the America Online software; version 2.7 is the current version. If you have one of those versions, choose TCP Connection from the Locality pop-up menu in AOL's Welcome window to access AOL via the Internet.

> **BTW**
> The term "America Online" refers to both the service and to the special software it provides for accessing the service. Sorry if it's confusing.

There are several advantages to using the Internet access method over the normal modem connection. Many people may have only Internet access at work, so connecting from there is not only possible but much faster if you have a fast Internet connection. In other cases, Internet access may be cheaper if you must otherwise call AOL long distance (the actual cost of using AOL is the same no matter how you connect). Also, because of the standard way Macintosh Internet programs work, you can use any number of them simultaneously. This simply isn't possible if one application hogs the modem, as is normal with AOL. Finally, Internet access makes it far easier for non-U.S. users to connect.

The main disadvantage to connecting to AOL via the Internet (other than possibly paying for both your Internet account and your AOL account) is that AOL seems to download new graphics more slowly via the Internet connection. The solution to this problem is Bill Karsh's $5 shareware control panel ArtValve (available in the Macintosh Utilities Forum on AOL, keyword MUT), which lets you choose when to download new graphics. It's also on the Internet Starter Kit CD-ROM in the Miscellany folder. But enough about the connection—let's look at the Internet services AOL provides.

Internet Services

I may have quibbles with the way it implements things, or how long it takes to do so, but AOL deserves major points for providing as much access to the Internet as it does. You can go to the Internet Connection (see Figure 19.2) to read more about it from anywhere on AOL by choosing Keyword from the Go To menu. In the Keyword dialog box, type **Internet** and press Return. There's also an Internet Connection button in AOL's Main Menu window.

Figure 19.2 America Online Internet Connection.

The problem with using AOL for Internet activities is that you're limited by what's available. AOL, for instance, doesn't support programs such as NetPhone or CU-SeeMe (see Chapter 17, "Real-Time Communications"). And, even if AOL does eventually support everything you can do on the Internet, the best software for using the Internet will always appear first for true Internet accounts, since that's what the programmers of those applications use.

> **BTW**
> The feature that I most want from AOL, and which it has promised, is the capability to forward all of my AOL email to my Internet address.

Email

America Online's Internet email gateway is easy to use, due to AOL's simple interface for sending email. If you can send email on America Online to another AOL user, you can send email to anyone on the Internet with no additional work. In addition, AOL makes it relatively easy to send email to a number of people all at once. Simply put multiple addresses in the To and/or CC fields, and your message goes to all of them (see Figure 19.3).

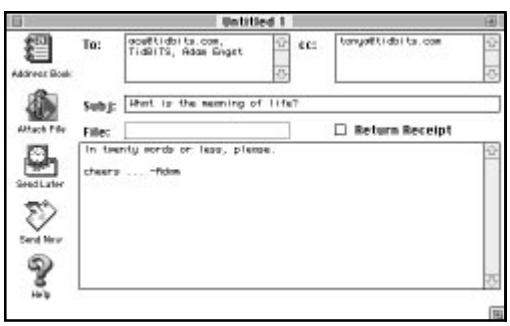


Figure 19.3 America Online Mail window.

Although it seems somewhat apologetic about not doing so, AOL doesn't reformat incoming Internet email. This means that you may have to expand the size of your email window to accommodate the longer line lengths that Internet email tends to have. An advantage of not reformatting incoming email is that to do so would undoubtedly destroy most ASCII graphics and hand-coded ASCII tables.

FYI

If you mainly receive Internet email on AOL, you may want to stick with a monospaced font such as Monaco or Courier for viewing your email, because proportionally spaced fonts such as Times and Helvetica won't work with ASCII tables.

To send email from America Online to the Internet, you don't have to do anything special. Simply type the Internet address in the To field, and fill in the Subject field and the body of the message as you do when sending email to another AOL user.

To send email from the Internet to a user on AOL, you must remember a few simple rules. First, you need to know the person's username. Second, type the username in lowercase letters, because some email packages on the Internet are picky about upper- and lowercase. Third, remove any spaces in the name. Fourth, append a `@` and the machine name and domain to the end of the address; for AOL, it's `aol.com`. My username on AOL, for example, is `Adam Engst`. To send email from the Internet to my AOL account, you would address your message to `adamengst@aol.com`. Please don't send me email on AOL—I don't read it very often.

If you plan to use AOL for serious Internet email, let me dissuade you somewhat. AOL limits the size of outgoing mail to the amount of text that can fit in its software's message box, which is 24,000 characters. AOL also can't display messages longer than about 24K; anything longer shows up as an attachment with a 2K introduction. Worse, when you download the text file that makes up the rest of the file, it will have an extra character at the beginning of each line—it looks as though AOL is creating a DOS text file, complete with both a carriage return and a linefeed. You'll need to search for and delete all the linefeed characters, or use a utility such as Add/Strip to clean up the files. Check out Chapter 10, "File Formats," for more information on linefeeds and carriage returns.

AOL can now send and receive file attachments through the Internet using MIME, which is a relatively new feature, and it's only somewhat broken. AOL users cannot receive a message with multiple file attachments. Rather, they can receive such messages, but the AOL software isn't fully MIME-compliant, so you must use an alternate MIME decoder such as uucd (people have reported less success with Mpack) to extract the attachments. Both uucd and Mpack are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/>`.

Finally, although you can type special characters such as the bullet (▶) or the trademark symbol (™) in the AOL email window, the Internet gateway software replaces many of the special characters with nonsensical replacements. It should do an intelligent replacement, so the trademark sign is converted to something such as [tm].

Although AOL's software is fine for a message or two a day, if you anticipate joining a mailing list that could generate up to 30 messages a day (which is easily possible), its interface for reading mail can quickly make your life miserable. AOL opens messages

slowly, and makes you confirm your actions when you delete a message or reply to a message offline. Your mailbox can hold only 550 messages, which may seem like a lot, but if you participate in a few high-volume mailing lists and then go on vacation, it's not unthinkable that your mailbox would fill up. Mail that you've read is deleted from your online mailbox within three to five days; unread mail sticks around for five weeks before being deleted automatically.

Overall, I find AOL's email to be so clunky such that I don't use it at all. Instead, I use Emailer, which I talked about at length in Chapter 13, "All About Email." Frankly, Emailer is a far better email program than AOL's software. Before Emailer came out, I used a different method of avoiding AOL's interface. Richard Shapiro's free MailConverter program (see the quick review at the end of this chapter) can read in mail that you download via an AOL FlashSession and convert it into a Eudora mailbox, translating the addresses into Internet format addresses along the way.

Usenet News

Along with email, America Online provides access to Usenet news. Although the interface provided for reading news works, it's about as bare bones as it comes. When you click on the Newsgroups button in the Internet Connection window, you see the Newsgroups window (see Figure 19.4), complete with handy buttons that enable you to read the newsgroups you've subscribed to, add more newsgroups to your subscription list, check new newsgroups, and search through the list of newsgroups for those that might interest you. Perhaps most interesting to those of us who have used the Internet is the Set Preferences button, which enables you to set the sort order of the article listings, enter a signature to be appended to your posts, and see the newsgroup names in the "correct" style as opposed to the confusing "expanded" names that AOL has assigned to many of the newsgroups. New to AOL are Parental Controls that enable a parent to lock out certain newsgroups from a given screen name under the main account and a FileGrabber utility that simplifies downloading files from binary newsgroups (I still say that you shouldn't bother and should stick with FTP or the Web for files).

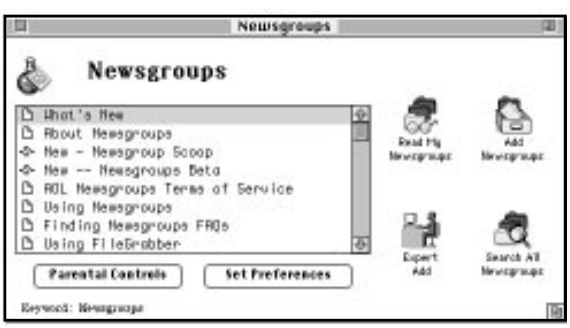


Figure 19.4 America Online Newsgroups window.

If you click the Add Newsgroups button, you see a list of the top-level hierarchies. AOL does a decent job of displaying the newsgroups and opening a new window for each level of hierarchy, although it's very slow to bring in large lists.

> **FYI**
> If AOL makes you wait for a very long list to come in, feel free to press Command-period to cancel the loading process. You won't see anything that hasn't come in, of course, but there may be plenty of items in the list to explore.

I find it extremely irritating to have to click the More button constantly when AOL doesn't list all the items in a hierarchy. This is a major problem with how AOL handles lists in general, so I doubt it will be fixed soon.

Being able to search for newsgroups with the Search All Newsgroups button is also useful, although both the basic list and the search feature limit the results to newsgroups that AOL finds "acceptable." If you wish to read any "unacceptable" newsgroups (most of the `alt.sex` hierarchy falls into this category, although some sex-related groups slip through), click the Expert Add button in the Newsgroups window and type the name of the group you want to read.

Using Expert Add is the fastest way to subscribe to newsgroups if you know the name of the newsgroup you want, although most people will probably just use the Add Newsgroups button and browse through the lists of groups, clicking the Add button when they see an interesting one (see Figure 19.5).

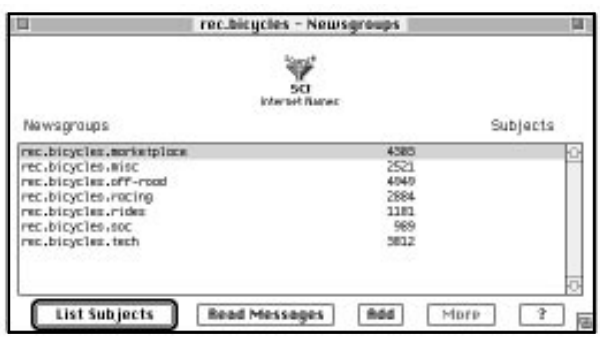


Figure 19.5 List of bicycle groups available on AOL.

After you've subscribed to a few newsgroups (and AOL subscribes everyone to a few newsgroups), click the Read My Newsgroups button to see to your subscription list (see Figure 19.6).

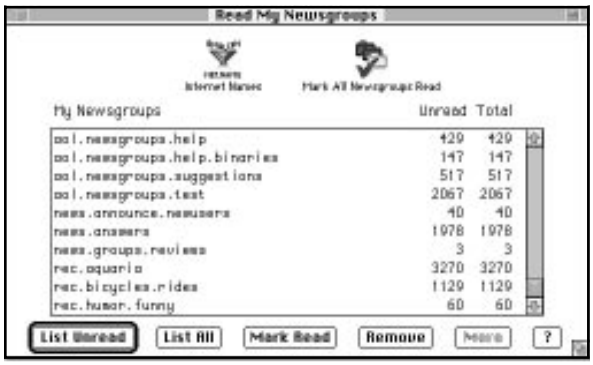


Figure 19.6 AOL Read My Newsgroups window.

The buttons here are fairly obvious. List Unread (or double-clicking a group name) opens the group and lists messages you haven't read; List All lists all the messages; Mark Read marks all the messages in the selected group as read; Remove unsubscribes you from the selected newsgroup; More displays any groups that aren't yet showing; and the ? button displays help.

After you open the list of the messages in a group, double-click a message title or click the Read button to read the messages in a thread. It's good that AOL groups messages in a thread, and I like being able to sort them alphabetically. You cannot easily mark which threads to read and which to kill, because you can select only one thread at a time. Similarly, when you get into the actual newsreader, all you can do is move forward and backward one article, mark an article as unread, or send a new message to the group or to the author. Basically, it's lousy in comparison to almost all of the Usenet newsreaders I reviewed in Chapter 14, "All About Usenet News" (and even uglier than in previous versions of the AOL software—the buttons run right into the bottom of the window, as you can see in Figure 19.7).

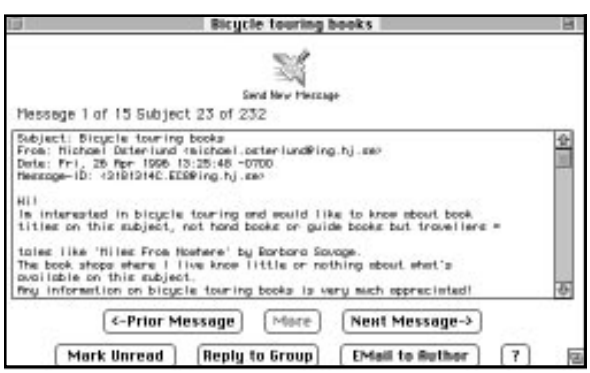


Figure 19.7 A minimalist interface, to be nice.

But enough ragging on AOL's Usenet interface. It works, it's somewhat graphical, and AOL is more accessible than Internet providers for many people. One recommendation: If you're only used to AOL, or are new to the whole shooting match, please read the newsgroup `news.announce.newusers`.

FTP

AOL's FTP client has some interesting features that set it apart, although it also suffers from AOL's overly window-based interface. After you tunnel into the FTP area by clicking the FTP button in the Internet Connection, you get a window that provides buttons for using FTP or searching through a limited set of FTP sites. Although useful, the search didn't turn up nearly as many sites as it should have when I searched on `apple.com`.

Nevertheless, when you click the Go To FTP button, AOL presents you with a short list of popular sites (see Figure 19.8) that it mirrors, which means that AOL keeps a copy of the files from those sites locally to reduce Internet traffic and load on those machines.

Figure 19.8 AOL FTP Favorite Sites.

Although this list of favorite sites is fairly short, you can connect to any other site by clicking the Other Site button and entering the FTP site's name. You also can enter full FTP URLs in the Other Site window to navigate all the way into an FTP site, although you cannot enter a URL that specifies a file—the URL must end in a directory name, such as `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/>`.

In either case, after you connect to a site, you see a window listing all the files in the default directory. Files are sorted alphabetically, and you cannot sort by date or size. Dates, file sizes, and little icons are provided for each entry, so you can tell when a file was uploaded, how large it is, and if it's a file or a folder or the equivalent of an alias in Unix (a little squiggly icon).

Now, the most interesting part of AOL's FTP client is that when you actually retrieve a file by clicking the Download Now button (see Figure 19.9), AOL first retrieves it from the Internet site (assuming you're not using one of the AOL mirror sites), and after it's on AOL's machines, proceeds to download it to your Mac.

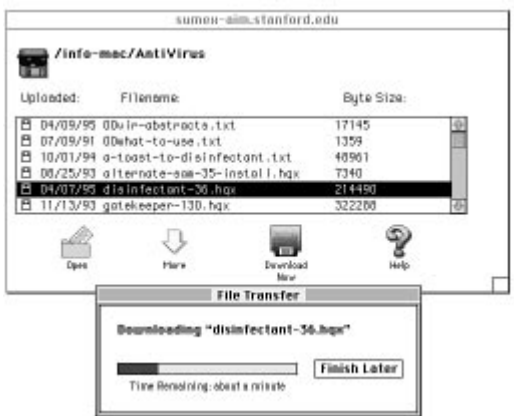


Figure 19.9 AOL FTP file downloading.

Note the Finish Later button in Figure 19.9. Because AOL has downloaded this file, Disinfectant in my example, to an AOL machine before letting me download it to my Mac, I can click the Finish Later button to put the download process in my Download Manager (located in the File menu) and finish the download at a later time, even during an automated FlashSession. I've never seen any other FTP client enable interrupting and resuming downloads, so this is a welcome feature. Why sit through a long file download when it can happen while you're off doing something, anything, else? This feature would be especially welcome with especially large files, although downloading large files via AOL might also cost a fair amount.

> **FYI**
> If you connect to a site that requires a userid and password (which is possible, and this is how you upload files) via AOL and download a file that contains sensitive information, remember that your file exists on AOL's machines, at least temporarily, and for the truly paranoid, that might be unacceptable.

Overall, AOL's FTP client is clunky, but functional, and it's extremely handy to be able to use it while getting files from the Internet for setting up an Internet connection. I would like to see it offer multiple connections at the same time as Anarchie does now, so that you could work on more than one site at a time rather than being forced to sit and wait for AOL to retrieve the file and then start downloading it to your Mac. One easily added feature would be to turn FTP into a batch operation—let the user basically mark a file for

downloading later, and have it come in via the next automated FlashSession. In the end, though, AOL's FTP client doesn't begin to compare to either Anarchie or Fetch (see Chapter 15, "All About FTP").

Gopher and WAIS

Along with its other Internet services, AOL provides limited access to Gopher servers and WAIS sources. Its interface for Gopher and WAIS isn't particularly good, but that doesn't matter all that much because you can use AOL's Web browser to access any Gopher servers or WAIS databases you may run across. Although there may still be good information available via Gopher and WAIS, little new is appearing in Gopher or WAIS servers—it's all on the Web now.

World Wide Web

AOL provides Web access through a program that's separate from the main AOL software. Called Web Browser, the software is actually a modified version of the Web browser that InterCon Systems wrote for TCP/Connect II and later included in the now-defunct NetShark. If you choose Configure from the Edit menu, the configuration window is even called "TCP/Connect II Configuration" (see Figure 19.10).

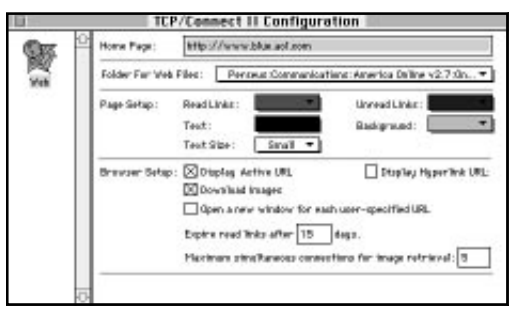


Figure 19.10 Oops! Better fix that window.

You access Web Browser by clicking one of any number of buttons throughout AOL's interface that take you to related Web sites. You can also choose Switch to Browser from AOL's Windows menu (and Web Browser has a corresponding AOL menu with a Switch to AOL item). You must be running the AOL software to use Web Browser—if you quit AOL, Web Browser terminates your connection, although you can reestablish it by choosing Connect from Web Browser's AOL menu.

Web Browser is a fairly basic Web browser (I can see that the name "Web Browser" is going to be awkward, so bear with me). It supports tables and a number of image formats (some of which, such as ART, aren't common). As a result, its screen display is quite good (see

Figure 19.11), although it has major speed problems that are more the result of the way AOL has set up its network than how Web Browser works.

Figure 19.11 AOL Web Browser.

> **BTW**
> AOL uses "proxy servers" for Web browsing. When you connect to a Web site on the Internet, AOL's proxy server actually makes the connection, downloads the information, and relays it to you. This is good if the proxy servers are fast, but if they're not, the performance suffers tremendously.

Web Browser supports multiple hot lists, but they're not hierarchical, which make storing lots of bookmarks difficult. It does support Apple's drag-and-drop technology for dragging text out of a Web Browser window to another drag-aware application or to the Finder, which is a nice touch. Other Apple technologies are also supported, including QuickTime movies, which Web Browser can play without the aid of a helper application. A final nice touch is that when you download a file using Web Browser (which is easier than using AOL's FTP client), it opens a small download window rather than taking up the entire browser window for a progress bar.

Overall, Web Browser is quite simple and functional, although I suspect it takes an unfair rap as being slower than molasses in the Yukon. I don't believe the speed problems are at all related to Web Browser itself, but instead to AOL's method of using overloaded proxy servers. In theory, AOL can and will fix the problem by adding more proxy servers.

In the spring of 1996, AOL announced deals with both Netscape and Microsoft (in fact, the deals were announced one right after another on subsequent days). The upshot of these deals is that the next major revision of the AOL software, probably version 3.0, will come with a different Web browser, probably Microsoft Internet Explorer. Whichever Web browser AOL ends up including, I gather that the other will be an option as well, which is

great. AOL should provide more choices because the interfaces it provides to Internet services aren't even competitive with TCP-based Internet software such as Eudora, NewsWatcher, Anarchie, and Netscape Navigator.

Serving FTP and Web Pages

A recent addition to AOL's stable of services is a feature called My Place, which enables users to create their own personal FTP directories and Web pages (with a limit of 2 MB of files). AOL has accomplished this by creating an FTP site called `members.aol.com` (also known as `users.aol.com`). You access My Place by choosing Keyword from the Go To menu and typing **My Place** (see Figure 19.12).

Figure 19.12 AOL My Place.

Clicking the Go to My Place button opens one of AOL's FTP windows to the correct directory, which, in fact, it has created for you on the fly. Your directory is named with your screen name. There's a link to a informational posting called usersFAQ.txt—read that file for useful information on how to use and access your space on AOL. You can even let other people upload files to your account if you create a directory called incoming (see Figure 19.13).

Figure 19.13 Creating an incoming directory in My Place.

People cannot see any files in an incoming directory, but they can upload without needing a userid and password, which is unusual. Only you can see the files uploaded to your incoming directory when you're in AOL, and you can move them out to your main directory by clicking the Utilities button, then the Rename button, and then renaming the file so the path doesn't include the incoming directory.

If you want to make files available to the Internet via FTP or the Web, you must upload them. Click the Upload button to upload files from your Mac to AOL (use ASCII for HTML files, Binary for graphics, MacBinary for programs). Unfortunately, you can upload only one file at a time. After the files have been uploaded, anyone can connect to AOL's FTP site and see everything in your directories (other than incoming and private, which AOL uses for its own software). The URL people would use to see your files via FTP would be `<ftp://users.aol.com/screenname/>`, where `screenname` is your screen name, all lowercase and without spaces. There's no way for someone to look up your screen name—for them to connect to your FTP folder, you must tell them your screen name (preferably within the full URL).

Web access is similar. If someone wants to read to your Web pages on AOL, he or she must use a URL such as `<http://users.aol.com/screenname/file.html>`, where `screenname` is your screen name, all lowercase and without spaces, and `file.html` is the name of the HTML file they want to read.

Frankly, I was quite impressed with how well AOL has implemented My Place. Although it suffers somewhat from AOL's general interface problems (clicking the Utilities button and then the Rename button to move a file is way too clumsy), the speed from the Internet was excellent, and AOL explained the quirks quite well. If you use AOL rather than a true Internet account, I encourage you to take advantage of the My Place service. You might want to check out AOL's Web Toolkit area by choosing Keyword from the Go To menu and entering **HTML**, and you should also read Chapter 22, "Create Your Own Web Site," for more information on creating your own Web page.

Charges and Connecting

AOL has monthly base rates of $9.95 for the first five hours and $2.95 per hour for each hour after that. You can often get special sign-up deals that offer ten free hours for the first month. As of July 1st, 1996, you'll be able to choose another billing plan that costs $19.95 for 20 hours each month, with all additional hours costing $2.95.

You need America Online's software to log on to the service, but AOL distributes it for free. Simply call 800-827-6364, and ask them to send you the software. Alternatively, if you have a friend who already uses AOL, that person can ask AOL to send you the software, and she receives some free time online when you first log on.

If you have an account somewhere that enables you to send Internet email, you can send email to `fulfill2@aol.com` and ask for a free AOL software kit, or, if you have FTP access, it's available for downloading in `<ftp://ftp.aol.com/mac/>` or `<http://www.aol.com/about/try/>`.

CompuServe

CompuServe is one of the oldest of the commercial online services, and until recently, it has moved relatively sluggishly to provide Internet services. It had one of the first Internet email gateways, but only added access to Usenet news, FTP, and Telnet somewhat recently. Although CompuServe still does not support the Web internally, you can use FreePPP to connect to the Internet via CompuServe's network of telephone numbers around the world (using your existing CompuServe account) and do anything you can do on a true Internet account except read email (for that you must use CompuServe normally).

CompuServe has announced that it plans to go entirely over to the Web at some point in the future, although I anticipate that will be some time off, given the enormity of the task. Until that time, you'll have to use its special program, CompuServe Information Manager, to access CompuServe.

You can make connections with CompuServe in three different ways, one of which, as I noted previously, gives you a true Internet connection. There's the normal method of using your modem to dial CompuServe directly in CompuServe Information Manager. Alternately, you can use CompuServe Information Manager to access CompuServe over your existing Internet connection. Finally, you can use CompuServe's network and your CompuServe account to connect to the Internet via PPP.

CompuServe provides a number of forums for discussing Internet issues (GO INTERNET to get to them, especially GO INETRESOURCE), although they seem to concentrate on Windows topics and software, so you may want to check out a couple of other places where people talk about Macs on the Internet. In the Mac Communications forum (GO MACCOM) there's a section for Macs On Internet, and in ZD Net/Mac, which runs on CompuServe's machines, has the Internet Help section in the ZD Net/Mac Tech and Business Forum (GO ZMC:DOWNTECH) forum. ZD Net/Mac costs an additional $3.50 per month, but is a good place to ask questions.

Special Software

CompuServe sells two graphical applications for accessing CompuServe's services. I recommend that you get CompuServe Information Manager (CIM), or, if you don't want to use the Internet aspects of CompuServe, another program called CompuServe Navigator.

Mike O'Connor designed Navigator specifically to save money when using CompuServe. You tell Navigator what you want to do in terms of reading mail, sending mail, reading discussions on CompuServe, downloading files, and so on, and then you tell Navigator to log on and do everything for you. Because it works quickly by itself, it stays on for a shorter time than you normally would, and thereby saves you money. That's good. However, Navigator was designed for reading discussions on CompuServe, so it's clumsy for email use. Every item, mail or otherwise, is appended to a linear Navigator session file that rapidly grows large and cumbersome to navigate when searching for old mail that you haven't yet replied to.

In contrast, CIM works much better for all of the Internet services that CompuServe provides because CompuServe is designing and updating it specifically to provide graphical access to Usenet news, FTP, and Telnet (as much as you can provide graphical access to a character-based service such as Telnet). Also important is the fact that CIM provides a much more flexible interface for reading and replying to email. If you plan to use CompuServe for anything other than participating in the discussion forums and uploading and downloading files, I recommend that you get CIM instead of Navigator. I personally use both because CIM is lousy for reading discussions and retrieving files.

Connecting to CompuServe over the Internet

You can use CIM to connect to CompuServe if you have the latest version of CIM (2.4.3 or later) and a Communications Toolbox Telnet tool like TCPack from About Software. To connect to CompuServe using CIM, go to the Special menu and choose Connection from the hierarchical menu (see Figure 19.14). In the Method pop-up menu, choose a Telnet tool that you've previously installed in your Extensions folder. I've found only two that work at all reliably: the VersaTerm Telnet Tool and the TCPack Telnet Tool (I used the demo). The others I tried, including the versions of the TCPack Tool for AOL, the Mark/Space Telnet Tool, and the MP Telnet Tool, either didn't work or crashed CIM. You can get the TCPack Telnet Tool demo from `<ftp://ftp.ascus.com/mac/demos/>`.

Click the Configure button and enter `compuserve.com` for the host name (the different Telnet tools will have different names for this field). All other default settings should work. Make sure the Network pop-up menu is set to Internet, and the Connect Type menu is set to Direct Connection. Click the OK button to save your changes.

CompuServe reportedly (and it seems this is true based on performance) limits the speed at which you can connect to the speeds supported by its modems, even if you happen to have a much faster Internet connection. The policy makes sense, given that some of CompuServe's accounts used to charge different rates based on speed of access, but it's still irritating to have a fast Internet connection throttled down to the speed of a modem.

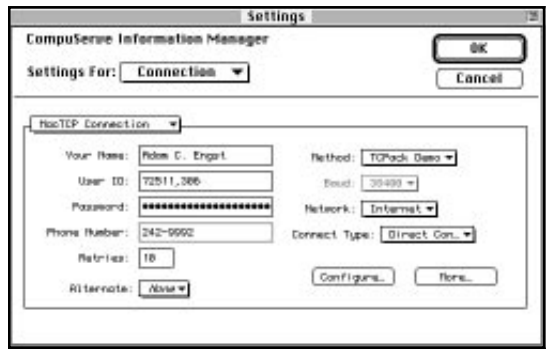


Figure 19.14 CIM Settings window.

Internet Services

CompuServe is an old service; it wasn't designed with the Internet in mind. Thus, all of the Internet services feel as though they've been badly tacked on to a framework that wasn't designed to support them. When you add in the fact that CompuServe could really use some good interface designers, you end up with tools that work, but may cause more frustration than they're worth. Currently, the four Internet services that CompuServe provides internally are email, Usenet news, Telnet, and FTP. You can access all of them (see Figure 19.15) from the CompuServe Internet Services window (GO INTERNET).

Figure 19.15 CompuServe Internet Services.

Email

CIM is good at email (GO MAIL), especially in comparison to Navigator, because it can transfer all your mail quickly and automatically. CIM shows you a nice list of all your mail and enables you to sort it in several different ways. I seldom mess with the sorting, but listing mail makes much more sense than forcing the user to scroll through each message, as Navigator does. See Figure 19.16.

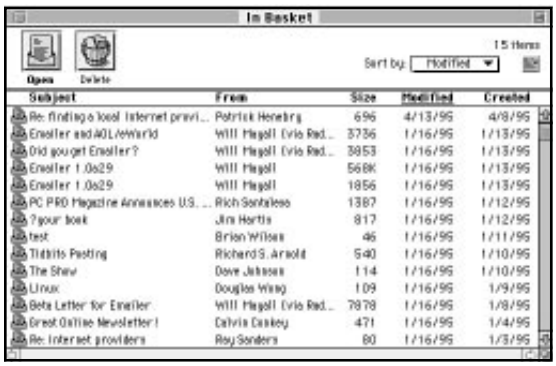


Figure 19.16 CIM In Basket.

I often find myself receiving email that I don't have time to respond to immediately, or perhaps the message requires enough research that I don't want to respond for a day or two. In either case, it's easy to lose email in Navigator, whereas in CIM you can easily see which messages need a response. CIM also makes it easy to save copies of outgoing messages (useful for those times when you want to say, "I didn't write that!" in a hurt tone). Also, you can file messages in different folders, essential if you receive email about different projects.

The hard part about sending email to the Internet from CompuServe is the addressing. You must know the magic words to add to an Internet address for CompuServe to behave properly. It's not difficult, only obscure and easy to type incorrectly. If you want to send email to my account on the Internet, `ace@tidbits.com`, you prefix `INTERNET:` to my address, so the ungainly end result looks like `INTERNET:ace@tidbits.com`. Easy enough, but people often type the address slightly wrong. It doesn't seem to make a difference if you put a space between the colon and the start of the Internet address, but remember that spaces are verboten within an Internet address.

Sending email from the Internet to CompuServe poses fewer problems. You must follow two simple rules. First, all CompuServe addresses are pairs of octal numbers, or some such nonsense. My CompuServe address looks like `72511,306`. Commas aren't allowed in Internet addresses (they usually indicate a list of addresses), so you must change the comma to a period and then add `@compuserve.com`. My address, then, becomes `72511.306@compuserve.com`. Unless you have a better memory for octal numbers than I do, put CompuServe addresses in a nicknames file or address book. Please don't send me email on CompuServe—I don't read it very often.

Usenet News

CompuServe's interface to Usenet news (GO USENET) is functional, but otherwise horrible. After you get to the main Usenet news window, you must first select USENET

Newsreader (CIM) from the list of options to bring up a modal dialog that enables you to read news, subscribe to newsgroups, create an article, and set various options.

> **FYI**
> Modal dialogs are dialog boxes on the Mac that prevent you from doing anything else in that program, or perhaps in any other program as well. They're called modal dialogs because they force you into a "mode," which is contrary to how most functions in a Macintosh application should work. In other words, they're often a bad thing.

CIM provides a searching interface for finding groups, and lets you enter a newsgroup name manually, which is the only way to subscribe to groups such as `alt.sex` that CompuServe doesn't like to list. After you've subscribed to a few groups (and the manual entry method is by far the fastest, followed by the search engine), you can read articles in those newsgroups by double-clicking Access Your USENET Newsgroups, at which point CIM displays a list of your subscribed groups in yet another modal dialog (see Figure 19.17).

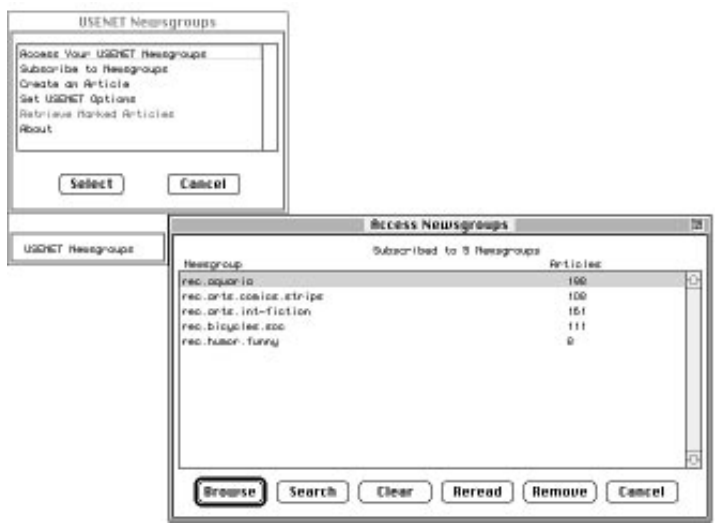


Figure 19.17 CIM Usenet Newsgroup list.

In the list of newsgroups, you can browse the articles contained within, search for text in the subject lines of the articles (a nice touch), mark all the articles read or unread with the oddly named Clear and Reread buttons, and unsubscribe from newsgroups with the Remove button. As with all of the other modal dialogs, the only way to back out is via the Cancel button.

Browsing in a newsgroup brings up a modal dialog with a list of articles (see Figure 19.18). To read messages in a thread, click their titles to put a check in the checkbox to the left.

Then, click either the Get button to read all the selected messages or the Retrieve button, which downloads the selected threads to your hard disk for later perusal. Even better, you can use the Mark button to mark articles, mark articles in other newsgroups, and then download them all at once when you're done. The other functions available in the article list dialog are mundane—you can create a new article with the Create button, mark a thread as read with the Clear button, and back out to the newsgroup list with the Cancel button.

Figure 19.18 CIM Usenet article list.

When you finally click the Get button to read an article, CIM opens (surprise!) one more modal dialog box (see Figure 19.19). CIM's designers should be forced to sleep with Apple's Human Interface Guidelines and have little signs with "Thou shalt not use modal dialogs needlessly" pasted up in their offices. Anyway, the actual dialog for reading news enables you to move forward and backward by the article or the thread, mark an article as unread with the Hold button, reply via email or in the newsgroup, forward an article to someone via email, and see the full header information with the More button.

Figure 19.19 CIM Usenet article-reading window.

Sorry if I'm ranting, but CIM's Usenet interface irks me to no end. There's absolutely no reason, other than poor design, to use so many modal dialogs that make it difficult and confusing for the user to do much of anything. For instance, if all you wanted to do was forward a single message to someone else via email, you would have to dive down through six modal dialogs and after you'd forwarded the article, come back to the surface through those six modal dialogs. In contrast, NewsWatcher, one of the best of the Usenet newsreaders, enables you to do the same thing entirely in modeless windows by opening a newsgroup window, double-clicking an article to read it, choosing Forward from the News menu, and clicking the Send button in the message window after you've entered the email address. In other words, what takes many frustrating minutes in CIM is simple task in NewsWatcher, simply because of a decent interface. I'll shut up now. If you use CompuServe and want to read Usenet news, CIM's newsreader works, but I'd recommend using the PPP connection with NewsHopper (to avoid high charges) instead. Just point NewsHopper at `news.compuserve.com`.

Telnet

Unlike AOL, CompuServe supports outgoing Telnet (GO TELNET), which means that you can connect to Internet sites in character mode and do whatever it is that the particular site in question enables. Telnet is rather dull. It's not really the point for those of us interested in using graphical interfaces, but it can be useful on occasion. I tried CompuServe's Telnet feature by telnetting back to my Unix account on `coho.halcyon.com`, and it sort of worked (see Figure 19.20), but because CIM 2.4.3 on the Macintosh doesn't provide full VT100 emulation, some things I tried were a little ugly or, in the case of Lynx (a Unix-based, character-mode Web browser that requires VT100 emulation), unusable.

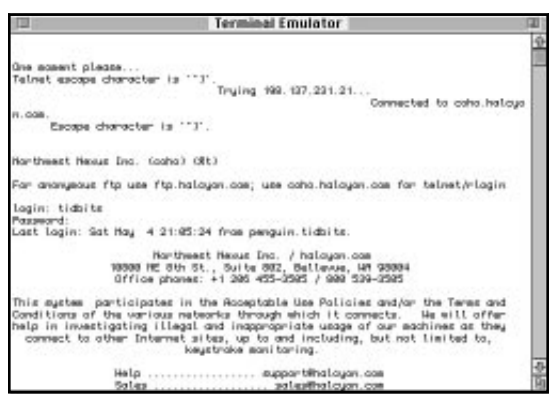


Figure 19.20 CIM Telnet window.

FTP

CompuServe's FTP service (GO FTP) includes a list of selected popular FTP sites (see Figure 19.21), although it includes only twelve sites, and the List of Sites button brings up almost exactly the same list, with a few minor additions. Similarly, the Site Descriptions button provides descriptions of the same basic list with a few exceptions. Given the thousands of useful FTP sites available, the limited lists and seemingly duplicated information strike me as odd.

Figure 19.21 CompuServe FTP window.

More interesting than CompuServe's prechewed-for-your-convenience sites is the Access a Specific Site button, which enables you to connect to any other Internet FTP site. I'm utterly unimpressed with CompuServe's FTP interface. First of all, when you click the Access a Specific Site button, CIM presents you with an ugly dialog box for you to enter the site name, the initial directory, and your userid and password (the last two of which it fills in for you with `anonymous` and your email address). Then, when you actually make the connection, CIM shows a window with two panes and some buttons along the bottom. The left-hand pane shows the current list of directories, whereas the right-hand pane shows the list of files in the current directory (see Figure 19.22).

You must always click the Back or Top buttons to move out of a directory. Although you can select multiple files to download from a directory, you cannot select multiple files from different directories—when you leave a directory, CIM forgets any files you've selected by clicking the checkbox to the left of the filename. The Filter button is handy because it enables you to limit the list to files matching a certain string, such as ***.hqx.** And the View button is a nice idea that can't work with long files—I suspect it's limited to 32K or less. You can connect to a site where you have write privileges and upload files, should you want to do that. Finally, the Leave button enables you to disconnect from an FTP site.

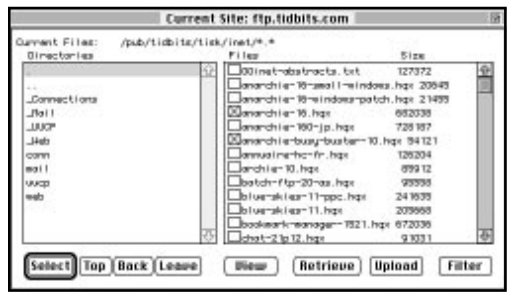


Figure 19.22 CIM FTP file list.

Overall, I'm unimpressed with CompuServe's FTP client. It feels sluggish and the interface is clumsy. It does work, and if you need to get a file via FTP, it's worth a try. For regular use, though, I strongly recommend that you use CompuServe's PPP connection and Anarchie or Fetch (see Chapter 15, "All About FTP").

World Wide Web

CompuServe currently does not offer any Web access in its Macintosh client software. Although some sort of Web browser (probably Microsoft Internet Explorer, with an option to try Netscape Navigator instead) is promised for the future, for the moment, you're stuck with using CompuServe's PPP connection and either Internet Explorer or Netscape Navigator. That may not seem like much of a liability, but AOL links its Web Browser into the AOL software, which CompuServe currently can't do.

CompuServe offers a Home Page Wizard program for Windows users that enables them to create and post their own home pages on CompuServe's Web site. Unfortunately, no Mac version currently exists, although CompuServe claims that one is planned for the future.

Using CompuServe's Network for PPP

I don't want to get into all the gory details of configuring Open Transport or MacTCP and FreePPP for use with the CompuServe network here, since they're basically the same for any other Internet provider. However, accessing the Internet using PPP and CompuServe's modems is the only way CompuServe users can use a Web browser. I'll keep the instructions brief. Read Chapters 11, "Open Transport and MacTCP," and 12, "PPP and SLIP," before you try to set up a PPP connection using CompuServe's network.

Open Transport

Open the TCP/IP control panel. CompuServe provides server-addressed accounts, so make sure that you have FreePPP selected in the Connect via pop-up menu and Using PPP

Server selected in the Configure pop-up menu. In the Name server address field, enter **149.174.211.5**, press Return, and then enter **149.174.184.41** so the TCP/IP control panel looks like Figure 19.23. If you plan to switch between configurations, I recommend saving your configuration under a specific name—choose Configurations from the File menu while the TCP/IP control panel is open.

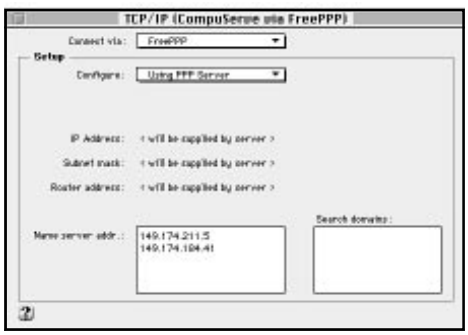


Figure 19.23 OPEN Transport configured for CompuServe.

MacTCP

CompuServe provides server-addressed accounts, so make sure that you have FreePPP selected in the outer level of the MacTCP control panel and then click the More button to bring up the Configuration dialog box. Make sure the Server button in the Obtain Address area in the upper right is selected. In the Domain Name Server Information area, enter **compuserve.com.** in the first left-hand field and **149.174.211.5** in the first right-hand field. Select the Default button next to the IP address that you just entered. In the second left-hand field, enter a period, and in the second right-hand field, enter the same IP number. In the third left-hand field, enter a period, and in the third right-hand field, enter **149.174.184.41**. Close MacTCP, restarting your Mac if it asks you to. See Figure 19.24.

FreePPP

In FreePPP, the only settings that are specific to CompuServe are the phone number, which you can get from CompuServe's automated voicemail system at 800-848-8199, and the Connect Script, which should look like the following figure, substituting your CompuServe ID number for `77777,777` and your password for `Enter-Your-Password-Here` (see Figure 19.25).

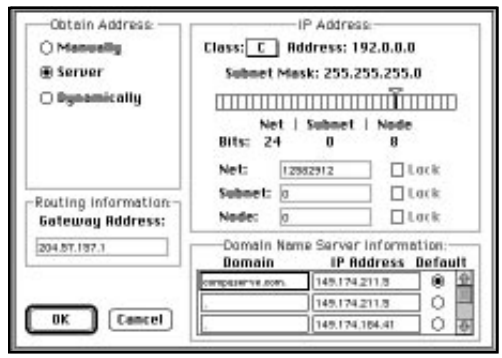


Figure 19.24 MacTCP configured for CompuServe.

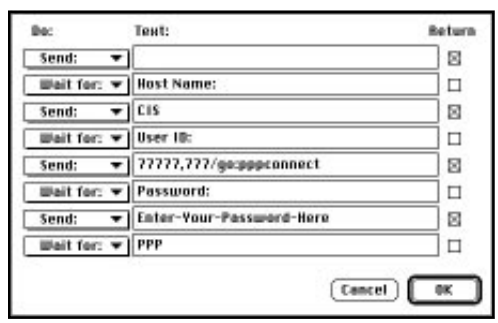


Figure 19.25 FreePPP connect script for CompuServe.

For information on how to configure everything else in FreePPP, read Chapter 12, "PPP and SLIP."

> **BTW**
> I couldn't verify this setup, which worked for the third edition of this book, because none of CompuServe's local modems would work for me. My Internet service provider's modems worked fine, so I was able to use CompuServe Information Manager via my Internet connection.

Charges and Connecting

Cost-wise, CompuServe used to hold the title for the most confusing pricing structures around. These days, it has simplified the billing plans, but it still requires some thought. CompuServe basically offers two options: the Standard Plan and the Super Value Plan add-on.

The Standard Plan costs $9.95 and provides five free hours per month. After your five free hours, additional hours are billed at $2.95 per hour.

The Super Value Plan, which must be added on top of the basic plan, costs an additional $15 per month, but adds 15 more free hours for that amount. Each additional hour costs $1.95.

You need a CompuServe Membership Kit to access CompuServe. You can order it from CompuServe at 800-848-8199. You also can get more information and sign up for CompuServe via the CompuServe Web page at `<http://www.compuserve.com/>`.

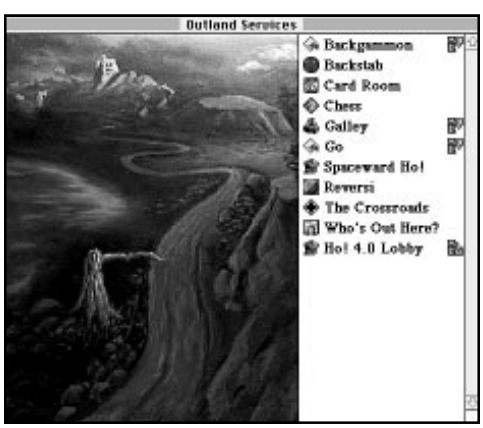
Other Commercial Services

Although I recommend America Online or CompuServe for most people, you might also want to try Outland's gaming network or Prodigy, the third of the major commercial services (but one which has never focused on the Mac and which is in financial trouble as of mid-1996). Note that I'm also not mentioning any commercial online services that don't offer a graphical interface, nor am I mentioning Apple's AppleLink. Although AppleLink is still in operation, it's slated to go away in the near future and I would be surprised if anyone could still sign up.

Outland

`http://www.outland.com/`
`ftp://ftp.outland.com/pub/`

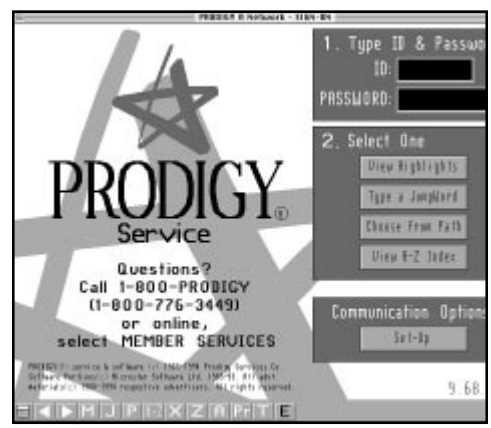
Outland is a nationwide commercial service solely for Macs that's dedicated to computer games. However, we're not talking just any computer games. It's specifically designed to support graphical multiplayer games with those multiple players coming in from all around the world. Along with a variety of standard board games, Outland offers a special version of Delta Tao's fabulous space opera game, Spaceward Ho!. Why am I blathering about games here? Well, Outland is unusual in that it is accessible only via the Internet. You must use Outland's special software, which is available for free, although playing the games costs money. Charges are $9.95 per month, flat rate, with a five-hour free test period. You can contact Outland for more information at 800-PLAY-OUT or at `info@outland.com`. You can retrieve the Outland software on the Internet.



Prodigy

```
http://www.prodigy.com/
http://pages.prodigy.com/memsvc/prodigy.hqx
```

Currently the least Mac-like of the services with graphical interfaces, Prodigy supports several Internet services. Most notable is a Web browser that is available only for Windows now, but Prodigy also supports Internet email and Usenet news for Mac users. Prodigy's online help claims it can't receive messages over 60K; in fact, it splits messages into chunks if the original is too large. To send email to a Prodigy user, append `@prodigy.com` to the user's Prodigy address—sending email to the Internet is straightforward. File attachments (for both internal and Internet email) aren't currently supported, but should be soon. Prodigy offers full access to Usenet news, and in a nice change from policies of yesteryear, it does not censor or withhold any messages on Usenet from Prodigy users. You need Prodigy's software, and the easiest way to get it is to call 800-PRODIGY. It comes with a number of free hours (pricing plans vary, but are competitive), although you must give a credit card number to sign up, and if you don't cancel before the end of your free hours, you're automatically subscribed.



Email Utilities

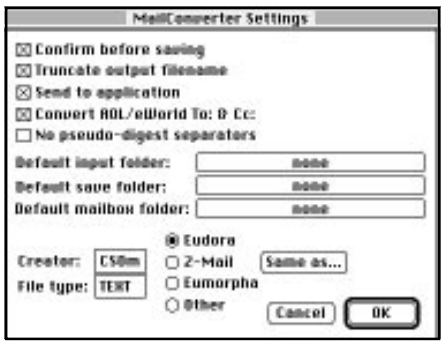
As I mentioned previously, there are a couple of programs that make dealing with email on the commercial online services quite a bit easier: MailConverter and SignatureQuote. Also, if you receive a lot of email from an online service or receive email from multiple online services, be sure to read about Emailer in Chapter 13, "All About Email."

MailConverter

```
ftp://ftp.tidbits.com/pub/tidbits/tisk/util/cmp/
```

I've become fairly fond of Richard Shapiro's free MailConverter 2.1.8 because it saves me from having to read and reply to email within America Online. Instead, I use AOL's FlashSessions to download the mail, then I have MailConverter convert the messages into a Eudora mailbox, where I can read and reply in a powerful and consistent environment. MailConverter also can convert a number of mail formats,

including messages from LeeMail, cc:Mail (limited support), VMS mail (limited support), Pine, Elm, and files saved from various newsreaders, including NewsWatcher. MailConverter also will break up mail digests into individual messages. MailConverter supports drag-and-drop and is rather flexible in terms of dealing with strange headers.



SignatureQuote

`http://www.opendoor.com/Rick/SQ.html`

Although most decent email programs have the capability to add a signature to your messages, it's uncommon for the commercial services to support signatures. In addition, none of the commercial services makes it easy to quote text from a message in a reply. Rick Holzgrafe's $10 shareware SignatureQuote 1.0 is the answer to such problems—just configure it with your signature and then you'll be able to add your signature to outgoing email with a single key press. To quote text, just copy it, activate SignatureQuote, and click one of the two Quote buttons to use one of two quoting styles. I highly recommend it if your email program doesn't support signatures well.

PART IV

Making More of the Net

Part IV, "Making More of the Net," takes a step beyond Part III, "Using the Internet." Its four chapters look not so much at the specifics of using programs as how you might accomplish certain tasks on the Internet. I strongly recommend you read Chapters 20 and 21, since they should prove immediately useful (not to mention fun, if you play the scavenger hunt at the end of Chapter 20). If you're interested in making your own Web page, Chapter 22 is a must-read. Similarly, if you're interested in setting up an Internet server on your Mac, Chapter 23 is for you. If not, feel free to ignore those chapters until such time as you might be interested.

- Chapter 20, "Finding Things on the Internet," provides techniques for finding almost anything on the Internet and reviews the main tools available for searching the Internet.
- Chapter 21, "Macintosh Internet Resources," does for the Macintosh what you might wish to do on your own for other subjects. It reviews the best Macintosh Internet resources available, complete with pointers to the sites and discussion groups.
- Chapter 22, "Create Your Own Web Site," could almost be its own book. It seems that everyone wants to make Web pages these days, and Chapter 22 tells you everything you need to know to do so. It even reviews the main software you can use to make the task easier.

- Chapter 23, "Set up Your Own Server," provides information about how to set up a Macintosh as an Internet server and reviews the main server software that's available.

Chapter 20 Finding Things on the Internet

Contents

One of the most common complaints I hear from people new to the Internet is that it's difficult to find whatever it is they want to find. Often people write to me, asking where they can find information about the 1932 Peruvian Rabbit Insurrection, or some such tidbit of esoterica. I always reply, as I must, that I haven't the foggiest idea where information about the 1932 Rabbit Insurrection is stored, not being an early twentieth century South American historian specializing in bunnies. I'm a computer guy with a background in Classics, and as you get more and more into what I know, you find that I know quite a bit about the Macintosh, and even more about using the Internet on the Macintosh. As a result, I have a pretty good idea where to look for information about Mac Internet use, and after that, I have no special tools that normal users can't access.

I won't pretend that finding any given piece of information on the Internet is trivial, because it's not. Unless your experiences were significantly different from mine, though, you'll remember the frustration of searching for information in traditional libraries, which have the benefit of card catalogs and the Dewey Decimal System and Library of Congress classification schemes. One of the main points of libraries is to make information available to the public. And yet, finding any given fact is not that easy, which is one reason that reference librarians are such popular people.

When I was in 9th grade Earth Science, one of our projects was to match hoofprints with the various evolutionary predecessors of the horse—Eohippus, Mesohippus, and so on. As I remember, no one had ever matched all the hoofprints correctly. Everyone always missed a certain one, and I was

determined to change that. First I went to the school library, but struck out quickly. I figured that everyone would have tried that anyway, so I decided to branch out. Next I searched in the Tompkins County Public Library in Ithaca, New York. Strike two. Never one to give up, I persuaded my mother to let me look for books where she worked in Olin Library, the largest of Cornell University's 17 library buildings, and one that reportedly holds more volumes that 90 percent of the world's library systems. A few hours of searching, a swing, a miss, and I joined the ranks of previous Earth Science students to miss identifying that one specific hoofprint.

The problem was almost certainly not that the answer didn't exist in any of the libraries I searched; for all I know, even the Newark Valley High School library contained the book I needed. No, the problem was twofold: First, I didn't know how to go about searching quickly and efficiently; I undoubtedly wasted much of my time on what would now seem to be obvious dead ends. Second, most existing searching systems work on "metadata," which is information about the primary data. If you think of the contents of a book as the data, the metadata is the index, which is "about" the primary data. It's time-consuming to search primary data without automated help; that's why we usually use metadata in the form of indices, tables of contents, or the like.

The best I could do with my limited knowledge and resources was to search a source of metadata, the card catalog, for books about the evolution of the horse or the proper time periods, and after I'd found the book, then go to the index, another source of metadata, and see if anything looked helpful. Even at the time I realized that searching the primary data, reading each book, was not feasible in the time I had available.

I'll be honest. Even when I was in college, I found libraries frustrating. They hold so much information, and the methods of accessing that information at the time were relatively archaic (even the online card catalog wasn't entirely in place by the time I graduated). So now that I have ready access to vast quantities of information on the Internet, my inclination is always to search on the Internet before I subject myself to the frustration of library research. I'm not always successful, but often I can learn far more from the Internet in just a few minutes than I could from the library in hours, especially considering that it takes 20 minutes to drive from my house to the closest library.

Where to Start

All that said, let's assume you wish to utilize your Internet connection to find things. I use the word "things" because the first thing to decide is precisely what it is you wish to find. This question isn't necessarily as hard in a library, but libraries primarily hold books and periodicals, whereas the Internet holds many different types of information. Of course, everything on the Internet can be reduced to zeroes and ones, but let's ignore that fact for the time being and look at some of the kinds of things you can find on the Internet, including general information, programs, discussion groups, and people.

- **General information.** One of the most common uses of the Internet is to find information about a specific topic. You might have a specific question, or you might just wish to read up on a topic so you have a better idea of what's going on. In either case, there are a number of tools and techniques that you can employ to zero in on what you're trying to find. Perhaps the hardest part of trying to find information on the Internet is that the metadata follows its own rules, not those of the Library of Congress, for example, so you must learn new classification systems and organizational schemes. Also difficult is learning how to formulate your questions, since few systems understand normal English. As such it's important that you learn how to pick good keywords, the words you enter to find your information. Almost all of this sort of information is available through the Web now, which makes things easier than in years past, when you might have had to use a variety of tools to hunt down that salient fact.

- **Programs.** Since everyone using the Internet uses a computer, many people want to find programs for use on their computers. Vast numbers of programs are available on the Internet, often for free or for a small fee, and it's inevitable that more programs will be distributed via the net in the future. Finding programs can be tricky because you must rely on metadata about the program, often created by someone other than the programmer, and that metadata is often abbreviated if it exists at all. In addition, some basic knowledge about where programs are stored goes an incredibly long way toward shortening your search. Finally, newcomers to the Internet are often thrown by the fact that most programs are stored on FTP sites, and the tools available for searching FTP sites aren't particularly impressive. Solutions exist, though.

- **Discussion groups.** There are tens of thousands of mailing lists and more than 16,000 newsgroups. Needless to say, finding the discussion groups that interest you in that mass isn't necessarily easy. Still, there are a few tools and techniques that I think you'll find useful.

- **People.** One of the first things that many people want to do when they first get on the Internet is search to see if any of their friends and relatives are also on the Internet. In the past, this process was frustrating, fraught with difficulty, and seldom rewarding. I used to advise people that if they wanted to find someone's email address, the best method was to call that person on the telephone and ask. Although that advice still holds, new tools have sprung up that enable you to find quite a bit of information about other individuals.

Finding General Information

How you search for any given bit of information depends on the information you want to find and the tool that you're using to find it. I've come up with a few methods of searching that I think work well, and after I explain those, I'll briefly describe each of the main tools for searching on the Web.

When I'm looking for information, the first thing I do is try to think a little about the type of information I want to find. Over the years, I've narrowed information to three basic types.

- **Information that is easily categorized.** Many Web searching sites present information categorically, so—for instance—if I'm looking for information related to the musician David Bowie, I should be able to find it in a Web catalog site by following a hierarchy of categories along the line of Arts & Entertainment, Music, Rock & Roll, Musicians, David Bowie. It might take me a few minutes to work my way down the hierarchy, but I'm likely to find what I'm looking for at the end.

- **Information that is not easily categorized.** It doesn't matter if there's a perfectly reasonable category for it; if I can't figure out what that category is, I won't be able to find the information based on a categorical searching technique. If I want to find information on water quality, for instance, I have no idea how that information might be categorized. In this case, I'd use a search engine to search on keywords related to the information I want.

- **Personal opinion, often about a current event or topic.** If I wanted to buy a PC Card modem for my PowerBook 5300, I would want to know what people are saying about that subject, which products people like, and which products are generating complaints. When I want to find this kind of information, I search Deja News or one of the other search engines that indexes Usenet news. After I've found what I believe to be a representative sampling of opinions, then I attempt to find more information about the specific products that have been recommended, either by searching on the Web or by guessing at a company Web site name.

FYI

Guessing at a Web site name is easy and effective. For instance, you might guess that Apple's Web site name is www.apple.com, and you'd be right. The same applies to most large companies—take the company name and sandwich it between "www." and ".com" and you might get lucky. I frequently use this technique when looking for corporate Web sites.

So there you have it, my personal method of searching for information on the Internet. Each of the three types of information requires different tools, and that's where I now turn my attention: short reviews of the main searching tools.

Keep in mind that these are the main sites available as of the writing of this edition of *Internet Starter Kit for Macintosh*. More sites are likely to appear in the future, and I wouldn't be surprised to see some of these sites go away. Making money on the Internet by providing a search engine is a tricky business, and some of the companies and organizations that run these search engines may throw in the towel after this book is published.

In each category, I'll briefly review my favorite site and settle for listing the rest in a table. There's not that much difference between the various sites, so it's up to you to find your favorites.

Web Catalogs

First, let's look at the Web catalogs, since they often provide the easiest way to find information. You don't have to type in any keywords or do much of anything other than navigate through hierarchical categories.

Computers are notoriously bad at automatically categorizing information. As a result, Web catalogs are created and maintained by people. Web catalog editors strive to differentiate their sites through categorization techniques and the quality of the pages linked to from their sites.

Yahoo

`http://www.yahoo.com/`

Yahoo was started by David Filo and Jerry Yang, electrical engineering graduate students at Stanford University. Initially the two just wanted to keep track of sites of personal interest, but Yahoo rapidly grew from a list of personal interests to the gigantic search engine it is today, requiring customized software to keep up-to-date. Yahoo is now a company, and recently had a successful public stock offering. I find that Yahoo is one of the best-organized of the Web catalogs, and the Yahoo team continues to come up with useful features, such as the capability to search within the Yahoo database and to limit searches to the category you're viewing. Yahoo avoids using a lot of graphics to maintain performance, which modem users will appreciate. Also nice is the way that Yahoo passes failed searches to other search engines on the Internet for you. Children might also especially enjoy Yahooligans, a new portion of the Yahoo site especially for kids.

Table 20.1 Other Web Catalogs

Site Name	URL	Comments
Galaxy	`http://galaxy.einet.net/`	One of the oldest catalogs; breaks up entries by types of resource.

continues

Table 20.1 Continued

Site Name	URL	Comments
GNN Select	`http://gnn.com/gnn/wic/wics/`	Only 2,500 sites listed, but shows most popular sites in each category based on logs.
InfoSeek Select	`http://www.infoseek.com/`	Limited set of resources with short descriptions.
LinkStar	`http://www.linkstar.com/`	Slow and uses too many graphics.
Lycos A2Z	`http://a2z.lycos.com/`	Lots of categories and graphics, not many entries.
Magellan	`http://www.mckinley.com/`	Nice display format and includes site ratings.
Point	`http://www.pointcom.com/gifs/home/`	Reviews of the top 5% of Web sites. Not sure how that 5% is determined.
WWW Virtual Library	`http://www.w3.org/hypertext/DataSources/bySubject/Overview.html`	Distributed subject catalog seems haphazard.

Web Search Engines

Next, let's take a glance at the main search engines on the Web. They all claim to index millions of Web pages and provide quick searches, but I think you may find the results from one seldom match the results from another. I have my favorites; you'll undoubtedly develop your own.

> **BTW**
> One of the main Web catalogs and search engines, InfoSeek, is testing iSeek, a small Macintosh application that enables you to enter InfoSeek searches from your Macintosh desktop without going to the InfoSeek Web page first. Check InfoSeek's Web page at <`http://www.infoseek.com/`> for a copy.

Many people wonder how Web search engines work. Generically, they're called "robots," and they use a variety of methods to attempt to find all the Web sites on the Internet. After a robot has found a Web site, it travels through the site, recording every page of information. The robot sends the text on those pages back to its home site, where it is put into a powerful database program and indexed. After that index has been created, searches that you might perform go quickly; without an index, the searches would probably take days, given the incredible size of these databases.

BTW
Well-written robot programs know to avoid parts of a Web site listed in a special file called robots.txt. For more information see <http://info.webcrawler.com/mak/projects/robots/norobots.html>.

AltaVista

http://altavista.digital.com/

Digital Equipment's AltaVista hit the Internet with a bit of fanfare and has proved itself to be one of the best of the Web searching engines. I prefer it to the others because over time, I've had the best luck with the results that AltaVista sent back in response to my search queries. Nice touches include different searching tips that appear each time you visit the AltaVista page, and multiple ways of displaying results (although I use the Standard Form most of the time). One interesting use of AltaVista is to search for the URL to your home page to see who has made links to it.

Table 20.2 Other Web Search Engines

Site Name	URL	Comments
Excite	http://www.excite.com/	Supports keyword and concept searches.
InfoSeek	http://www.infoseek.com/	Busy design but generally good results.
Lycos	http://www.lycos.com/	Badly formatted results make evaluating hits difficult.

continues

Table 20.2 Continued

Site Name	URL	Comments
New Riders' World Wide Web Yellow Pages	`http://www.mcp.com/nrp/wwwyp/`	Related to the book.
Open Text	`http://www.opentext.com/omw/f-omw.html`	Somewhat clumsy method of searching but enables narrowing of searches.
WebCrawler	`http://www.webcrawler.com/`	Very fast, minimal descriptions by default.

Usenet Search Engines

Next we come to the sites that enable you to search through some subset of Usenet news. It can be difficult to figure out what the difference is between these sites without using them, since they all make similar claims. If your first attempt doesn't turn anything up, I've found that it's worth running the same search elsewhere since their results vary significantly.

These sites work much the same way the Web search engines do. They subscribe to all the Usenet newsgroups they can, and each message that comes in is added to the master database and indexed. Given the vast amount of traffic on Usenet every day, older information might be purged from the database each day as well, but as long as the index is kept in synch with the database, you can search through all of Usenet news in a matter of a minute or less.

Deja News

`http://www.dejanews.com/`

I don't search Usenet very often, but every time I have, I've found the best results from Deja News. It enables the user to make a simple search, which is often all that's necessary, but in those cases in which you need more control over your search, the Deja News Power Search enables you to create a query filter to limit your search by newsgroup, date, or author. You can also change some of the basic options, including how Deja News searches and how it sorts and displays the results. After you've found some articles, you can read them or get a list of all the articles that person has posted.

Table 20.3 Other Usenet Search Engines

Site Name	URL	Comments
AltaVista	`http://altavista.digital.com/`	Returns lots of off-the-wall hits; nice display, includes links to the author's email address and the newsgroup itself.
Excite	`http://www.excite.com/`	Supports keyword and concept searches.
InfoSeek	`http://www.infoseek.com/`	Good results; includes a Similar Articles link that refines the search further.
SIFT	`http://sift.stanford.edu/`	Personalized Usenet filtering tool.

Metasearch Sites

By now you might have realized that the problem with having so many tools available is that you must go from one to the next until one of them finds the information you want. Others have realized that this can be a problem as well, and as a result, they've created Web sites that themselves don't store any information, but instead submit a search to a number of other search engines simultaneously. In other words, you do one search, and the Web site takes care of submitting it to a number of the main search engines at the same time.

There's some thought that using these metasearch sites isn't particularly polite, since it's likely that a number of the searches will return the information you want immediately, so searching all of them is unnecessary. In addition, most of the Web search engines make their money by selling advertising space on their sites. If a metasearch engine searches Lycos, for instance, but you don't see the ad on Lycos's search page, the fact that you didn't visit the page makes for a reduction in hits to Lycos and could make it harder for Lycos to sell ad space in the future. (Of course, one hit more or less isn't a problem; the problem arises when thousands of people skip Lycos in favor of a metasearch engine.) That's not your problem, obviously, but it might result in metasearch engines being locked out of search engine sites.

I don't particularly use MetaCrawler or SavvySearch because most of the time they seem like overkill. It's uncommon that I won't find what I want at the first site I try, and even more uncommon that I won't at the second site I try if the first fails.

More common than the true metasearch engines are pages that provide search forms for a slew of the search engines. You can search multiple search engines more quickly using one of these pages, but they don't submit the searches to all the different search engines for you.

Table 20.4 Metasearch Engines

Site Name	URL	Comments
MetaCrawler	`http://metacrawler.cs.washington.edu/`	Good performance and returns accurate hits.
SavvySearch	`http://savvy.cs.colostate.edu:2000/`	Searches several search engines at a time; decent performance.

Finding Programs

I'm going to go out on a short, stout limb here and assume that you're using a Macintosh, and as such, the programs that you want to find are most likely to be Macintosh programs. This assumption enables me to help you find any given piece of freely distributed Macintosh software, since I can easily point you to three systems set up to help you: description files, new file postings, and search engines.

Description Files

Most programs are stored on FTP sites, and although Archie enables you to search the names of files stored on FTP sites, frankly, I don't recommend you waste your time on Archie. It's slow, out of date, and often just useless. Luckily, the Internet holds two main collections of mirror sites, the Info-Mac Archive and the UMich archive, that store basically all freely distributed Macintosh programs. In theory, you can just go to the Info-Mac or UMich FTP site and find the file for which you're looking. Nice idea, eh?

FTP is stupid. It's just a method of copying files from one place to another, and as a result, looking around an FTP site is like working in DOS. You go to a directory, list the files and directories in it, go to another directory, and so on. Eventually you may find the right directory, but then you may have trouble finding the file you want, since files aren't often stored with hugely descriptive names. In addition, many programs have similar or misleading names.

So although FTP is a fine way to store and transfer files, it's a lousy interface for finding them. If you use an FTP client such as Anarchie to search around an FTP site, you should go in knowing how the directories are organized and at least approximately what the file you want is called. The volunteers who run these archives have set up some techniques for maintaining order. They generally require that people submitting programs to the archives provide short descriptions, and those descriptions are generally archived in a large file in the same directory as the files described. The upshot of this fact is that you might consider downloading the file of descriptions and reading through that to find a specific file. These files are usually the first file in each directory, and are often called something such as 00inet-abstracts.txt. They're always straight text files, and you can read them in any word processor to find the filename of the specific program you want.

Searching through files of descriptions was the best you could do in the past, though I found searching these files to be clumsy and slow. Not only is searching a large text file a pain, but the description files change frequently (often daily). In other words, dealing with the description files is often more trouble than it's worth.

New File Postings

Easier, but less systematic, is reading the Info-Mac Digests and the new files postings of the UMich archive. Both appear in the `comp.sys.mac.digest` newsgroup in Usenet news, and both include descriptions of new files that have just been posted to the archives. If you regularly scan these descriptions, you'll easily be able to download new software just after it's been released. Needless to say, these lists contain only new and updated files, and won't help you find any given file in the archive. Unless you're into trying out the latest and greatest freely distributed programs, this method probably takes more time than it's worth.

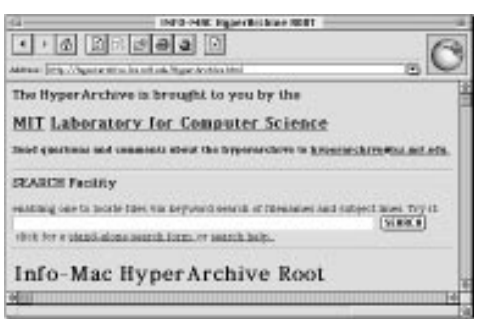
Shareware Search Engines

The obvious solution to these problems is to create a program that can index the filenames of all the files in the archives. Or, it could go one step further and index those descriptions, enabling you to search for words not just in the name of the file, but also in the description. That's precisely what a number of people have done with the files stored on Info-Mac and UMich, along with some other popular sites.

Info-Mac HyperArchive

`http://hyperarchive.lcs.mit.edu/HyperArchive.html`

`http://www.pht.com/info-mac/`



The Info-Mac HyperArchive at MIT is a tremendously useful site for searching the two gigabytes of files stored in the Info-Mac Archive. You can search for files by using keywords in either the filenames or the Subject lines of the descriptions for those files. After you've found a file, you can either view the abstract for the file or download the file. If you're not sure what you want, you can also browse through the files in the Info-Mac Archive without searching—although this technique will be slower, it might produce some results that a search would miss.

Table 20.5 Shareware Search Engines

Site Name	URL	Comments
Mac Software Catalog	`http://web.nexor.co.uk/public/mac/archive/welcome.html`	Enables searching of filenames and descriptions of files at UMich.
Search Info-Mac	`http://www.netam.net/~baron/infomac/`	Flexible search form.
Search UMich	`http://www.netam.net/~baron/umich/`	Flexible search form.
shareware.com	`http://www.shareware.com/`	Can search many shareware sites; busy display format.

Finding Discussion Groups

My impression is that most people don't go looking for discussion groups but instead happen upon them. Perhaps a friend sends you a few messages from a mailing list and suggests that you should join. Or perhaps you're trying out a program such as NewsWatcher for the first time and you find a newsgroup that not only sounds interesting, but proves to have fascinating discussions. I personally tend to receive far too many questions about the Mac in email, so I generally refer people to the Info-Mac mailing list, and I imagine that for many of these people my message is their first introduction to Info-Mac.

Even if a reference from a friend or a mention on a related Web page is the best way to find discussion groups that interest you, there are a few other methods.

Mailing Lists

Although it's not unheard of, I'd say that few mailing lists and almost no newsgroups have their own Web pages. As a result, searching in the more general Web search engines probably won't prove fruitful. You might find a reference to a specific mailing list or newsgroup, but that may not be sufficient to learn how to subscribe to the group.

Luckily, a number of dedicated search engines have appeared that include large lists of mailing lists, complete with short descriptions and subscription instructions. These search engines are only as useful as the information they contain, of course, and mailing lists tend to come and go fairly frequently, so don't be too upset if a group you find turns out to have disappeared in the meantime.

Liszt

`http://www.liszt.com/`

My favorite Web site for finding mailing lists is a relatively new one with the punning name of Liszt. As of last count, Liszt includes over 40,000 mailing lists and almost 16,000 newsgroups (accessed from a different page within Liszt, oddly enough). What I like the most about Liszt, though, is that the maintainers seem to be serious about keeping the Liszt database up-to-date. It's frustrating to find the perfect list and subscribe, only to find out that it no longer exists. You can even search Liszt through email if you want at `liszter@bluemarble.net` (though the Web form will be much faster). Liszt provides relatively little information about each list, so you might try one of the other services if you need more detailed information.

Table 20.6 Shareware Search Engines

Site Name	URL	Comments
InterLinks Discussion Groups	`http://www.nova.edu/Inter-Links/cgi-bin/news-lists.pl`	Covers both Usenet and mailing lists.
List of Lists	`http://catalog.com/vivian/interest-group-search.html`	Seemingly somewhat small and out of date, but provides descriptions.
Publicly Accessible Mailing Lists	`http://www.neosoft.com/internet/paml/index.html`	Provides a number of different sorting options; updated monthly.

Newsgroups

Although the search engines listed above work well for mailing lists, they don't generally contain descriptions of newsgroups. So, if you're looking for a newsgroup, you must use a slightly different technique. If you search in one of the search engines that indexes all the

traffic in Usenet news, you should get an idea of which newsgroups carry the kind of discussions you want. For instance, say I'm interested in finding a discussion group that talks about tropical fish and aquariums. If I search in Deja News on "tropical fish aquariums" I find messages in a couple of newsgroups that match my search terms (see Figure 20.1). From the results of my search, I can see that I might want to subscribe to `alt.aquaria`, `alt.business.import-export.only`, `rec.aquaria`, `rec.aquaria.marine.misc`, `rec.aquaria.freshwater.goldfish`, or `rec.aquaria.marketplace`, although it's a good bet that the last of those groups would only prove interesting if I wanted to buy or sell aquarium paraphernalia.

Figure 20.1 Deja News search for tropical fish-related newsgroups.

Read back to the previous section, "Usenet Search Engines," for a list of the main Web sites that help you search through all of Usenet news.

Searching the Full Newsgroup List

You need a newsreader to read Usenet news on a regular basis, of course, and most newsreaders make it easy to browse through the full group list. Some, such as NewsWatcher, even enable you to search for specific terms within the newsgroup names (see Figure 20.2 for the results of my search for tropical fish groups), and some might even display the newsgroup descriptions. Since newsgroup names are generally quite descriptive and specific (see the discussion of how they're formed in Chapter 14, "All About Usenet News"), it's often obvious what topics are discussed in a group, and that might be enough information for you to find the right group.

Figure 20.2 Searching for `rec.aquaria` in NewsWatcher's Full Group List.

However, you can never tell precisely what a newsgroup might be discussing since the topics of discussion do change over time. Thus, the best technique for finding interesting newsgroups in a newsreader is to pick a few likely looking newsgroups and scan through the subjects of the messages in those newsgroups. Drill down even deeper and read the messages in a few discussion threads so you can see if you like their flavor.

After you've found some potentially interesting newsgroups, I recommend subscribing to them and reading them for a few days before you decide whether or not you want to continue to read them. If the group turns out to be extremely high volume or if the discussions turn out to be mostly inane, then you should feel no compunction about unsubscribing and returning to your search. The Internet is a very big place, and there's no reason for you to waste your time on inappropriate discussion groups of any sort.

Finding People

It may strike you as odd that there isn't a list of all the people on the Internet somewhere, given the fact that those records must exist in some form or fashion. The problems with creating a complete directory of people on the Internet are actually quite significant, which might help you better appreciate the tools we do have today.

One significant problem that the various projects to create an Internet directory have faced (and there have been a number) is the decision of precisely what information to store. That might sound trivial, but when you start thinking about all the issues, you see the problem. For instance, most people would probably agree that such a directory should store names, since it's useless without them, and probably email addresses. But how many email addresses should it store? I have seven different addresses, but I dislike receiving email at any but my main Internet address. Maybe the directory should store home page URLs as well, but relatively few people have home pages. And then what about increasingly personal information, such as telephone numbers and physical addresses? Perhaps it's acceptable to store work phone numbers and addresses, but not home phone numbers and addresses?

There are solutions to those problems, but the issues surrounding the inclusion of home phone and address raise additional concerns. What about privacy? Perhaps I don't want people to know my home phone number or address. Or, on a larger scale, think about a large company that provides Internet access to all of its employees. Think Microsoft. Microsoft very well might not want the names and email addresses of its employees published for the world to find because that's an invitation for disgruntled users to harass Microsoft employees about a bug in a Microsoft program, for instance.

Finally, consider the problem of how to update the data. I've moved four times since 1990, and my preferred email address has changed several times in that period as well. How can a database keep information up-to-date easily and automatically? Perhaps I could be allowed to update my own information, but that then raises the possibility of either me or someone else consciously entering incorrect information.

All of these problems aside, there are two basic ways of finding people on today's Internet: searching in the directories or searching the full Web.

Directories

In the last year or so, a number of Web sites have appeared that provide varying levels of information about people. Some of these directories go so far as to include information about people who aren't on the Internet, which makes them somewhat useful for searching out long-lost relatives and the like. See Table 20.7 for a list of directories.

Table 20.7 Search Engines for People

Site Name	URL	Comments
American Directory Assistance database.	`http://www.abii.com/lookupusa/adp/peopsrch.htm`	Finds phone numbers; definitely incomplete
Bigfoot	`http://www.bigfoot.com/`	Nice design; searches for email addresses.

Site Name	URL	Comments
Four 11 White Pages	http://www.four11.com/	Finds email addresses; a number of interesting advanced features.
Switchboard	http://www.switchboard.com/	Finds snail mail addresses and phone numbers. Extensive, but often out of date.
WhoWhere?	http://www.whowhere.com/	Finds email addresses; somewhat out of date.
Worldwide White Pages	http://www.wyp.net/info/search/NA.html	Finds phone numbers; somewhat out of date.
Yahoo People Search	http://www.yahoo.com/search/people/	Finds phone numbers, email addresses, and home pages; somewhat out of date.

You might not want to find another person, but a business. Finding a business is perhaps a little easier because businesses generally want to be found, unlike some individuals. See Table 20.8 for some sites that help you find businesses, along with their names, snail mail addresses, and phone numbers.

Table 20.8 Search Engines for Businesses

Site Name	URL	Comments
American Directory Assistance	http://www.abii.com/lookupusa/ada/bussrch.htm	Same as American Yellow Pages, but different interface.
American Yellow Pages	http://www.abii.com/lookupusa/ayp/aypsrch.htm	Excellent help with finding the right category; includes credit scores.
AT&T 800# Directory	http://www.tollfree.att.net/dir800/	Listing of companies with AT&T 800 or 888 numbers.
BigBook	http://www.bigbook.com/	Provides a personalized address book.
BigYellow	http://www.bigyellow.com/	Confusing interface.
GTE SuperPages	http://yp.gte.net/	Seems to be incomplete.
Internet 800# Search	http://inter800.com/	Free listing of 200,000 800 numbers.
Internet Business Directory	http://www.ibdi.com/	Slow, but good method of narrowing category searches.
Switchboard	http://www.switchboard.com/	No category searching available.
World Yellow Pages	http://www.wyp.net/	Includes a metasearch engine for other Yellow Pages.

continues

Table 20.8 Continued

Site Name	URL	Comments
YellowNet	`http://www.yellownet.com/`	Decent interface, can link listings to Web sites.

Full Web Search

If you think the person you're attempting to find is likely to be a heavy Internet user, then there's a pretty good chance that they've left some record of themselves on the Internet itself, either on the Web or in a newsgroup.

An ever-increasing number of people have their own home pages that provide personal information to anyone who wishes to read it. I've had quite a lot of luck finding information about people by finding their home pages, and I've used search engines in order to find them. The section on "Web Search Engines" earlier in this chapter mentions some tools that you might try.

> **FYI**
> If the person you're looking for has a common name, try adding words unique to them to your search terms. For instance, if I were trying to find a friend named John Smith who was a student at Cornell University, I would search on "John Smith Cornell University" since that would be more likely to find the right John Smith.

Also, an extremely large number of people participate in Usenet newsgroups, and as I mentioned earlier in this chapter, a number of Web sites enable you to search a subset of Usenet news. Usually the subset is based on time, so the site will have indexed the last four weeks of postings or something along those lines. Thus, if the person you're trying to find has posted to a Usenet newsgroup during that time, you might be able to find one of her postings. After you've found her posting, it will tell you her email address at a minimum, and if you're lucky, you might even find a pointer to her home page in her signature. "Usenet Search Engines," earlier in this chapter, suggests some Web sites to try.

Once again, if you're searching for someone with a relatively common name, try adding the names of newsgroups in which they're likely to participate to your search terms. In any search you must provide the search engine with sufficiently specific terms that it has a chance of finding the right person. It's easier to start broad and focus the search in, though, so don't try being too specific right away.

Scavenger Hunt

Enough of this pedantic nonsense—let's have some fun! I once gave an Internet seminar that took place in part at an Internet café in Los Angeles. We had about six computers

hooked to the Internet using a fast connection, and with three or four people per computer, we had a blast doing an Internet scavenger hunt.

> **BTW**
> If you ever find yourself teaching an Internet class, I strongly recommend the scavenger hunt with teams of students as a way to get people started finding things on the Internet. Feel free to use my examples here if you want (and if they still work).

It's hard to come up with items to find that will stick around for the entire lifetime of this book, but I'm going to try. First I'll give the questions, and then, on the next page, I'll provide some information about how or where I originally found the answers. If the sites where I found the answers aren't around anymore, don't feel bad if you weren't able to find one of the items. Ready? Great, fire up your Web browser and let's go!

> **BTW**
> I encourage you to go through the scavenger hunt questions relatively slowly, and allow yourself to wander among the many and varied links you'll no doubt run across during your explorations.

The Questions

1. What was the birth date of the first President of the United States?
2. Which species of penguin shares its name with a type of pasta?
3. On what widely celebrated holiday was Apple Computer founded?
4. What is the list price of a 1995 Lamborghini Diablo VT?
5. One of Frank Lloyd Wright's most famous houses is built over a waterfall. What type of stone was used in its construction?
6. Which Negro League player also played in the major leagues, becoming both the oldest rookie and the oldest player to pitch in a major league baseball game?
7. What is the full ZIP+4 code for computer industry giant Microsoft's main address?
8. What eight foods cause 90 percent of all food allergic reactions?
9. In the animated life of Wallace and Gromit, who's the villain in control of the trousers?
10. Where is Alice sitting at the beginning of Lewis Carroll's *Alice in Wonderland*?
11. Bonus question: How many people are there in the Electric Bonsai Band?

The Answers

1. *What was the birth date of the first President of the United States?*

   A quick search in Yahoo on "George Washington" revealed a number of sites devoted to the United States' first President. Searches in AltaVista and other search engines, in contrast, couldn't break through the fact that "George" and "Washington" are common names, even when used together. The answer is that George Washington was born on February 22, 1732, and I found that fact at `<http://sc94.ameslab.gov/TOUR/gwash.html>`. See Figure 20.3. I believe you can also find this information by going to the White House site at `<http://www.whitehouse.gov/>` and sifting through its historical information.

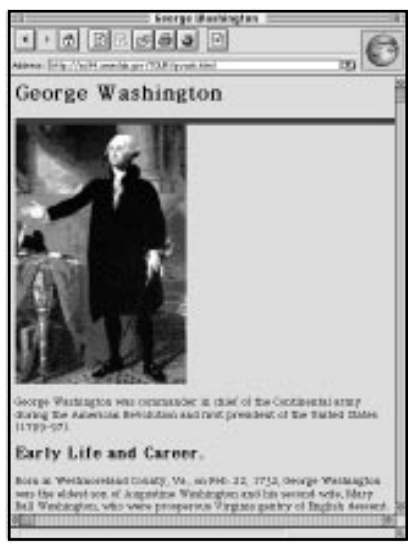


Figure 20.3 George Washington biography.

2. *Which species of penguin shares its name with a type of pasta?*

   Discovering a species of penguin that shares a name with a type of pasta isn't too hard—just search on "penguin species" in AltaVista and pick one of the links that lists the 17 species of penguins. The answer is the Macaroni Penguin, which I found at `<http://magic.geol.ucsb.edu/~geo10/Students/pen/mac.htm>`.

Figure 20.4 Macaroni Penguin.

3. *On what widely celebrated holiday was Apple Computer founded?*

   You could try searching for the answer to this question, but it's probably easier to go straight to the source, Apple Computer. If you guess that Apple's Web site is `<http://www.apple.com/>` (it's an easy way to guess at most company sites), you can follow links entitled About Apple and Apple History to `<http://www.atg.apple.com/areas/history/>`. The answer is April Fools Day, one of the Internet's favorite holidays. Beware of anything you read on April 1st.

Figure 20.5 Apple history page.

4. *What is the list price of a 1995 Lamborghini Diablo VT?*

   Just searching on "Lamborghini Diablo VT" should provide a number of pages devoted to information about the car; the question is if the one you select contains the manufacturer's suggested retail price, as does <http://www.deltanet.com/autonet/manu/lamborg/diablo.html>. The lesson here is that sometimes you simply have to sift through all the pages that come back to find the fact in question. The answer, by the way, is $239,000, so save your pennies.

Figure 20.6 Lamborghini Diablo VT.

5. *One of Frank Lloyd Wright's most famous houses is built over a waterfall. What type of stone was used in its construction?*

   This question requires a number of steps. First, you must determine which house is involved, Fallingwater, in this case. I found that fact by searching on "Frank Lloyd Wright waterfall" in AltaVista. But, the site I found didn't provide any additional information. So, I went to Yahoo and searched again on Wright's name to find a site devoted to Fallingwater at <http://www.envirolink.org/orgs/fallwater/index.html>. Even then, I had to delve down into a page that covered the history of Fallingwater to discover that it was made of Pottsville sandstone.

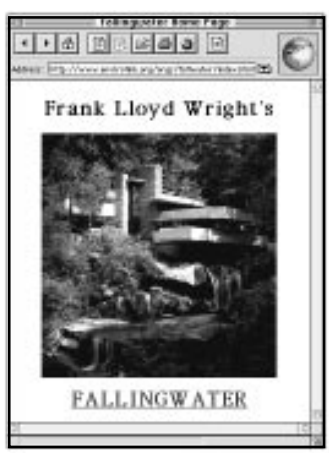


Figure 20.7 Fallingwater.

6. *Which Negro League player also played in the major leagues, becoming both the oldest rookie and the oldest player to pitch in a major league baseball game?*

   I'm sure some baseball fans already know the answer to this question, Satchel Paige, but can you find the answer on the Internet? I found it by first using Yahoo to find the Web site devoted to the Negro Baseball Leagues, then following links down to the profiles of the players, and then the players who are in the Baseball Hall of Fame, before selecting the link for Satchel Paige at `<http://www.blackbaseball.com/paigesat.html>`.

Figure 20.8 Satchel Paige.

7. *What is the full ZIP+4 code for computer industry giant Microsoft's main address?*

   Once again, answering this question requires two pieces of information. First, you have to find Microsoft's main address, which probably won't have the ZIP+4 code, and then you need to look up the ZIP+4. Guessing at `<http://www.microsoft.com/>` to get to the Microsoft Web site, clicking the Visit Microsoft link, and then clicking the button that lists Microsoft's Worldwide Phone & Address Directory displays Microsoft's address at the top of the page. Make a note of that, and then go to Yahoo and search for "ZIP+4" to find the service run by the United States Postal Service `<http://www.usps.gov/>` to find ZIP+4 codes based on an address. When I did that, I came up with 98052-8300.

Figure 20.9 Microsoft's ZIP+4 code.

8. *What eight foods cause 90 percent of all food allergic reactions?*

   I included this question to make a point about searching. If you just search for "food allergies eight foods" in AltaVista, you'll get way too many hits. However, if you enclose the "eight foods" within quotes, that tells AltaVista to search for those two words next to one another. Searching for "food allergies "eight foods"" (ignore the outer quotes) brings you to the right page at `<http://www.foodallergy.org/factfict.html>` instantly. It pays to learn the tricks of searching sometimes. The answer is milk, eggs, wheat, peanuts, soy, tree nuts, fish, and shellfish.

Figure 20.10 Food Allergies.

9. *In the animated life of Wallace and Gromit, who's the villain in control of the trousers?*

   So I like penguins. A penguin is the answer, and it should be relatively easy to find by searching on "Wallace and Gromit" in AltaVista and browsing through some of the fan pages for Nick Parks's animated movies, such as <http://www.aber.ac.uk/~mkc3/wallgrom.html>. I threw this one in also as a spelling comment—you must spell your keywords correctly, but if you spell them wrong (Gromit vs. Grommit) in the same way that everyone else has, you'll be fine.

Figure 20.11 Wallace and Gromit.

10. *Where is Alice sitting at the beginning of Lewis Carroll's Alice in Wonderland?*

    Alice is sitting "on the bank," as you can read in the first line of Alice in Wonderland, which is on the Web in its entirety. There are probably many different ways of finding the book online, but I searched in AltaVista on ""Alice in Wonderland"" (ignore the outer quotes—I used the inner quotes in the search to make AltaVista search for that phrase exactly). I found about a thousand instances of the phrase, but one on the first page was obviously a chapter from the book, so I went there and then followed a link to the first chapter at <http://nspace.cts.com/html/FireBlade/Carroll/alice/Wonder/alice1.html>.

Figure 20.12 Alice in Wonderland.

11. *How many people are there in the Electric Bonsai Band?*

    Trick question. The answer is one, and the only hope of finding that information is to find, as I did, some announcements of Electric Bonsai Band concerts that mention that fact. A standard search on "Electronic Bonsai Band," should turn up the same concert announcements, assuming they're still around. In the case of this sort of timely information, I wouldn't bet on them lasting.

I should come up with some kind of scoring system for this scavenger hunt, but since I can't guarantee that even I would be able to find the answers to my questions this time next year, I'll refrain from falling into the modern predilection for rating everything. Even if you had trouble finding the answers to those specific questions, the act of trying should have exposed you to some of the wide variety of information available on the Internet, and if that's true, I've succeeded.

I have a PowerBook 5300c that, when I'm not traveling, lives in my kitchen (all the other computers live in our basement offices). I enjoy using that PowerBook to search the Internet for answers to real-life questions rather than computer questions, so I've used it to figure out what they're constructing on I-405 through Bellevue, Washington (widening and replacing some utilities), whether or not I should be able to wash running sneakers in the washing machine (not a good idea with good running sneakers), what the magnitude of the earthquake Seattle experienced in early May of 1996 was (4.8 by the first estimates), and how bad the traffic is on the 520 floating bridge into Seattle (usually pretty bad, but not if you're in a three-person carpool).

Those are just a few minor examples of the utility of the Internet in my life; I hope you can find similarly useful examples in your life.

Chapter 21 Macintosh Internet Resources

Contents:

In Chapter 20, "Finding Things on the Internet," I showed you some of the main sites that help you find information on the Internet. Those search engines and catalogs are tremendously helpful, and I recommend that you make heavy use of them because they'll stay up-to-date with the latest Internet resources.

But now it's confession time. As a computer book author, I've been tremendously frustrated by the popularity of the many different "Internet Yellow Pages" books that merely offer long lists of Internet resources. There's nothing in those books that you can't find yourself using a good search engine or catalog. Even worse, those books are by definition obsolete before they hit the shelves. They even admit this failing by setting up Web sites that are updated more frequently than the publishing companies can churn out new collections of slightly less obsolete dead trees.

So why are these books so popular? I believe it's because they offer to hold the user's hand while he learns how to get around on the Internet. I suppose you could think of them as training wheels for the Internet. People who have never used a search engine before can flip through something familiar, a big book that lists Internet resources, and laboriously type in the URLs listed therein. For someone who has never used the term "keyword" or who has never used a database, books are far more comfortable than search engines.

When I sat down to think about ways I could improve this book (and hey, I'll admit it, ways I could help it sell better), the concept of a catalog of resources came up quickly. The

problem was that the first and second editions of *Internet Starter Kit for Macintosh* included a large appendix with lists of Internet resources, and those lists were a bear to create and update. As soon as something in my list disappeared, I immediately started getting email from people asking why they couldn't find it. In addition, I'm a computer guy with a few other specific interests. It's fair to say that I'm not interested in most topics (who is?), and as a result, I'm not qualified to research the best sites in most topics. Add to that the fact that any list of topics I did cover wouldn't match with the interests of most of my readers, and you can see my dilemma.

That was when I came up with the idea for this chapter, which offers a concise list of the best general Macintosh-related Internet resources. I can assume with some certainty that everyone who has bought this book at least has a Macintosh and is interested in using it on the Internet. Thus, Macintosh-related Internet resources should be of some interest to most of my readers. If that doesn't describe you, please, ignore this chapter until you have a general Macintosh question and need some help. Then come back here and look for the best source of help the Internet can provide.

I decided not to include any Internet resources that are specific to a product or company because they aren't likely to be as interesting to as many people, and besides, those products and their related sites should be discussed elsewhere in the book.

I've divided the chapter into a number of categories: mailing lists, newsgroups, FTP sites, and Web sites. For mailing lists, FTP sites, and Web sites, I'll provide quick reviews; there isn't much to say about most newsgroups, so I'll restrict myself to a table.

Macintosh Mailing Lists

The many Macintosh mailing lists form the heart of the Macintosh Internet community. I've met most of my Internet friends through Macintosh mailing lists, and even today I find them one of the most useful ways of finding more information about topics related to the Macintosh. I've chosen a few of the Macintosh mailing lists that I feel are the most useful to the most people, but there are many others that may interest you. Check the Well Connected Mac Web site at `<http://www.macfaq.com/mailinglists.html>` for a large list of mailing lists.

To subscribe to any of the lists I mention in the following section, send email to the list address with the subscription command in the body of the message. Where appropriate, replace "Your Name" with your real name. For more information about working with mailing lists, check back to Chapter 13, "All About Email."

Apple Internet Lists

`http://www.solutions.apple.com/apple-internet/`

This group of five related mailing lists is run by Chuq Von Rospach (the self-titled "List Mom") of Apple with some Assistant List Mom help from yours truly. Apple Internet Announce is a low-volume moderated list that carries announcements of interest to Macintosh Internet users. Apple Internet Authoring discusses issues and products related to creating and serving Web pages on the Macintosh. Apple Internet Providers is dedicated to discussions of software, hardware, and issues relating to providing Internet services from a Macintosh. Apple Internet Users focuses on helping people use Macintosh Internet tools as end users. Finally, Mac Communications exists to discuss issues and products related to accessing the Internet at a low level—things such as Open Transport, MacTCP, PPP, SLIP, and modems.

List Address:
`listproc@solutions.apple.com`

To Subscribe:
subscribe apple-internet-announce *Your Name*
subscribe apple-internet-authoring *Your Name*
subscribe apple-internet-providers *Your Name*
subscribe apple-internet-users *Your Name*
subscribe mac-communications *Your Name*

EvangeList

`http://www.zdnet.com/macuser/macway/`

`http://wais.sensei.com.au/searchform.html`

Apple Fellow Guy Kawasaki's EvangeList is a high-volume mailing list that carries postings of good news about Apple and the Macintosh. A selection of messages might include summaries of Apple press releases, stories about how the Macintosh is being used in various industries, sightings of Macs in television shows and movies, special deals from Macintosh developers, and calls to action when the Macintosh is being maligned on the Web or when there's a survey that includes questions about Apple or the Macintosh. Guy's list is tremendously good fun and goes to many thousands of Macintosh supporters every day. The Web sites listed above contain a selected set of the postings and a search form for finding back postings.

List Address:
`listproc@solutions.apple.com`

To Subscribe:
subscribe macway *Your Name*

Info-Mac Digest

`http://www.pht.com/info-mac/`

The Info-Mac Digest is one of the longest-running mailing lists about the Macintosh. It takes the form of a semidaily digest of questions, answers, and comments that cover every aspect of the Macintosh. In addition, digests often contain lists of new files (with descriptions) that are posted to the Info-Mac Archive. Info-Mac is perhaps the best general Macintosh list available. The mailing list might move to a new site sometime in 1996, so if you have trouble subscribing, check the Web page above for updated instructions.

List Address:
`listserv@ricevm1.rice.edu`

To Subscribe:
subscribe info-mac *Your Name*

Mac-L

Mac-L is a bit like Info-Mac in that it's a long-running general Macintosh list. Overall, the discussions on the two lists seem relatively comparable; the main difference is that Info-Mac always comes as a digest, whereas Mac-L comes as individual messages by default (you can set a digest mode if you want). Mac-L does require confirmation of your subscription, so be prepared to reply to the response from your subscription request within 48 hours.

List Address:
`listserv@yalevm.cis.yale.edu`

To Subscribe:
subscribe mac-l *Your Name*

TidBITS

`http://www.tidbits.com/`

TidBITS is a free weekly electronic newsletter that I've published on the Internet since 1990, making it one of the oldest electronic publications on the Internet. Read by an estimated 150,000 people in about 100 countries each week, *TidBITS* covers the computer industry with an emphasis on the world of the Macintosh and the Internet. Issues are available via a mailing list, in the Usenet newsgroup `comp.sys.mac.digest`, via FTP, and on the Web page listed above. Translations of *TidBITS* into Japanese, French, Spanish, Dutch, and other languages are also available at the *TidBITS* Home Page.

List Address:
`tidbits-on@tidbits.com`

To Subscribe:
subscribe tidbits *Your Name*

Macintosh Usenet Newsgroups

Listed in Table 21.1 are most of the newsgroups that in some way discuss the Macintosh. I've edited the list to remove groups specific to a geographic region, groups that contain no traffic (at least on my news server), and some groups that don't contain worthwhile information. I've also eliminated newsgroups that carry programs—as I've said before, Usenet is a lousy method of transferring files, and you should stick to FTP and the Web for such uses.

You'll note that the descriptions often follow the names of the groups quite closely. That's because Usenet newsgroups are named quite intelligently most of the time, so you can usually tell what a newsgroup discusses from the name alone.

> **FYI**
> I've saved bookmarks to all of these Usenet newsgroups in the Author's Bookmarks folder that's on the Internet Starter Kit CD-ROM. Check for the Macintosh Usenet Newsgroups folder inside the Chapter 21 folder.

Table 21.1 Macintosh Newsgroups

Newsgroup	Description
`alt.sys.mac.newuser-help`	Help for new Mac users.
`biz.marketplace.computers.mac`	Gobs of Macs and Mac peripherals for sale. High volume.
`comp.emulators.mac.executor`	Discussions of Macintosh emulators.
`comp.infosystems.www.browsers.mac`	Discussions of Macintosh Web browsers.
`comp.infosystems.www.servers.mac`	Discussions of Macintosh Web servers.
`comp.lang.forth.mac`	Programming in Forth on the Mac.
`comp.lang.pascal.mac`	Programming in Pascal on the Mac.
`comp.mail.eudora.mac`	Discussions about Eudora on the Mac.
`comp.sys.mac.advocacy`	Heated discussions of why the Mac is great.
`comp.sys.mac.announce`	A very few important announcements.
`comp.sys.mac.apps`	Discussions of general Macintosh applications.
`comp.sys.mac.comm`	Discussions of Internet and communications on a Mac.

continues

Table 21.1 Continued

Newsgroup	Description
comp.sys.mac.databases	Discussions of Macintosh database applications.
comp.sys.mac.digest	Info-Mac discussions, *TidBITS*, and UMich new files postings.
comp.sys.mac.games.action	Discussions of Macintosh "twitch" games.
comp.sys.mac.games.adventure	Discussions of Macintosh adventure games.
comp.sys.mac.games.announce	Announcements about Macintosh games. Low volume.
comp.sys.mac.games.flight-sim	Discussions of Macintosh flight simulators.
comp.sys.mac.games.marketplace	A place to buy, sell, and trade Macintosh games.
comp.sys.mac.games.misc	Game discussions that don't fit elsewhere.
comp.sys.mac.games.strategic	Discussions of Macintosh strategy games.
comp.sys.mac.graphics	Discussions of Macintosh graphics. High volume.
comp.sys.mac.hardware.misc	Macintosh hardware discussions that don't fit elsewhere.
comp.sys.mac.hardware.storage	Discussions of Macintosh hard disks, CD-ROMs, and other storage devices.
comp.sys.mac.hardware.video	Discussions of Macintosh video hardware.
comp.sys.mac.hypercard	Discussions of HyperCard and HyperTalk programming.
comp.sys.mac.misc	Miscellaneous Macintosh discussions that don't fit elsewhere.
comp.sys.mac.oop.macapp3	Discussions of object-oriented programming using MacApp 3.
comp.sys.mac.oop.misc	Miscellaneous object-oriented programming discussions.
comp.sys.mac.oop.powerplant	Discussions of object-oriented programming using PowerPlant.
comp.sys.mac.oop.tcl	Discussions of object-oriented programming using Think Class Libraries.
comp.sys.mac.portables	Discussions of PowerBooks and other Macintosh portables.

Newsgroup	Description
comp.sys.mac.printing	Discussions of Macintosh printers and printing Issues.
comp.sys.mac.programmer.codewarrior	Discussions of programming for the Macintosh using CodeWarrior.
comp.sys.mac.programmer.games	Discussions of programming Macintosh games.
comp.sys.mac.programmer.help	Questions from people seeking help with programming on the Macintosh.
comp.sys.mac.programmer.info	Information for Macintosh programmers. Low volume.
comp.sys.mac.programmer.misc	Discussions of Macintosh programming issues that don't fit elsewhere.
comp.sys.mac.programmer.tools	Discussions of Macintosh programming tools.
comp.sys.mac.scitech	Discussions of using the Macintosh in science and engineering.
comp.sys.mac.system	Discussions about the Macintosh system software and other things in the System Folder.
comp.sys.mac.wanted	Postings of Macintosh-related items that people want.
comp.unix.machten	Discussions of MachTen, a Macintosh version of Unix.
misc.forsale.computers.mac-specific.cards.misc	Postings of miscellaneous Mac NuBus and PCI cards for sale.
misc.forsale.computers.mac-specific.cards.video	Postings of Macintosh video cards for sale.
misc.forsale.computers.mac-specific.misc	Posting of miscellaneous Macintosh stuff for sale.
misc.forsale.computers.mac-specific.portables	Postings of Macintosh PowerBooks for sale.
misc.forsale.computers.mac-specific.software	Postings of Macintosh software for sale.
misc.forsale.computers.mac-specific.systems	Postings of Macs and Power Macs for sale.

Macintosh FTP Sites

For the most part, FTP sites are dedicated to specific types of files that relate to a certain company or program, so it doesn't make much sense to pull those sites out here. However, a few popular FTP sites carry files of general interest to many Macintosh users.

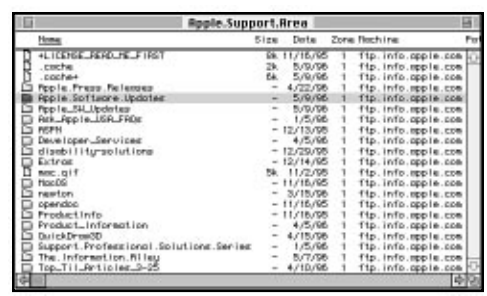
FYI

I've saved bookmarks to these FTP sites in the Author's Bookmarks folder that's on the CD-ROM. Check for the Macintosh FTP Sites folder inside the Chapter 21 folder.

Apple Support Site

`ftp://ftp.info.apple.com/`

Apple releases numerous updates to the hundreds of pieces of software the company distributes, and although once you had to visit your local Mac dealer to get these updates, now you can download them from the Internet. Apple runs a number of FTP sites, but the main one, listed above, includes all these software updates, plus a ton of other information. Apple's Web site is a better place to read Apple press releases, for instance, but if all you want is the latest version of the HyperCard Player or Extensions Manager, this is the place to visit. The organization is a bit haphazard, and files are buried deeply, but you'll be amazed at what you can get from this FTP site.



Info-Mac Archive

`ftp://mirrors.aol.com/pub/info-mac/`
`ftp://mirror.apple.com/mirrors/Info-Mac.Archive/`

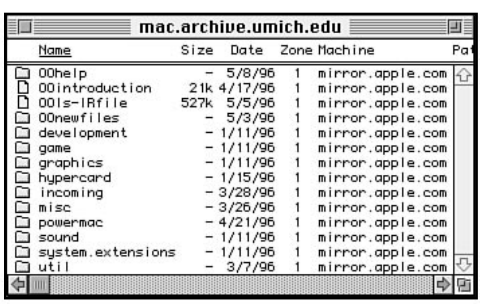
The first of the two major archives of vast quantities of freely distributable software is the Info-Mac Archive, which goes hand-in-hand with the Info-Mac Digest. Info-Mac is staffed by several volunteers, including myself, and boasts over two gigabytes of Macintosh-related files. If any given program is freely distributable, it can, and

should, be at Info-Mac (send submissions to `macgifts@info-mac.org`). When you browse the Info-Mac Archive, keep in mind that all directories have two names, a short name and a long, descriptive name. Files relating to communications and Internet, for instance, live in the `comm` directory, which is also know as `_Communication` (the underscore before the name ensures that all long names sort together in a file list). Info-Mac has many mirror sites; I've listed two common ones above. Check Anarchie's bookmarks for many others.

UMich mac.archive

`ftp://mirrors.aol.com/pub/mac/`
`ftp://mirror.apple.com/mirrors/mac.archive.umich.edu/`

The other major Macintosh FTP site is called UMich or mac.archive and is run from the University of Michigan. It's also staffed entirely by volunteers. Although Info-Mac and UMich tend to have the same files, one might have a newer version than the other, and they have different directory structures (so you might find one easier to use than the other. I personally prefer Info-Mac's organization). The UMich volunteers work hard to verify each submission and test for viruses, and they're also pickier than the Info-Mac moderators about accepting submissions.



Macintosh Web Sites

Choosing useful Macintosh Web sites was difficult because this book will have a life span of a year or more, so I had to find sites that covered topics likely to be interesting in that time (not true of sites devoted to just-released software). Even more difficult was finding sites that are likely to exist in a year. If a motivated college student creates a cool

Macintosh site that might disappear or fail to be updated at the end of the semester, I can't include that site here for fear of frustrating users. And, of course, I wanted to find sites that I think will interest most Macintosh users, not just those who do desktop publishing or database programming or whatever. Given those requirements, I've come up with this list of Web sites that I hope you find useful.

FYI

I've saved bookmarks to all of these Web sites in the Author's Bookmarks folder that's on the CD. Save yourself the trouble of typing URLs and use the bookmarks.

AMUG and BMUG

`http://www.amug.org/`
`http://www.bmug.org/`

AMUG (Arizona Macintosh Users Group) and BMUG (Berkeley Macintosh Users Group) are two of the largest Macintosh User Groups in the world. Both have extensive Web sites that offer information about the user groups (you don't have to be in Arizona or Berkeley, California to join), and both offer a good bit of Macintosh information and even sell Macintosh products. Of particular utility is BMUG's BMUG Information Resources page, which has links to the BMUG Glossary, the BMUG Choice Products awards, and more. If there's no local Macintosh users group in your area, give these international groups a try.

Apple Computer

`http://www.apple.com/`

It's almost not fair to limit Apple to a single entry in this list, because the company runs many Web sites devoted to different aspects of the Macintosh. You should be able to reach most of Apple's sites from the main Apple Web page. Apple provides information about the company, information about its hardware and software products (including specs and tech support resources such as the excellent Tech Info Library), lists of Macintosh-related Internet resources, and early releases of some Apple software. You should spend some time exploring Apple's Web sites to familiarize yourself with all the great information that Apple provides. The Tech Info Library alone can make a few minutes of browsing worthwhile if it contains answers to your Macintosh technical questions.

Cult of Macintosh

`http://cult-of-mac.utu.fi/index.html`

One of the most popular features on most Web sites is a collection of links to related Web sites. Cult of Macintosh has taken this innocuous concept to new heights, collecting and categorizing a huge number of links to other Macintosh resources available on the Web. If you're ever just browsing and want to find interesting Macintosh sites, be sure to visit Cult of Macintosh early on—it makes a great jumping off point for explorations of how the Macintosh is represented on the Internet.

Info-Mac HyperArchive

`http://hyperarchive.lcs.mit.edu/HyperArchive.html`

The Info-Mac HyperArchive at MIT is a tremendously useful site for searching the two gigabytes of files stored in the Info-Mac Archive. You can search for files by using keywords in either the filenames or the Subject lines of the abstracts for those files. After you find a file, you can either view the abstract for the file or download the file immediately. If you're not quite sure what you want, you can also browse through the files in the Info-Mac Archive without searching. Although this technique is slower, it might produce results that a search would miss.

Internet Starter Kit Home Page

`http://www.tidbits.com/iskm/`

I've tried to gather together lists of the primary search engines and Web catalogs on the Internet Starter Kit Home Page with an eye to making it a useful jumping-off page for new users. In addition, because it's difficult to keep track of when new versions of Internet applications are released, my Internet Starter Kit Software Updates page lists the latest versions of what I consider to be the essential Macintosh Internet applications.

MacInTouch

`http://www.macintouch.com/`

MacWEEK columnist and Mac expert Ric Ford maintains the MacInTouch Web site as a resource for Macintosh users on the Internet. Whereas Apple always provides the company line about problems you may experience with Macs, Ric seeks out

problems Macintosh users are having and the solutions to those problems, whether or not they're approved by Apple. He also posts announcements of new Mac products and Internet sites, complete with links when possible. Frankly, if you're having trouble with your Mac, particularly if it's a new one, check the MacInTouch site first thing to see if Ric has posted a solution.

MacUser

`http://www.zdnet.com/macuser/`

One of the two major consumer-level Macintosh magazines, *MacUser* has created a Web site that contains articles from the print magazine, plus sorted lists of all the products that *MacUser* has reviewed, complete with mouse ratings and links to the article if it's online. *MacUser* also commissions programmers to create exclusive *MacUser* utilities, and the *MacUser* Web site is the only place on the Internet where you can download these free utilities. These utilities alone make a visit to *MacUser*'s site worthwhile.

MacWEEK

`http://www.zdnet.com/macweek/`

MacWEEK is a weekly trade publication aimed at Macintosh managers, but its timeliness and product reviews make it one of the most useful of Macintosh publications. Although the print version is free to qualified subscribers, it can be hard to qualify, and *MacWEEK*'s Web site provides not only the latest breaking news about Apple and other Macintosh developers, but also past *MacWEEK* reviews of products, a

continues

MacWEEK, *continued*

list of Netscape Navigator plug-ins for the Mac, and a variety of other reference the information. If you want *MacWEEK* to inform you of the news before the issue comes out, you can subscribe to the *MacWEEK* mailing list and receive a list of top headlines every Monday.

Macworld

`http://www.macworld.com/`

MacUser's main competition comes from *Macworld Magazine*. Like *MacUser*, *Macworld* has placed many of its articles online. *Macworld* offers a search capability for both the full text of back articles and its software library of freely distributable software. *Macworld* also offers a vendor directory of Macintosh companies. A set of message boards for discussing Macintosh topics (registration required), and two online areas called NetSmart and Technocultural Café round out the *Macworld* Web site.

The Well Connected Mac

`http://www.macfaq.com/`

The Well Connected Mac is a massive Web site created and maintained by Elliotte Rusty Harold. It contains loads of Macintosh information and should be one of the first places you go when looking for Macintosh information. Elliotte includes FAQ lists from many Macintosh Usenet newsgroups, vendor information for over 1,700 Macintosh vendors (with Web sites for over 400 of them), a list of Macintosh software sites, a calendar of Macintosh trade shows, reviews of Mac products, a list of Macintosh periodicals, a huge list of Macintosh mailing lists and newsgroups, and a collection of other Macintosh Web sites.

Chapter 22 Create Your Own Web Site

Contents:

Interested in making a Web page? Then this chapter is for you. In this chapter, I explain how to work with HTML (HyperText Markup Language), the language of the Web. I also discuss the many technical, social, and even philosophical issues that you might encounter while creating Web pages. After covering all the HTML tags, this chapter takes a look at how you'd prepare graphics, sounds, and movies for inclusion on the Web. Toward the end of the chapter, I look at a collection of software that you might find useful.

BTW

Those of you who pay attention to writing styles might wonder who wrote this chapter, since it doesn't sound exactly like the rest of the book, which was written by Adam Engst. The "I" behind this chapter is me, Tonya Engst. When it comes to most Internet stuff, Adam (my husband) is my personal expert, but when it comes to Web authoring, I'm Adam's personal expert. As a result, he asked me to write this chapter.

Web Authoring Overview

Web pages might look elaborate when viewed through a Web browser, but all Web pages are based on simple documents saved as text files. Text files cannot hold formatting or graphics. In fact, they only contain basic characters, such as the letter T or the number 6. However, you can use basic characters to code for formatting or graphics, and this idea of putting codes into a text file is key to HTML, the code-based language used to create Web pages.

Consider Figure 22.1 as an example of an HTML document. The document has lots of tags, and those tags code for the approximate appearance of the Web page shown in Figure 22.2. The tags in Figure 22.1 should be easy to pick out—each tag begins and ends with an angle bracket.

Figure 22.1 The HTML behind Ingrid's Penguin Page, shown in Figure 22.2.

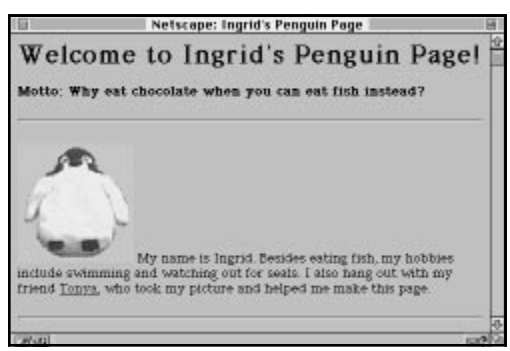


Figure 22.2 Ingrid's Penguin Page has a big heading at the top, a motto with a strong appearance, a graphic of a penguin, a link, and two horizontal rules.

In essence, to make a Web page, you make a text document and set it up with HTML tags. After you've done this, a Web browser can use the tags to display the document.

Because Web pages are text documents, you don't need special software to create them. You can use any word processor or text editor, such as SimpleText. Or, you can use software designed for Web authoring. Some of this software even shields you from working with HTML. You can read about such software later in this chapter.

When you create a Web page, you are a Web author, and hence—to use the slang appropriately—you are authoring a Web page. Web authoring used to be fairly easy, and it still is, though serious Web authors are finding that new tags and technologies provide many sophisticated options and much more to learn. Before we plunge into the specifics of Web-related tags and technologies, I need to provide some perspective and offer some advice.

Pay Attention to Detail

Attention to detail counts because HTML tags are picky little things and typographical errors can wreak havoc on even the simplest of Web pages. To best appreciate this, you need to have a better idea of how HTML tags work. HTML has two types of tags: single and paired.

A single tag sits by itself and tells a Web browser to do something specific. The `<hr>` (horizontal rule) tag, for instance, tells a Web browser to insert a horizontal line (Figure 22.2 shows two horizontal rules).

Paired tags come in twos, and they surround the text they apply to. The `<strong>` tag pair, for example, works like this: `<strong>Pay Attention!</strong>`. Notice that the end tag always includes a forward slash right after its beginning bracket (the forward slash is the one on the question mark key).

The `<strong>` tag pair codes for strength, and a Web browser will interpret the pair by giving the phrase "Pay Attention!" a strong appearance. Often, Web browsers show `<strong>`-tagged text in bold (see the motto in Figure 22.2).

Although HTML requires that you carefully type and position tags, it is surprisingly lenient when it comes to capitalization. You can type tags in uppercase, lowercase, or mixed case.

Use Common Sense

HTML is a language created under the auspices of SGML, which stands for Standard Generalized Markup Language. SGML, if you can believe it, is a language that tells people how to create other languages (such as HTML), and it's commonly used in United States government work.

"Standard" in SGML's name is important. You see, SGML (and thus HTML) was designed so people could share information, regardless of which computers they used, which software they used, or which fonts they installed. People all over the world use the Web with all sorts of computers, ranging from elderly mainframe systems that can display only one font and no pictures, to modern Macintosh computers that were born to display fonts and pictures. The future might bring Web browsers in phones, televisions, cars, speech synthesizers, and more.

Given HTML's roots in SGML, you might think that HTML tags work well in all Web browsers. If this were the case, authoring Web pages would be considerably simpler. The IETF (Internet Engineering Task Force) sets HTML standards (with help from several other organizations, including the World Wide Web Consortium), and most browsers support the tags specified in HTML 2.0. So far so good, but HTML 2.0 is limited in scope, and right now we have two additional draft proposals for HTML. HTML 3.0 is a broad proposal that introduced many new tags and ideas. HTML 3.2 is mostly a subset of HTML 3.0, although it includes a few new tags.

Some browsers support some of the tags proposed for HTML 3.0 and 3.2; there's no telling which browsers will support which tags in the future. To further complicate matters, browsers often support their own HTML tags, called HTML extensions. The most notable browser in this respect is Netscape Navigator, but Microsoft Internet Explorer also has its own set of extensions. Some browsers support other browsers' extensions, some don't.

This makes for a certain amount of chaos, chaos that you can best work around by using your common sense. In Figures 22.3 and 22.4, you can see the problem—in this case, a Web page that works in Netscape dies an awful death in version 1.0 of the America Online browser.

Figure 22.3 Netscape does a nice job showing the custom-formatted horizontal rule at the top (it looks like a square) and the centered table.

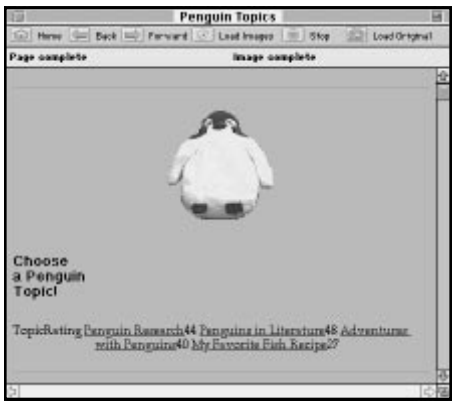


Figure 22.4 Version 1.0 of the America Online browser cannot display the custom rule or the table, and that causes a number of problems!

I see this tag chaos as being pretty awful. As a Web author, I don't want to have to consider whether or not my HTML tags will work in certain browsers, and I don't like being pushed around tag-wise by large companies that are concerned more about market share than about me as an individual. These big companies want market share so they can dominate the industry, not just in terms of browsers, but in terms of servers, Web authoring tools, and all sorts of software that will likely spin off from the Web in the future.

On the other hand, HTML extensions give Web authors far more flexibility and power than we would have otherwise, and they also bring out ideas for tags that the IETF can evaluate the merits of in real-life situations. For instance, the infamous `<blink>` tag pair, introduced by Netscape, enables Web authors to create flashing text, a feature that was once widely used, but has recently fallen somewhat out of favor because many users found flashing text annoying to watch.

What to Do About the Nonstandardization of HTML

First of all, don't panic! If you use HTML 2.0 tags, they will definitely work, and this chapter makes it clear which tags are HTML 2.0 and which are not. Second, if you venture beyond HTML 2.0 into the world of HTML 3.0 or HTML extensions, use your common sense and keep these tips in mind:

- If a browser doesn't understand a tag, chances are good that the browser will ignore it. Typically this results in your page not looking the way you intended, but not looking horrible. (Tables are perhaps the biggest exception to this rule, as illustrated in Figures 22.3 and 22.4.)
- Expand your collection of browsers and test your HTML documents in each one.

- Educate yourself! The different HTML specs and extensions are all posted online. An ounce of knowledge is worth pounds of testing effort. Look for useful links at <http://www.tidbits.com/tonya/jumpgate.html>.
- If you design Web pages for use on an "intranet" (a network within an organization), you might want to design pages exclusively for the browser of choice for that organization.
- If you decide (or your customer decides) that you will make a Web site for use on the Internet, but only design for one browser, be sure to mention that up front in the Web site.

Look Before You Leap

Before you jump in and author a Web page, decide how you will serve it to the Internet. As you've probably guessed, just creating an HTML document isn't enough to make the page available on the Web. To make the page available, you must place the HTML document on a Web server.

If you decide to run your own Web server, check out Chapter 23, "Set up Your Own Server," which provides information about how to do this on a Macintosh. If you don't run your own server, you must find an organization that will do it for you. Fortunately, it's likely that your Internet provider offers Web serving services, and such basic services often come free with Internet accounts. If you access the Internet through a network at a school or job, ask your network administrator for help. After you find an organization that will serve your page, ask about these issues:

1. Make sure you aren't limited to just a file—if you can have only one file, you won't be able to include additional pages, sounds, graphics, or other enhancements. Ask how many megabytes you can place in your Web directory, and if you'll be charged extra for uploading more than a certain amount.
2. The Web is picky about filenames, and filenames must end with an extension indicating the file type. For example, an HTML document needs a .htm or .html extension. GIF graphics must end with .gif, JPEG graphics with .jpg or .jpeg, and so on. Whether to use three- or four-character extensions depends on the Web server. Also, the length of your filenames might be limited by the server.
3. If you plan to have a default page (a page that people enter by default when they type your base URL), find out if it should be called default.html or index.html. In general, index.html is more common on Unix Web servers, whereas default.html is more common on Mac Web servers.
4. Ask if your provider charges extra if a large number of people view your page and a lot of data gets sent from your directory to their Web browsers.

5. If you'll be transferring files to the Web server via FTP, ask what the FTP URL is to your directory. Also, ask what your Web URL will be. You might also need to know the userid and password to your FTP directory.
6. You might want to include elements that need a separate program, called a CGI or Common Gateway Interface, to process information. Common elements include forms, counters (to display how many people have come to your site), and imagemaps (graphics with clickable hot spots that act as links). Find out if you can include CGIs and if your provider has standard CGIs available.

Web Page Content

Before you start creating a Web page, you'll probably want to think about what it will say and what it will look like. Some people even make sketches showing page sections and how pages will be linked. As you enter this planning process, consider the following tips. If you plan to make only a simple page, some of these tips won't apply to you, but you might enjoy thinking about them the next time you browse the Web, because they illustrate what makes for a good site.

- Give a page a descriptive title. Titles show up in bookmarks made to a page and in results returned by a search engine.
- Most search engines return a page's title, URL, and the first few lines of text. If the first few lines of text on your page summarize its content or sound enticing, people are more likely to visit.
- Don't assume everyone will enter your site through the home page. Provide navigational links on all pages.
- Use the top six inches or so of your home page to let people know what's interesting about your page and encourage them to continue reading.
- Most Web browser windows can (by default) display graphics 505 pixels wide, so you'll want to make your graphics a little narrower than that; perhaps between 470 and 485 pixels. (See "Making Graphics for the Web" later in this chapter for information about making Web-ready graphics.)
- Contribute content of your own. For example, if you love toasters, don't just put in links to other toaster pages. The links are fine, but you might also include your top ten tips for toaster care. If you set up a page for an organization, include information about a topic the organization specializes in. Commercial sites can especially benefit from this technique because it makes a site less a mundane billboard and more an interesting Internet resource.

- Include contact information, especially an email address. If your Web page is for a business, make it easy for people to also locate the business' phone number.
- If you post timely information, provide a date, so people know when it was last updated. Don't use a date format such as 1/2/97—some people take that to mean January 2, others take it to mean February 1. To be safe, use a format such as 02-Feb-97.
- Make sure your page will work for people who cannot use graphics or who do not have the latest popular browser.

Starting and Saving an HTML Document

Now that you've had a chance to think about what content you might include on your Web pages, it's time to learn the basic HTML behind every Web page. It's also time to learn a few extremely important things about saving Web pages.

An HTML document begins with the tag `<html>`, ends with the tag `</html>`, and anything between those two tags is either basic text or another tag. Put the right tags and text together, and you end up with a nifty Web page.

A Web page has two main parts: the head and the body. The head contains introductory and descriptive matter, such as a title, and the body contains everything else, except for the ending `</html>` tag. The text and tags for the basic Web page shown in Figure 22.5 look like the following:

```
<html>
<head>
<title>Ingrid's Penguin Page</title>
</head>
<body>
Why eat chocolate when you can eat fish instead?
</body>
</html>
```

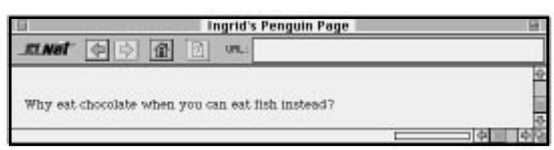


Figure 22.5 A basic Web page.

As you can see in Figure 22.5, the Web browser uses the paired <html>, <head>, and <body> tags behind the scenes. Anyone viewing the page sees only the title and body text. If you type lots of text between the <body> tag pair, the text will show on the Web page as one long paragraph.

Before you add much in the way of text or tags to an HTML document, you'll want to save the document. If you're making a single Web page that will have no graphics, sounds, or movies on it, you can save the page anywhere you like. It's more likely, though, that you are making a Web site with several pages as well as graphics, sounds, or movies. If this is the case, it's *extremely* important that you create a folder where everything in your site will be saved. You might name the folder Web Site Folder (that's how I'll refer to it), although you certainly might name it anything that you like.

FYI

When you upload your site to a Web server, you'll be uploading to a directory (a directory is the same as a folder on the Mac). The arrangement of files in your Web Site Folder must *exactly* match their arrangement on the server. If the server directory permits you to add subdirectories, you can also add folders within the Web Site Folder. After you put a graphic or Web page into the Web Site Folder or a subfolder, and once you link that graphic or page into your site, do not move the graphic or page. (If you move it, you'll have to redo the links to it!)

When you save a page, it's not only important to save it into the correct folder, it's also important to name it correctly. When you name the page, keep these points in mind:

- Don't use spaces, colons, quotes, angle brackets, or ampersands in the filename.
- The filename usually must end with the five characters .html (a period plus four letters). For example, if you create a page about sales, you might name it sales.html. To use the jargon correctly, you say, "I named my page with a dot HTML extension." (depending on your Web server, you might have to use .htm instead of .html.)
- Although the Macintosh enables filenames of up to 31 characters, your Web server might only allow 11.
- Give a home page a short, obvious name. (A home page is the welcome or table of contents page to a Web site). For example, if the URL to your Web directory is <http://www.webserver.com/~ingrid/>, and you name your home page ingrid.html, the URL to your home page will be <http://www.webserver.com/~ingrid/ingrid.html>.
- To get fancier with the name of a home page, name it either index.html or default.html (which name depends on the Web server; index.html is more common on Unix Web servers; default.html is more common on Mac Web servers). By giving your page one of these names, you make it a default page. For instance, if the URL to your Web directory is <http://www.webserver.com/~ingrid/>, and someone browses to that URL, the browser will display the default page, if a default page is present.

FYI
If you save an HTML document from a word processor, and you plan to test the document (which you can do right from your hard disk) or upload it to a Web server, you must save the file as text (all word processors can save as text). Also, given the choice, don't save as "text with line breaks."

HTML Tags

If you've read this chapter in order, so far you've learned a lot about things to watch out for. You've also learned the basic head and body tags that all HTML documents must have, and you know how, exactly, to save your documents. The good news is that you are done with warnings and worries. It's time to learn HTML. As Maurice Sendak would have said, "Let the wild rumpus begin!"

FYI
This section is all about making HTML tags. At the end of the section, you'll find a chart that summarizes all the tags, plus a few additional tags that didn't make it into the text of the chapter.

Tagging for Basic Text Layout

HTML has a number of tags that you use within the body of an HTML document to set up the structure and appearance of a page.

New Paragraphs and Lines

Web browsers do handle word wrap, such that text automatically wraps down to the next line, but they do not understand the idea of pressing Return to start a new line or paragraph. Even if you press Return to start new paragraphs within an HTML document, Web browsers ignore those Return characters. Web browsers also ignore multiple spaces created by pressing the Spacebar (although you can sometimes work around this problem with the `<pre>` tag pair, which I cover later in this chapter).

Fortunately, HTML includes tags for starting a new paragraph and for starting a new line. The new paragraph tag, `<p>`, typically puts some space above the new paragraph, and the new line tag, `<br>`, starts a new line without adding extra space (see Figure 22.6). Here is a snippet of HTML code with `<p>` and `<br>` tags:

```
<p>This page was last updated on April 1, 1995.</p>
<p>Ingrid Penguin
<br>One Herring Lane, Snowy Patch #27
<br>Frosty City, South Pole</p>
```

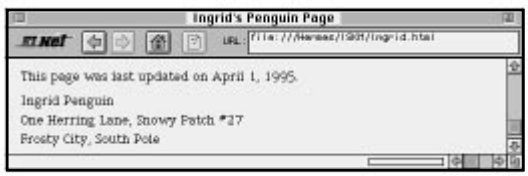


Figure 22.6 The extra space above "Ingrid Penguin" is due to a tag.

Notice that in the HTML code for Figure 22.6, the tag is paired, but the <br> tag is not. Under the HTML 2.0 spec of a year or so ago, you would not use the tag; instead, you'd simply place a at the start of each paragraph. The current HTML 2.0 spec shows examples both ways; the tag is paired in the HTML 3 spec, and the 3.2 spec says the end tag is optional. Unless you use a Web authoring tool that doesn't insert tags I suggest that you use a paired tag.

By default, Web browsers align paragraphs to the left. You can specify that a paragraph appears on the Web centered or right-aligned, although older browsers will still display the paragraphs left-aligned. For instance, the HTML below centers the first paragraph and right-aligns the second (see Figure 22.7).

```
<p align=center>This page was last updated on April 1, 1995.</p>
<p align=right>Ingrid Penguin
<br>One Herring Lane, Snowy Patch #27
<br>Frosty City, South Pole</p>
```

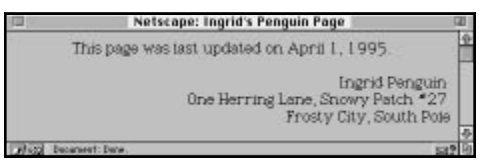


Figure 22.7 Netscape 2.0 understands the `align` attribute in the start tags.

The HTML for Figure 22.7 brings up two important points:

- The HTML uses *attributes*. Attributes go within a start tag and make the tag work in a more specific way. In this case, `align=center` and `align=right` went inside the start tags.

- Attributes have *values*. The value is what you set the attribute equal to, such as `center`, or `right`.
- You could also use the attribute `align=left`, although most people don't currently bother.

> **BTW**
> If you want to create more white space between paragraphs or lines, note that different browsers help or hinder you in this process differently. Some use multiple `<br>` tags to create white space, whereas others put in more white space in response to multiple `<p>` tags, although usually only to a limited extent. If you must have more white space, your best bet is either to change your design so it doesn't require that level of control or to insert transparent graphics and hope for the best in browsers that have graphics turned off. (Flip ahead in the chapter to find out about transparent graphics.)

Topic Headings

Web pages use topic headings to help viewers understand the flow of information. The `<h1>` pair is for the most important headings, the `<h2>` pair is for the next most important headings, and so on, all the way to the `<h6>` pair, which is for headings at the sixth level of importance. Figures 22.8 and 22.9 show a series of headings as they might appear in Netscape and Lynx. The HTML behind the figures looks like this:

```
<h1>Penguin Adventures</h1>
<h2>Penguin Adventures</h2>
<h3>Penguin Adventures</h3>
<h4>Penguin Adventures</h4>
```

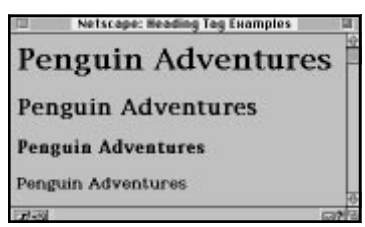


Figure 22.8 Headings in Netscape.

Heading tags are part of HTML 2.0 and work well in all browsers. Most browsers left-align headings. Setting up a centered or right-aligned heading works much like setting up a centered or right-aligned paragraph, although older browsers will ignore the `align` attribute. Here's an example of the HTML to center a level one heading:

```
<h1 align=center>Penguin Adventures</h1>
```

Figure 22.9 Headings in Lynx.

Lists and Glossaries

HTML makes it easy to create numbered and bulleted lists. People familiar with HTML call a numbered list an *ordered list*, and tag it with the `<ol>` pair (and Web browsers put in the numbers for you). They call a bulleted list an *unordered list*, and tag it with the `<ul>` pair (and Web browsers put in the bullets for you). Lists also require the single tag `<li>`, which precedes each list entry. Figure 22.10 shows the result of this HTML 2.0 code snippet for an unordered list:

```
<h2>Penguins in Literature</h2>
<ul>
<li>Monty Python's The Penguin on the Telly and the Death of Mary, Queen of Scots.
<li>Anatole France's Penguin Island, translated into English by A. W. Evans.
</ul>
```

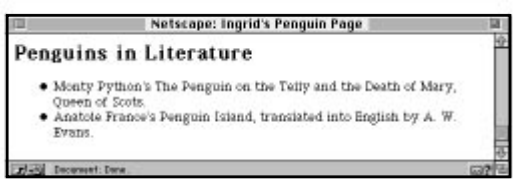


Figure 22.10 A bulleted list.

A glossary is a list of terms and definitions (see Figure 22.11). In HTML, the `<dl>` (definition list) tag surrounds a glossary list, the `<dt>` (definition term) tag begins a term, and the `<dd>` (definition data) tag begins a definition. To see how the tags work, check out this sample of HTML 2.0 code:

```
<dl>
<dt>The Penguin on the Telly and the Death of Mary, Queen of Scots
<dd>The first time I heard this Monty Python skit, I laughed so hard that I fell off
my chair.
<dt>Penguin Island
<dd>I've never read this book by Anatole France, but I've always wanted to.
</dl>
```

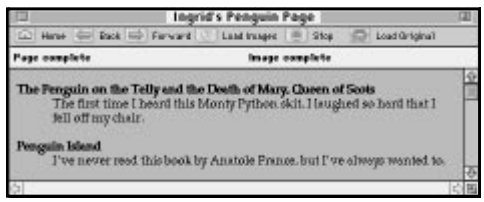


Figure 22.11 A glossary-like list.

Addresses—Snail Mail and Email

It's polite to end your home page with contact information so viewers can get in touch with you. If you include a snail mail address, you might enclose it in the `<address>` tag pair. A snail mail address has a solid, traditional feel to it, but sharing your email address usually makes sense as well. You can, of course, just type your email address in the text of your page, but just typing your email address brands you as a rank novice; instead, you should make a mailto link. Here's the HTML 2.0 code behind the address information in Figure 22.12:

```
<address>Ingrid Penguin
<br>One Herring Lane, Snowy Patch #27
<br>Frosty City, South Pole</address>
<br><a href="mailto:ingrid@tidbits.com">ingrid@tidbits.com</a>
```

Figure 22.12 A snail mail and email address, displayed in Netscape.

The first part of the code shows the `<address>` tag pair in action, and the last line shows an example of an anchor tag pair with an `href` attribute. Anchor tags can do many different things, and I talk more about them in the "Tagging for Links" section later in this chapter.

In this example, the anchor tag uses the `href` attribute to link to an email address (href stands for Hypertextual REFerence). In this case, if someone clicks the link, the Web browser brings up a window or calls another program to send email, with `ingrid@tidbits.com` in the To field (see Figure 22.13).

Figure 22.13 In Netscape, clicking the link shown in this figure opens a window for sending email to the linked-to address.

> **BTW**
> Some browsers don't support `mailto` URLs, and others do support them but must be set up correctly. Fortunately, if a reader's browser doesn't work with mailto URLs, he can still see the email address and transcribe it manually.

Quotations

If you put a long quotation on a Web page, you might set it off in a special way, using the `<blockquote>` pair. Web browsers typically indent or italicize blockquoted text.

To make quotation marks, use the double quotation mark entity (`"`) (see "Tagging for Special Characters" later in this chapter). Many Web browsers will display a double straight quote even if you type `"` and don't use the entity, but it's considered bad form not to use the entity.

If you use a word processor to type HTML and the word processor automatically types curly quotes when you press the Quote key, you must turn off the curly quotes. Look for a Preferences or Options command, or if your program has an automatic-correction feature, this might be where you turn off curly quotes.

Tagging for Styling Text

Mac users are accustomed to having lots of options for styling text, and HTML might be a letdown for those who enjoy setting the exact visual look of text. Many features are flat-out missing, and others no longer make sense when translated from the world of paper to the online world.

HTML's typographical tags come in two main categories: *logical* and *physical*. Logical tags have little to do with Spock from *Star Trek*, but they do suggest how a browser might display text. In contrast, physical tags specify how a browser should show text. For instance, `<strong>` is a logical tag that codes for text to have a strong appearance. Most browsers show `<strong>` text in bold, but they don't have to, and some browsers can be customized to show `<strong>` text differently, perhaps as purple italic. On the other hand, `<b>` is a physical tag that codes for bold text, and `<b>`-tagged text appears in bold unless the browser in question cannot display bold.

Logical Tags

Of the logical tags in HTML 2.0, only three show up frequently on the Web:

- Cite: `<cite>…text…</cite>` (for book titles and the like)
- Emphasize: `<em>…text…</em>` (browsers often show in italic)
- Strong: `<strong>…text…</strong>` (browsers often show in bold)

If you write a software tutorial in HTML, you might also use these logical tags from HTML 2.0:

- Code: `<code>…text…</code>` (for bits of programming code)
- Keyboard: `<kbd>…text…</kbd>` (for text to be typed)
- Sample: `<samp>…text…</samp>` (for a message returned by a computer)
- Variable: `<var>…text…</var>` (for customized text to be typed, such as an email address)

Physical Tags

Physical tags from the HTML 2.0 specification include:

- Bold: `<b>…text…</b>`
- Italic: `<i>…text…</i>`

- Typewriter: <tt>…text…</tt> (displays text in a monospaced font)
- Underline: <u>…text…</u>

Some of the physical tags in the HTML 3.0 and 3.2 drafts have started to gain acceptance and some browsers support them even now. Common ones include:

- Big: <big>…text…</big> (makes text bigger)
- Small: <small>…text…</small> (makes text smaller)
- Subscript: _{…text…}
- Superscript: ^{…text…}

FYI

To see what styling tags work in your browser, and to see how they work, you could make an HTML document that includes all the tags, and then load the document into your browser. Or, you could save yourself some time and use your browser to look at such an HTML document that I've already created. The document is at: <http://www.tidbits.com/tonya/HTML3test.html>. This document also includes some tags that don't appear in this book.

BTW

Although it's not part of the HTML 2.0 spec, you can color text on a Web page. I give directions for how to do that later in this chapter, in the section called "Tagging for Text Colors."

Preformatted Text

"But, but, but…" you might be sputtering. "I *need* some text to appear in Web browsers exactly the way it shows on my computer." For example, if you need to present tabular information in a monospaced font (such as Monaco), you don't want the font to turn into a proportional font (such as Times) up on the Web, because your carefully aligned columns will turn into alphabet soup.

Luckily, help is at hand, in the form of the <pre> tag pair. Surround your text with a <pre> tag pair, and it will display in a monospaced font, exactly as you typed it (including multiple spaces in a row), and you don't have to use <br> tags to start new lines.

Tagging for Special Characters

First, the good news—many text characters work fine in HTML documents—you just type them on the keyboard and they show up as you expect on the Web. Second, the bad news—you do have to code for HTML's four reserved characters (>, <, ", and &) and for "upper ASCII character set" characters.

ASCII stands for American Standard Code for Information Interchange, and the lower ASCII character set, also known as "7-bit ASCII," consists of 128 characters, each with an assigned number. Of those 128 characters, about 100 are for letters and numbers that people use. On an English keyboard, pretty much any character that appears is part of lower ASCII; with non-English keyboards, your mileage may vary considerably.

The upper ASCII character set adds another 128 characters to the lower ASCII character set, and the lower and upper ASCII character sets are collectively known as "8-bit ASCII." Bullets, accented characters, and other special characters come from upper ASCII. Unfortunately, different computers and programs use different upper ASCII character sets. When you type an upper ASCII character on the Mac, it's unlikely to be the same character when viewed through a Web browser, which uses a standard called ISO Latin-1 for its upper ASCII characters.

Named and Numbered Entities

You can tag for many upper ASCII characters with "named entities." A named entity is a special code that begins with an ampersand, continues with a name, and ends with a semicolon. Table 22.1 shows a few examples of named entities. You can find a full list of ISO Latin-1 characters and their entities at <http://www.sandia.gov/sci_compute/symbols.html>.

Table 22.1 Tagging for Upper ASCII Characters

Character	Named Entity
á	á
é	é
ñ	ñ

BTW

You can also specify ISO Latin-1 characters using "numbered entities" (in which numbers specify the characters), but for numbered entities above 127, you might run into problems with some Web browsers not displaying them correctly, so I recommend that you use named entities whenever possible.

Reserved Characters

HTML reserves four characters for its tags, and you can't use those characters as regular text and count on them appearing correctly on the Web. The reserved characters are the left angle bracket (<), right angle bracket (>), straight double quote ("), and ampersand (&). To code for these characters, use special named entities (see Table 22.2).

Table 22.2 Tagging for Reserved Characters

Character	Tag
<	<
>	>
&	&
"	"

Tagging for Horizontal Lines

In Web author jargon, a horizontal line across the page is a *horizontal rule*, and you code for it using the <hr> tag. Web authors frequently use horizontal rules to visually separate topics. To make a rule, just stick <hr> where you want the rule to go. Here's the HTML code for the horizontal rule shown in Figure 22.14:

```
<p><strong>Motto: Why eat chocolate when you can eat fish instead?</strong></p>
<hr>
<p>My name is Ingrid. Besides <a href="#recipe">eating fish,</a> my hobbies include
swimming, waddling, and watching out for seals.</p>
```

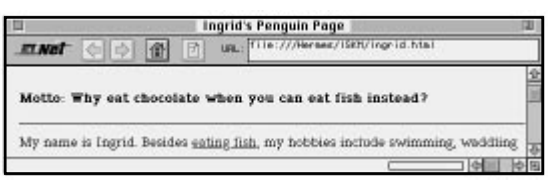


Figure 22.14 A Web browser interprets the <hr> tag by showing a horizontal line.

BTW

If you've spent much time hanging out on the Web, you've almost certainly noticed that some Web pages have colorful or whimsical horizontal rules, placed on the page via an `<img>` tag. (I explain about the <img> tag just a few pages later in the section about tagging for graphics, sounds, and movies.) Not only do these graphical rules liven up Web pages, but they also exist, often free for the taking, in Web-based collections sprinkled all over the globe (see "Finding Web-Ready Graphics" later in this chapter). Usually, it's best to put a horizontal rule in its own paragraph or to follow it with a `<br>` tag. You might also want to center the rule.

The Netscape HTML extended tag set has attributes for the `<hr>` tag that enable you to modify the appearance of a horizontal rule. As an example of a line you could make, consider the following code:

```
<hr size=20 width=288 align=center noshade>
```

Figure 22.15 shows what such a horizontal rule would look like in Netscape.

Figure 22.15 This horizontal rule, as interpreted by Netscape, is 20 pixels high, 288 pixels wide, center-aligned, and not shaded.

Briefly, here's how each attribute works:

- `size` sets the height of the line in pixels (figure on about 72 pixels per inch).
- `width` specifies the line width. You can use a measurement in pixels, or you can specify a percentage of the page width. If you specify a percentage, put a percent sign after the number.
- Use `align` to center, left-, or right-align the line on the page (because I shortened the width, I can now choose how the line aligns).

- Netscape shades its horizontal rules, but you can turn off the shading by including the `noshade` attribute.

As another example of how you might use these attributes, Figure 22.16 shows a coded `<hr>` tag:

```
<hr size=20 width=75%>
```

Figure 22.16 This horizontal rule, as interpreted by Netscape, is 20 pixels high and 75 percent as wide as the page.

> BTW
> If you leave shading on and make a small rule, you will end up with a rule that looks like a small box.

Tagging for Links

If you absorbed most of the information so far in this chapter about tagging text to make HTML documents, you should be able to fire up a word processor and make a simple HTML document with headings, lists, emphasized text, and so on. Even so, your journey to Web authoring mastery won't be close to complete until you learn how to make links. Links enable people to move quickly from one place to another on the Web. If you serve your Web page from a site in San Francisco, but make a link to a Web page stored in London, someone clicking your link will be instantly (or somewhat instantly) able to look at the page in London. Links come in three flavors: links to other Web pages, links to other Internet resources, and links within a page.

Linking to Other Web Pages

To link to a different page, you need to know the URL of that page. If the page isn't part of your Web site, it often works well to find the page via your Web browser and copy the URL

out of the browser. You can then paste the URL into your HTML document, within the start tag of an <a> tag pair. (Think of A as standing for anchor; usually, an <a> tag anchors a link.)

For instance, the URL to Apple Computer's What's New page is <http://www.apple.com/documents/whatsnew.html>. To make a link from your page to Apple's page, you might use the following HTML:

```
Find out what's new at <a href="http://www.apple.com/documents/whatsnew.html">Apple
Computer</a>.
```

Notice that the link is created by enclosing "Apple Computer" within a pair of <a> tags. You can put any text that you like between the <a> tags, and the text between the tags will show in a Web browser in a special format (usually underlined) to indicate the start of a link (see Figure 22.17).

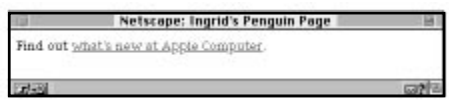


Figure 22.17 Web browsers usually display linked text in a different color and with an underline.

The start <a> tag is fairly long, because it has an href attribute (href stands for Hypertextual REFerence.) The href attribute tells a Web browser to go to <http://www.apple.com/documents/whatsnew.html> if someone clicks "Apple Computer." Within the start <a> tag, notice that the URL is enclosed in straight, double quotes. It's important that you use the quotes, and—as with any text in an HTML document—it's also important that the quotes be straight, not curly.

When you make a link to a page that's not on your Web site, you use a normal URL, also known as an *absolute URL*. Technically speaking, an absolute URL has all the information needed to find the end of a link: the protocol (http), the server (www.apple.com), and the path (/documents/whatsnew.html).

To create a link to another page on your own Web site, you don't need to use a full URL in the href attribute; instead, you use a *relative URL*, one that begins at the directory (remember, in case you didn't know, a directory is the same idea as a folder) holding the page that starts the link.

Relative URLs can save you a lot of time in the long run, because if you later move your pages to a different Web server (which you would do if you switched providers, for instance), you can move your files without changing the href attributes, because the URLs don't include the server name. Also, you can test links made with relative URLs before uploading the files to a Web server, because the links work the same way in either location.

BTW
If all this talk of URLs is making your head swim, skip back to Chapter 9, "Addressing and URLs," for a discussion of the various parts of a URL.

Linking to a file stored in the same directory as the file that starts the link is easy. For instance, Figure 22.18 shows a small Web site. The main level has three files: default.html, fish.gif, and fish.html. The main level also has a folder, called travel.

Figure 22.18 A small Web site.

To link from default.html to fish.html, you would use a relative URL, and the HTML might look like this:

```
Over the years, I've developed several excellent <a href="fish.html">fish recipes.
</a>
```

The URL doesn't mention anything except the name of the file to link to (fish.html) because everything else is assumed.

Not all the files shown in the Web Site Folder (refer to Figure 22.18) are at the main level. The file travel.html is down one level in the travel folder, and miami.html and paris.html are down two levels. The HTML that would create links from default.html to these other files might look like this:

```
I love to <a href="travel/travel.html">travel</a>, and I recently visited both <a
href="travel/trips/miami.html">Miami</a> and <a href="travel/trips/
paris.html">Paris</a>.
```

These relative URLs direct browsers from the directory holding default.html to a place more deeply nested in the directory structure. You can also use relative URLs to move to files less deeply nested. For instance, the HTML to link from miami.html to travel.html looks like this:

```
For more info, see the <a href="../travel.html">travel page</a>
```

Or, to link from miami.html all the way up to default.html, use this HTML:

```
<a href="../../default.html">Home</a>
```

Linking to Other Internet Resources

You can link to anything that has a URL, although some Web browsers have trouble with FTP URLs, so if you give an FTP URL, be sure to also mention the URL in the regular text of the Web page. Links to Gopher files tend to work well. The code below shows the HTML for an unordered list with links to two Gopher items.

```
<ul>
<li>Monty Python's <cite><a href="gopher://ocf.berkeley.edu:70/00/Library/
Monty_Python/penguin ">The Penguin on the Telly and the Death of Mary, Queen of
Scots.</a></cite>
<li>Anatole France's<cite><a href="gopher://gopher.vt.edu:10010/02/84/1">Penguin
Island,</a></cite> translated into English by A. W. Evans.
</ul>
```

Linking Within a Web Page

You also can use links to help people get around within a page. You might make a linked table of contents, for example, of `<h1>`- or `<h2>`-tagged titles (see Figure 22.19).

Figure 22.19 Links used as a table of contents.

To create an internal link, you first do some special HTML tagging at the *target* of the link. The target is where viewers end up after they click. For example, in the Web page shown in Figure 22.19, if you click "Other Penguins on the Web" you'll end up a little further down that same page, at the target (which happens to be a level-two heading that reads "Other Penguins on the Web"). The HTML used to make the target looks like this:

```
<h2><a name="other penguins">Other Penguins on the Web</a></h2>
```

If you haven't already, do notice a few picky details about the HTML:

- Unlike a start <a> tag that begins a link, this start <a> tag ends a link, and it includes a name attribute.
- I named the target other penguins, but I could have used any name I wanted, including george, lnk1, or aa1.
- The value is enclosed in straight double quotes.
- I placed the <h2> tag pair *outside* the <a> tag pair.

After naming the target, you set up the beginning of the link like this:

```
<a href="#other penguins">Other Penguins on the Web</a>
```

The start <a> tag uses an href attribute. The value begins with a pound sign and then continues with the target name that you want to link to. As you probably expect by now, the value must be enclosed by straight, double quotes.

Tagging for Graphics, Sounds, and Movies

In the last section, I talked about tagging for links. I hope you paid attention, because much of what you learned will come in handy when you tag for graphics, sounds, and movies. Before I talk about tags for graphics, sounds, and movies, I should mention that you can't include any old graphic, sound, or movie on a Web page. I should also mention that later on in this chapter you'll find complete sections on each of these topics, so feel free to flip ahead if you need to. Briefly, though, let's take a look at the tagging options available:

- You can place graphics on a Web page either as regular graphics, as single clickable items that begin single links (such as a Next Page button), or as imagemaps that contain multiple clickable "hot spots" that begin multiple links. Graphics should be in GIF or JPEG format.
- Sounds go on Web pages as clickable links. Click the link and a sound downloads to your computer and plays in a helper application, such as SoundMachine. (See Chapter 16, "All About the World Wide Web," for more information on helper applications.)
- Movies also go on Web pages as clickable links. As with sounds, you click the link to download the movie to a helper application (such as Sparkle) on your computer. Movies also go on Web pages as animated GIFs. Animated GIFs play live in some browser windows.

BTW

Because helper applications aren't particularly elegant, more and more plug-ins (such as Shockwave and FutureSplash) are appearing for sounds and movies. A plug-in allows a sound or movie to play directly within a browser window, although often with onerous memory requirements and download times. I talk about the HTML for plug-ins later in this chapter, and you can also find out more about them in Chapter 16, "All About the World Wide Web."

Tagging for a Regular Graphic

To place a graphic on a Web page, you use the unpaired `<img>` (image) tag. The `<img>` tag takes a number of attributes, which tell Web browsers where the graphic is located and how to display it. Here's an example:

```
<img src="ingrid.gif" width=64 height=44 align=bottom alt="I have expressive eyes
with long eyelashes.">
```

Here's what's going on with the attributes in the example:

- The first attribute, `src="ingrid.gif"`, specifies the source of the image as a file called ingrid.gif. The source should always be given as a URL. In this case, I used a relative URL to a GIF in the same folder as the HTML document that will show the GIF. (Flip back to the section "Tagging for Links" to find out more about relative URLs.)
- The next two attributes, `width=64` and `height=44`, tell Web browsers the dimensions of the graphic, in pixels. A number of browsers use this information as they display a Web page. They quickly put up a correctly sized but blank rectangle in place of the image and then bring in text on the page (so users can start reading the text). After bringing in the text, the browsers load the image.
- Use the `alt` attribute for text that shows in browsers that can't display the image.
- The `align` attribute specifies how text should line up with the graphic. In this case, `align=bottom` lines up text at the bottom of the graphic. You could also use `align=top` or `align=center` (see Figure 22.20). Although some browsers won't show it correctly, you can also place images to the right or left of text (which sort of makes the text wrap around the graphic) with `align=left` and `align=right`.

BTW

Within an HTML tag, such as the `<img>` tag, you can include attributes in any order you like. You can also omit or include any attributes that you like.

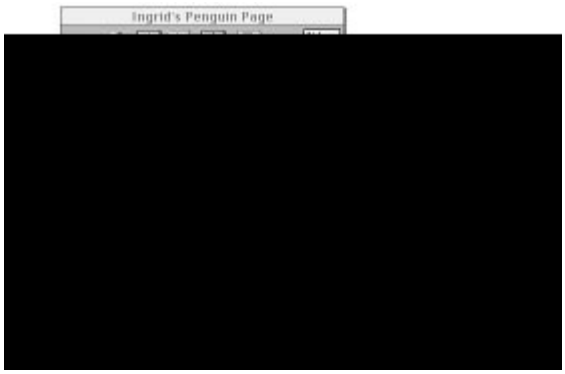


Figure 22.20 Use the align attribute to align images at the top, center, or bottom of their lines.

Tagging for a Graphic that Starts a Link

You can also make a graphic into a clickable start of a link. As you might recall, the HTML for a text link consists of text enclosed in a pair of `<a>` tags, like this:

```
<a href="http://www.web.com/myhomepage">Check out my home page!</a>.
```

If you put a graphic between the `<a>` tags instead of text, the graphic would act like a link. Here's an example:

```
<a href="http://www.web.com/myhomepage/"><img src="logo.gif" width=10 height=10
align=bottom alt="link to my home page"></a>.
```

A graphic set up as the start of a link will show on the Web with a border, and the border will be colored to indicate that the graphic starts a link. If you don't want a colored border, add the attribute `border="0"` to the `<img>` tag. (Set `border` equal to zero, not to the letter O.)

> **FYI**
> Because not everyone views the Web with graphics turned on, it's best to include text-based links that duplicate links you've set up graphically.

GifScan 1.9

`http://www.users.dircon.co.uk/~marcb/gifscan.html`

GifScan is a handy and highly customizable utility that generates `<img>` tags for Web-ready graphics (all GIFs and some JPEGs). You can also set it to report on whether a graphic is interlaced or transparent, what colors are in the graphic, and more. (To find about transparent or interlaced GIFs, flip ahead in this chapter to the section, "Making Graphics for the Web.") To operate the program, you simply drag-and-drop one or more graphic file icons over GifScan's Finder icon. GifScan responds by analyzing the image and creating an `<img>` tag that contains `alt`, `width`, and `height` attributes. If you are mainly interested in the `<img>` tag, you can set the program to copy HTML to the clipboard. Then when you drag icons to the GifScan icon, GifScan automatically places the `<img>` tag in the clipboard, and you can simply paste it into your document. Written by Marc Boon, GifScan is free, although Marc wouldn't mind receiving email, postcards, or money in compensation.

Setting Up an Imagemap

Although many Web pages don't take graphics to this level, you can also create a graphic that offers clickable areas. Click an area, and you zoom off to the URL matched with that area. Such graphics are called "imagemaps," and different portions of an imagemap link to different URLs (see Figure 22.21 for an example). Imagemaps are only partially within the scope of this book, so you'll need to consult with your Web administrator for help filling in gaps left by this section.

Figure 22.21 The Film.com imagemap.

Imagemaps require four things of you: an image, a map definition file, a CGI program on your Web server, and the correct HTML in your HTML document:

- The image can be any GIF or JPEG, although GIFs are a more common choice.
- A map definition file is a text file that lists shapes in your image and associates each shapes with a URL. Map definition files use a slightly different syntax, depending on what type of Web server you use, usually either NCSA or CERN (ask your Web administrator for help figuring out which one). A number of commercial programs provide visual tools for setting up map definition files, as do a number of utilities available on the Internet (see Table 22.3 for information about a few such utilities). The map definition file goes on your Web server.
- The CGI runs on your server and uses the imagemap file to correctly route users who click the imagemap.
- The HTML for an imagemap links the GIF or JPEG to the CGI and (if necessary) the map definition file. Here's an example:

```
<a href="/cgi/mapcgi"><img src="choose.gif" ismap></a>
```

Notice that the HTML contains an `<img>` tag enclosed by an `<a>` tag pair. The `<img>` tag has a new and critical attribute: `ismap`. The start `<a>` tag links to the CGI on the Web server. In this case, the CGI already knows where to find the map definition file. The CGI might be programmed to use a specific file, or it might be programmed to look in a particular directory for the file.

Sometimes, though, you must tell the CGI where to locate the map definition file (your Web administrator can tell you which situation you are in). To accomplish this, you modify the start `<a>` tag so that it begins by linking to the relative URL leading to the CGI and then launches right into the relative URL for the map definition file. The HTML might look like this:

```
<a href="/cgi/mapcgi/my_home_directory/choose.map"><img src="choose.gif" ismap></a>
```

Table 22.3 Utitlities for Creating a Map Definition File

Name	URL	Comments
HyperMapEdit 1.0	`http://www.libertynet.org/~gasser/projects/hypermap.html`	Free; HyperCard stack.
MacMapMaker 1.0a1	`http://www.ncsa.uiuc.edu/Edu/MMM/`	HyperCard stack.
WebMap 2.0b9	`http://www.city.net/cnx/software/webmap.html`	$25; Polished and easy to use.

FYI

When it comes to naming imagemap graphics and map definition files, the convention is to give them the same name, but different extensions. The graphic, of course, should have a .gif, .jpg, or .jpeg extension, and the map definition file should have a .map extension. So, for example, you might name the graphic choose.gif and the map definition file choose.map.

BTW

Imagemap technology could use some improvements. Because it involves CGIs, it makes servers work harder than they would otherwise. Also, you cannot test imagemaps without first loading all your files onto the server. Client-side imagemaps, a technique that's currently a Netscape extension to HTML, avoids these problems by enabling you to include a map definition file within an HTML document (between a pair of `<map>` tags). In a browser that understands the `<map>` tag, the imagemap works just fine without the help of a server. Netscape has posted directions for setting up client-side imagemaps at: `<http://www.netscape.com/assist/net_sites/html_extensions_3.html>`.

Tagging for Sounds

You link to a sound with an anchor tag pair. The `href` attribute in the start `<a>` tag should link to the sound file (probably through a relative link). For instance, the HTML for including a sound called wow.au might look like this:

```
<a href="wow.au">Click here for a WOW sound, 30K, ulaw</a>
```

Although it is optional, I recommend that you mention both the size and file type of the sound. This makes it easy for people to decide if they have the time and software necessary to handle your sound. The same advice applies to movies, which I talk about next.

Tagging for Movies

Tagging for movies works the same way as tagging for sounds. You use an anchor tag, which links to the movie. For example, your HTML might look like this:

```
<a href="wedding.mov">Ingrid's wedding, 200K, QuickTime</a>
```

You could also make a graphic image into a clickable button that leads to a sound or movie. The HTML for that might look like this:

```
<a href="wedding.mov"><img src="firstframe.gif" height=20 width=20 alt="click here to
see a 200K QuickTime movie of Ingrid's wedding"></a>
```

FYI
Sounds and movies must be saved in formats that can transmit across the Internet and be understood when they reach their destinations. To find out more about these formats, the utilities that help you create them, and animated GIFs, see the section "Making Sounds and Movies for the Web" later in this chapter.

Tagging for Animated GIFs

Tag for an animated GIF just as you'd tag for any graphic, using the `<img>` tag. For instance, your HTML might look like this:

```
<img src="animated_box.gif" width=194 height=194 alt="animated GIF of a box floating
about on-screen, 42K">
```

Tags for Embedded Files (Plug-Ins)

Now that we've looked at the HTML for basic graphics, sounds, and movies, it's time to look at tagging for "embedded files," files accessed on the Web with the help of plug-ins. Chapter 16, "All About the World Wide Web," covers plug-ins in more detail, but I will note here that plug-ins currently play a vital role in the stategy of a number of influential companies, including Adobe and Macromedia. Basically, you can "embed" certain types of files within an HTML document, and these files are typically some form of a graphic, sound, or movie. Embedded files typically cannot display in a Web browser unless the browser is equipped with a matching plug-in (although future browsers might include some plug-in capabilities; even now, Internet Explorer 2.0 can play some sound files without the help of a plug-in). For instance, you might embed an Adobe Acrobat file in an HTML document, and then people trying to see the Acrobat file can do so in their Web browsers if—and only if—they've installed the appropriate Acrobat-enabling plug-in.

Because users must specifically download plug-ins, and because plug-ins often place large disk and RAM demands on client machines, use embedded files with care. Also, be sure to provide a link on your page to a location where users can download any required plug-ins.

The basic HTML for an embedded file uses a single `<embed>` tag and might look like this:

```
<embed src="ball.spl" width=100% height=100% salign=t quality=best play=true>
```

All `<embed>` tags have one extremely important attribute, `src`. Use `src` to indicate the location of the embedded file (just as you would indicate the location of a graphic that you want to include on a page). Be sure to set up your relative URL correctly, as explained in the "Tagging for Links" section earlier in this chapter.

The specific attributes for an <embed> tag depend on the plug-in that ultimately displays the embedded file, so I won't attempt to cover them here. However, in case you were wondering, the HTML above is for an embedded FutureSplash file, which I created in an animation program called CelAnimator. The section "Web-Ready Movies: QuickTime, GIF Animations, and More" later in this chapter has a bit more information about FutureSplash and CelAnimator.

Tagging for Text Colors

One way to make your Web page stand out visually is to change the text color. To change the color for the entire page, put a text attribute in the start <body> tag. Here's an example of a start <body> tag that makes all text on a Web page blue:

```
<body text="#1516FF">
```

In the above HTML, I've placed the text value in straight double quotes. The value consists of a pound sign and a six-digit hexadecimal number, and all those characters are enclosed in straight double quotes. Lest you think that I know what hexadecimal numbers go with what colors, rest assured that I did what most Web authors do—I ran a program that computed the hexadecimal value based on a color I visually selected. Fortunately, most Web authoring programs offer such a conversion feature, and the end of this section also reviews a few utilties whose main function is to help you convert colors into hexadecimal values.

> **FYI**
> Some browsers don't support text colors and some browsers permit users to set personalized text colors that override yours.

If you're thinking that it's all fine and nice to change the text color but that you'd also like to be able to modify the color of linked text, then keep reading, because you can add additional attributes to the start <body> tag in order to accomplish just that. Here's the HTML:

```
<body text="#1516FF" link="#FF4F4C" alink="#52D81B" vlink="#FFAEA0">
```

Each of these attributes shares the same basic setup. You surround an attribute's value with straight double quotes. The value begins with a pound sign and continues with a hexadecimal value. Use link for unvisited links, vlink for visited links, and alink for the color of a link while it is being clicked.

BTW
Hexadecimal or "hex" is a system of counting that has 16 digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F.

To determine what hexadecimal value corresponds with what colors, you'll need help. Many Web authoring tools have features for visually picking out colors, or you might try one of the utilities mentioned in Table 22.4. Some of these utilities have their own URLs, and you can also look for them at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/html/>`.

Table 22.4 Utilities that Match Colors with Hexadecimal Values

Name	URL	Comments
HTML ColorMeister 1.3.5	`http://wizlink.iserver.com/conner/ParticleFlux/index.html`	Free; nice interface; generates a complete body tag.
HTML ColorPicker 2.0.3	n/a	$5; a basic tool that generates one hexadecimal number at a time.
HTML ColorSelect 1.2	n/a	$5; you must retype hexadecimal number generated by the program. You can open a graphic, click a pixel, and see the hex number for that pixel.
HTML ColourTool 2.0.1	n/a	$10; shows a preview of background and text colors as you set them and generates a complete body tag.
WebColor	`http://users.aol.com/wcolorinfo/`	$5; a polished program that enables you to set up a complete body tag. It helps with background tiling (which I discuss later in this chapter).

Tagging for Background Colors

If you just read the previous section "Tagging for Text Colors," you are probably thinking that it's all fine and nice to tag for text colors, but it would be even better if you could also change a page's background color. For instance, say you want to set up yellow text. So that people can actually read the yellow text, it needs to go on a dark background. You change

the background color by adding a `bgcolor` attribute to the start `<body>` tag. The `bgcolor` atribute works much like the text coloring attributes explained in the previous section. Here is an example:

```
<body bgcolor="#2CEB36">
```

Tagging for Background Patterns

Web pages can also have background patterns; common patterns look like fancy paper, marbled surfaces, bubbles, and so on. A background pattern is usually a small image that "tiles" across the back of a Web page. By employing a tiling technique, you can keep your background pattern file quite small, and have it look okay no matter what size browser window it displays in. To include a background pattern, you use the `background` attribute in the start `<body>` tag. For instance, if your background pattern file is called woodgrain.gif, your HTML might look like this:

```
<body background="woodgrain.gif">
```

Be sure to use the correct relative URL within the `background` value.

Tags for Tables

If you want to arrange information in rows or columns, a table might be exactly what you need. Tables work well not only for text but also for arranging text and graphics within a grid-like structure. Unfortunately, tables pose two big problems for Web authors. For one thing, you might have trouble visualizing how your tags will translate to a finished table (although I list some utilities at the end of this section that you might find helpful). For another thing, table tags are not universally understood by all Web browsers, so it can take some thought to come up with a table that works reasonably well in a variety of browsers. In this section, I don't explain every table tag available; instead, I try to focus on tags that are more universally understood.

A Basic Table

Briefly, tables are enclosed in the paired `<table>` tag. To make borders show around the columns and rows in a table, include a `border` attribute within the start `<table>` tag. Each row starts with a `<tr>` (table row) tag and each data cell starts with a `<td>` (table data) tag. Cells for headings begin with `<th>` (table heading) tags. The HTML for the table shown in Figure 22.22 looks like this:

```
<table border>
<tr><th>Cookie<th>Size
```

```
<tr><td>Gingersnap<td>big
<tr><td>Monster Fudge<td>big
<tr><td>Lemon Swirl<td>small
</table>
```

Figure 22.22 Text in `<th>`-tagged cells appears bold and centered. In contrast, text in `<td>`-tagged cells appears left-aligned and in plain text; most (if not all) browsers that display tables use this convention.

> **FYI**
> Some people end rows and cells with end tags (i.e. `</tr>`, `</td>`, and `</th>`), although I've never seen a problem with omitting end tags. If you use a program that puts in the end tags, don't worry about taking them out!

Aligning Text Within Cells

If you don't like the default way that tables show table headings centered and data cells left-aligned, you can add an `align` attribute to any or all `<th>` and `<td>` tags. These attributes work much the way they do for paragraphs or headings. For instance, to left-align a table heading, use the tag `<th align=left>`. Similarly, to right-align a table heading, the tag would be `<th align=right>`.

You can also vertically align text within a cell by putting a `valign` attribute within a `<th>` or `<td>` tag. `valign` takes the values of `top`, `middle`, or `bottom`. For instance, to vertically align text to the bottom of a data cell, use the HTML `<td valign=bottom>`. To align text to the top, use `<td valign=top>`. Text usually defaults to a middle vertical alignment (see "big" in the second column of Figure 22.23), but if you want to specify it, use `<td valign=middle>`.

Cells that Span Multiple Rows or Columns

You can set up tables with cells that fill more than one row or column using `rowspan` and `colspan` attributes. Here's an example of the HTML for a table that uses both of these attributes (see Figure 22.23).

```
<table border>
<tr><th colspan=2>Cookie Sizes
<tr><td>Gingersnap<td rowspan=2>big
<tr><td>Monster Fudge
<tr><td>Lemon Swirl<td>small
</table>
```

Figure 22.23 This table with `colspan` and `rowspan` attributes and cells that span more than one column or row.

In the HTML for Figure 22.23, notice that the `colspan` value is 2. The 2 means the cell in question spans two columns. (This works the same for `rowspan`.) It wouldn't be worth your time to use a value of 1, because that's the default, but you can use any sensible value to make your `colspan` or `rowspan` cells span as many normal columns or rows as you like. You can also combine `colspan` and `rowspan` in the same cell.

Making Tables for Browsers that Don't Show Tables

Because tables aren't part of HTML 2.0, a number of browsers cannot display them. Most browsers shipping now do support tables, but lots of users haven't updated their browsers. You can make a table look better in a non-table-savvy browser by employing a few clever tricks.

If a browser doesn't understand table tags, chances are good that it will simply ignore them. For example, Figure 22.24 shows Lynx ignoring the table-related tags in this HTML:

```
<table>
<tr><td>color<td>tree<td>animal
<tr><td>red<td>maple<td>polar bear
<tr><td>green<td>oak<td>cat
</table>
```

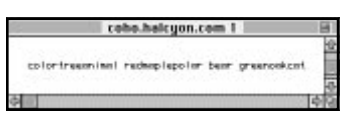


Figure 22.24 Lynx ignores the table tags and runs all the text together.

If you set up a table with strategically positioned spaces and <br> tags, it has a better chance of working out in browsers such as Lynx (see Figure 22.25). For example, the following HTML has extra spaces at the end of the first and middle cells in each row and a <br> tag at the end of each row.

```
<table>
<tr><td>color <td>tree <td>animal<br>
<tr><td>red <td>maple <td>polar bear<br>
<tr><td>green <td>oak <td>cat<br>
</table>
```

Figure 22.25 The extra spaces and <br> tags make a big difference in Lynx.

FYI
If you include extra spaces and <br> tags in a table, test the table in a variety of browsers, particularly if the table is at all complex. You might have to do some custom tweaking to make it look good.

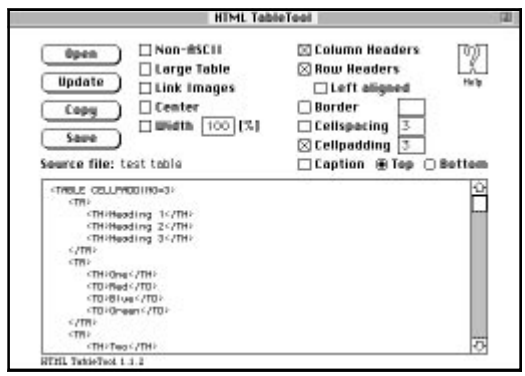
Making Tables Without Typing the HTML

If you want to make a table without the fuss and bother of typing all the tags, help is at hand, either in the form of a Web authoring program that supports tables (and many do; in particular, note the BBEdit HTML Tables extension mentioned at the end of the "BBEdit" section later in this chapter) or in the form of a utility that converts text files into HTML tables. Where possible, I've provided URLs for these utilities, and many of them are also available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/html/>.

Typically, these utilities work with tab-delimited text files; that is, files in which tabs separate the text for each cell and return separate the text for each row. You can create tab-delimited text files in most word processing programs, and—if your word processing program supports tables—chances are good that it also has a command that automatically converts a table to tab-delimited text. You can also usually export spreadsheet and database files to tab-delimited text files.

HTML TableTool

The free HTML TableTool 1.1.2, written by Bertil Holmberg, puts a HyperCard interface in the process of converting tab-delimited text to an HTML table, and also offers the useful feature of converting upper ASCII characters and reserved characters to named entities during the conversion process. TableTool presents its output in an editable field within HyperCard. You can then copy and paste the HTML from HTML TableTool to another application.



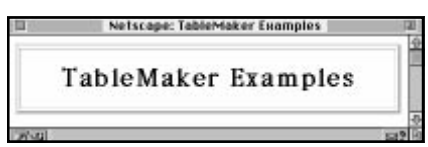
TableCloth

TableCloth 1.6, an AppleScript emailware applet by Ben Elroy, converts tab-delimited text to tables. To use the applet, you drag-and-drop a text file over the applet and then answer a few questions about how you want your exported table set up. TableCloth enables you to set attributes that go inside the `<table>` tag as well as any attributes that go inside the `<tr>` or `<td>` tags. There's no question that this will save some people a lot of time, but there's no way to set some attributes for some `<tr>` tags and other attributes for other `<tr>` tags. After you use TableCloth to make one table, the answers you gave are saved so that you can easily use them again on a different text file.

TableMaker

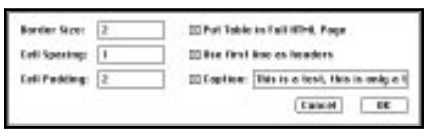
`http://www.missouri.edu/~c588349/tablemaker.html`

Sam Choukri's $5 TableMaker 1.0.1 stands out from the pack by virtue of its excellent documention, which you view in a Web browser and which includes some excellent links to table information available on the Web. TableMaker can convert a text file into a fairly sophisticated table (it can even do `rowspan` and `colspan` if you set up your text file correctly), but in exchange for that power, you must be willing to edit a text-based settings file that controls TableMaker's conversion. The settings file is easy to edit, and I recommend that you check it out, because the defaults might not be set to your liking. You can download and use TableMaker like a normal Macintosh application, or you can use TableMaker live on the Web.



Text->Table

Written by Nathan Cook, Text->Table1.0 is a free utility that converts a tab-delimited text file into an HTML-tagged table. Besides intelligently setting up `<tr>` tags for table rows and `<td>` tags for data cells, Text->Table can optionally convert the first row into `<th>`-tagged cells and insert a caption. It also enables you to specify a border width, set cell padding (pixels between the edge of a cell and the text in the cell), and set cell spacing (pixels between cells). Text->Table doesn't support other tags, though, so you might need to refine Text->Table tables by adding additional tags and attributes.



Converting Excel Worksheets into HTML Tables

Although any of the tools already mentioned would work well for Excel worksheets, they might not be the best tools for the job, and that's because there are several converters available that work specifically with Excel and do not require you to first save worksheets as text.

Internet Assistant for Microsoft Excel

`http://198.105.232.4:80/msexcel/internet/ia/default.htm`

Microsoft's free Internet Assistant for Microsoft Excel is an add-in wizard that converts worksheets into HTML. The wizard works with Excel 5.0 and later. Once installed, it places an Internet Assistant Wizard command in Excel's Tools menu, and—like XTML Add-In (reviewed next)—it can convert some formatting.

XTML Add-In

XTML 1.3.0 costs $7 and was written by Ken Sayward. It works with Excel 5.0 and later by providing a Convert to HTML Table command in Excel's Tools menu. The converter can pick up on some character formatting (like bold or centered) and apply appropriate HTML tags. It also converts upper ASCII characters and supports a reasonably sophisticated set of features. Unlike Microsoft's Internet Assistant, XTML offers features for setting up how you want a conversion to go, and then you can do the conversion with a click of the mouse. In contrast, Internet Assistant makes you walk through a series of dialog boxes for each conversion.

Tags for Forms

If you've used the Web much, you've probably seen forms. Forms enable the people behind a Web site to interact with the people who view the site. For instance, Figure 22.26 shows a simple feedback form. Other common reasons to set up forms include online ordering, signing people up to recieve a catalog or join a mailing list, enabling people to enter a password to enter a special area of the Web, and interfacing with programs that actually run over the Web.

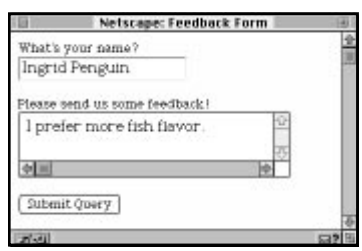


Figure 22.26 You can use a form to solicit feedback.

> **BTW**
> As you read this section, you will notice that it contains more technical details and high-end concepts than does much of the rest of this chapter. I hope this won't deter you, but if you are just getting started with HTML, you might need to get your feet wet with some of the easier aspects of Web authoring before sucessfully plunging into forms.

Although it's simple to set up the tags necessary to create a form's interface (that is, what shows on a Web page), it takes a bit of doing to properly process and store the information that people send in via a form. To work with the information, you need to incorporate the help of a CGI, a program that runs on Web servers and falls into the domain of details that server administrators worry about; Chapter 23, "Set up Your Own Server" has some information about CGIs. This section focuses on setting up form interfaces.

For starters, forms are enveloped by a pair of `<form>` tags. The start `<form>` tag has a few important attributes that tell a Web browser how the form interacts with its server. Here's an example of the HTML for the basic form shown in Figure 22.26:

```
<form method="post" action="/cgi/form.cgi">
<p>What's your name?
<br><input name="username" type="text"></p>
<p>Please send us some feedback!
<br><textarea name="feedback" cols=60 rows=2></textarea></p>
<p><input type="submit"></p>
</form>
```

Notice that in the HTML for the form in Figure 22.26, quite a number of things are happening:

- The start `<form>` tag has two important attributes, which all start `<form>` tags should have. The first attribute, `method`, indicates the method used to send form information to the CGI. The method can be either `post` or `get`. `post` enables you to send more information, is more flexible, and more commonly used. Which to use depends on your CGI. The second attribute, `action`, indicates the URL at which the CGI resides. (I've seen problems with WebSTAR and URLs that include hyphens, so if you use WebSTAR, watch out for hyphens!)

- The form uses two common form fields, an `<input>` field of the `type` text for a smallish field where users can enter their names, and a `<textarea>` field that provides a larger space for entering comments. I'll talk more about these fields in a bit, but for now, notice that each of the two fields has a `name` attribute. You can name a field anything that you like. I named these two fields "username" and "feedback," but I could have named them anything, perhaps "George" and "Louisa."

- This form has a Submit button created with an `<input>` tag having a `type` attribute of `submit`. All forms need submit buttons.

Perhaps the most mysterious thing about forms is the question of how the form that shows in a Web browser passes information to the CGI that sits on your Web server. To understand how this works, you must know about "names" and "values." Names are what you name a form element (in the HTML for Figure 22.26, I named my elements "username" and "feedback"). Values are the information that people type into each form element.

As an example of names and values at work, say someone fills out the form in Figure 22.26, and indicates that her name is Ingrid Penguin and that she would prefer more fish flavor.

When Ingrid clicks the Submit Query button, her Web browser sends the CGI the following name and value information (although the information is unlikely to be in this format):

```
Name          Value
username      Ingrid Penguin
feedback      I prefer more fish flavor.
```

The CGI can then take these names and values, shuttle them off to a database or spreadsheet, and pop up another Web page that lets Ingrid know her feedback was received.

> **BTW**
> If you use the `post` method and want to see what names and values a form is sending, make the `action` attribute point to `<http://hoohoo.ncsa.uiuc.edu/cgi-bin/post-query>`. The CGI at that URL will respond to your clicking the Submit button by sending back a Web page listing the names and values submitted. If you use the `get` method, you can access a similar CGI by setting the `action` attribute to `<http://hoohoo.ncsa.uiuc.edu/cgi-bin/query>`.

Fields for Typing Text

If you've been reading the Forms section of this chapter from its beginning, you've already seen two basic text fields: an `<input type="text">` field and a `<textarea>` field. Both of these fields work fine for normal text, but for secret text you can also set up an `<input type="password">` field.

For small amounts of text (such as names, passwords, and phone numbers), you use an `<input type="text">` field or an `<input type="password">` field. Figure 22.27 and this HTML show a number of ways that you could set up such a field:

```
<p>Name: <input type="text" name="input"></p>
<p>Name: <input type="text" name="molly" size="40"></p>
<p>Name: <input type="text" name="sally" size="40" maxlength="40"></p>
<p>Name: <input type="text" name="phoebe" size="40" maxlength="40" value="Type your
name here."></p>
<p>Name: <input type="password" name="password"></p>
```

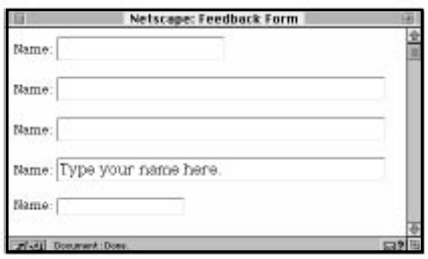


Figure 22.27 Form fields for typing short amounts of text.

When working with text-based input fields, keep the following points in mind:

- The default size for an input field is 20 characters. Change the size by including a `size` attribute in the `<input>` tag.
- To limit how many characters a user can type in a field, use the `maxlength` attribute.
- To make a text input field show with default text already filled out, use the `value` attribute. If you use a `value` attribute and a user doesn't change the default text, that default text will go to the CGI when the user clicks the Submit button. Also, if you employ a Reset button on your form, the default text will reappear if a user clicks the Reset button.
- To make characters the user types appear as bullets on-screen (but not in the value sent to the CGI), set the `type` value to `password`.

For a larger text input field, one in which a user might enter more than one row of text, use a `<textarea>` tag (see Figure 22.28). The HTML for such a tag might look like this:

```
<textarea name="anecdote" rows=4 cols=60></textarea>
```

Figure 22.28 A `<textarea>` field.

Use the `rows` and `cols` attributes to set the size of the text area in terms of rows and columns of characters. To make text appear by default in the field, enter it after the start `<textarea>` tag, like this:

```
<textarea name="anecdote" rows=4 cols=60>This is default text</textarea>
```

FYI
As you set up names and values, I recommend that you stick to regular letters and numbers and avoid punctuation. Also, do not use spaces, although you can use an underscore in place of a space.

Radio Buttons and Checkboxes

Radio buttons and checkboxes both let users quickly select options from a form (see Figure 22.29).

Figure 22.29 Radio buttons enable a user to choose one option from many; checkboxes enable users to choose as many options as they like from many.

Use radio buttons when you want a user to pick just one option from a set (in much the way that you can only pick one channel at a time from a car radio). Use checkboxes to enable users to pick as many items as they like from a set. The HTML behind Figure 22.29 looks like this:

```
<p><strong>Do you like to travel?</strong>
<br><input TYPE="radio" name="liketravel" checked>yes
<br><input TYPE="radio" name="liketravel">no </p>
<p><strong>What continents have you lived on or visited?
</strong>
<br><input TYPE="checkbox" name="Africa" value="africa">Africa
<br><input TYPE="checkbox" name="Asia" value="asia">Asia
<br><input TYPE="checkbox" name="Antarctica" value="antarctica">Antarctica</P>
```

A few points about checkboxes and radio buttons deserve specific mention:

- Use a `checked` attribute to set a radio button or checkbox on by default.
- Every radio button in a set should have the same name.

- Because every radio button in a set has the same name, you must give each radio button a unique value. That way, the CGI will be able to determine which radio button is selected.
- All checkboxes in a set can share the same name or each (or some) of them can have different names.
- If you do not specify a value for a radio button or checkbox, if that radio button or checkbox is on when the Submit button is clicked, the CGI recieves "on" as the value. If you do specify a value, and the radio button or checkbox is on, the CGI recieves the value that you specify.
- If a radio button or checkbox is off when the Submit button is clicked, the CGI receives nothing: no name and no value.

Pop-Up Menus

Pop-up menus enable users to choose an item from a list of possibilities. In this regard, they work much like radio buttons (see Figure 22.30).

Figure 22.30 Pop-up menus consume small amounts of space and enable users to choose one choice from multiple options.

Pop-up menus make more economical use of space than do radio buttons. Here's the HTML behind Figure 22.33:

```
<strong>Departure City:</strong>
<select name="city">
<option>Atlanta
<option>Boston
<option selected>Miami
<option>New York City
</select>
```

Notice that the entire menu contents are enveloped in a `<select>` tag pair. The start `<select>` tag includes a `name` attribute. The value returned by the menu will be whatever option the user selects from the menu, although you can include a `value` attribute within an `<option>` tag to set a different value. Each option begins with an `<option>` tag, and

there's no need to employ an end <option> tag. Normally, a pop-up menu will display the first option as the default selection, but you can change that by inserting a selected attribute inside the <option> tag. The HTML for Figure 22.30 shows a selected attribute inside the <option> tag for Miami.

Scrolling List of Options

A scrolling list works much like a pop-up menu, except it displays more than one option at a time (see Figure 22.31). If you need to offer quite a number of options, a scrolling list is the way to go.

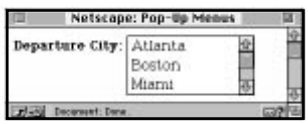


Figure 22.31 Scrolling lists enable you to offer lots of options in a small, easy-to-use area.

The HTML behind Figure 22.31 looks a lot like the HTML shown just previously for a pop-up menu, because all you must do to convert a pop-up menu into a scrolling list is to add a size attribute to the start-<select> tag. (So that the list will scroll, set the size to fewer than the number of options in the list!)

```
<strong>Departure City:</strong>
<select NAME="city" size=3>
<option>Atlanta
<option>Boston
<option>Miami
<option>New York City
<option>Philadelphia
</select>
```

You can also place a multiple attribute inside the start <select> tag, and the tag might look like this:

```
<select NAME="city" size=3 multiple>
```

multiple enables users to choose more than one option from a scrolling list. You would, of course, use a multiple attribute only for lists for which—like in a set of checkboxes—it made sense to choose more than one option. Because many users might not know what keyboard shortcut to press within their browsers in order to select multiple items from a list, think twice before using one on a form.

Hidden Fields

Yes, you can include hidden fields. You would mainly include a hidden field in order to store informaton that will be passed to the CGI, information that you didn't want the user to see or that there's no reason for the user to see. An example of this might be data a user picks up as she browses an online store and adds items to a virtual shopping cart. The HTML for such a field might look like this:

```
<input type="hidden" name="cart" value="45699X">
```


Submit and Reset Buttons

Submit buttons are extremely important on all forms, and Reset buttons can be handy, although they are not necessary. The Submit button is the one a user clicks in order to send the filled-out form to the CGI that processes the data. The Reset button (at least in theory—I've had mixed luck with it) resets the form to its defaults.

Both buttons use `<input>` tags in their HTML:

```
<input type="submit">
<input type="reset">
```

To change the wording on either button, use a `value` attribute:

```
<input type="submit" value="Send My Info">
<input type="reset" value="Reset to Form Defaults">
```

If you want to get fancy, you can use images for Submit buttons. Here's what the HTML might look like:

```
<input type="image" src="submit_button.gif">
```

Notice that the `type` value is set to `image`. The second attribute, `src`, stands for source, and it points to the location of the image that you want to substitute for the normal Submit button. The `src` attribute should make sense if you've read "Tagging for Graphics, Sounds, and Movies" earlier in this chapter.

BTW

In my research into forms, I found two excellent online resources. The first, Carlos' Forms Tutorial, located at `<http://robot0.ge.uiuc.edu/~carlosp/cs317/ft.1.html>`, steps you through the different form elements and even gives you a friendly quiz at the end. The second site at `<http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/Docs/fill-out-forms/overview.html>` talks about creating forms for the X version of Mosaic, but about 98 percent of the information applies generically and the examples let you see the names and values returned from a variety of forms.

Tag Round-Up

That's it. If you've read this entire section, you know enough about HTML tags to make many different Web pages. This section simply summarizes the tags you've learned about, and hopefully serves as a handy reference.

When learning and typing HTML, I've found it handy to have a quick reference that reminds me what the basic tags are, what version of HTML they go with, and what they do. This section provides you with such a reference and summarizes the tags presented in this chapter. It also includes a few tags that I didn't have room to cover in the chapter; once you are familiar with HTML, I hope you'll find this extra information helpful.

The first column in this section lists tags, the second lists which version of HTML the tags are associated with (2.0=HTML 2.0, 3.2=HTML 3.2, N=Netscape extensions to HTML), and the third column explains what the tag does and summarizes its attributes. In some cases, a tag was introduced with HTML 2.0, but has attributes that are only part of HTML 3.2. In those cases, I indicate which version of HTML each attribute goes with. If I don't specifically indicate attribute versions, the attributes are the same version as their tag.

> **BTW**
> This section does not attempt to tell you which browser which tags work in, although you can assume that HTML 2.0 tags will work in any browser. Browser technology is changing so quickly that there would be no point in documenting which tags work in which browsers in something as static as a printed book. A browser's documentation should refer these specs. For instance, if a new browser called MegaBrowse came out, its documentation might state, "MegaBrowse supports HTML 2.0, HTML 3.2, five additional Netscape Navigator extensions to HTML, five additional Internet Explorer extensions to HTML, and 17 new MegaBrowse extensions."

When you read this section, note that I've used special syntax within some of the attributes:

- If "value" appears in italics, replace *value* with a number.
- If "URL" appears in italics, replace *URL* with a URL of your own, perhaps a full URL or perhaps simply a relative URL.
- If you see an attribute set equal to more than one possibility, separated by slashes, that means you should use only one of the possibiliites, and you need to pick which one yourself.
- If "text" appears in italics, you must replace *text* with text of your own.

Basics

`<html></html>`	2.0	Envelopes entire HTML document.
`<head></head>`	2.0	Envelopes the head of an HTML document.
`<title></title>`	2.0	Titles an HTML document; goes inside the `head` tags.
`<body></body>`	2.0	Envelopes the body of an HTML document. Attributes:
	3.2	`alink="#value"` (sets the color of link text as its link is followed)
	3.2	`background="URL"` (indicates the location of a background tile graphic)
	3.2	`bgcolor="#value"` (sets the background color)
	3.2	`text="#value"` (sets the text color)
	3.2	`link="#value"` (sets the color of text for unfollowed links)
	3.2	`vlink="#value"` (sets the color of text for followed links)

Embedded Files (Plug-Ins)

`<embed></embed>`	N	Places an embedded file. Attributes depend on plug-in that will load the file.

Forms

`<form></form>`	2.0	Envelopes entire form. Attributes: `method="post/get"` (how the form sends data to the CGI) `action="URL"` (indicates the location of the form's CGI)
`<input></input>`	2.0	Sets up an input field. Attributes: `checked` (turns on a checkbox or radio button as the default) `maxlength="value"` (sets the maximum number of characters in a text field) `name="text"` (names the field) `type="text/password/radio/checkbox/hidden/submit/reset"` (indicates the type of field) `size="value"` (changes the default size of a text field) `src="URL"` (indicates the location of a custom image for a submit or reset button) `value="text"` (sets the default text and value)
`<option>`	2.0	Indicates the start of an option in a pop-up menu or scrolling list.

Forms, Continued		
`<select>` `</select>`	2.0	Creates a pop-up menu or list. Attributes: `multiple` (so users can choose multiple items from a scolling list) `name="text"` (names the field) `size="value"` (sizes a scrolling list)
`<textarea>` `</textarea>`	2.0	Sets up a larger area for entering text. Attributes: `cols="value"` (columns of characters in the field) `name="text"` (names the field) `rows="value"` (rows of characters in the field)

Graphics		
`<img>`	2.0	Places a graphic. Attributes:
	2.0	`alt="text"` (text that appears if graphic does not)
	2.0	`src="URL"` (indicates the location of the graphic)
	3.2	`height="value"` (indicates the height, in pixels, of the graphic)
	2.0	`ismap` (indicates that the graphic is an imagemap)
	3.2	`width="value"` (indicates the width, in pixels, of the graphic)

Horizontal Lines		
`<hr>`	2.0	Places a horizontal rule. Attributes:
	3.2	`align="left/center/right"` (horizontally aligns the rule)
	3.2	`noshade` (turns off Netscape's interpretation of the rule as a shaded bar)
	3.2	`size="value"` (sets the height, in pixels)
	3.2	`width="value"` (sets the width, in pixels)
	3.2	`width="value%"` (sets the width as a percent of the page width)

Links		
`<a></a>`	2.0	Envelopes the text (or graphic) that starts the link. Attributes: `href="#text"` (indicates the destination of a link within the current page) `href="URL"` (indicates the destination of a link going outside the current page) `name="text"` (names a link destination within a page)

Tables

`<caption></caption>`	3.2	Envelopes a table caption. Attributes: `align="top/bottom"` (places caption above or below the table)
`<table></table>`	3.2	Envelopes entire table. Attributes: `border` (puts lines around each table cell) `border="value"` (sets the line thickness, in pixels) `cellpadding="value"` (sets spacing between cell contents and edges, in pixels) `cellspacing="value"` (sets spacing between cells, in pixels) `width="value"` (sets the table width, in pixels)
`<td></td>`	3.2	Envelopes a normal cell, although `</td>` is optional. Attributes: `align="left/right/center"` (horizontally aligns cell text) `colspan="value"` (makes the cell span more than one column) `rowspan="vlaue"` (makes the cell span more than one row) `valign="top/middle/bottom"` (vertically aligns cell text)
`<th></th>`	3.2	Envelopes a cell whose text is a title, although `</th>` is optional. Attributes: `align="left/right/center"` (horizontally aligns cell text) `colspan="value"` (makes the cell span more than one column) `rowspan="value"` (makes the cell span more than one row) `valign="top/middle/bottom"` (vertically aligns cell text)
`<tr></tr>`	3.2	Envelopes a table row, although `</tr>` is optional.

Text Layout

`<address></address>`	2.0	Envelopes an address, usually a snail mail address.
`<blockquote>` `blockquote>`	2.0	Envelopes quoted material, such as an excerpt from a `</` book.
` `	2.0	Indicates the start of a new line.
`<dd>`	2.0	Indicates the start of a definition in a definition list.
`<dl></dl>`	2.0	Envelopes a definition list.
`<dt>`	2.0	Indicates the start of a term in a definition list.

Text Layout, Continued

`<h1></h1>`	2.0	Envelopes a primary heading. Attributes: `align="left/right/center"` (horizontally aligns header text)
`<h2></h2>`	2.0	Envelopes a secondary heading. Same attributes as `<h1>`.
`<h3></h3>`	2.0	Envelopes a tertiary heading. Same attributes as `<h1>`.
`<h4></h4>`	2.0	Envelopes a fourth-level heading. Same attributes as `<h1>`.
`<h5></h5>`	2.0	Envelopes a fifth-level heading. Same attributes as `<h1>`.
`<h6></h6>`	2.0	Envelopes a sixth-level heading. Same attributes as `<h1>`.
`<li>`	2.0	Indicates the start of a list item in an unordered or ordered list.
`<ol></ol>`	2.0	Envelopes an ordered (numbered) list.
`<p></p>`	2.0 3.2	Envelopes a paragraph, although `</p>` is optional. Attributes: `align="left/right/center"` (horizontally aligns each line of text in a paragraph)
`<pre></pre>`	2.0	Shows text in a monospaced font. Retains returns and spaces.
`<ul></ul>`	2.0	Envelopes an unordered (bulleted) list.

Text Styles

`<b></b>`	2.0	Applies a bold format.
`<big></big>`	3.2	Makes text bigger.
`<center></center>`	3.2	Centers enveloped text. Not preferred.
`<cite></cite>`	2.0	For citing titles of books, articles, and so on.
`<code></code>`	2.0	Indicates that text is programming code.
`<em></em>`	2.0	Emphasizes text.
`<i></i>`	2.0	Italicizes text.
`<kbd></kbd>`	2.0	Indicates that text should be typed by the reader.
`<samp></samp>`	2.0	Indicates that text is a message that will be returned by a computer.
`<small></small>`	3.2	Makes text smaller.

`<strong></strong>`	2.0	Sets text to have a strong appearance (perhaps big and bold).
`<sub></sub>`	3.2	Subscripts text.
`<sup></sup>`	3.2	Superscripts text.
`<tt></tt>`	2.0	Causes text to display in a monospaced font, such as Courier.
`<u></u>`	2.0	Underlines text.
`<var></var>`	2.0	Indicates that readers should personalize and type the text.

Testing Tags

Before you go to the trouble of uploading HTML documents to the Internet, it makes sense to open them in a Web browser to see whether the tags work correctly. You can also test documents as you create them in order to see an ongoing update of what they will look like when viewed on the Web. Most commonly, people test documents by viewing them in Web browsers, but some Web authoring programs offer tag testing features and there are even a few utilities devoted to testing HTML.

Before you can open a document in a Web browser, it must be saved as a text file. All Web authoring tools currently available automatically save files as text files, as do SimpleText, Nisus Writer, and BBEdit. Most word processors, though, do not save automatically in text format, and you must use the Save As command (in the File menu) to save in text format. Be sure to name your document with a .html extension (if your provider requires a .htm extension, note that some Mac Web browsers won't open files from your hard disk unless those files have .html extensions).

To view a document in a Web browser, first launch the browser. Then, look around in the browser for some sort of Open File command. In Internet Explorer 2.0 and Netscape Navigator 2.0, you'll find an Open File command on the File menu. If you discover a problem with the file, you can keep the Web browser open and also open the file in the program you used to create it. Once you fix the source of the problem, save the file (be sure to save as text), and then switch back to the Web browser. To see your changes in the browser, you must reload. In Netscape Navigator, use the Reload command on the View menu; in Internet Explorer choose Refresh from the View menu. (Also, note that many Web authoring programs offer quick ways to switch into different browsers for testing purposes.)

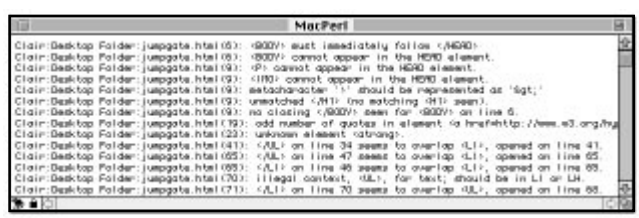
> **BTW**
> To quickly open a file in Netscape, simply drag-and-drop the file's icon over a Netscape window. This technique doesn't work in most other browsers.

The more browsers you test in, the more likely you are to identify problems, particularly problems associated with which HTML tags a particular browser supports. Depending on the importance of your pages and the size of the audience that will view them, you'll want to make more or less of an effort to test in a wide variety of browsers. If your site is likely to be viewed by people on other types of computers (such as Windows machines), and if your site is a mega-sized commercial site or an important part of your company's "intranet" (internal network), be sure to test your site in popular browsers on those other computers. You might also want to test your HTML in MacWebLint.

MacWebLint

`ftp://sparc.clearink.com/pub/mac/`
`http://www.khoral.com/staff/neilb/weblint.html`

MacWebLint 1.014 is a free Macintosh version of WebLint, a Perl script commonly used to check HTML documents. Jon Stevens from ClearInk Technology ported WebLint to the Macintosh partly to provide a resource to the Macintosh community and partly to make it easier for the folks at ClearInk to proof HTML documents. To use MacWebLint, you must also install the free MacPerl 5, which MacWebLint requires (MacPerl 5 should be available at the FTP URL above; if not, check the Info-Mac archives). To check an HTML document, simply drag-and-drop its icon over MacWebLint. MacWebLint will analyze the file and generate a problem report.



Strategies for Learning More HTML

Given that the future of Web authoring holds lots of changes and new coding possibilities, as you browse the Web, you will almost certainly see pages with formats that I don't explain in this chapter. To figure out how the authors of those pages created those formats, I recommend that you view the code behind the pages in question. This is a common practice on the Web; nobody will accuse you of being a cheat or a sneak. You can even paste the code that you find directly into your own HTML document, although as HTML becomes more complicated, outright "borrowing" from other Web authors code will likely become less kosher.

To view the code behind a page, you typically issue a View Source command, although I can't look into a crystal ball and say for certain that your Web browser will have a View Source command or where that View Source command might be located. Even so, here's how to view source in three of today's popular browsers:

- In Microsoft Internet Explorer 2.0, choose Source from the View menu.
- In Mosaic 3.0, from the File menu, choose View Source.
- In Netscape Navigator 2.0, go to the View menu and choose Document Source.

You can also learn a good deal of HTML by reading the official HTML drafts and specifications published by the World Wide Web Consortium (also called the W3C). Try `<http://www.w3.org/pub/WWW/MarkUp/>` as a good place to start looking at HTML-related documents posted by the W3C. You might also try browsing the home pages associated with different Web browsers, because they often link to specifications for the HTML they support. I maintain a list of links to some of the major HTML specifications at my HTML Jumpgate page, located at `<http://www.tidbits.com/tonya/jumpgate.html>`.

Final sources of HTML information include other Web authors, other books, HTML-related mailings lists, and the Web itself. Search any search engine on "HTML" and you're likely to find a large list of tutorials and references. My HTML Jumpgate page (see the URL in the previous paragraph) has a few links to a few of what I consider the best tutorials.

Making Graphics for the Web

Although the Web stands out as a much better way to share graphics online than most other Internet services, the Web is by no means a perfect medium for graphics. In this section, we take a look at a number of the issues surrounding Web graphic formats and at a number of the programs available for converting graphics into Web-ready format.

GIF vs. JPEG

Today's crop of Web browsers limit you to viewing two graphic formats: GIF and JPEG. Both formats use internal compression routines that make the graphics smaller, thus decreasing download times. Generally speaking, use GIF for line art, navigational icons, and illustrations in which colors don't much blend into one another. Use JPEG for scans of photographs or for images with color blending and gradual color changes. Keep reading to learn more about both formats and the pros and cons involved in using each one.

What's a GIF?

GIF stands for Graphics Interchange Format. GIF graphics have a number of important advantages when it comes to the Web, including the ability to make a color transparent, interlacing, and even animations.

The latest version of the GIF specification (version 89a) supports transparent mode, a nifty option that enables you to make one color in a graphic transparent. GIFs are shaped like rectangles, but the transparent option enables you to make what looks like an irregularly shaped object, such as a penguin (see Figure 22.32).

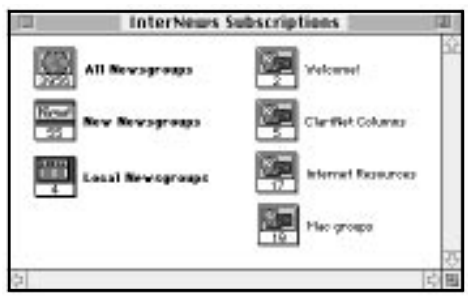


Figure 22.32 Ingrid with a transparent background versus Ingrid with a dark background.

GIFs also can be interlaced, meaning the image is saved in alternating horizontal bands. If you looked at the first half of an interlaced GIF, you would see a low-resolution, striped image, with blank horizontal stripes representing the second half of the image. Most Web browsers display interlaced GIFs as they read them—first they display every eighth line, then every fourth line, then every second line, and then every line. This makes it so people waiting for the image to load can quickly make out what the final image will look like.

> **BTW**
> GIF89a also enables you to store more than one image within a single GIF file such that when the file is displayed, the images show in flip-book fashion, like a movie. Later in this chapter, in the "Web-Ready Movies: QuickTime, GIF Animations, and More" section, I talk more about these animated GIFs.

GIF images are limited to a maximum of 256 colors per image (also known as "8-bit" images). Because of the way GIF compression operates, GIFs work best for images that have abrupt changes in color, such as line art or flat color illustrations. The GIF compression scheme records images in terms of horixontal bands of pixels. Every time a pixel within a horizontal band changes color, that color change is recorded and increases the file size.

To see an example of how a GIF's pattern relates to its file size, check out Figure 22.33, which shows four identically sized GIF images, created under the same circumstances and saved with just two colors present: black and white. The top image in Figure 22.33 is solid black, and it takes up 130 bytes of disk space. Adding a white horizontal line doesn't change the image size much; the second image comes in at 155 bytes. Because the GIF format records horizontal changes in color, the third image grows to 208 bytes in order to record color changes made each time a vertical white line intersects a horizontal band. Finally, the speckled bottom image consumes the most space at 815 bytes.

Figure 22.33 Four identically sized and created GIF images take up different amounts of disk space.

What's a JPEG?

If you want to save an image that has lots of gradual color changes, GIF is probably not the way to go; similarly if you simply cannot take your image down to 256 colors, GIF isn't for you. Instead, you would save your image with JPEG compression. (For a comparison of GIF and JPEG, see Table 22.5.)

Table 22.5 GIF vs. JPEG

Consideration	GIF	JPEG
Lossy compression	no	yes
Transparency option	yes	no
Interlacing option	yes	no
Maximum number of colors	256	16,777,216
Good for line art	yes	no
Good for flat color illustrations	yes	no
Good for digitized photographs	no	yes
Good for graphics with color gradations	no	yes
Likely to display in older browsers	yes	no

JPEG stands for Joint Photographic Experts Group. It was designed for compressing digitized photographs, and works especially well for photos of natural scenes, such as sunsets. JPEG is a *lossy* format, meaning that when it does its compression magic, it loses some of the detail in the graphic.

JPEG was designed to lose details that the human eye won't notice, particularly details that wouldn't be noticed from an image with gradual changes in shading and color. Sometimes the loss of detail means the graphic looks fuzzy; other times you can't tell at all. JPEG is most likely to lose too much detail with images that have sudden transitions from one color to another, so JPEG tends to be a poor format for graphics containing text, line drawings, and navigational icons.

> **BTW**
> A new form of JPEG, called a progressive JPEG, is becoming popular. The problem with normal JPEGs is that they display in a sequential manner from top to bottom, so when a browser displays a slow-loading JPEG, you can't tell what the image looks like until it loads almost all the way. In contrast, a progressive JPEG displays much like an interlaced GIF. It quickly displays as a rough image, then the finer details fill in slowly. Many current browsers do fine with progressive JPEGs; unfortunately, not all browsers can even display progressive JPEGs.

Tips and Tricks for Saving Images as GIFs and JPEGs

Although this book cannot hope to make you a professional Web graphic designer, it can offer a few tips that you might find handy:

- When saving a GIF or JPEG from a graphics program such as Photoshop, *always* save a copy of the file. That way, you will still have the original in its original format.
- Save GIF images with as few colors as possible. If a 6-bit image looks just as good as the 8-bit image, use the 6-bit image. The fewer the colors, the smaller the image.
- When saving a JPEG, try a few different compression levels in order to find the highest possible level that still gives you reasonable image quality. Always save from your original, not from a copy that has already undergone compression.
- Most advice that I've seen recommends that Web-ready graphics be 485 pixels wide at most. A 485-pixel-wide graphic leaves a little breathing room on each side of the 505-pixel-wide default Netscape window.
- Because Web graphics will be viewed on-screen, there's little point in putting up high-resolution graphics. Instead, use 72 dpi (dots per inch).

Professional designers, plus people extra concerned about the quality of graphics on their sites, should also keep the following points in mind (if you aren't a professional graphic designer, don't worry if you don't understand these points):

- Pay attention to what color palette gets included with an image. Include a color that's not available on a user's computer (or browser), and that color will be created using dithering (colors that are available will be combined on-screen approximate the missing color, but this tends to work poorly for on-screen graphics). Dithering can be particularly problematic with 24-bit JPEGs, given that most Web users are limited to viewing 256 colors. Current advice suggests that you should use the Netscape Browser CLUT (color look-up table), which you can find through Lynda Weinman's Web site about Web authoring. The specific URL is <http://www.lynda.com/hex.html>.

- When you create a transparency from a graphic in which an image has been anti-aliased so its edges blend nicely into the background, watch out for unsitely halo effects that often occur when the background turns transparent. For best results, remove the anti-aliasing or create the image with aliased edges.

Finding Web-Ready Graphics

If creating graphics yourself isn't your cup of tea, don't even worry about finding a Web graphics tea kettle until you check out some of the free graphic collections on the Internet. Some commercial Web authoring packages, such as PageMill 1.0, come with small Web-ready image collections, and a few commercial Web-ready "clip-art"-style packages have also recently shown up.

The Web has hundreds of different sites that people have put up for the purpose of sharing bullets, horizontal rules, navigational icons, backgrounds, and the like. Some sites offer images freely for any use; others ask that you use the graphics only for personal projects. To enter the world of free graphics collections, check out these three sites:

- A page that I've found especially handy is Randy's Icon and Image Bazaar, located at <http://www.infi.net/~rdralph/icons/>. The site has plenty of graphics in its own right, but if you click the Other Icon Collections link, you'll find an extensive directory to similar Web sites, complete with short reviews that help you decide which links to follow.

- To find rules to use in place of the horizontal lines created by the <hr> (horizontal rule) tag, visit the Web Rulers page, created by David Bouman, at <http://pmwww.cs.vu.nl/home/dsbouma/rulers/>.

- The Backgrounds Archive at <http://the-tech.mit.edu/KPT/bgs.html> features quite a number of absolutely gorgeous background images.

To use images on these sites, download the images, place them on your Web site, and make a relative link within the <img> tag. (I explained the <img> earlier in this chapter, in "Tagging for Graphics, Sounds, and Movies.") Unless you have permission, it's considered

extremely rude to link to the copies of images that are located on someone else's Web page. The following section lists a few commercial sources of Web-ready graphics. If I don't list a URL for a product, look for it at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/html/>`.

3D Web Workshop

`http://www.specular.com/`

3D Web Workshop, a $399 CD-ROM from Specular, has quite a lot to offer. It includes Specular's LogoMotion and TextureScape, plus a large collection of Web-ready GIFs, called WebHands. It also comes with Adobe's PageMill (see the "PageMill" section later in this chapter for more info on PageMill). If you own any portion of the product, you can purchase the entire thing at a discount. On a basic level, you use 3D Web Workshop to browse a collection of GIF-based clip art. You can use that art in any HTML document or you can just drag it into a PageMill document. You can also use TextureScape to edit the graphics and create a wide array of dramatic effects (you can also create graphics from scratch). LogoMotion comes into play for creating 3D text and animations.

WebStationery

WebStationery, an attractive and diverse array of free tiling backgrounds for Web pages, currently exists in four different volumes. Each volume offers five or ten tiles and comes with a Web page that you can use to quickly view what the tiles look like in a Web browser. I'd like to see the creator of WebStationery, Christopher Hunt, release a compendium version that includes all the backgrounds in one set, but I certainly cannot argue with the price.

WebTools

`http://www.imagine-net.com/artbeatswebtools/frdoor.html`

Artbeats Software and stat™ media have released the $89 WebTools 1.2, a CD-ROM of Web-ready graphics, including images for buttons, horizontal rules, background patterns, and miscellaneous icons. The miscellaneous icons tend to be somewhat

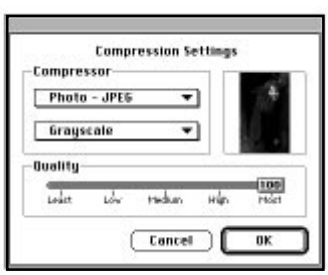
cartoonish, whereas the buttons, rules, and patterns tend toward the organic with wood and rock patterns. A number of the images can be animated and can have one of the many sounds that come with WebTools added to them. You operate WebTools from a Turbo Browser view that helps you quickly view and install images. WebTools has somewhat high-end hardware requirements, so check them before you purchase the product. Also, although the WebTools directions say it won't work with RAM Doubler, I've experienced no problems personally. A few free WebTools samples are available on the ArtBeats Web site.

Graphics Software Reviews

Lots of commercial graphics programs can save in GIF or JPEG format, and I mention a few of them here. If you don't own or can't afford a more expensive commercial program, the good news is that a variety of noncommercial programs are available; two particularly popular and full-featured such options are clip2gif and GraphicConverter. Other graphics tools mentioned in this section range from simple tools that perform only one function, such as Transparency, to elaborate programs that perform a panoply of tasks, such as DeBabelizer and Photoshop. The noncommercial software mentioned should be available on the Info-Mac archives and at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/util/>`. If you cannot find a program in one of these locations, check the URL provided in the program's review.

All JPEG

All JPEG 1.0, written by Paul C.H. Ho, is a simple freeware application that converts PICTs to JPEGs. If you press Option while dragging a file over the All JPEG icon, you'll be presented with a dialog in which you can customize the level of compression.



clip2gif

`http://iawww.epfl.ch/Staff/Yves.Piguet/clip2gif-home/`

Written by Yves Piguet, clip2gif 0.7.2 is a free, clever utility that converts between a variety of graphics formats, including the all important conversion of PICTs to GIFs or JPEGs. It can convert single images, batches of images, and an image on the Clipboard. It can make a GIF interlaced or give it a transparent background (to pick a specific color in your image to turn transparent, choose GIF from the Options menu and choose Other from the Transparent Background hiearchical menu. Then press Shift and click a pixel having the color that you want to turn transparent). Clip2gif is simple, easy, and elegant; I recommend it highly.

DeBabelizer

`http://www.equilibrium.com/ProdInfo.html`

The $399 DeBabelizer, from Equilibrium, has a real-life, almost gritty feel, and you use it to simplify real-life tasks, like converting batches of images to Web-ready formats. Designed primarily for the 8-bit world of multimedia and on-screen presentations, the program can convert among a vast array of formats, including GIF, JPEG, progressive JPEG, a number of Macintosh and DOS/Windows formats, and formats from the Apple II, Atari, Sun, and more. DeBabelizer has many features, and is perhaps best known for its capability to help out with palettes and scaling. To make DeBabelizer process a batch of images, you create a script of processing actions that DeBabelizer should run on the batch, although the current version, 1.65, comes with a few premade scripts for preparing Web-ready graphics. Although I recommend DeBabelizer highly to people who need a sophisticated, flexible, and powerful graphics conversion tool, I do not recommend it to novice computer users. Also, if you have simple batch conversion needs, check out the considerably cheaper, noncommercial clip2gif and GraphicConverter.

GIFConverter

`http://www.kamit.com/gifconverter.html`

GIFConverter 2.3.7, a $30–$40 shareware program from Kevin Mitchell, enables you to open a variety of file formats, including GIF, PICT, TIFF, and JPEG. GIFConverter has a number of handy editing options, and enables you to save in GIF or JPEG format. When you save in GIF format, in the Save As dialog box click the Options button to indicate whether you want the graphic interlaced. Kevin is currently working on a major revision of GIF Converter that should support progressive JPEGs and animated GIFs.

GraphicConverter

GraphicConverter 2.4 stands out as a particularly useful shareware utility for creating Web-ready graphics. It offers the most features of any noncommercial program, and it can open PICTs, TIFFs, JPEGs, GIFs, and a whole menagerie of less common formats. GraphicConverter can also create animated GIFs, which I discuss later in this chapter. Written by Thorsten Lemke, GraphicConverter costs $30 to $35, depending on where you live.

Interactive Graphics Renderer

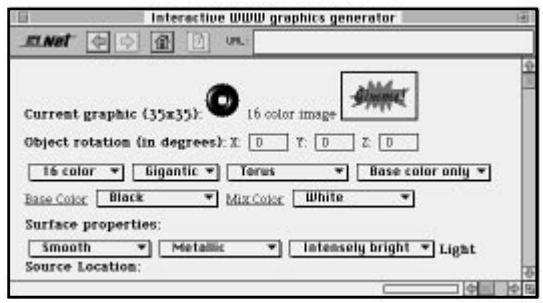
`http://www.eece.ksu.edu/IGR/intro.html`

Interactive Graphics Renderer is a wonderful commentware Web page and GIF generator for personal use from Patrick J. Hennessey at the Kansas State University of Electrical Engineering. Interactive Graphics Renderer helps you make your own GIF-format horizontal rules and bullets

continues

Interactive Graphics Renderer, *continued*

in a variety of rendered colors and shapes. To download your GIF, simply click the Gimme! button. You might need to configure your browser to work with the MIME type used by the Renderer; I set mine to StuffIt Expander and it worked fine.



Photoshop

`http://www.adobe.com/Apps/Photoshop/`
`http://www.adobe.com/Tips/GIFJPGchart/gifjpgcon.html`

Adobe Photoshop lists for $895 (though its street price is often somewhat less), and people lucky enough to have access to Photoshop can use it for a wide variety of graphical manipulations and transformations. Photoshop can also save images in GIF or JPEG format, though to save in GIF format, you must use a plug-in.

Photoshop 3.0.4 comes with a CompuServe GIF plug-in accessed via the Save As dialog, but you'll be better off using Adobe's GIF89a plug-in, which ships with Photoshop 3.0.5, but also works with 3.0.4 (and is free to 3.0.4 users). If you have Photoshop 3.0.5, look for extensive directions on using the GIF89a plug-in on the 3.0.5 CD-ROM, in a file called GIF89A.PDF. Once you've installed the GIF89a plug-in, you can access it by choosing Export from Photoshop's File menu.

PhotoGIF and ProJPEG

`http://www.aris.com/boxtop/`

Many Photoshop users swear by BoxTop Software's PhotoGIF, a plug-in that helps you save files from Photoshop as GIF images, complete with support for creating transparencies and interlacing. You can download a copy from BoxTop's Web site;

the registration fee is $25. BoxTop software also makes a ProJPEG, a $25 Photoshop plug-in for saving progressive and normal JPEGs.

Progressify

Sam Bushell's kindwordware Progressify 1.0, offers a straightforward way to convert JPEGs to and from progressive JPEG format. To operate the program, simply drag-and-drop a JPEG file icon over the Progressify icon. Progressify comes with a nice set of directions that explains why progressive JPEGs are cool and gives a few visual examples.

Thumbnailer

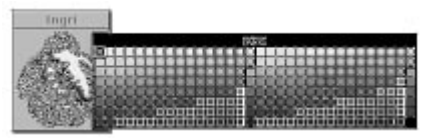
`http://siolibrary.ucsd.edu/preston/scripting/applescript.html`

Created by Preston Holmes, Thumbnailer 1.5 is "drop-me-a-line-ware." Thumbnailer is highly customizable and has an impressive number of useful options. The program relies on AppleScript and works with clip2gif. Basically, you feed Thumbnailer a group of images and it creates a Web page that shows each image as a scaled-down GIF. Thumbnailer also links each GIF to another Web page that contains a JPEG of the same image. You end up with a collection of Web pages that would be handy for an online art or photography exhibit in which you display many small GIFs as "thumbnails" on one page, and have it set up so users can click any thumbnail in order to see a larger, more detailed JPEG of the same image. If Thumbnailer complains about low memory, be sure to increase clip2gif's memory allocation. Preston has also released Thumbnailer 1.6, but due to a number of bugs, he has recalled 1.6 and is currently working on 1.7.

Transparency

`http://www.med.cornell.edu/~giles/projects.html`

Transparency 1.0, freeware from Aaron Giles, enables you to make one of the colors in a GIF transparent. Transparency doesn't try to do anything else, and it's easy to use—just drag the icon of a GIF onto the Transparency icon. Transparency launches and displays the image. Click and hold on the background color and watch as Transparency pops up a palette showing the colors in the image with the color you selected. Release the mouse button, and Transparency makes the selected color transparent.



Making Sounds and Movies for the Web

If you carefully read the entire section of this chapter that talked about creating HTML tags, you no doubt found that the section explained the mechanics of creating the HTML for linking to and including sounds and movies on your page. This section ignores the HTML aspects of sounds and movies and briefly focuses on tools and techniques for making Web-ready sounds and movies.

Web-Ready Sounds

As you might expect, before you can successfully link to a sound file, you must save that file in an appropriate format and name it with an appropriate extension. Perhaps the most common sound format is Sun au, a somewhat scratchy, 8-bit format, which uses an .au extension. Sun au is also commonly called Ulaw, Mulaw, or μ-law. You can also use the less-common MPEG audio, which sounds nicer and uses a .mp2 extension.

Table 22.6 lists utilities that will help you record and convert sounds into Web-ready format. I've tried to find URLs for each utility, and many of them should also be available at `<ftp://ftp.tidbits.com/pub/tidbits/tisk/util/>`.

> **BTW**
> Of course, you can also include sounds on your page via a plug-in; Chapter 16, "All About the World Wide Web," has additional information about such plug-in formats.

Table 22.6 Utilites for Making Web-Ready Sounds

Name	URL	Comments
ConvertMachine 1.0.1	`http://online.anu.edu.au/RSISE/teleng/Software/ConvertMachine/welcome.html`	$10; offers a clean interface to a wide array of sound conversion options, including Sun au.
SoundApp 2.0.2	`http://www-cs-students.stanford.edu/~franke/SoundApp/`	Free; converts sounds into Sun au (use the NexT format). Offers features that control sound playback.
SoundHack 0.868	`http://shoko.calarts.edu/~tre`	$30 or send music/art that you have created; converts sounds into a variety of formats, including Sun au. Has extensive sound manipulation cababiliites.
Ulaw 1.4	n/a	Free; a somewhat elderly program. Its programmer is currently focusing his attention on ConvertMachine.

Web-Ready Movies: QuickTime, GIF Animations, and More

This section briefly discusses the bare basics of creating movies for use on the Web. Traditionally, movies went up on the Web in QuickTime or (slightly less commonly) MPEG format, and I expect that tradition will continue, although a number of other formats are now available. Until recently, you needed a helper application to view a movie on the Web, although now you can also view movies in plug-ins.

If you put a Macintosh QuickTime movie up the Web, you must first *flatten* it; that is, run it through a program that moves all the data into the data fork (all Mac files have a data fork and a resource fork). (Use flattenMooV, mentioned at the end of this section, to flatten movies.) QuickTime files need a .mov extension; MPEGs an .mpg or .mpeg extension.

> **BTW**
> To find out more about MPEGs, take a look at the MPEG FAQ, located at <`http://www.powerweb.de/mpeg/mpegfaq/`>.

QuickTime is a widely accepted movie format, but QuickTime files tend to be large. Another format that's currently in vogue is the animated GIF, which works much like flipbook movies. Animated GIFs consist of a series of images displayed in sequence on-screen in order to create an animation. You can adjust a few aspects of the animation, so—in fact—they are slightly more sophisticated than basic flipbooks. Animated GIFs tend to be small in terms of the hard disk space they consume, easy to make, and easy to put on a Web page.

Animated GIFs don't look animated in all browsers, but when they do, they usually loop continually. On my Macintosh, they cause my hard disk to access endlessly, making me click past pages offering animated GIFs fairly quickly unless the GIF is the main point of looking at the page. Still, I can't think of a less resource-intensive way to place animations on the Web.

> **BTW**
> To find out everything you ever wanted to know about animated GIFs, I suggest you check out the Royal Frazier's excellent GIF Animation on the WWW home page, located at <http://members.aol.com/royalef/gifanim.htm>.

Animated GIFs sit on the low end of the movie spectrum. They are cheap and easy not only to create, but also to view in a browser. Those of you looking at more specialized situations might want to check out some of the higher-end movie formats that can be viewed over the Web via plug-ins. For instance, Shockwave movies come from animations created in Macromedia's Director, FreeHand, or Authorware, and make heavy demands on client machines attempting to view them, both in terms of hard disk space and RAM. Other animation formats that show promise include FutureWave's CelAnimator/FutureSplash and Totally Hip Software's WebPainter/Sizzler.

Table 22.7 mentions a sampling of programs that you might find helpful in creating Web-ready movies. If a listing doesn't include a URL, look for the software at <ftp://ftp.tidbits.com/pub/tidbits/tisk/html/>.

Table 22.7 Utilities for Creating Web-Ready Movies

Name	URL	Comments
CelAnimator 1.0	http://www.futurewave.com/	$250; creates complex animations. Exports in FutureSplash, QuickTime, or animated GIF. (See the section about plug-ins in Chapter 16 to learn more about FutureSplash.)
FlattenMooV		Free; flattens QuickTime movies so they will work properly when accessed via the Web.

Name	URL	Comments
GifBuilder 0.3.2	`http://iawww.epfl.ch/Staff/Yves.Piguet/clip2gif-home/GifBuilder.html`	Free; excellent tool for creating animated GIFs.
Gif.gIf.giF 1.0	`http://www.cafe.net/peda/ggg`	$28; a tool for making GIF animations of actions taking place on the Mac screen.
Shockwave	`http://www-1.macromedia.com/index_in.html`	A RAM-hungry technology for placing files from various Macromedia programs (such as Director) on the Web to be viewed within a plug-in. (See the plug-ins section in Chapter 16 for more details.)
Sparkle 2.4.5	`ftp://ftp.tidbits.com/pub/tidbits/tisk/util/`	Free; converts QuickTime movies into MPEG movies.
WebPainter 1.0	`http://www.totallyhip.com/`	$49; offers painting tools for creating animations. Exports in Sizzler, QuickTime, and animated GIF formats. (See the section about plug-ins in Chapter 16 for more details about Sizzler.)

Web Authoring Software Reviews

Now that we've covered all sorts of details about how to make HTML documents, as well as taken a look at how to prepare Web-ready graphics, sounds, and movies, we reach the part of the chapter that discusses software for creating actual Web pages. In this section, I'll talk in-depth at what I consider the two most popular Web authoring programs: BBEdit and PageMill. BBEdit offers extensive features for working with HTML tags; PageMill takes a more visual approach and offers a WYSIWYG (What You See Is What You Get) environment. I'll also offer short takes on a wide variety of other software.

Features you might want in a Web authoring tool range widely; the list below is fairly complete; you might have far more modest needs.

- The capability to import files from other programs, such as word processors or desktop publishing programs.
- The capability to easily apply a wide variety of tags.
- Features that make it easy to visually experiment with page layout.
- A way to quickly set up forms and tables, which often require a WYSIWYG view in order to visualize properly.

- Graphic editing and imagemap-creation features.
- Text editing options such as spelling checkers and search-and-replace features.
- A way to easily preview documents in a variety of Web browsers.
- The capability to create an entire site on your hard disk, complete with correct relative links from page to page and to graphics, sounds, and movies.
- Automation capabilities that make it easy to apply global changes to an entire Web page or site.

BBEdit

Created by Bare Bones Software, BBEdit is a text editor, a program designed for manipulating text. Before the Web became popular, text editors had their place as tools for programmers and for people who needed to make extensive, automated changes to large text files, such as files exported from databases. Because text editors are so adept at manipulating (or "massaging") text, Web authors often use them as tools for working with HTML.

BBEdit turned out to be especially good for HTML, partly because it can accept extensions. BBEdit extensions don't go in the Extensions folder in the System Folder; instead they go in the BBEdit Extensions folder and they extend what BBEdit can do. A number of programmers have written HTML-related BBEdit extensions, and these extensions have increased BBEdit's popularity enormously. BBEdit 4.0 ships with version 2.0.1 of Lindsay Davies' BBEdit HTML Tools, a handy set of extensions.

Upon seeing the popularity of BBEdit among Web authors, Bare Bones Software started adding HTML-related features to the program. Perhaps the three most noteworthy of those features are the capability to wrap text (as normal word processors do), spell checking that doesn't flag HTML tags, and colored HTML tags.

BBEdit 4.0 shipped in the spring of 1996, just in the nick of time for me to talk about it here. BBEdit 4.0 lists for $199, but you can also use the free BBEdit Lite (currently at version 3.5.1), which is quite capable, though not as fully featured as BBEdit.

For Web authors, the basic BBEdit interface consists of the main document window and the HTML Tools palette (see Figure 22.34). The top of the main document window has a toolbar of sorts, which can be toggled on and off by clicking the toggle symbol at its far right. Similarly, you can shrink the HTML Tools palette by clicking its toggle symbol.

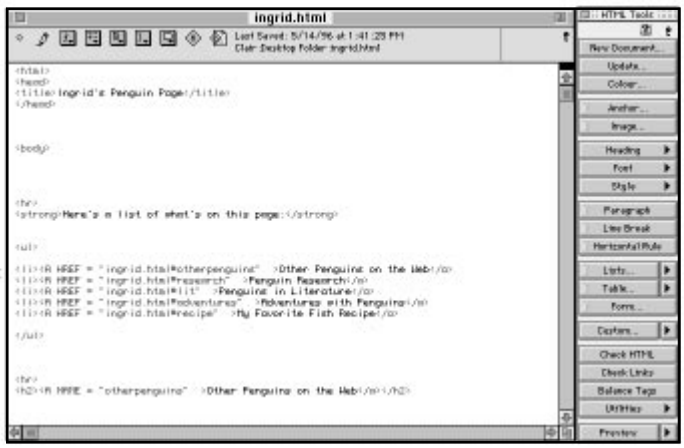


Figure 22.34 Basic BBEdit interface.

Configuring BBEdit for Web Authoring

BBEdit works with Internet Config, and if you have Internet Config installed, you'll see a picture of a globe on your BBEdit menu bar. Clicking the globe displays BBEdit's Internet menu, and you use the menu to quickly open Internet applications. BBEdit figures out which application to open by looking at what you've set in Internet Config's Helpers section. (To learn more about Internet Config, see Chapter 18, "Utilities and Miscellany.")

To use the Resolve URL command, you first select a URL that's typed into a BBEdit document. If you then choose Resolve URL from the Internet menu, BBEdit opens your preferred Web browser and goes to the selected URL. The View HTML File command also opens your preferred Web browser, but instead of going to some external URL, the browser displays your current HTML document. (To quickly see your document in a nonpreferred browser, use the Preview button on the HTML Tools palette.)

BBEdit has a few preferences of particular interest to Web authors, and you access them by choosing Preferences from the Edit menu. The Preferences dialog box displays a long list of options in a column on its left side (see Figure 22.35). The first item, Browser, doesn't refer to a Web browser, but to a special file browser provided by BBEdit as a quick way to navigate through your hard disk's files and folders. You needn't much worry about that for now. However, you should definitely check out the HTML and Text Colors preferences.

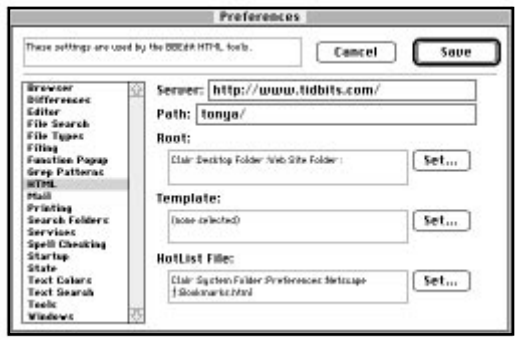


Figure 22.35 BBEdit Preferences.

The HTML section enables you to set a number of helpful items. As you can see in Figure 22.38, I've entered the URL to my Web directory in the Server and Path fields. To help BBEdit set up relative links correctly, I've indicated my "root" folder, the folder that will hold my Web pages and any related files, such as graphics. (If you indicate a root folder—and I recommend that you do—place your graphics in the folder *before* you link to them. The root folder should *exactly* mirror the way you'll arrange the files on your Web server). I didn't set up the Template option (it's a bit involved to use templates seriously in BBEdit, but the directions suggest that you might get started with templates by choosing the HTML Templates Folder that comes with BBEdit). I have, however, pointed BBEdit at my Netscape hotlist. You can fill in the Root, Template, and Hotlist options either by clicking their respective Set buttons or by simply dragging files or folders from the Finder into the correct rectangles.

Use the Text Colors section of the Preferences dialog to set the colors BBEdit uses to display HTML tags. I encourage you to explore other BBEdit preferences, although we've covered the preferences that directly apply to basic Web authoring. Be sure to use the Balloon Help if you need help.

Creating HTML in BBEdit

Most of the time when you create HTML documents in BBEdit, you use the HTML Tools palette. Some of the buttons simply insert HTML tags (for instance, you might select a paragraph of text and then click the Paragraph button in order to enclose the paragraph in a pair of `<p>` tags). Other buttons lead to dialogs of options.

The HTML Tools palette is perhaps the most drag-and-drop-aware palette I've ever seen. Many of the buttons can be dragged onto BBEdit documents. (Drag-and-drop the Table button over your document, and BBEdit inserts a table at the spot where your drop the button.) Other buttons accept files dragged onto them. (Drag-and-drop a graphics file icon over the Image button and BBEdit creates an `<img>` tag for that file.)

BBEdit comes with documentation for the HTML Tools palette, so I'm not going to repeat it here. I will point out, though, that if you are more a keyboard shortcut type of person than a button type of person, you can assign keyboard shortcuts to the buttons. To do so, choose Set Extension Keys from the Extensions menu. In the resulting dialog, select the item to which you want to assign a keyboard shortcut (I chose Ordered, as in "ordered list" in Figure 22.36). With the item selected, press your keyboard shortcut. In Figure 22.36, I actually pressed Control-O for my Ordered shortcut. BBEdit automatically also included a Command key in my shortcut. As you would expect, you can assign as many shortcuts as you like within the dialog, and you should click the Save button when you finish.

Figure 22.36 The Set Extension Keys dialog box.

> **BTW**
> Some of the HTML Tools dialogs (such as the Colour dialog) also have keyboard shortcuts. To see them, open a dialog and then press the Command key.

Advanced Features

Looking for advanced features? BBEdit has them in droves. BBEdit's search-and-replace function puts many word processors to shame. You can search multiple files at once, and you can search with "pattern matching." Pattern matching is a search technique in which you can seek out patterns like "find every instance of a `<td>` tag, followed by the word Macintosh and then some other characters, and keep looking until you encounter a `<`." Unfortunately, you must set up such search-and-replace operations using not English, but GREP (Global Regular Expression Parser), a system for expressing complicated search-and-replace requests. If you need the power of GREP, you'll find it in BBEdit, and you'll also find that BBEdit's documentation is among the best available for explaining the intricacies of GREP.

BBEdit also offers "include" files, which can automate some aspects of keeping a site up-to-date. Include files work sort of like publish and subscribe. For instance, say you have a certain footer that you want on the bottom of a series of Web pages. Instead of coding the HTML for the footer in each page, you could set up an include file that contained the

footer. Then, in each document, you'd simply add an include statement where the footer should go. At a later date, if you want to change all the footers, you simply change the include file and issue an Update command.

If you really want to delve into advanced features, check out what BBEdit can do when paired with UserLand Software's Frontier 4.0. Such a pairing helps automate some aspects of creating and uploading HTML documents. Frontier comes on the BBEdit CD-ROM, and you can find out more at <http://www.scripting.com/apps/bbedit.html>.

Evaluation and Details

Through its quick evolution into an increasingly useful Web authoring tool, BBEdit has become a leading choice for working with HTML. If you are just getting started with HTML, and especially if you are somewhat new to computers (or easily flummoxed by them), BBEdit might be a bit much for you, and if that's the case, check out the reviews later in this section that cover some excellent alternatives. If you'd like to learn more about BBEdit (or BBEdit Lite), visit Bare Bones Software's Web page at <http://www.barebones.com/>. This section concludes with a brief tour of some of the HTML-related extensions that you can plug into BBEdit.

BBEdit HTML Extensions

http://www.uji.es/bbedit-html-extensions.html

Release 14 of Carlos Bellver's free BBEdit HTML Extensions works with BBEdit 3.5 or BBEdit Lite 3.5 or later, and simplifies the insertion of a variety of HTML tags. Interestingly, these extensions come in two versions: uncppercase and lowercase. If you want your tags to appear in uppercase, you install the uppercase version; to make your tags appear in lowercase, you install the lowercase version. Release 14 works from the Extensions menu or (if you have one in your version of BBEdit) the Internet menu (it looks like a globe in the menu bar). If you like keyboard shortcuts, you'll need to set them up on your own.

BBEdit HTML Tools

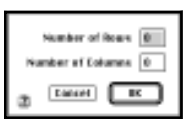
http://www.york.ac.uk/~ld11/BBEditTools.html

BBEdit HTML Tools currently come in two major releases. Version 2.0.1 works with BBEdit 3.5.2 or later, and it also comes on the CD-ROM with the commercial version of BBEdit. If you use BBEdit Lite, you need to use version 1.3 of BBEdit HTML Tools,

though Lindsay is working on a "2.0 Lite" version. BBEdit HTML Tools are freeware from Lindsay Davies. Version 2.0.1 has a drag-and-drop-aware palette; version 1.3 works from BBEdit's Extensions menu or via keyboard shortcuts and supports a variety of basic tags.

BBEdit HTML Tables

Although BBEdit HTML Tools does help with making tables, Stephen Marshall's $5 BBEdit HTML Tables is a more powerful tool, and if you do make tables in BBEdit, I recommend that you give it a try. Although the extension doesn't add a visual way to set up tables, it does facilitate typing table tags and it can also convert existing delimited text to tables.



PageMill

BBEdit is an evolutionary product. It evolved from a text editor into an extremely capable HTML tool. In contrast, Adobe's PageMill 1.0 is a revolutionary program, and it was the first commercial Web authoring tool to offer a WYSIWYG interface. You type formatted text and add graphics to a PageMill 1.0 document much as you do to a word processing document, and you never see a single HTML tag. You can even drag text and graphics around on-screen in order to experiment with different layouts.

One of PageMill's strengths is its handling of graphics. PageMill can import GIFs and JPEG and it can convert PICTs to GIFs. It can change a GIF's background color to transparent or add interlacing. PageMill also offers a nice set of tools for making imagemaps.

As I write this chapter, PageMill 2.0 is not yet available to beta testers, but Adobe has announced its feature set, and PageMill 2.0 will differ from the 1.0 version in a number of important ways. It will create better HTML (an important feature for a program that claims its users don't need to know HTML), it will provide an optional text window where you can edit the HTML, and it will support a much larger variety of HTML tags.

Because PageMill 2.0 will likely be available by the time this book reaches you, I'm going to look at PageMill only briefly, since much will be different in the 2.0 release.

BTW
PageMill 1.0 is a subset of features included in Adobe's SiteMill 1.0. SiteMill works just like PageMill except that it also includes some site management features. I briefly review SiteMill later in this chapter.

Getting Started with PageMill

The basic PageMill interface consists of two modes, one for editing (working on a document) and another for previewing (testing relative links, testing a form, and so on). To switch modes, click the button at the upper right of the document window. In Edit mode, the button shows an image of a sheet of paper with a pen; in Preview mode, the button shows an image of a globe. In Figure 22.37, PageMill is in Edit mode.

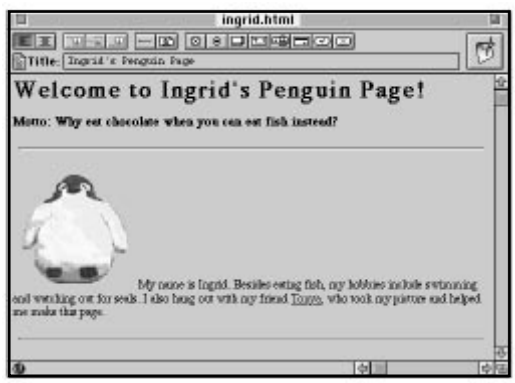


Figure 22.37 PageMill in Edit mode.

Before you do anything else, when starting a Web site in PageMill, create a folder in the Finder for the site. This folder will eventually hold all files associated with the site, and the contents of this folder should be maintained so as to exactly match the contents of the Web server directory that will eventually hold your site. Set up a second folder inside the site folder. Put any graphics that will be part of your site into this folder.

After setting up a Web site folder and a graphics folder, but *before* creating your Web page, set your preferences. If you don't, you might run into relative link problems further down the road. To set the preferences, choose Preferences from the Edit menu (see Figure 22.38).

The page flip sound option is entirely up to you, but the Page Preferences option might not be. If you plan to use Anarchie or Fetch to upload your Web pages to the server, you should be fine with any of the Line Breaks options, though Macintosh should prove the most flexible. The File Suffix depends entirely on what Web server you use, so ask your provider if you're not sure. Personally, I use Anarchie for FTP uploads and a WebSTAR server, so in Figure 22.38 I chose Macintosh line breaks and a .html file suffix.

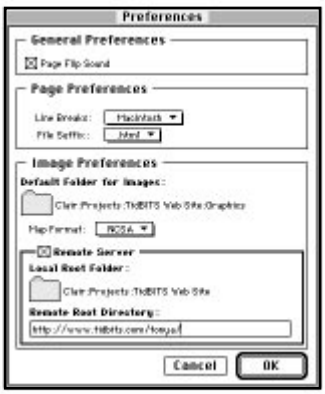


Figure 22.38 PageMill Preferences.

The Default Folder for Images is the folder you should have set up just a few paragraphs ago. It's the folder where PageMill will store converted images. Don't worry about Map Format unless you plan to include an imagemap. If you do, ask your Web server administrator for help.

Finally, if the Web server is a different computer from the one you are working on, check the Remote Server checkbox and then double-click the folder icon beneath Local Root Folder. Set the Remote Root Directory to the Web site folder that I had you set up earlier in this section. Also, in the Remote Root Directory field, type the URL to the server directory where your files will be stored. (Ask your server administrator for help if you aren't certain what to type.)

Using the Attributes Inspector

Although you can apply HTML tags from PageMill's menu bar and toolbar, I recommend that you use the Attributes Inspector. The Inspector is quick and easy to use, and I've had problems with not being able to turn formats off when I don't use the Inspector. To open the Inspector, choose Show Attributes Inspector from the Window menu. The Inspector has three modes, and you switch among them by clicking the three buttons at its top left (see Figure 22.39).

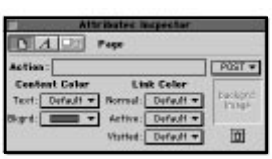


Figure 22.39 PageMill's Attributes Inspector.

- Page mode is for setting global aspects of a page, including background and text colors. Use the Action field and POST pop-up menu to finish setting up a form, if you choose to include one (PageMill 1.0 supports only one form per page). To make background tiling, drag-and-drop the icon of a GIF image from the Finder over the "backgrd image" panel. To remove a background tile, double-click the trash can icon.
- Text mode offers a handy way to style text selected in the document. Use Raw HTML to style HTML tags that you type directly (in PageMill 1.0, you might directly type tags for tables, since PageMill 1.0 doesn't otherwise support tables). The Location field offers one way to create a link. Select some text and then type a URL into the Location field, and the text will become the start of a link to that URL.
- Object mode offers controls for graphics and for form elements (such as checkboxes). Select the object you want to work with before clicking the Object button.

Although PageMill offers a number of ways to create links, none of them is obvious. My favorite method is to select the text that will start the link, press Enter (not Return), type (or paste) the URL, and then press Enter again.

Keep in mind as you work with PageMill that even though you cannot see your tags, PageMill files are text documents, and you can open them in any Web authoring tool or browser that you like.

FYI

If you use PageMill to open an HTML document created in some other program, be sure to import a copy of the document. PageMill 1.0 has an unfortunate tendency to change preexisting HTML tags, and you may not like what it does. PageMill 2.0 should be much improved in this regard, but there are no guarantees.

Evaluation and Details

PageMill 1.0 is a good program for people who do not wish to learn HTML and are willing to use the HTML that PageMill puts out. PageMill 1.0 is also an excellent program for laying out Web pages. After using PageMill 1.0 to set up a Web page, Web authors often open the pages in a text editor (such as BBEdit) in order to tweak the tags. BBEdit's HTML Tools palette even offers a Fix PageMill command.

PageMill 2.0 has a promising-sounding feature set. Much as PageMaker set the standard for desktop publishing software, PageMill stands every chance of setting the standard for "webtop" publishing. PageMill does, however, face stiff conceptual competition from new programs, such as Netscape's Navigator Gold, that will enable you to edit HTML documents live in your Web browser.

To get help in using PageMill, join the PageMill-Talk mailing list. You can find out more by visiting PageMill-Talk's Web page at <http://www.blueworld.com/lists/pagemill-talk/>. Adobe posts information about PageMill at <http://www.adobe.com/prodindex/pagemill/main.html/>.

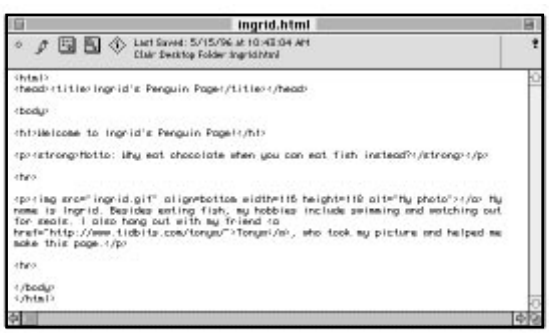
Other Web Authoring Programs

Mentioning every existing Web authoring program would be an exercise in futility. By the time I finished writing about all the programs currently available, I'd have to start all over, since several new programs would have been released and most of the old ones would have been updated. This section offers a reasonably comprehensive overview of what I consider the most interesting and most useful software. Most of these programs are available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/html/>, and if a program is not available there, you'll be able to find out more about the program at the URL given in the program's review.

BBEdit Lite

http://www.barebones.com/

A freeware program by Bare Bones Software, BBEdit Lite 3.5.1 is an excellent way not only to get your feet wet with a serious text editor but also to get an idea of the power of BBEdit for HTML authoring. (If features like a GREP-based multifile search make you drool, then BBEdit Lite is for you.) Be sure to equip your BBEdit Extensions folder with an appropriate set of HTML-related BBEdit extensions (see the "BBEdit" section earlier in this chapter for more information).



PageSpinner

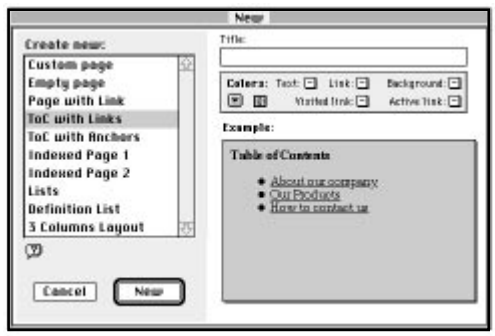
http://www.algonet.se/~optima/pagespinner.html

Currently my favorite of the shareware HTML editors, the $25 PageSpinner 1.1b3 offers a text-based environment that sets you up for success. When you start a document, you can choose from a number of templates (with visual previews). You may tag text in PageSpinner using a variety of the usual toolbar buttons and menu bar commands, but I recommend that you use

continues

PageSpinner, *continued*

the HTML Assistant, a floating window that enables you to switch among dialogs for setting up different document elements, such as lists, tables, and forms. If you become confused while setting up an element, you can easily bring up the HTML Examples dialog, which presents you with examples shown both visually and as HTML. PageSpinner makes it easy to learn HTML, and strikes me as an especially attractive option for people learning HTML or for people who want to work with HTML tags but don't use them often enough to memorize them.



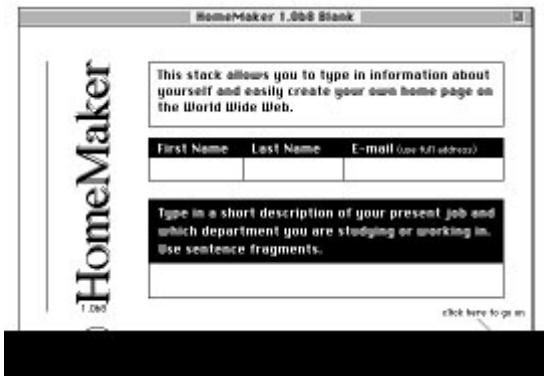
Frontier

`http://www.scripting.com/frontier/`

Frontier 4.0 is a free, powerful scripting environment and language created by Dave Winer of UserLand Software. Although Frontier can script all sorts of things, it comes with a system for creating and maintaining Web sites. Dave describes this system as having six important features. The first, "rendering," is what Frontier can do to a normal document that does not necessarily contain HTML, and in the rendering process, Frontier employs the other five important features. When Frontier renders a document, it can employ macros to insert entities in place of high ASCII characters and also generally spiff up the document. It uses a centralized "glossary" to insert links into the document (so you don't need to mess around with anchor tags yourself). It also uses a "template" to place the necessary tags that go before and after the body of an HTML document. An "object" hierarchy makes for far more sophisticated rendering options, and finally, "connections to standard tools" enable Frontier to use Fetch (or another FTP client) to upload the rendered document to the correct remote directory. Frontier 4.0 also ties nicely with BBEdit, which I discussed earlier in this chapter.

HomeMaker

HomeMaker, written by Bernie Dodge, is a nicely done, freeware HyperCard stack that walks you through creating a home page. Bernie intends the stack not only for individuals, but also for organizations that want to provide members with a simple way to make a home page that includes some standard text and a link to a particular page at the organization's Web site. If you want to make a home page without using a lick of HTML, this stack could be exactly the tool you need.



Chapter 23 Set up Your Own Server

Contents:

Before you jump in and start reading this chapter, consider if you're interested in this topic: how to set up your Macintosh as an Internet server. If you're not, just skip this chapter. It doesn't contain information you need to know to connect to the Internet as a user. In addition, the information below is *much* more technical than the rest of the book, so if you're interested but just getting started, you might wish to read this chapter after you've been on the Internet for a while.

Why might you want to set up your own server? There are a couple of common reasons, perhaps the most important of which is control. If you have your own server, you say what goes. If you want to set up another email address or run your own mailing list, you can. Maybe you want to make files available for anyone in the world to download via FTP. Running your own server is a great way to do that. If you want the ultimate level of control over your Web site, you need your own server so you can customize everything just so. In the end, you run your own server if you have an unquenchable need to provide information to other people, either for fun or profit.

Many people have expressed interest in this topic. In earlier editions of *Internet Starter Kit for Macintosh*, I avoided saying much about how to run an Internet server on a Macintosh. I had several reasons, and although they're no longer valid, they were then.

First, in the past, few people ran servers on Macs due in large part to the difficulty of obtaining a high-speed Internet connection suitable for a server. Nowadays, it's easier to set up an ISDN or even 28.8 Kbps dedicated modem connection for running a limited-use server. A few popular servers, such as ListSTAR, don't even require a dedicated connection.

A second and related reason is that this is a "starter" kit, and—in the past—I didn't consider running a server something a beginner would attempt. Internet novices continue to become more capable all the time, though, which is why in the third edition of *Internet Starter Kit for Macintosh* I added a chapter on the basics of HTML. Internet beginners wanted to create Web pages right off, and who was I to stand in their way? I now believe many beginners want to know at least what's involved in running a server and many may want to set up simple servers fairly shortly after getting on the Internet.

That said, in this chapter I discuss a number of important, basic aspects of running a Macintosh Web server. Even so, this chapter won't answer all your questions about running a Web server or a mailing list. Those tasks are significantly more complex than using Netscape or Eudora, for instance, and if you plan to shoulder them, you must be willing to learn a great deal on your own. Most of the programs I discuss here have their own mailing lists for support questions, and the Apple Internet Providers mailing list (see Chapter 21, "Macintosh Internet Resources") is a good general place to ask about issues surrounding Mac Internet servers.

Also, I'd like to recommend a few books I think you'll find especially helpful while setting up and running a Macintosh Internet server. The first book, *Providing Internet Services via the Mac OS,* by Carl Steadman and Jason Snell, is the best book out there for people who want to run a variety of servers on a Macintosh. It also has a useful Web site at `<http://www.pism.com/>`. Second, if you primarily plan to run a Web server, check out *Planning and Managing Web Sites on the Macintosh*, by Jon Wiederspan and Chuck Shotton. Chuck wrote the most popular Web server on the Mac, WebSTAR, and Jon knows more about running Web servers on a Mac than almost anyone.

I can't compete with two complete books in this one chapter. My goal, instead, is to acquaint you with some of the issues that surround running a server, and briefly discuss some of the main server programs.

Before I get into the specifics of the different servers, though, I want to talk about what you need in terms of hardware and connections to run Macintosh-based Internet servers, along with some related issues that you should understand before starting out with a server.

Server Requirements

Chapter 1, "The Right Stuff," talks about exactly what you need to connect to the Internet, but basically, you need any relatively modern Macintosh with at least 8MB of RAM, System 7.1 or later, and a modem. Most people have little trouble meeting those requirements. However, the same is not true of the requirements for running Internet servers on a Macintosh, and although you might need a more powerful machine than you would need for a personal Internet connection, you may be surprised at which Macs make ideal servers.

FYI
Keep in mind that you should dedicate a Mac to be your server—running server software on a Mac you're using for other tasks is infeasible. It's possible, but it doesn't usually work out all that well.

Internet connections are another story, though, since you almost always need a permanent Internet connection (or an ISDN connection that can open and close quickly and automatically), preferably at a relatively high speed, to run servers. (The main exception is for running relatively small mailing lists via ListSTAR or Macjordomo, since both can work over a normal dialup connection.) What good is your server if it's available only between 10 AM and 2 PM on weekends? Personal Internet connections don't require much in terms of time or money; you determine how much time you wish to spend, and the same applies to money after about $25 per month. However, dedicated Internet connections and the related accounts can be significantly more expensive.

Thus, two requirements you should keep in mind are those two basic forces of the universe: time and money. A permanent Internet connection and the hardware necessary to run an Internet server will consume more of your time and money than you might expect. Some of those costs in terms of time and money are one-time expenses, but others will hit you constantly, and you must be able to deal with them.

Before I continue, I want to give you a piece of advice: Consider getting professional help when setting up a dedicated Internet connection. When deciding on and setting up a connection, you are likely to encounter many different variables, and you must work closely with your Internet provider to configure your hardware (and even possibly to figure out what hardware to use) and make sure it works properly with the connection installed by the telephone company. Your Internet provider may offer these services, and if so, take advantage of them, since that may well prove the easiest route. Setting everything up is not impossible if you haven't done so before, but you may find it impossible if you don't have a good understanding of Internet technology and networking hardware.

I've learned far more about dedicated Internet connections and telephone company infrastructure than I would have liked in my quest to bring a dedicated Internet connection to my current house, and even still, I don't think I'll be able to set up the connection without help from a good friend who's a network consultant and who helped me set up my previous 56K frame relay Internet connection.

That said, once a connection is up and running, it's likely to stay that way. I had my previous 56K frame relay connection up for a year and a half at my previous house, and it was flawless. A friend who has a leased line T1 connection hasn't had a hint of a problem in the last 14 months.

Macintosh Servers

You may have heard about the tremendously powerful Unix workstations used for the Netscape Web server, or other equally popular Internet sites. Just because the big boys favor big iron doesn't mean you must imitate them. In fact, it turns out that Macs make wonderful Internet servers for a number of reasons. Macs are cheap compared to high-end Unix boxes, they're easy to set up and administer, and they're secure (more about security in a minute).

"Okay, great," you say, "so I believe you about using a Mac. But shouldn't I use the fastest Mac I can buy to come as close as possible to those Unix machines?"

No, you definitely shouldn't buy the fastest Mac on the market unless you like donating money to Apple. The reason is that most Internet services require little processing power and throwing the fastest Power Macintosh at a task such as running a Web server is generally overkill. It turns out that the bottleneck for running an Internet server is almost always the relatively slow Internet connection. Thus, if you pop a high-end Power Mac on an ISDN-based Internet connection running at 128 Kbps, the Power Mac is going to sit there idling almost all the time, and even when it's serving data to someone, the constraint comes not from the Mac itself, but from the Internet connection.

So the first rule of buying a Mac to act as an Internet server is that you shouldn't get the fastest one out there unless you have more money than sense. That rule has a caveat, however. If you run a lot of CGIs (Common Gateway Interface programs) such as Apple e.g. or Tango that require additional processing, the additional processing power of a fast Power Mac will come in handy. Most people don't run many CGIs, though.

> **BTW**
> People who are aiming for the best possible performance on very busy sites sometimes run CGIs on separate machines.

The second rule about buying Macintosh Internet servers is that you should always buy a Power Mac, preferably a nice low-end one such as a 6100. Increasingly, Internet server software is going Power Mac-native, and the performance improvements of native software running on a Power Mac can be significant. My current Internet server hardware is an Apple Workgroup Server 6150, which is basically a Power Macintosh 6100. There's nothing wrong with 68K-based Macs if you have one around that you can use for free, but if you're buying another machine, 68K Macs aren't worth the money.

My third rule of thumb is that Apple's Internet Server Solution for the World Wide Web is a great deal. You get an Apple Workgroup Server (currently the 6150, 7250, or 8250) along with a slew of software on CD-ROM, including WebSTAR, for not that much more than a normal Power Mac. If you figure out how much the software would cost separately, it's well worth the price.

The fourth rule for people with little money is that whatever you have around with at least 8MB of RAM and a 68030 CPU will probably work well for starters. I once ran POP and SMTP email, email auto-replies, FTP, Gopher, and Web servers on my elderly SE/30 (it did have 20MB of RAM) for a number of months with no troubles whatsoever, although it wasn't as fast as a newer Mac would have been. I believe strongly in reusing older computers, and it turns out that the minimal processing required by Internet server software is well suited to the wicked fast Macs of 1991.

I can see some people worrying about the future. "What if a Power Mac 6100 isn't enough in a year?" they wonder. Never fear, since the fifth rule of using cheap Macs as servers is that you can always increase your performance significantly by adding another Mac to the mix. If you run Apple Internet Mail Server, ListSTAR, NetPresenz, and WebSTAR on the same Mac (as I do), for instance, then buying another Mac and moving one or more of those programs to the second Mac will relieve the load. Similarly, if you run only WebSTAR, you can add another Web server and have it serve just the graphics for your Web pages, for instance. Another popular technique is "round robin DNS," in which you have two or more identical Web servers and people are routed to one or another of them randomly, thus splitting the load equally among the many servers. Apple's MacDNS program, which comes with the Apple Internet Server Solution bundles, provides this functionality.

Routers

There's another piece of equipment that you need for almost every dedicated Internet connection—a router. In networking terms, a router is a device that routes packets from one network to another. Basically, the router knows which addresses are local and which are not, just as a mail carrier learns his or her route. Routers "know" when they see data bound for the outside world, because the packets of data are labelled with their destination addresses. In practical terms, a router enables one or more computers on a LocalTalk or Ethernet network to connect to the Internet through your dedicated connection. In theory, you don't need a router if you use a dedicated modem or ISDN connection, since modems and ISDN terminal adapters such as the Motorola BitSURFR can connect directly to a single machine. However, if you go to the expense of setting up a dedicated Internet connection, there's no reason to skimp and skip the router, since a router will give all the Macs on your network a fast connection to the Internet.

Just as I didn't want to get into recommending specific modems for normal Internet use, I don't want to recommend specific routers for dedicated connections. Suffice it to say that Mac folks have nice things to say about routers from companies such as Compatible Systems `<http://www.compatible.com/>`, Ascend Communications `<http://www.ascend.com/>` (known for its ISDN-capable routers), Farallon `<http://www.farallon.com/>`, Livingston `<http://www.livingston.com/>`, and Cisco Systems `<http://www.cisco.com/>` (these last two are probably the most expensive, and may have more features than you need). Prices range from about $500 to upwards of $4,000, depending on features.

Actually, there's a second piece of equipment that you need for frame relay and dedicated connections: a CSU/DSU, which stands for Channel Service Unit/Data Service Unit. Don't worry about the abbreviation expansion—a CSU/DSU is essentially the equivalent of a modem for a frame relay or leased line. Despite the fact that these connections are digital, you still need a CSU/DSU on either end of the connection to manage the traffic between the routers on either end. CSU/DSU prices range from about $350 to $1,500, with the more expensive models working with faster connections and providing more diagnostic information.

IP Numbers

If you plan to use a router to attach your entire network, be it two Macs or 200 Macs, to the Internet, you need a set of IP numbers. Remember back in Chapter 9, "Addressing and URLs," when I said that every machine on the Internet has an IP number? Although true, that fact isn't all that relevant when you use the Internet as a client. However, if you want to put a server on the Internet, it must have a fixed IP number, and, if you want to attach your network to the Internet, each Mac on your network needs an IP number.

How do you get IP numbers assigned to your Macs? You ask your Internet provider for help, that's how. One way or another, since your network will connect to the Internet through your provider's network, your provider must either provide or coordinate the process of getting you one or more IP numbers. I wish I could say more, but I fear that anything I say will apply only in relatively small number of situations because each Internet provider may handle dedicated connections in a different manner.

You should ask your provider if it can help you get what's called a Class C address. A Class C address gives you 255 different IP numbers that you can use for up to 255 different machines. For instance, my Class C address is `204.57.157.*`, where `*` stands for any number between 1 and 255. I use only about ten of my IP numbers, but since my provider gave me the entire Class C address, I don't have to worry about anyone else using those IP numbers and I have room to grow.

Internet Connections

The bottleneck for almost all Internet servers is their Internet connections. Connection speeds vary widely, and it's difficult to recommend one sort of connection over another, since the details (such as cost and ease of setup) vary equally as widely depending on where you live. The most common types of dedicated connections are, in order of increasing speed, dedicated 28.8 Kbps modem, 56K frame relay, ISDN, frame T1, and leased-line T1 (which you can also purchase in chunks, called fractional T1). After you get past a full leased-line T1 connection, you can purchase multiple T1 lines, and after that, parts of a T3 (running at 45 Mbps) line. Let's look quickly at each of the types of connections. Keep in

mind that price and availability range widely—contact the small business group at your local phone company for a quote, or if you dislike getting the phone company runaround as much as I do, ask your Internet provider for the name of its phone company representative and call that person.

> **FYI**
> Getting a dedicated Internet connection does not mean you're accessing the Internet directly. You still need a connection to an Internet provider; the difference is that your connection is fast and permanent.

Dedicated 28.8 Kbps Modem

The minimum level of permanent Internet connection is a relatively normal PPP connection to the Internet that's active all the time. If you go this route, there's no reason to use anything slower than a 28.8 Kbps modem—it will be slow enough even working at full speed. There are two main differences between a permanent modem connection and a normal dialup Internet account. First, normal dialup accounts often give you a different IP number each time you connect. That's unacceptable for a server, since you cannot provide a moving target for the people you want to attract to your site. Second, permanent modem connections are always much more expensive than your standard $25 per month account. Some Internet providers charge more for these sort of connections than you'd expect, since modems are such a pain to use on both ends.

If you run a dedicated modem connection for only a single Mac, you can get away with a single IP number, and you should investigate solutions for making sure your Mac connects to the Internet automatically if the phone connection drops for any reason. In some locations, the phone company will drop all connections in the middle of the night as it does diagnostics—such drops may not be a problem for a voice call but will probably confuse a modem. Some people use a utility called PPP Guardian, available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/conn/>`, although it hasn't received stellar reviews on the Apple Internet Providers mailing list. Other people have written AppleScripts that continually check the connection and redial if the connection disappears.

Dedicated modem connections using routers can be set to redial automatically if the connection goes down for any reason. In general, using a router will make things much easier, after the initial trouble of setting it up.

Frame Relay (56K or T1)

Frame relay is a permanent digital connection that requires only two pairs of normal copper phone wire. I don't know how readily available it is throughout the country or the world, but here in the Pacific Northwest, it's the low-cost dedicated connection of choice. Frame relay is cheaper than leased lines running at the same speed because the

connectivity is shared. With a leased line, the phone company creates a circuit between your house or office and your Internet provider's office. That circuit is yours, and you're guaranteed the full bandwidth, whatever that may be. In contrast, with frame relay the phone company creates what's called a "permanent virtual circuit" between you and your Internet provider. The wires leave your house or office and go into something known as a "frame cloud," along with many other frame connections. The cloud is essentially a switching device, and more wires come out the other side of the cloud and go to your Internet provider.

The utility of running everything through a switching device is that most connections don't use their full bandwidth at all times, which means the phone company can divide the total bandwidth more ways than would otherwise be possible. For example, assume the switching device provides the bandwidth of a T1 line, which runs at 1.54 Mbps. That's roughly equivalent to 24 56K connections, and if each connection was guaranteed its full 56K throughput, that switching device could support only 24 connections at most. However, if you assume that at any given time, only half of the bandwidth is being used on each connection, then you can see that the phone company could sell up to 48 connections through that single device without anyone noticing. At least in the Seattle area, a 56 Kbps frame relay connection is guaranteed to have 48 Kbps throughput, and a 1.54 Mbps frame T1 connection is guaranteed to have 768 Kbps throughput. You may not like the fact that you're not guaranteed your full bandwidth, but you get what you pay for, and frame relay connections are cheaper than leased lines. Pick your poison: speed or money.

ISDN

ISDN has long been the promised savior of inexpensive, high-speed Internet access. The technology is about 15 years old, but it simply hasn't enjoyed any kind of widespread acceptance in the U.S. until recently. ISDN has features in common with both of the previous connection types. Like a modem, ISDN is a dialup technology, so if you use it to create a dedicated connection, you must make sure that your ISDN modem or router can redial if the connection drops for some reason. However, like a frame relay connection, ISDN is digital, and it provides much higher speeds than a modem.

Technically, a BRI (Basic Rate Interface) ISDN line has three channels: two 64 Kbps B channels and a 16 Kbps D channel. There are also what are called PRI (Primary Rate Interface) ISDN lines that providers generally use to enable ISDN connections to their machines. I haven't heard of anyone using a PRI ISDN connection in favor of a leased-line T1 line, which runs at a similar speed. You can use an ISDN connection at a number of speeds, which depend on variables that you might not control. First, I gather some phone companies have a somewhat weird ISDN setup that steals 16 Kbps of the B channels' 64 Kbps. In that case, you can get 56 Kbps using one B channel or 112 Kbps if you combine the two (something most ISDN routers can do). If you can get the full 64 Kbps of each B channel, you can get either 64 Kbps or 128 Kbps, depending on whether or not you use one or both of your B channels.

In most cases, you'd want to use both B channels if possible, of course, because the extra speed is always nice. However, ISDN's main feature, in my opinion, is its flexibility. Because ISDN is a dialup technology and you can hook telephones to ISDN lines as well as networking hardware (which isn't true of frame relay or leased-line T1 connections), you can use one of your B channels as a voice line. You can even have one B channel used as a voice line on demand, so when it rings, your ISDN router would throttle the Internet connection down to 64 Kbps. When you hang up the phone, the ISDN router would detect that the line was available again, and accelerate the connection back up to 128 Kbps.

It's even conceivable that you could use one of your B channels for other networking purposes. Before US West admitted that it couldn't provide me with ISDN at all where I live, I had worked out a neat scheme for my line. I would establish a dedicated ISDN connection to my Internet provider, but when Geoff, our managing editor for *TidBITS*, wanted to send files to us or do anything else on our network, he could use an ISDN modem or router to connect to our network via one of our 64 Kbps B channels. The Internet connection would automatically slow to 64 Kbps from 128 Kbps while Geoff was connected, but while he was connected, it would seem as though his machines were on our AppleTalk network and he could use the Internet through our remaining 64 Kbps connection.

Leased-Line T1 to T3

Leased-line T1 (or faster) connections tend to be quite a lot more expensive than frame relay connections, but in return for that money, you get more speed. A full T1 connection runs at 1.54 megabits per second (Mbps), but you can also purchase a fractional T1 running at 128 Kbps, 256 Kbps, 384 Kbps, or 512 Kbps; the costs are somewhat lower than the full T1 cost, and if you don't need the bandwidth, why pay for it? For more bandwidth than a T1, you can buy multiple T1s. The next full step is a T3 that runs at 45 Mbps, and although that might be overkill for your purposes, you can purchase a fractional T3 from the telephone company if you only need, and want to pay for, something less than a full T3.

The hardware that you need, in terms of a router and a CSU/DSU, is similar to what you need for a frame relay connection, so if you plan ahead somewhat, you could get an inexpensive frame relay connection to start and then move up to a leased-line T1 connection, without having to invest in entirely new hardware.

On occasion, leased-line T1 connections can be less expensive than frame relay T1 lines. The reason is that leased-line T1 connections generally have a base charge and then have mileage charges added on, depending on how far away you are from the telephone company's closest central office. If you happen to be in the same building as the central office, or right next door, the mileage charges might be so low that the total cost comes in somewhat lower than the flat rate for the frame relay connection. It's worth investigating with the telephone company when you place your order.

Someone Else's Network

One option for avoiding the problems of setting up and paying for a dedicated connection is to work with an Internet provider that will let you place your server on its network. I've seen a number of these sort of services appear, usually charging about $300 per month for the space, electricity, and connectivity. For more, the provider will do a certain amount of administration for your machine. The details vary widely, but if you're not interested in setting up a dedicated connection for your Internet server, check around and see if you can locate it somewhere else. Of course, if you do that, you should check into what kind of connectivity your host will provide. With a remote connection such as this, you'll almost certainly want to rely on a PowerKey Pro and Timbuktu Pro—see the "Utilities" section at the end of the chapter.

Time

Perhaps the most overlooked requirement in running a server is time. If you assume that the point of an Internet server is to be accessible all the time, you must balance how available you want it to be with how much of a life you want to have. Serious Internet providers have their servers set to page them at any hour of the day or night if something goes wrong, and you can do the same thing with a Mac server if you want. Personally, I think that's excessive. If I'm asleep and my server goes down, it can stay that way until I wake up.

Being paged in the middle of the night is the extreme, but you must allot a fair amount of time for dealing with your server, potentially at awkward moments. Ignoring for the moment the amount of time it takes to set up a server and configure the software (which isn't all that much, on a Mac), be aware that something will go wrong eventually. After you notice a problem, you must be willing to drop everything and fix the problem, unless you're better at living with known problems than I am. For instance, if ListSTAR 1.0 receives an improperly formed message without a From line, it generates an error message to you every time it tries to process the bad message. Since I have ListSTAR set to process messages every ten minutes, that means I get one error message every ten minutes. If I went away for a week and didn't check my mail, I could build up thousands of error messages that might cause other problems for my mail server.

Of course, you want to set things up so that they don't demand your time like this if at all possible, but sometimes it's not possible. My feeling is that running an Internet server that supports a number of different services, email, a mailing list or two, FTP, and the Web, for instance, will require at least a few hours a week of basic checkup. It might be more, it might be less, but be sure you can spend the time on the server when it needs help.

This issue of time is one of the major reasons that people choose not to run their own servers and instead pay someone else to do it. You can still publish your own information or run your own mailing list, but if you spend the money for someone else to deal with the headaches, you're effectively turning money into time.

Money

Speaking of money, servers can cost a fair amount. You can break the charges down into two basic categories, those that occur once and those that are recurring.

One-Time Charges

These costs fall more or less squarely into the hardware arena. As I've discussed earlier in this chapter, you simply need a certain amount of hardware to run a server. At the minimum, you need a Mac and a modem, and it's more likely that you'll want a router of some sort instead of the modem. Add the necessary CSU/DSU for the router if you have a frame relay or dedicated Internet connection, and you're talking real money. I can't provide hard numbers, but assuming that you have to buy everything, the low end of the price range will probably be about $4,000 for a Mac and the communications hardware. On the high end, the sky is the limit, but about $10,000 should provide you with everything you could need for a Mac server.

Also included in your one-time charges are setup fees for your Internet connection and your account with your Internet provider. I can't predict those for you, but for a 56K frame relay connection in Seattle from US West, working with my provider, it would cost about $365 for the connection and $300 for the Internet account. Add $100 if you need to get a new domain name from the InterNIC.

Recurring Charges

Monthly recurring charges give me nightmares. I find it quite easy to determine whether or not I can afford a one-time charge for hardware or a setup fee, but since we authors don't have guaranteed incomes, monthly charges are more worrisome.

The two charges that you will have with any Internet server are the charge for your Internet connection and the charge for your Internet account. Again, these vary widely throughout the country, but the lowest I can think of would be about $50 for the connection each month and maybe $150 for the account (that would be for an ISDN connection). Something along the lines of my 56K frame relay connection here in Seattle costs about $90 per month for the line from US West and $300 per month for the Internet account with Northwest Nexus. A leased-line T1 connection will run you between $1,500 and $4,500, with $2,000 to $2,500 being typical costs, depending on your location. The faster the connection, the more expensive it and the Internet account will be, so be sure to compare the possibilities carefully.

There aren't many ways to reduce the impact of recurring charges, although you might be able to pay for the Internet account in part by bartering with your Internet provider. For instance, if you set up a Web site that will take thousands of hits each day, you might be able to advertise your provider's services on your home page in exchange for a discount on

the Internet account. It may or may not work, but it's worth asking if you're worried about that charge. Reducing or eliminating the cost of the connection itself from the telephone company is either difficult or impossible—telephone companies aren't generally all that flexible.

Security

The topic of Internet security is a huge one, and numbers of books have been written about it. How then can I get away with devoting such a small section of one chapter to it here? The answer is quite easy. It turns out that Macs, thanks to their single-user operating system and purely graphical interface, are extremely secure when used as Internet servers.

Let me explain further. Most security problems on the Internet stem from holes in the Unix operating system that's used on the majority of Internet servers. Unix was designed to be used by multiple people at the same time—it's a multiuser operating system. In addition, a number of basic Internet services are installed by default on many Unix machines. These two facts make Unix systems inherently less secure than a Mac, which uses a single-user operating system and runs only Internet servers that you consciously install and configure.

The problem with Unix being a multiuser operating system is that Unix makes it easy for multiple people to connect and do whatever they want. Of course, safeguards exist to prevent most users from doing damage, but anything that's designed to provide access to multiple users will have holes that a clever cracker can exploit to gain control of the machine. Unless the system administrator of the Unix machine is diligent about closing all of those holes, the machine is vulnerable to cracking.

Also, Unix uses ports for Internet services, so any given machine can have dozens of ports, one for each kind of service, each with its own holes. Unix is particularly vulnerable because if you can defeat any of these services, often you can get the machine to run your own programs through these holes. This simply isn't possible on a Mac.

> **BTW**
> Among sophisticated computer users, "hacker" isn't a derogatory term. Instead, it's defined as a person who wants to learn more about the inner workings of a system and investigates for that purpose. The popular media trend is to say "hacker" when they really mean "cracker," or someone who wants to break into other systems and cause damage or steal information.

Since Macs are designed for use by only a single person, the Macintosh operating system (Mac OS) doesn't have the inherent problems that Unix does with making it easy for multiple people to connect simultaneously. It might seem as though the limitation of a single-user operating system would make it impossible to run a server that serves information to multiple people, but that's not the case. You can write a Macintosh program that

enables multiple people access at the same time, but then those people have access to only those things to which your program gives them access.

In other words, the Mac OS and Unix come to the same point from different directions. An Internet server running on the Mac enables capabilities that weren't there before, making the Mac slightly less secure with each addition. In contrast, many of those capabilities exist on all Unix machines by default, which forces the system administrator to remove capabilities in the effort to create a secure environment.

Of course, there's no such thing as a completely secure server. If there is any access to the machine at all, over the network or in person, it cannot be completely secure. And, if you set up a variety of Internet servers on a Macintosh stupidly, it won't be secure. For instance, if you set up an FTP server and give all anonymous users the ability to upload files to any part of the server, a clever cracker could write a custom CGI program that would send him your confidential data and then use a Web browser to activate the CGI with your Web server. Because of this, you want to make sure that no unauthorized users can upload into a folder that a Web server uses. Similarly, if you use Timbuktu Pro to administer your server remotely, as many people do, if someone steals or guesses your master password, that person can use Timbuktu Pro to control your server and do anything they like, ranging from data theft to malicious electronic vandalism.

To show that Macs make extremely secure servers, in late 1995 a number of companies pooled their money and set up a challenge. If an enterprising soul could break the security on a specific Mac server and show how it was done, he could claim a $10,000 prize. In short, no one claimed the prize, and the administrator of the machine believes that no one even came close to compromising its security. You can read the full account of the challenge and the results at `<http://www.forest.net/advanced/securitychallenge.html>`.

Email Servers

The server software that I've probably enjoyed using the most is my email server software. I can't quite explain it, but I enjoy being able to create accounts in the `tidbits.com` domain whenever I like and for whomever I like. Along with myself and my wife, I've created accounts for Geoff and Lauren, two other people who work with us on *TidBITS*.

In addition, running your own email server enables you to set up small mailing lists and auto-reply messages easily. Without your own email server, you're at the mercy of your Internet provider each time you want a new email account, and depending on how your provider has things set up, you might not be able to get some of the desirable usernames, such as `info@yourdomain.com` (which many companies use as an auto-reply that provides basic information about the company and its products).

For the longest time, the Macintosh had no programs that supported the Internet email standards, SMTP and POP, as their native way of working. Gateway programs that enabled

LAN-based email systems such as CE Software's QuickMail to send and receive Internet email had been around for some time, but in almost every case, they were clumsy and hard to set up. And of course, when you used a LAN-based email program, you were limited to that program. In contrast, if your email server supports the Internet's SMTP and POP, you can use one of any number of different email programs to send and receive your email.

The program that broke the drought was called MailShare and was written by Glenn Anderson in New Zealand. MailShare proved so incredibly popular that Apple bought MailShare from Glenn and hired him to continue working on the program, renamed Apple Internet Mail Server. A few other email servers have arrived since then, most notably Stalker Software's CommuniGate, which supports far more than just SMTP and POP through its flexible messaging system.

Some of these programs are available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/mail/>; I've listed Web pages as well.

AIMS LocalTalk Bridge

http://www.gcnet.com/~owenc/alb/alb.html

Chris Owen's $10 shareware AIMS LocalTalk Bridge 1.3 (previously called UUCPShare) is an interesting program that might be useful for an office that has a full-time modem connection to the Internet and that wants to provide Internet email access to multiple people on a Mac network in the office. AIMS LocalTalk Bridge takes advantage of the capability in Apple Internet Mail Server to save incoming messages as a file and the capability in Eudora to read email from a file in UUCP format. Setting up AIMS LocalTalk Bridge isn't hard, but it's a fairly picky process, so be careful.

Apple Internet Mail Server

http://cybertech.apple.com/AIMS.html

The free Apple Internet Mail Server (AIMS) 1.1 is the most commonly used SMTP and POP server for the Macintosh, in part because it was the first and in part because it's free. Creating new users and setting up is quite easy, and you can do things such as forward mail from one address to another automatically or even

run a small distribution list. Performance in my testing has been good, although I did have to set it to handle more simultaneous connections. Word on the net is that AIMS can't handle thousands of users, though, so if you want to support many people, you should look elsewhere (or use multiple servers). Definitely worth a look.

CommuniGate

`http://www.stalker.com/CommuniGate/CommuniGate.html`

Stalker Software's CommuniGate System 2.1 is far more than just a mail server. It's an entire messaging system that includes a server and a client and a slew of modules that enable a variety of additional features. You must run the CommuniGate Server and you'll probably want to run CommuniGator, the email client (although you can use any POP-based email program such as Eudora to send and receive mail as well). After that, though, you can pick and choose from a number of communication modules that enable CommuniGate to communicate via UUCP (Unix to Unix CoPy, an old but useful protocol), SMTP, or POP. In addition, CommuniGate includes modules that can send fax messages, communicate with alphanumeric pagers, print remotely, and send files from within applications directly via email. CommuniGate is commercial, but you can use it for free as long as you like, although it puts a "Sent with a trial version…" banner on all of your messages until you register. Prices vary by the number of users you need to support and what modules you buy, and the details are on Stalker's Web site. CommuniGate is one of the most flexible email systems I've seen, and if you want to run a mail server, you should check it out.

Export MailShare Users

`http://www.pism.com/`

Apple Internet Mail Server has no facility for exporting a list of the users you've entered, which is a concern, because if your Internet Mail Servers prefs file becomes corrupted for some reason, you'll have to attempt to recreate your entire user list. The free Export MailShare Users

continues

Export MailShare Users, *continued*

AppleScript 0.9b from Frederick Haislmaier does just this, providing you with a text file containing your user list. It has no capability for importing users back into the Internet Mail Server prefs file.

MacPost

`http://www.macpublic.ldc.lu.se/macpost/`

Lund University's free MacPost 1.2 server and client works much like CommuniGate and AIMS LocalTalk Bridge in that it provides Internet email to Macs on an AppleTalk network if one Mac can connect to the Internet. The MacPost server serves mail to the clients using a proprietary protocol. The MacPost server can communicate with an SMTP server out on the Internet as well, thus opening the doors to the Internet for the MacPost clients. The MacPost server knows only how to talk to the MacPost client, so you can't use a different email program, such as Eudora.

MailShare Loader

`http://fcd.fairbanks.org/FCDWebPage/sharedsoftware/SoftwareDirectory.html`

One problem with Apple Internet Mail Server is that there's no way of exporting your list of users for backup. The Export MailShare Users AppleScript mentioned previously can do that, but it can't import users into the Internet Mail Server prefs file as well, which is handy if you're managing any number of users. William Leshner's free MailShare Loader 1.1.2 also imports and exports passwords (using a simple encryption scheme to protect the passwords). You can get MailShare Loader only via email—send a message to `msl@fairbanks.pvt.k12.ca.us` to receive a copy back. If you use Apple Internet Mail Server, you should use MailShare Loader as well.

Mailing List Managers

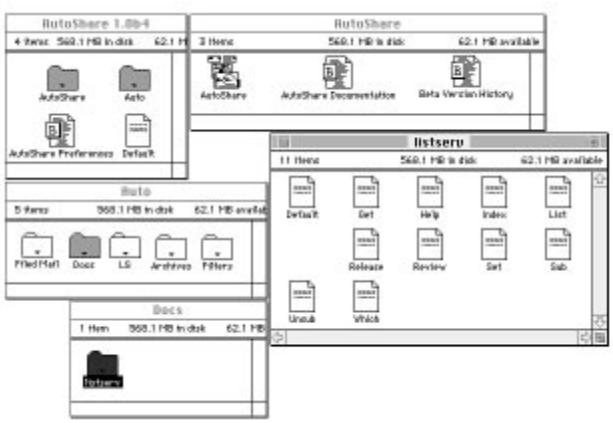
Having an email server is all fine and nice, but being able to run your own mailing lists is a far more common desire. Some email servers, such as Apple Internet Mail Server, can run simple distribution lists, but it lacks the main useful features of a mailing list manager program—namely enabling people to add and delete themselves from the list automatically.

The first program that appeared to solve this problem, AutoShare, worked closely with the then-MailShare (now Apple Internet Mail Server) to provide basic mailing list, auto-reply, and vacation mail capabilities. Macjordomo soon followed, but both were eclipsed by the extremely flexible ListSTAR from Quarterdeck. AutoShare is available at <ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/mail/>; I've listed Web pages as well.

AutoShare

http://www.dnai.com/~meh/autoshare/index.html

The first program to provide interesting email capabilities on the Mac was Mikael Hansen's free AutoShare 1.0.2fc10, which works only with Apple Internet Mail Server. AutoShare provides an auto-reply capability that can immediately return a message to any inquiries that come in to a specific address. You also can set AutoShare to reply with different responses based on the contents of the Subject line, and it can even attach a binhexed file if necessary. AutoShare also provides basic mailing list manager capabilities, and although it could use more of a graphical interface, it has performed well. AutoShare isn't as full-featured as ListSTAR, but it's a lot cheaper.



ListSTAR

http://www.starnine.com/liststar/liststar.html

ListSTAR from Quarterdeck (previously from StarNine) is the most powerful application available for running mailing lists and providing auto-replies on the Mac. You can create extremely flexible mailing list setups via a rule-based interface, and thanks to the flexibility of ListSTAR's rules, you can also create "email on demand" systems that send back specific files in response to items in an email message. I've used ListSTAR heavily for some time and plan to move the *TidBITS* mailing list over to it in the summer of 1996. Perhaps what I like the most about ListSTAR is the way it enabled me to rethink how people interact with a mailing list manager and avoid some of the common pitfalls. ListSTAR comes in four versions: SMTP, POP, QuickMail, and Quarterdeck Mail (formerly Microsoft Mail). The SMTP version is the most expensive and has the highest performance, but the POP version doesn't require a dedicated Internet connection. Highly recommended.

The folks at Quarterdeck asked me to include this information about using evaluation copies of ListSTAR, since there's one on the Internet Starter Kit CD-ROM.

"Time-limited copies of ListSTAR are available from ListSTAR's Web page for evaluation purposes. After downloading the archive, a serial number is required to activate the software. To obtain a 30-day evaluation serial number, please send mail to keys@starnine.com with the subject of the product you wish to evaluate, i.e., either **ListSTAR/SMTP**, **ListSTAR/POP**, **ListSTAR/QM**, or **ListSTAR/QDM**. The serial number you receive in the auto-reply will activate the software for 30 days from the day of your request. Only one serial number will be provided per customer. Please request the serial number from keys@starnine.com after you are ready to begin the evaluation period."

Macjordomo

http://leuca.med.cornell.edu/Macjordomo

Unlike AutoShare, Leuca Software's free Macjordomo 1.0b8revB (unrelated to the Unix Majordomo, other than the punning name) works with any SMTP or POP server, including Apple Internet Mail Server. You also don't need a dedicated Internet connection to use Macjordomo. You can either add users to a list yourself or let them subscribe themselves using standard mailing list commands in Macjordomo. Nice touches include digests, enabling only subscribers to post to the list,

making the list into a moderated list so only the moderator can post, or turning it into a distribution list that refuses all postings from people other than the moderator. Macjordomo can even block messages that contain attachments (there's little worse than someone sending a message with a large attachment to a mailing list).

Web Servers

Everyone seems to want his or her own Web server these days, and setting one up on a Macintosh is extremely easy. The first Web server for the Mac was a piece of shareware called MacHTTP from Chuck Shotton. MacHTTP eventually became the commercial WebSTAR and commands the market for Mac Web servers. Since then, a number of other servers have appeared, each offering a slightly different set of features in an attempt to differentiate itself from WebSTAR.

Apple has announced plans to build a personal Web server into the Mac OS in the future, and at that point people who just want to serve a few files will probably use that built-in server. Until that time, though, one of the Web servers listed following should serve your needs. Some of these programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/web/>` and if not, I've listed Web pages where they are available as well.

EasyServe

`http://summary.net/soft/easyserve.html`

Jason Linhart's free EasyServe 0.2 is probably one of the easiest Web servers to set up and use on any machine. It has almost no features to muddy the waters, so you don't get a log, you can't run CGI programs, and you can't set up any customized security options. EasyServe simply serves HTML documents in its folder to clients that request them. In part because it's a recent program, EasyServe requires Open Transport 1.1—you cannot run it under MacTCP.

httpd4Mac

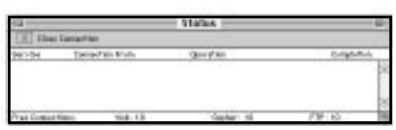
`http://sodium.ch.man.ac.uk/pages/httpd4Mac/home.html`

The free httpd4Mac 1.3, by Bill Melotti, is a simple Web server implemented as a faceless background application. Bill designed httpd4Mac to be fast and free, since most Mac Web servers are either shareware or commercial. Unfortunately, httpd4Mac doesn't currently support common Web features such as forms or imagemaps, which limits its appeal for heavy use. In addition, the complete lack of an interface might bother some people because tracking what httpd4Mac thinks is happening becomes difficult, and the only way to modify its configuration is by editing a preferences text file. Still, it might be worth a look if you want a free Web server to try out.

InterServer Publisher

`http://www.intercon.com/products/interserverp.html`

InterCon's $495 InterServer Publisher 1.2 is probably the second most well-known Macintosh Internet server package. InterServer Publisher differentiates itself from WebSTAR by supporting not only the Web, but also FTP and Gopher, so you can set up a more full-featured Internet server with a single program. Actually, InterServer Publisher works as an extension, which InterCon claims improves performance over the application-based servers. A nice touch is InterServer Publisher's support for XTML, an extension to HTML that InterServer Publisher uses to create a directory listing in a Web page, create a counter on a Web page, and automatically append a modification date to a Web page. InterServer Publisher reportedly supports all WebSTAR-compliant CGIs, and is definitely worth a look if you need a combined Web, FTP, and Gopher server. You can download a copy for free from InterCon's Web page and request a demo key to try it out for a limited time.



NetPresenz

Peter Lewis's $10 shareware NetPresenz 4.0.1 has long been one of the mainstays of Internet servers in the Macintosh world. Previous versions could serve FTP and Gopher, with Web support being added in version 3.0. With NetPresenz 4.0, Peter

turned the program into a full-fledged Web server. You can choose which of the three protocols you'd like to serve. Setting up and using NetPresenz is easy, especially for Gopher and Web access. If you plan to provide usernames and passwords for users to connect to your FTP site, you must use Apple's Users & Groups control panel and Sharing Info dialog boxes to assign access privileges, and that can be rather confusing. For best performance, use Open Transport on a Power Mac with the latest version of AppleShare rather than the System 7 Personal File Sharing. NetPresenz is well worth a look, and its shareware fee is cheap for what it provides.

NetWings Internet Server

`http://www.netwings.com/`

Several new Web servers have opted to compete with WebSTAR by building on top of a powerful database called 4th Dimension. Bringing database functionality into a Web server enables quick changes to an entire set of Web pages, easy inclusions of forms without an additional CGI program, and flexible reporting features. The $295 NetWings Internet Server 1.1 goes beyond even this capability, adding a SMTP server, a POP server, and a Gopher server to the program's basic task of serving Web pages. NetWings' email capabilities aren't limited to just serving POP and SMTP, either, since it can run auto-replies and mailing lists. The NetWings Internet Server comes with the NetWings Gateway System, which enables Macs on an AppleTalk network to use the Internet through a dedicated Internet connection on one of the Macs. Using NetWings might be a bit confusing to people who have run other Web servers before, thanks to its database heritage and interface.

NovaServer

`http://www.resnova.com/product/`

The $2,200 NovaServer Advanced Server 4 from ResNova started life as a bulletin board system (BBS) server, but in recent releases has added support for outgoing Internet email, Usenet news, and Web serving. Interestingly, NovaServer stores email internally in HTML format (you can't read email using a normal email program such as Eudora—only with NovaTerm, its dedicated graphical client for BBS users) and uses HTTP to communicate with NovaTerm and with the Web.

NovaServer is overkill for most situations, but if you're interested in running a normal BBS that also has a dedicated Internet connection, it's worth a look.

RushHour

`http://www.maxum.com/RushHour/`

Maxum Development's $295 RushHour 1.1 is a specialized Web server. It doesn't serve HTML at all, but instead concentrates on serving graphics and other large files. You might want to run RushHour if your site has a lot of graphics and is having trouble keeping up with the load. RushHour improves performance over other Web servers by serving all files (if possible) from RAM rather than the hard disk, by using Open Transport if available, by optionally not logging hits, and by eliminating redundant security. I've seen a demo of RushHour serving GIF images so fast over Ethernet (which is admittedly much faster than any Internet connection) that the Web browser that was reading them in could display them as a movie. Most people won't need RushHour, but those who do should waste no time in checking it out.

TeleFinder

`http://spiderisland.com/`

Spider Island's $675 TeleFinder v5, such as NovaServer, started life in the BBS world and has added heavy-duty Internet features, including MIME-compatible POP and SMTP email support (so you can use Eudora or Emailer to read mail) along with

a full-featured Web server. Users can use the dedicated TeleFinder graphical client and publish Web pages via the TeleFinder Web server. TeleFinder's Web server supports standard CGIs, and, in an unusual feature, supports the Finger directory protocol so you can see who's logged in to the BBS at any time. My feeling is that TeleFinder is mainly a good choice if you want to run a BBS as well as a Web server, since it provides both levels of functionality.

Web Server 4D

`http://www.mdg.com/`

Like NetWings, MDG Computer Services' $395 Web Server 4D is built on top of the powerful relational database 4th Dimension. Web Server 4D sports fast performance and compatibility with many standard CGIs, including the popular NetCloak and NetForms from Maxum. Its database underpinnings enable Web Server 4D to provide such useful features as real-time Web statistics (most Web servers require you to analyze a log file to generate statistics), new and repeat user tracking capabilities, page counters, custom tags for inserting variables such as the date and time, automatically generated HTML, and a slew of other stuff. The $995 Web Server 4D Developer edition requires that you own 4th Dimension, but it enables you to customize the 4th Dimension source code completely. You can download a demo of Web Server 4D and get a demo key from the MDG Web site.

WebSTAR

`http://www.starnine.com/webstar/webstar.html`

Quarterdeck's $495 WebSTAR 1.2.5 is by far the most popular Macintosh Web server, in large part because its predecessor, MacHTTP, was the first Macintosh Web server. WebSTAR's developer, Chuck Shotton, hasn't rested on his historical laurels, though, and each version gets faster and more powerful (WebSTAR can handle all but the highest-volume sites, so it can almost certainly handle anything most people would throw at it). Almost all CGI

continues

WebSTAR, *continued*

programs are written to work with WebSTAR, and WebSTAR 1.3 will introduce a plug-in capability that will enable developers to extend WebSTAR's capabilities without the loss in performance that plagues CGIs. Setting up WebSTAR is simplicity itself, since all you must do is launch the program on a Mac with an Internet connection. WebSTAR is more configurable than many other Web servers, though, so if you wish to increase the number of simultaneous connections or password-protect certain files, you can do that as well. You won't go wrong with WebSTAR, and it's bundled with the Apple Internet Server Solution machines. Quarterdeck also plans a low-cost shareware version of WebSTAR that won't have many high-end features but will support WebSTAR plug-ins. Highly recommended.

The folks at Quarterdeck asked me to include this information about using evaluation copies of WebSTAR, since there's one on the Internet Starter Kit CD-ROM. "You need a serial number to activate evaluation versions of WebSTAR that you can download from the Web page above. Please send mail to `keys@starnine.com` with the subject of **WebSTAR**. The serial number you receive will activate the software for 30 days from the day of your request. Only one serial number will be provided per customer."

CGIs and Web Server Utilities

Web servers are often relatively simple programs, but they provide tremendous flexibility by communicating with other programs via the Common Gateway Interface. A number of these CGIs and other related programs have become essential for many people.

Unfortunately, there are so many of these available that I couldn't hope to evaluate all of them for this book. Rather than look at just a few, I provide Table 23.1, which lists many of the most useful CGIs and other Web server utilities. Most of these utilities were developed originally for MacHTTP or WebSTAR but should work fine with many other Web servers as well. Also note that prices listed (when I could find them) are suggested retail prices; many of these companies offer volume or educational discounts.

Many of the following programs are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet/web/>`, and I've listed their Web pages where available as well. Check the Internet Starter Kit CD-ROM first, since I was able to include a number of the programs on it as well.

Table 23.1 CGIs and Web Server Utilities

Name	URL	Comment
Database and Searching Utilities		
Apple e.g.	http://cybertech.apple.com/Appleeg.html	Free; makes it easy to add searching capabilities to a Web site
FoxAELib	http://www.icnc.com/icn/index.html	Enables you to write CGIs in FoxPro for Macintosh
iHound	http://valley.interact.nl/ICATT_TOOLS/ihound/home.html	Shareware; indexes your Web site and enables users to search it
MacSiteSearcher	http://www.blueworld.com/macsite/searcher/	$295; enables full-text searches on the contents of HTML and text files in a Web site
NetLink/4D	http://www.fsti.com/productinfo/netlink.html	$189; enables you to use 4th Dimension as a CGI with various Web servers
Phantom	http://maxum.catalogue.com/phantom/	First commercial Web crawler for the Macintosh; indexes every HTML page on a Web site and enables users to search the site
ROFM	http://rowen.astro.washington.edu/	Free; requires AppleScript and the shareware Acme Script Widgets to link WebSTAR and FileMaker Pro databases
Tango	http://www.everyware.com/Tango_Info/	Integrates SQL databases such as Butler SQL with Macintosh Web servers
WarpSearch		$15; provides fast nonindexed searches
Web FM	http://www.macweb.com/webfm/	$195; links WebSTAR and FileMaker Pro databases
WebCatalog	http://www.pacific-coast.com/St_Pages/PCSPages/datasheets/webcatalogad.html	$695; provides flexible searching features to WebSTAR; supports online shopping carts
WebFox	http://www.cais.net/wrngrp/webfox.html	$45; links a Web server to FoxPro databases

continues

Table 23.1 Continued

Name	URL	Comment
Discussion Room Utilities		
GenesisJive	http://www.webgenesis.com/webgenesis/products/genesisjive.html	$295; brings full-featured conferencing capabilities to a Web server
Interaction/IP	http://www.ifi.uio.no/~terjen/interaction/	Provides dynamic Web services such as threaded discussions, chat rooms, and shopping carts
WebCrossing	http://webx.lundeen.com/	$395; enables text-based online discussion groups on your Web server
WebNews		Helps archive online discussions
Dynamic Web Page Utilities		
NetCloak	http://www.maxum.com/NetCloak/HomePage.html	$195; provides dynamic generation of text in HTML documents
Romulan	None available	$20; enables you to hide certain pages from certain machines
SmartPage	None available	$20; lets you add variables to your Web pages, including, date, time, counters, and voting
Webink Lite	http://www.webink.com/	$475; enables the creation of dynamic Web sites
File Listing Utilities		
Indexer.cgi	http://ape.com/diana/indexing.html	"Chocolateware"; lists the files in a folder with a variety of options
listdir.cgi	http://weyl.zib-berlin.de/HTMLs_English/lutz_programs.html#listdir	Lists the files in a specific folder; one version supports folder aliases as well
Apple NetFinder	http://cybertech.apple.com/AppleNetFinder.html	Free; provides a Finder-like display of files in a folder
WebSTAR Indexer	http://www.dow.com/~haberman/wsi/wsi.html	Lists the files in one or more folders for users

Name	URL	Comment
Forms Utilities		
Email.acgi	http://www.lib.ncsu.edu/staff/morgan/email-cgi.html	Free; delivers the contents of form entries to an email address
Flexmail	http://www.netdreams.com/net.dreams/software/flexmail/README.html	$20; delivers the contents of form entries to an email address
Forms.acgi	http://web77.biola.edu/~steve/cgi/forms/	Free; delivers the contents of form entries to an email address
FormSaver	http://ns.iliad.com/pliner/formsaver/	Saves the contents of form entries to a tab-delimited text file
NetForms	http://www.maxum.com/NetForms/HomePage.html	$195; automatically converts contents of forms to HTML
Imagemap and Graphics Utilities		
Frameserver	http://reddwarf.wmw.utwente.nl/pub/www/persons/vertegaal/software/aboutframeserver.html	Emailware; enables you to serve constantly changing images from a camera on a Web page
Mac-ImageMap	http://weyl.zib-berlin.de/imagemap/Mac-ImageMap.html	Free; makes it easy to serve imagemaps
MapServe	http://www.spub.ksu.edu/other/machttp_tools/mapserve/	$20; enables Web servers to serve imagemaps
MacWebCam	http://www.ccnet.com/~parasoft/webcam/index.html	$39; serves ever-changing images on your Web server from a video camera
ServerScreen Capture	http://www.maller.com/	Free; displays what's showing on the Macintosh screen when activated
Miscellaneous Utilities		
Finger CGI	http://www.westmont.edu/webmaster/readme.nclk	Free; enables users to access Finger servers from a Web page
FireSite	http://www.clearway.com/	Various prices; WebSTAR plug-in that gives T1 speeds to 28.8 Kbps modem connections

continues

Table 23.1 Continued

Name	URL	Comment
Frontier	http://www.scripting.com/frontier/	Free; powerful scripting environment and language for creating CGIs
HomeDoor	http://www.homedoor.com/	$399; enables you to serve multiple domains from a single Web server
HyperCGI		$7; enables you to link a Web server and HyperCard
PageSentry	http://www.maxum.com/PageSentry/HomePage.html	$145; pages you when your Web server crashes
SiteCheck	http://www.pacific-coast.com/St_Pages/PCSPages/Datasheets/SiteCheckdata.html	$79; verifies links on a Web server
SiteEdit	http://www.pacific-coast.com/St_Pages/PCSPages/Datasheets/Site_Editdata.html	$39; enables you to edit HTML documents live on a Web server
WebLock	http://www.maxum.com/WebLock/	$195; enables you to set WebSTAR security using file sharing privileges set in the Finder or AppleShare
Webphone	http://reddwarf.wmw.utwente.nl/pub/www/persons/vertegaal/software/aboutwebphone.htmlNetPhone or CU-SeeMe or the like by clicking a link in your Web page	Emailware; enables people to call you using
Redirection Utilities		
Make Redirect Script	ftp://ftp.starnine.com/pub/extending_webstar/make_redirect.sea.hqxre	Free; helps you create direction files for WebSTAR
Meat	http://dingbatms.starnine.com/meat/about-meat.html	$5; helps you create redirection files for WebSTAR
Random and Deflect	http://kreeft.intmed.mcw.edu/software.html	Free; returns a random URL or sends the user to that URL
Random URL	http://arpp1.carleton.ca/grant/mac/cgi/random.html	Shareware; sends the user to a random URL picked from a text file

Name	URL	Comment
Statistics and Reporting Utilities		
Bolero	http://www.everyware.com/Bolero/Bolero_info.html	Provides flexible Web server logging and analysis
Count WWWebula	http://www.io.com/~combs/htmls/counter.html	$25; provides a graphical counter on your Web pages
ServerStat Lite and ServerStat	http://www.kitchen-sink.com/ss.html	$20 or $99; helps you analyze standard Web and Gopher logs
Winker	None available	$10; tracks how often certain links are followed

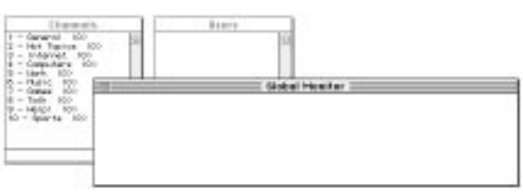
Other Servers

There are many other Internet servers available for the Macintosh, some of which are in common use and others that serve more esoteric needs. FTP servers, for instance, are still popular, whereas there isn't much call for Gopher servers any more. People who want to run Internet service providers entirely on Macs often lament the lack of a Usenet news server for the Mac, but another hole, domain name server software, was recently filled by three separate programs.

Most of the programs mentioned in this section are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/inet>`, and I've also included Web pages where available.

Chat

Chat 2.1pre12 enables you to run a chat server on your Macintosh, much like IRC itself. It's limited in comparison to IRC, so unless you have a specific use in mind, it might make more sense to use Homer and a private channel on IRC than it does to attempt to run your own chat server. Chat was originally created by the ubiquitous Peter Lewis and was significantly updated by Nathan Neulinger, who has made it shareware and charges $10. Unfortunately, it does not appear that Nathan is maintaining Chat; for similar functionality, check out NetRPG coming up.



Daemon

http://www.share.com/peterlewis/daemon/daemon.html

Peter Lewis's free Daemon 1.1 is a generalized server program that can provide services to the appropriate clients. Basically, if you want to provide a Finger server, a Whois server (a variant of Finger that is generally less personal), an Ident server (fairly useless on a single-user Macintosh), and a Daytime, Time, and NTP (Network Time Protocol) server, Daemon is the program for you. Daemon is a background-only application, so it has no interface—you configure it through a plain text Plan file.

Daemon Killer

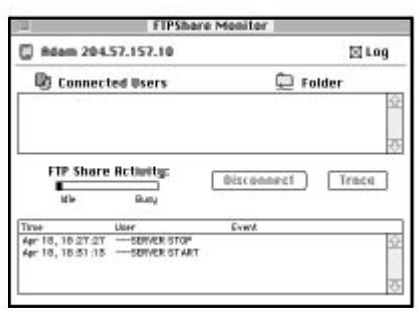
http://www.eskimo.com/~ravensys/software.html

The problem with a faceless background application such as Daemon is that there's no way to quit it without restarting your Mac. The free Daemon Killer from Raven Systems solves this problem by quitting Daemon when you double-click the Daemon Killer icon. It's that simple—there's nothing more to it.

FTPShare

http://www.wpine.com/

The commercial FTPShare 3.13 was originally published by About Software Corporation (ASC), although it appears that White Pine has now purchased ASC. I couldn't find any updated information about FTPShare on the White Pine Web site, but FTPShare enables you to run an FTP server on your Mac. FTPShare has four pieces: a setup application, a monitoring application, an application to define user profiles, and an extension that does most of the work, since none of the applications need be open for FTPShare to work. FTPShare supports up to 20 simultaneous clients and claims that it works well in the background.



GopherSurfer

`gopher://boombox.micro.umn.edu:70/11/gopher/Mac_server`

There isn't much call for Gopher servers these days, but other than NetPresenz and InterServer Publisher, you might look at GopherSurfer 1.1b3r2 from the University of Minnesota. Along with basic serving of documents to Gopher clients, GopherSurfer can work with AppleSearch, Apple's searching engine. So, if you are serious about setting up a searchable Gopher server on a Mac, check out the combination of GopherSurfer and AppleSearch. Like TurboGopher, GopherSurfer is free for noncommercial use—commercial organizations should contact the Gopher team at the University of Minnesota.

MacDNS

`http://cybertech.apple.com/MacDNS.html`

Apple's free MacDNS enables you to run a domain name server on your Mac, which for a long time wasn't possible. MacDNS has a clean and easy-to-use interface, but DNS is still not for the faint of heart or the Internet-inexperienced. In addition, MacDNS can't do recursive lookups, although it does cache lookups and serve them from the cache. The main reason you'd want to run MacDNS is that doing a domain name lookup internally on a network might be a good bit faster than doing the lookups to the domain name servers that your Internet provider runs.

MacMud

Mimir Reynisson's free MacMud is a Macintosh implementation of a MUD. MacMud is a definite instance of "If you have to ask, you won't understand it." I didn't understand it, even after reading the minimal documentation, but I gather that if

continues

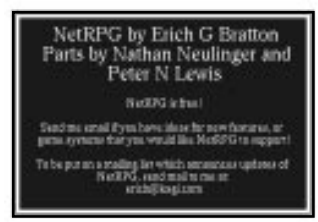
MacMud, *continued*

you want to run your own MUD on a Macintosh permanently connected to the Internet, you can use MacMud, which is a port of the Unix LPMud program. One of the pieces of documentation is a description of MacMud's scripting language, but even that documentation is fairly minimal.

NetRPG

`http://www.lextech.com/egb/netrpg.html`

For people who used to play role-playing games such as TSR's lawyer-laden Dungeons® & Dragons™ but whose games disappeared as friends moved on, check out Erich Bratton's free NetRPG 2.55 for a renewed fix. Based on the Chat server originally written by Peter Lewis and updated by Nathan Neulinger, NetRPG is essentially a server for running D&D-type games, although you can also use it as a basic chat server (which it does better than the older Chat, upon which it is based). Players connect via Telnet or through a more suitable program such as MUDDweller, and the entire game takes place in text. Sounds like a lot of work to me, but then again, so are real-life role-playing games.



NonSequitur

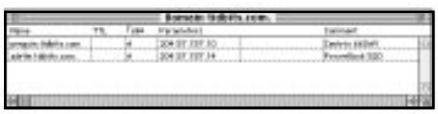
`http://www.gross.net/sw/nonsequitur/`

The free NonSequitur 0.8, written by Glenn Anderson (who also wrote Apple Internet Mail Server) and Stephan Somogyi, is a domain name server like MacDNS. However, NonSequitur has no Macintosh interface; you configure it by editing a text file called Hosts. The Hosts file uses the same syntax as the Unix equivalent, called BIND, so if you know how to configure BIND, you'll be at home with NonSequitur (which can also use existing BIND-format files. Also unlike MacDNS and QuickDNS Pro, NonSequitur does not support recursion or caching.

QuickDNS Lite and QuickDNS Pro

`http://www.menandmice.is/`

The $49 shareware QuickDNS Lite 1.0.3 and the $290 QuickDNS Pro 1.0.1 are domain name servers for the Macintosh. QuickDNS Lite is a caching-only domain name server, so all it does is cache lookups to frequently visited sites (which is handy for improving performance on an otherwise overloaded DNS server). QuickDNS Pro, in contrast, is the most fully featured domain name server available for the Mac. It has a clean Mac interface and provides primary, secondary, and recursive name service. Also, testing done by the developers, Men and Mice, indicates that QuickDNS Pro outperforms even Unix domain name servers. If you need to run DNS on a Mac, QuickDNS Pro should do everything you want.



RealAudio

`http://www.realaudio.com/products/server.html`

Progressive Networks has created a RealAudio 2.0 Server that works on the Mac, so if you want to serve RealAudio files, you're in luck. You do need a Power Mac with at least 16MB of RAM and a Web server running on it, not to mention a fast connection. Prices range from $495 for five simultaneous streams of audio up to $8,495 for 100 simultaneous streams. There's also a yearly fee on top of the basic license price if you want upgrades and support. Finally, you'll also want the RealAudio Encoder, which enables you to compress audio for live or on-demand playback.

Script Daemon

Script Daemon is yet another tiny background application from Peter Lewis. It enables you to telnet to your Macintosh from another machine and enter AppleScript commands. Needless to say, it enables only the owner (using the Owner name and password) to log in for security reasons. Peter states up front that Script Daemon is rather rough, which is one reason he released it for free and without many features. He's waiting to see how

continues

Script Daemon, *continued*

people attempt to use it and what questions and suggestions they have before he spends more time on it. Script Daemon makes much sense only if you have a permanent connection to the Internet. Still, being able to telnet to a Macintosh and then enter AppleScript commands and run AppleScript scripts is a neat idea, so if you can imagine how you would use it, check out Script Daemon.

SOCKS

Peter Lewis's $50 shareware SOCKS 1.0.1 implements version 4 of the SOCKS firewall protocol, which means that it enables a Macintosh to become a SOCKS server. Users who then have SOCKS-compatible Internet clients can connect to the SOCKS firewall, at which point the server connects to the outside Internet for the user. In all likelihood, you have utterly no use for SOCKS; those people who do will know what to do with it. SOCKS has no interface, and you must configure it with ResEdit.

Utilities

Running an Internet server involves quite a bit more software than just the server programs themselves. You might, for instance, need to configure and administer the machine over the Internet, and for that, you need Timbuktu Pro. Or, you might be concerned about software crashing when you can't check in to restart the machine, and there are products that can help out in that situation as well. Everyone who runs a server has a bag of tricks full of utility software, and here are a few of my favorites. AutoBoot, Keep It Up, and Okey Dokey are available in `<ftp://ftp.tidbits.com/pub/tidbits/tisk/util/>`, and I've listed Web pages for the other products mentioned.

AutoBoot and Keep It Up

Karl Pottie's shareware AutoBoot 1.4.5 ($20) and Keep It Up 1.3 ($25) are utilities that help keep an Internet server running. AutoBoot is a control panel that tries to restart your Macintosh if it crashes—obviously it can't work all the time because

it's running on the Mac that has crashed, but it can still help sometimes. Keep It Up is an application that watches certain other applications, and if they crash, Keep It Up relaunches them. After several crashes in a row, Keep It Up restarts the Mac. I find Keep It Up more generically useful than AutoBoot, but both are worth a look.

Okey Dokey

The free Okey Dokey 1.0.1 is a tiny control panel from Dan Walkowski and Brent Pease that has but one purpose in life—it clicks OK buttons in modal dialog boxes. There's nothing more frustrating than a program hanging your server by putting up an informative dialog box that requires you to click the OK button to continue. Install Okey Dokey, and those dialog boxes will be a thing of the past. You can configure how long Okey Dokey waits before clicking OK.

PowerKey Pro

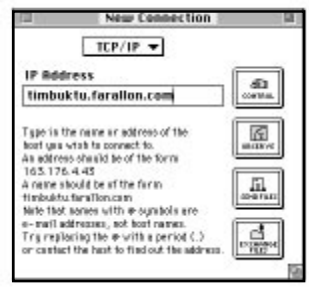
`http://www.sophisticated.com/pages/pk_pro.html`

The $120 (discounted) PowerKey Pro from Sophisticated Circuits is a necessity for anyone running a Macintosh Internet server, thanks to a single feature that appeared in version 3.1 of the software. Normally the PowerKey Pro is a piece of hardware that helps you turn a number of devices on and off all at once. However, it can also watch a Mac and restart it if it has crashed, which is incredibly useful for any server that doesn't have 24-hour supervision. You can also set up the PowerKey Pro to reboot a Mac when you call a certain telephone number and let the phone ring a user-defined number of times. Highly recommended.

Timbuktu Pro

`http://www.farallon.com/www/gen/software.html`

If you need to administer an Internet server at another physical location, you need Farallon's Timbuktu Pro 2.0 remote-control application ($100 online, $140 for disks and manuals). Timbuktu enables you to observe, control, or trade files with a remote Macintosh or Windows machine over AppleTalk or over the Internet. Timbuktu Pro has worked well for the time I've spent administering my remote Internet. The Macintosh lives elsewhere, but it's directly connected to the Internet, and I can check in any time with Timbuktu Pro. Although Timbuktu Pro's speed is impressive, it's far slower than normally using a Mac. However, programs run at full speed on the host Mac—the only slowdown is in screen redraw. There's a free trial version and more information on Farallon's Web site.



Appendix A Internet Starter Kit Providers

To help you get connected to the Internet as quickly and inexpensively as possible, we have developed a set of Internet Starter Kit providers. These providers, which include a number of local, national, and international organizations, are included within the Internet Configurator, which means that you can configure your system to work with one of these providers more easily than other Internet providers.

> **FYI**
> The information below has been provided by the Internet access providers themselves, so we can't be responsible for any mistakes or changes. Always double-check rates and the like before signing up.

Organizing these providers was fairly tough, since some cover more than one area and some cover the whole country. The information on these pages, along with the discussion in Chapter 2, "Choosing a Connection," should be enough for you to figure out which provider you would like to try.

> **FYI**
> We didn't have room to include the Web page URLs for each of these providers, but here's a trick that should work almost all the time. Take the domain from the email address listed (the part after the `@` character) and put `www.` before it to guess at the URL. So, if the email address is `info@tidbits.com`, you could guess at the Web page being `<http://www.tidbits.com/>`. Clever, eh?

What should you look for? To keep your costs down, you probably want to find a provider you can call with a local phone call, so check the Cities and Area Codes items. There may be several that you can choose from, so use the rate information to figure out which is most advantageous for you. Also check the nationwide providers, because you might actually end up with lower costs by using one of them. Of course, if there is no local provider listed in your area, one of the national providers may be your best bet. If you don't live in the U.S., check the international providers who have agreed to work with us. Once you have decided on a provider to try, use the contact information to sign up with that provider.

FYI

Appendix B, "Providers of Commercial Internet Access," contains another list of providers, but the Internet Configurator can't configure automatically for those providers. With one of them, you're on your own. Still, if you can't find a provider that's right for you below, check Appendix B.

This sounds more complicated than it really is. Don't worry, it isn't that tough. Here's a description of the data you will find for each provider:

- Provider Name: This is the name of the company that provides the access; for example, Northwest Nexus.
- Cities: These are the cities that generally can get local call access to the provider. Area codes and cities don't always match, so look also for the area codes that are covered.
- Area Codes: These are the area codes from which you can access the provider via a local call—sometimes calls within your own area code may have tolls, so be aware of what prefix you must dial to connect.
- Rates: Look here to find out how much it will cost you to use a provider.
- Contact Info: Each provider has listed its phone number and email address for you to use.

FYI

The ways that you sign up with different providers vary widely, and I had no space to include sign-up instructions for each Internet Starter Kit Provider in this appendix. However, all of this information is in the Internet Configurator program on the Internet Starter Kit CD-ROM. The Internet Configurator provides a searching interface for the 350 or so providers covered, and, once you've selected an Internet provider, helps you configure your Internet software for that provider.

BTW
Remember that coverage areas don't always match geographic locations, so make sure you look over several providers in order to get the best connection for you.

Biddeford Internet Corp.

Cities: Augusta, Biddeford, Damariscotta, Kittery, Lisbon Falls, Portland, Sanford, Wiscasset, Lewiston, ME
Area Codes: 207
Rates: Silver: $25 activation fee, $9.95/mth and $1.95/hr after 10 hrs. Gold: $25 activation fee, $29.95/mth and $.50/hr after 100 hrs.
Phone: 207-286-2057
Email: support@biddeford.com

CyberNexus

Cities: Biddeford, Kennebunk, ME
Area Codes: 207
Rates: $30/mth for PPP account. No time limit.
Phone: 207-283-4235
Email: info@cybernexus.net

Agate Internet Services

Cities: Augusta, Bangor, Belfast, Caribou, East Millinocket, Ellsworth, Freeport, Gardiner, Gray, Greenville, Guilford, Lincoln, New Glocester, Portland, Presque Isle, Rumford, Sidney, Waterville, ME
Area Codes: 207
Rates: $30/mth for 30 hrs, $1 each add'l hr. $20/mth for 15 hrs, $1.50 each add'l. $10/mth for 10 hrs, $2 each add'l hr.
Phone: 800-245-6623
Email: info@agate.net

WorldPath Internet Services

Cities: Gilmanton IronWorks, Farmington, Sanbornville, NH
Area Codes: 603
Rates: Fast Track: $9.95 for 10 hrs/mth + $1/add'l hr. Main Line: $19.95 for 40 hrs/mth + $.50/add'l hr. Expressway: $29.95 for 100 hrs/mth + $.50/add'l hr. CyberCruiser: $49.95 for 200 hrs/mth + $.30/add'l hr. One-time $25 setup fee.
Phone: 603-859-5000, 603-364-5000
Email: support@worldpath.net

Empire.Net, Inc.

Cities: Nashua, Derry, Salem, Milford, NH; Tyngsboro, MA
Area Codes: 603, 508
Rates: PPP-50: Up to 50 hrs/mth for $19.95, $20 activation. PPP-150: Up to 150 hrs/mth for $49.95, $20 activation.
Phone: 603-889-1220
Email: info@Empire.Net

The Connecticut River Network

Cities: All of VT and NH
Area Codes: 802
Rates: $25 setup fee, monthly charge of $19.95 for 50 hours. Additional hours are $.50/hr with any revenues from additional hours used given back to the community.
Phone:C®02«57-8004
Email: support@ConnRiver.net

Sovernet, Vermont's Sovereign Internet Connection

Cities: Throughout VT
Area Codes: 802
Rates: SLIP/PPP (shell included), single-user intermittent dial-up (up to 33.6Kbps): $20/mth with a one-time $20 setup charge. Local call access.
Phone: 802-463-2111
Email: info@sover.net

CMS on.the.net

Cities: Hyannis, MA
Area Codes: 508
Rates: Variable for service.
Phone: 800-359-3151
Email: sales@cms.net

Infinet (T&G Online)

Cities: Worcester, MA
Area Codes: 508

Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Shore.Net

Cities: Boston, Burlington, Georgetown, Gloucester, Haverhill, Lawrence, Littleton, Lowell, Lynn, Manchester-by-the-Sea, Marlborough, Marshfield, Wellesley, MA.
Area Codes: 617, 508
Rates: SLIP/PPP (standard): $30/mth includes 90 hrs ($.50/hr thereafter), includes shell account with 10MB disk quota, Web home page, $50 setup fee. Additional user accounts: $10/mth includes 20 hrs ($.50/hr thereafter), 5MB disk quota, $10 setup fee.
Phone: 617-593-3110
Email: info@shore.net

TIAC - The Internet Access Company

Cities: Boston, Ashburnham, Athol, Attleboro, Brockton, Danvers, Fall River, Gloucester, Harwich, Haverhill, Kingston, Leominster, Littleton, Greater Lowell, Marlborough, Martha's Vineyard, Mashpee, Medway, New Bedford, Provincetown, Rowley, Springfield, Walpole, Greater Worcester, MA; Washington D.C.; Portland, ME; New York, NY; Providence, Woonsocket, RI; Concord, Derry, Dover, Epping, Portsmouth, NH; Hartford, CT; Hackensack, NJ
Area Codes: 617, 508, 413, 202, 207, 212, 401, 603, 860, 201
Rates: Dial-up SLIP/PPP (up to 100 hrs/mth): $29/mth ($20 initial fee). Dial-up SLIP/PPP (up to 300 hrs/mth): $49/mth ($20 initial fee). Special rate plans available.
Phone: 617-276-7200
Email: info@tiac.net

UltraNet Communications, Inc.

Cities: Blackstone, Clinton, Fitchburg, Framingham, Kingston, Littleton, Lowell, Marlboro, Middleboro, NewBedford, Oxford, Taunton, Waltham, Westboro, Worcester, Wrentham, MA; Dover, Exeter, Manchester, Nashua, Pelham, Portsmouth, NH; Providence, RI
Area Codes: 508, 617, 603, 401
Rates: Economy Plan: $9.95/mth for 10 hrs, plus $2/hr beyond that. Value Plan: $19.95/mth for 100 hrs, plus $1/hr beyond that. Unlimited Plan: $29.95/mth for unlimited connect time.
Phone: 508-460-1336
Email: info@ultranet.com

WorldNET

Cities: Beverly, Boston, Burlington, Cambridge, Canton, Fitchburg, Framingham, Lexington, Lynnfield, Malden, Marlboro, Northboro, Norwood, Plymouth, Provincetown, Quincy, Randolph, Reading, Saugus, Shrewsbury, Waltham, Westboro, Woburn, Worcester, MA
Area Codes: 508, 617
Rates: $29.95/mth unlimited usage. Up to 5 email addresses included. 10MB of Web space for noncommercial page.
Phone: 617-551-9977
Email: info@wn.net

CyberNet Ramp Online

Cities: Ashburnham, Athol, Attleboro, Bedford, Boston, Brockton, Danvers, Fall River, Gloucester, Haverhill, Kingston, Leominster, Littleton, Lowell, Marlboro, Martha's Vineyard, Mashpee, Medway, New Bedford, Provincetown, Rowley, Springfield, Walpole, Whitinsville, Worcester, MA; Hackensack, NJ; Washington D.C.; Portland, ME; New York, NY; Providence, Woonsocket, RI; Concord, Derry, Dover, Epping, NH; Hartford, CT
Area Codes: 508, 201, 202, 207, 212, 401, 413, 603, 617, 860
Rates: $29 for 100 hrs flat fee. $49 for 300 hrs flat fee.
Phone: 617-276-7200
Email: info@tiac.net

Infinet

Cities: Hartford, CT
Area Codes: 860
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Paradigm Communications, Inc.

Cities: Cheshire, EastHaddam, Hartford/Newington, Middletown, New Haven, Newtown, Norwich, Southbury, Stamford, Torrington, Trumbull, Wolcott, CT
Area Codes: 203, 860
Rates: Personal PPP Plus: $35/mth, 75 hrs, $1/hr over 75, $30 startup fee. Low-Volume PPP Plus: $20/mth, 10 hrs, $2/hr over 10, $30 startup fee. Power User PPP Plus: $65/mth, 150 hrs, $1/hr over 150, $30 startup fee.
Phone: 203-250-7397
Email: info@pcnet.com

Call-Net

Cities: New Haven, CT
Area Codes: 203
Rates: $25/mth for 20 hrs of SLIP or PPP access, plus $1 each add'l hr, $25 startup fee. $9.95/mth for 5 hrs of SLIP or PPP access, $2 for each add'l hr, $25 startup fee.
Phone: 203-389-7130
Email: info@callnet.com

Connix

Cities: Hartford, Midldefield, New Haven, Norwich, Stamford, Trumbull, Farmington, New Canaan, Old Lyme, CT
Area Codes: 860, 203
Rates: Plan A: $20 startup, $19.95 for 120 hrs/mth, $.75/extra hr. Plan B: $20 startup, $45.95 for 300 hrs/mth, $.75/extra hr.
Phone: 860-349-7044
Email: info@connix.com

CyberShore

Cities: Madison, Clinton, New Haven, Middletown, Old Saybrook, Westbrook, Branford, North Haven, CT
Area Codes: 860, 203
Rates: Platinum: unlimited, $24.95. Gold: 40 hrs, $19.95. Silver: 20 hrs, $15.95. Basic: 10 hrs, $10.95. Rates changing, check back soon!
Phone: 203-245-1175
Email: info@cshore.com

Internet Connection, Inc.

Cities: Brockton, FallRiver, Kingston, Mansfield, Needham, New Bedford, Taunton, MA; Providence, RI
Area Codes: 508, 617, 401
Rates: Intro: $4.95/mth, $1.50/hr after 5 hrs. Light, $9.95/mth, $1/hr after 10 hrs. Medium Use: $14.95/mth, $.75/hr after 15 hrs. Heavy Use: $19.95, $.50/hr after 100 hrs). Unlimited Use: $24.95, no hourly charges!
Phone: 508-261-0383
Email: info@ici.net

TunaNet (division of InfoHouse, Inc.)

Cities: New York, NY
Area Codes: 212
Rates: $20/mth unlimited 28.8 or 33.6 PPP. $25/mth with 5MB personal Web page. 7 mths if you prepay for 6, 12 months if you prepay for 10.
Phone: 212-805-2470
Email: info@tuna.net

LinkAmerica Internet Services

Cities: New York, NY
Area Codes: 212
Rates: Personal PPP accounts: $25/mth for unmetered access. Up to 5MB of disk space for personal Web pages included. Additional email accounts $1/mth per name.
Phone: 212-334-0331
Email: info@link-net.com

Echo Communications Group, Inc.

Cities: New York City, NY
Area Codes: 212
Rates: $25/mth, flat fee. Features: 150 hours of usage of a PPP account per mth, 2MB of space on our Web server for pages.
Phone: 212-292-0900
Email: info@echonyc.com

Digital Telemedia

Cities: New York City, Lynbrook, New Rochelle, NY
Area Codes: 212, 718, 516, 914
Rates: Includes unlimited 14.4/28.8Kbps dial-up PPP Internet usage, Web, POP3 access, FTP, Telnet, news, and more. No startup fee. $24.95/mth.

Phone: 800-363-3428
Email: info@dti.net

InterNet eXchange

Cities: New York City, Garden City, NY
Area Codes: 212, 516, 217
Rates: Standard PPP dial-up account: $19.95/mth with a $5 setup, $200/yr.
Phone: 212-935-3322

Interport Communications

Cities: New York, Mount Vernon, Great Neck, NY; Stamford, CT
Area Codes: 212, 914, 516, 203
Rates: $25/mth, 60 hrs included, $1.50 per additional hr. Includes shell access and 5MB disk space for noncommercial use.
Phone: 212-989-1128 ext. 221
Email: info@interport.net

I-2000 Internet Services

Cities: New York City, Long Island City, White Plains, NY; Babylon, Suffolk Co., Farmingdale, Nassau Co., Mineola, Riverhead, Selden, Elizabeth, Union Co., Hackensack, Metuchen, Warren, NJ; Philadelphia, PA; Stamford, Fairfield Co., CT
Area Codes: 212, 718, 516, 908, 201, 914, 215, 203
Rates: Analog 28.8 or 64K ISDN (unlimited), Web page with 5MB FTP space: $29.95. Analog 28.8 or 64K ISDN (60 hrs/mth), Web page with 5MB FTP space: $19.95.
Phone: 800-464-3820
Email: info@i-2000.com

NetHeaven

Cities: Ballston Spa, Glens Falls, North Creek, Lake Placid, NY
Area Codes: 518
Rates: PPP with many extras: $30/mth.
Phone: 800-555-1212
Email: info@netheaven.com

Klink Net Communications

Cities: Amsterdam, Gloversville, Northville, Lake Pleasant, NY
Area Codes: 518
Rates: Unlimited access for $24.95. 40 hrs for $19.95. 15 hrs for $9.95. 5 hrs for $4.95. $.75/hr after limit.
Phone: 800-KLINK-123
Email: info@klink.net

NextStep Access Services

Cities: Kingston, Poughkeepsie, NY
Area Codes: 914
Rates: Basic PPP, 60 hrs: $19.95. Heavy PPP, 120 hrs: $29.95.
Phone: 914-338-6640
Email: info@netstep.net

Infinet (Westchester Today)

Cities: White Plains, NY
Area Codes: 914
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Cloud 9 Consulting, Inc.

Cities: White Plains, Mount Kisco, NY
Area Codes: 914,
Rates: SLIP/PPP: $45/quarter. Enhanced SLIP/PPP: $60/quarter (includes Unix shell).
Phone: 914-696-4000
Email: info@cloud9.net

InterAxess

Cities: Syracuse, NY
Area Codes: 315
Rates: $23.95/mth unlimited PPP/SLIP. Additional email addresses extra, group and professional group rates available.
Phone: 315-432-1926
Email: info@axess.net

Global 2000

Cities: Albany, NY
Area Codes: 518, 315
Rates: $25: unlimited access. $10: 10 hrs of access.
Phone: 518-452-1465 or 315-733-0984
Email: info@global2000.net

AlbanyNet

Cities: Albany, NY
Area Codes: 518
Rates: $13.89/mth for 15 hrs, $1/additional hr. $24.95/mth for unlimited usage.
Phone: 518-462-6262
Email: info@albany.net

Art Matrix - Lightlink

Cities: Ithaca, NY
Area Codes: 607
Rates: $20/mth flat rate for interactive use.
Phone: 607-277-0959
Email: info@lightlink.com

ServiceTech, Inc.

Cities: Rocheser, Buffalo, Syracuse, Utica, Jamestown, Dansville, Hornell, Hammondsport, Corning, Ithaca, Binghamton, Owego, NY
Area Codes: 716, 315, 800, 607, 416
Rates: $19.99/mth flat rate, unlimited usage. Substantial prepayment discounts available. All accounts include a static IP address. 10MB of Web and FTP space. We register domain names at no charge. Free software.
Phone: 800-454-4874
Email: info@servtech.com

ASB Internet, Inc.

Cities: Hicksville, Ronkonkoma, Ridge, NY
Area Codes: 516
Rates: Personal SLIP/PPP accounts, no startup fees, no hourly connect time charges, unlimited online time: $19.95/mth, $199.50/yr.
Phone: 516-981-1953
Email: info@asb.com

Cybernex, Inc.

Cities: New York City, NY; Boonton, Cragmere, Dover, Dunellen, Erskine Lakes, Hackensack, Jersey City, Little Falls, Livingston, Matawan, Metuchen, Monmouth Junction, MountainView, Newark, Red Bank, Succusunna, Summit, Toms River, Westwood, Souix Falls, NJ
Area Codes: 212, 201, 908, 605
Rates: Personal dial-up PPP: $19.95/mth, unlimited time. Corporate dial-up PPP: $29.95/mth, unlimited time.
Phone: 201-664-0419
Email: info@cybernex.net

Infinet (Philadelphia Online)

Cities: Cherry Hill, NJ
Area Codes: 609
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Skylands Networks, Inc.

Cities: Sussex, Franklin, Newton, Montague, NJ
Area Codes: 201
Rates: $9.95/mth for 10 hrs + $1.95/additional hr. $29.95/mth for untimed access.
Phone: 201-875-1274
Email: info@skylands.net

Carroll-Net, Inc.

Cities: Hackensack, Ridgewood, Westwood, Union City, Passaic, NJ
Area Codes: 201
Rates: $18/mth, paid quarterly.
Phone: 201-488-1332
Email: info@carroll.com

Eclipse Internet

Cities: Belvidere, Bloomfield, Hampton, Morristown, Netcong, Plainfield, Roselle, Somerville, Whitehouse, NJ
Area Codes: 908, 201
Rates: Prospector: 15 hrs/mth at $10/month, $25 setup, $1.50/hr for add'l hrs. Full PPP dial-up: min. 3-mth term, Navigator, 100 hrs/mth at $25/mth, $25 setup, $.75/hr for add'l hrs, Web pages available ($25 setup), up to 4 extra mailboxes included. Voyager: 300 hrs/mth at $45/mth, $25 setup, $.50/hr for add'l hours, Web pages available ($25 setup), up to 4 extra mailboxes included. Discounts for 6- and 12-mth terms.
Phone: 800-483-1223
Email: info@eclipse.net

Crisp Network Solutions, Inc.

Cities: Franklin Park, Bound Brook, NJ
Area Codes: 908
Rates: 23.95/mth flat rate with virtually unmetered access.
Phone: 908-885-0808
Email: info@crisp.net

Garden Networks

Cities: Pine Brook, Morristown, Newton, Wayne, Cliffside Park, New Brunswick, NJ
Area Codes: 201, 908

Rates: Unlimited PPP access at 33.6K: $20.77/mth (prepaid for 1 year). Unlimited ISDN PPP: $49.95/mth.
Phone: 201-808-5558
Email: info@garden.net

Infinet (Philadelphia Online)

Cities: Philadelphia, PA
Area Codes: 215, 610
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

PlantagaNet, Inc.

Cities: Doylestown, Levittown, Philadelphia, PA
Area Codes: 215
Rates: Month-to-month $19.95. 6 months $99. 1 year $179.88.
Phone: 215-489-2850
Email: sales@plantaganet.com

FishNet

Cities: Philadelphia, King of Prussia, PA
Area Codes: 215, 610
Rates: One-time setup fee $35, 19.95/mth for unlimited usage.
Phone: 610-337-9994
Email: info@pond.com

Net Access

Cities: Wyndmoor, Levittown, Warrington, Chester Heights, Valley Forge, BrynMawr, Swarthmore, Conshohocken, Philadelphia, Chestnut Hill, PA; Mt. Holly, NJ
Area Codes: 215, 610, 609
Rates: PPP: $20 setup + $180/yr ($15/mth), or $30 setup + $20/mth paid monthly. Includes a Unix shell account.
Phone: 215-576-8669
Email: support@netaxs.com

ProLog

Cities: Doylestown, Allentown, Bangor, Berwyn, Green Hills (Reading), Ironton, Lehighton, Palmerton, Sassamansville (Pottstown), Topton, Bloomsburg, Camp Hill, Ephrata, Frackville, Hawley, Hazleton, Honesdale, Lancaster, Lansford, Lebanon, Lewisburg, Mahanoy City, Mansfield, Middleburg Area, Mifflinburg, Milford, Milton, Minersville (Pottsville), Scranton, Shamokin, Stroudsburg, Sunbury, Wellsboro, Wilkes Barre, Williamsport, York, PA; Clinton, Holland Township, Sparta, NJ
Area Codes: 215, 610, 717, 908, 201
Rates: Full access (SLIP/PPP): $19.95/mth plus one-time $25 setup fee. (Fee may be waived during special offers and promotions.) Also if paid up for full year, $17.95/mth.
Phone: 800-610-8266
Email: info@ptd.net

Infinet TRIbutaries

Cities: Pittsburgh, Greensburg, PA
Area Codes: 412
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Lancaster Online)

Cities: Lancaster, PA
Area Codes: 717
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Gateway HometownPlus)

Cities: Monroeville, PA
Area Codes: 412
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Schuylkill)

Cities: Pottsville, PA
Area Codes: 717
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Westomoreland Online, Inc.

Cities: Greensburg, Ligonier, Belle Vernon, Mt. Pleasant, Indiana, Trafford/Murrysville, New Kensington, Irwin, Pittsburgh, PA
Area Codes: 412
Rates: $18.95/mth flat rate, no overtime, no setup charges.
Phone: 412-830-4900
Email: sysop@westol.com

Chester County Internet Services, Inc.

Cities: HoneyBrook, Downingtown, Parkesburg, Coatesville, West Chester, MarcusHook, Collegeville, Avondale, Phoenixville, PA
Area Codes: 610
Rates: Standard PPP dial-up: $19.95 for 90 hrs, $1/hr extra hours. Includes free startup package. $35 one-time setup.
Phone: 610-273-7829
Email: info@chesco.com

COMCAT INC.

Cities: Doylestown, Jenkintown, Langhorne, Philadelphia, Allentown, Ardmore, Center Point, Reading, Springfield, West Chester, PA
Area Codes: 215, 610
Rates: $19.95/mth. $54.95 for 3 months. $99.95 for 6 months. $179.95/yr. $25 setup.
Phone: 215-230-4923
Email: info@comcat.com

Infinet (Wilkes-Barre)

Cities: Wilkes-Barre, PA
Area Codes: 717
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Centre Daily Times)

Cities: State College, PA
Area Codes: 814
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Oasis Telecommunications

Cities: Allentown, Swarthmore, Perkasie, PA
Area Codes: 610, 215
Rates: $18/mth flat rate for full Internet access. Discounts for one-year commitment. Payment accepted by credit card and personal checks.
Phone: 610-439-8560
Email: info@ot.com

Pittsburgh OnLine, Inc.

Cities: Pittsburgh, PA
Area Codes: 412
Rates: $24.95/mth unlimited for personal account. $50/mth for basic business account.
Phone: 412-361-8305
Email: support@pgh.net

NewTech Net

Cities: PA
Area Codes: 610, 215
Rates: Unlimited access is $10.50/mth (reflects 30% discount prepaid annual subscription), otherwise $15 paid monthly.
Phone: 800-570-7302
Email: support@newtech.net

Infinet (Carroll County)

Cities: Carroll County, MD
Area Codes: 410
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Capitol Online)

Cities: Annapolis, MD
Area Codes: 410
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Internet Interstate

Cities: Bethesda, Baltimore, MD; Chantilly, VA
Area Codes: 301, 703, 410
Rates: Internet Interstate Power Plan: 6 hrs access daily plus midnight - 8 am, $21.75/mth plus $25 setup. Internet Interstate Power Plan Special:

1 year of access as above for the cost of 10 mths, $217.50, $25 setup fee is waived.
Phone: 301-652-4468
Email: interest@intr.net

DelMarVa Online!

Cities: Salisbury, Easton, Trappe, Chestertown, MD; Dover, Milford, DE
Area Codes: 410, 302
Rates: $25/mth: unlimited hrs, dial-up PPP accounts.
Phone: 800-220-9262 x401
Email: support@dmv.com

MAGPAGE (The Magnetic Page)

Cities: Wilmington, DE; West Chester, PA
Area Codes: 302, 610
Rates: $20 for unlimited access. Includes shell account.
Phone: 302-651-9753
Email: info@magpage.com

InterNet Delaware

Cities: New Castle Co., Kent County, Sussex County, DE; S. Chester County, PA
Area Codes: 302
Rates: Basic: $9.95 for 10 hrs, 1 email account. Standard: $19.95 for 100 hrs, 2 email accounts. Preferred: $39.95 for 250 hrs, 4 email accounts. Unmetered: $11.99/mth with annual payment (New Castle county only).
Phone: 888-737-1001 or 302-737-1001
Email: info@del.net

DCANet

Cities: Wilmington, Milford, Smyrna, DE; Chester Heights, Paoli, Conshohocken, Philadelphia, Huntingdon Valley, Yardley, PA
Area Codes: 302, 610, 215
Rates: Dial-up PPP 90 hrs/mth: $19.95 monthly, $24.95 setup. Dial-up PPP 10 hrs/mth: $9.95 monthly, $24.95 setup.
Phone: 302-567-2010
Email: info@dca.net

Infinet (Washingtonian)

Cities: Washington D.C.
Area Codes: 202
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Journal Newspapers)

Cities: Washington D.C.
Area Codes: 202
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (The Washington Times)

Cities: Washington D.C.
Area Codes: 202
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

LaserNet (laser.net)

Cities: Washington D.C.; Northern VA; MD Metro Area, Prince William County
Area Codes: 703
Rates: Economy User Account: SLIPP/PPP 24-hour access, 8MB of disk space, includes one email account, free LaserNet Access Software (includes Netscape & Eudora), $192/yr ($16/mth). Star User Account: SLIPP/PPP 24-hour access, free shell, free Web page, free LaserNet Access Software, includes one email account, 8MB of disk space, IP address and domain name available, $20/mth or $228/yr.
Phone: 703-592-4232
Email: info@laser.net

ShireNet Communications Systems, Inc.

Cities: Northern VA, Western Loudoun County, VA; Washington, D.C.; MD DC suburbs
Area Codes: 703, 202
Rates: Budget PPP Account: $20 setup and $6.95/mth for up to 15 hrs/mth, additional hours $1/hr. Full Service PPP Account: $20 setup and $23/mth if billed monthly. Includes free shell account, 300 hrs/mth, and 5MB storage.
Phone: 703-444-2406
Email: info@ShireNet.com

Institute for Global Communications

Cities: Washington D.C.
Area Codes: 202
Rates: No sign-up charge. Monthly subscription fee: $12.50/mth. SF Bay Area and DC: first 12 hrs/mth free, add'l hrs $1.50/hr. National via ACCESS1: first 12 hrs/mth $1/hr, add'l hrs $2.50/hr. Via SprintNet peak time (7 am-6 pm weekdays): first 12 hrs/mth $4/hr, add'l hrs $5.50/hr. Off-peak time: first 12 hrs/mth $2/hr, add'l hrs $3.50/hr. Via 800 number: first 12 hrs/mth $5/hr, add'l hrs $6.50/hr. Call for storage charges.
Phone: 415-561-6100
Email: igc-info@igc.org

Neptune Interactive Communications

Cities: Washington, D.C.; Arlington, VA; Bethesda, MD
Area Codes: 703
Rates: PPP accounts: $10/mth with a one-time $15 setup fee. Accounts must be paid in advance in 6-month increments.
Phone: 703-924-9236
Email: info@nicom.com

digitalNATION

Cities: Alexandria, VA
Area Codes: 703, 202, 301
Rates: Citizen PPP Accounts: as little as $12.50/mth, includes 80 hrs/mth, additional hrs are $2 each. Senator PPPAccounts: as little as $15/mth for unlimitedaccess.
Phone: 703-642-5901
Email: sales@dn.net

Infinet (Daily Express)

Cities: Hampton Roads, VA
Area Codes: 804
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (pilot Online)

Cities: Hampton Roads, VA
Area Codes: 804
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Global Connect, Inc.

Cities: NewportNews/Norfolk, Richmond, Gloucester, Franklin, Petersburg, Emporia, VA
Area Codes: 804
Rates: Serious UnlimitedSLIP/PPP Access: $19.95/mth. Beginner SLIP/PPP Access: $8.25/mth for 10 hrs/mth.
Phone: 804-595-6714
Email: info@gc.net

Infinet (style weekly)

Cities: Richmond, VA
Area Codes: 804
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Star Web)

Cities: Fredricksburg, VA
Area Codes: 540
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Roanoke Times Online)

Cities: Roanoke, VA
Area Codes: 540
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (NewsEnterpriseOnline)

Cities: Elizabethtown, KY
Area Codes: 502
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Kentucky Connect)

Cities: Lexington, KY
Area Codes: 606
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

WinNET

Cities: Louisville, KY
Area Codes: 502
Rates: $19.95/mth: ISDN access and 28.8 access, 100MB Web site and 10MB FTP site, 20 hrs direct dial, or 4 hrs 800 connect.
Phone: 800-589-5999 ext.3
Email: info@win.net

Interpath

Cities: Asheville, Burlington, Charlotte, Chapel Hill, Eden, Elizabeth City, Fayetteville, Gastonia, Goldsboro, Greensboro, Greenville, Hickory, High Point, Kill Devil Hills, Lumberton, Newberry, Raleigh, Rocky Mount, Roxboro, RTP, Salisbury, Sanford, Wilmington, Winston-Salem, NC; Columbia, Greenville, SC; Washington D.C.
Area Codes: 704, 910, 919, 803, 703, 800
Rates: SuperCruiser PPP: $29.95/mth, $25 setup, dynamic address, electronically billed. Weekender! PPP: $9.95/mth, 10 hrs, $2/extra hr, $25 setup, dynamic address, electronically billed, access from 6 pm Fri. through 6 am Mon.
Phone: 800-890-6305
Email: info@interpath.com

GroveLink

Cities: Murphy, NC
Area Codes: 704
Rates: Budget account: $9.95 for 5 hrs, $2/hr over 5. Standard account: $29.95 for 30 hrs, $1/hr over 30. Power User account: $50 for 100 hrs, $.50/hr over 100.
Phone: 704-837-9200
Email: support@grove.net

Netpath, Inc.

Cities: Burlington, Mebane, NC
Area Codes: 910, 919
Rates: $10 for 20 hrs/mth. $20 for 50 hrs/mth. $ 30 for 100 hrs/mth. $40 for 150 hrs/mth. $60 for 250 hrs/mth.
Phone: 910-226-0425
Email: info@netpath.net

Infinet (Charlotte.Com)

Cities: Charlotte, NC
Area Codes: 704
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

WebServe, Inc.

Cities: Charlotte, NC
Area Codes: 704
Rates: unlimited PPP access (unlimited hrs/mth): $35/mth. Limited PPP access (15 hrs/mth): $15/mth, $1/hr extra above 15 hrs/mth. PPP accounts include Netscape Navigator, 5 free MB personal Web space.
Phone: 704-556-7482
Email: info@Webserve.net

Infinet (Fayetteville)

Cities: Fayetteville
Area Codes: 910
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Triad Online)

Cities: Greensboro, Winston-Salem, NC
Area Codes: 910
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (hpe.com)

Cities: High Point, NC
Area Codes: 910
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (NC 5 Online)

Cities: Nashville, TN
Area Codes: 615
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Telalink

Cities: Nashville, TN
Area Codes: 615
Rates: $35/mth for 120 hrs access (28.8 or ISDN), $25 one-time startup fee. Includes 5MB Web space.
Phone: 888-Telalink
Email: info@telalink.net

Magigox Incorporated

Cities: Memphis, TN
Area Codes: 901
Rates: $30 setup fee and $30 monthly, unlimited.
Phone: 901-452-7555
Email: info@magibox.net

ISDN-Net, Inc.

Cities: Nashville, Knoxville, Memphis, TN
Area Codes: 615, 423, 901
Rates: Analog PPP: $30 for 50 hrs, $1/hr over 50. ISDN PPP: $45 for 30 hrs, $2/hr over 30.
Phone: 615-371-1625
Email: info@isdn.net

Infinet (Cyber State)

Cities: Columbia, SC
Area Codes: 803
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Carolina Online, Inc.

Cities: Anderson, Central, Clemson, Gaffney, Greenville, Spartanburg, Union, Walhalla, SC
Area Codes: 864, 800
Rates: Intro: $10.99/mth, 10 hrs free, extra hrs $2.50. Basic: $19.99/mth, 50 hrs free, extra hrs $2. Personal Surfer: $29.99/mth, unlimited interactive. Executive: $39.99/mth, 120 hrs free, extra hrs $1. 10% discount for 6 mths paid up front: $215.95 (which is an average of $35.99/mth).
Phone: 864-375-0600
Email: info@carol.net

NetDepot

Cities: Atlanta, GA; Greensboro, NC
Area Codes: 404, 770, 706, 910
Rates: $25 setup, $25/mth (unlimited access), or $25 setup, $125 for 6 mths. Special rate for Atlanta Macintosh Users Group members. All accounts include 3 additional mailboxes, 10MB personal Web space, custom alias assignment, and much more!
Phone: 770-434-5595
Email: info@netdepot.com

Icanect (Internet Communications Of America)

Cities: Miami, Homestead, Ft. Lauderdale, Boca Raton, West Palm Beach, FL
Area Codes: 305, 954, 561
Rates: $17.95 unlimited access PPP accounts. Account will be activated within 2 business days; $10 speedy access (one-time fee) to activate accounts immediatly. No setup or startup fees.
Phone: 800-422-9209, 305-829-0054
Email: support@icanect.net, sales@icanect.net

Internet Providers of Florida

Cities: South FL
Area Codes: 305
Rates: Unlimited Personal PPP account: $12.50/month. Corporate Account w/Web page and link: $300/yr.
Phone: 305-273-7978

Infinet (Bradenton Herald)

Cities: Bradenton, FL
Area Codes: 941
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Florida Today)

Cities: Brevard County, FL
Area Codes: 407
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Chronicle Online)

Cities: Crystal River, FL
Area Codes: 352
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (HeraldLink)

Cities: Fort Lauderdale, Miami, FL
Area Codes: 954, 305
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Nuestro Mundo)

Cities: Fort Lauderdale, Miami, FL
Area Codes: 954, 305
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (connecT-U)

Cities: Jacksonville, FL
Area Codes: 904
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Packetworks Inc.

Cities: Tampa, Clearwater, Sarasota, FL
Area Codes: 813, 941
Rates: $29 for 30 hrs for either analog or ISDN, $1/hr over 30, $25 one-time setup fee.
Phone: 813-446-8825
Email: info@packet.net

Shamrock Internet Services

Cities: Tampa, FL
Area Codes: 813
Rates: $20/mth. 10% discount for 6-month subscriptions, 20% discount for 12-month subscriptions.
Phone: 813-265-2913
Email: support@shamrock.net

Network Tallahassee

Cities: Tallahassee, FL
Area Codes: 904,
Rates: $15/mth, unlimited (active) access.
Phone: 904-422-2242
Email: support@nettally.com, mac.support@nettally.com

PalmNet USA

Cities: Merritt Island, FL
Area Codes: 407
Rates: $4.95 for 5 hrs/mth. $9.95 for 30 hrs/mth. $14.95 for 150 hrs/mth. $19.95 for timeless.
Phone: 407-454-4333
Email: info@palmnet.net

Action Computer Technology

Cities: Miami, FL
Area Codes: 305
Rates: $20/mth: unlimited access at 28.8.
Phone: 305-254-2254
Email: Webmaster@action-net.net

Infinet (GulfSurf)

Cities: Pensacola, FL
Area Codes: 904
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Tallahassee Democrat)

Cities: Tallahassee, FL
Area Codes: 904
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

MeadNet

Cities: Venice, Sarasota, Bradenton, Palmetto, Ellenton, FL
Area Codes: 941
Rates: Standard Plan: $25/mth includes 100 hrs. Email Plan: $10/mth includes email access and 5 hrs.
Phone: 941-746-8933
Email: info@mead.net

PSS InterNet Services

Cities: Daytona Beach, Orlando, Miami, FL
Area Codes: 904, 407, 305
Rates: Basic PPP dial-up account with 1 email address: $22.95/mth (unlimited). Additional emails are $10. PPP accounts include a free Unix shell account.
Phone: 904-253-7100
Email: support@america.com

Internet Media Services

Cities: Hudson, Clearwater, Tampa, Spring Hill, FL
Area Codes: 813, 352
Rates: 60 hrs: $20/mth, $15 sign-up fee, additional time $1/hr, 2 email boxes. Unlimited: $45/mth, $15 sign-up fee, 3 email boxes.
Phone: 800-400-5970
Email: todd@niven.imsWeb.net

Icanect, Internet Communications of America

Cities: North Dade County, South Dade County, Broward County, Boca Raton, West Palm Beach, FL
Area Codes: 305, 954, 407
Rates: $17.95/mth, no setup fee: modem dial-up access. $50/mth, $50 setup fee: ISDN 64K access.
Phone: 305-621-0210
Email: info@icanect.net

MagicNet, Internet Services, Inc.

Cities: Orlando, Kissimmee, Sanford, FL
Area Codes: 407, 904
Rates: $20/mth for 99 hrs.
Phone: 407-657-2202
Email: info@magicnet.net

Netpoint Communications

Cities: Miami (Dade County), Ft. Lauderdale (Broward County), FL
Area Codes: 305, 954
Rates: $25/mth for PPP accounts.
Phone: 305-801-1955
Email: info@netpoint.net

Sunline.Net

Cities: Port Charlotte, Venice, FL
Area Codes: 941
Rates: $25/mth for an unlimited personal account.
Phone: 941-629-8360
Email: info@sunline.net

Innervision Technologies, Inc.

Cities: Brevard County, FL
Area Codes: 407
Rates: $15 setup and $15/mth, unlimited access.
Phone: 407-459-0911
Email: info@nexusprime.org

Netwide Access, Inc.

Cities: Orlando, FL
Area Codes: 407
Rates: $19.95 flat fee for unlimited access at 33.3Kbps. All accounts include space for Web pages.
Phone: 407-384-6305
Email: info@netwide.net

Net Magic, Inc.

Cities: Fernandina Beach, FL
Area Codes: 904
Rates: $19.95/mth, unlimited access.
Phone: 904-261-8817
Email: admin@net-magic.net

Southern Internet Services

Cities: Palm Beach Gardens, FL
Area Codes: 561
Rates: $24.95 PPP, $15 setup fee. Unlimited hours.
Phone: 561-627-7227
Email: sis@siservices.net

LakerNet!

Cities: Miami, Ft. Lauderdale, Boca Raton, West Palm Beach, Orlando, FL
Area Codes: 305, 954, 407
Rates: $24.95/mth for PPP/SLIP/shell. 10MB shell space for WWW page.
Phone: 800-508-6467
Email: admin@laker.net

Shadow Information Services, Inc.

Cities: Miami, Orlando, Ft. Lauderdale, West Palm Beach, Tampa, FL
Area Codes: 305, 407, 954, 813,
Rates: $24.95 for unlimited access. $12.95 for 6 free hrs and $2.50/add'l hr. Check http://www.shadow.net/faq_html/prices.html for more information.
Phone: 305-594-3450
Email: admin@shadow.net

Polaris Network, Inc.

Cities: Tallahassee, FL
Area Codes: 904
Rates: PPP dial-up account pricing is currently under revision.
Phone: 904-878-9745
Email: info@polaris.net

StarServe Communications

Cities: Davie, Miami, FL
Area Codes: 954,305
Rates: Internet access: $24.95/mth, $250/yr. Each additional email address: $5/mth, $50/yr. Each additional email account: $15/mth, $150/yr.
Phone: 305-418-4002
Email: info@starserve.com

CFTnet

Cities: Tampa, St. Pete, New Port Richey, Sarasota, FL
Area Codes: 813
Rates: $10 regular account, flat rate.
Phone: 813-980-1317
Email: help@cftnet.com

Internet Access Group

Cities: Orlando, Seminole County, Lake County, Volusia County, FL
Area Codes: 407, 352, 904
Rates: Personal PPP/SLIP accounts. Standard Option: 100 hrs/mth, additional hrs $1/hr, by credit card $20, by personal check $22. Dedicated IP Address (PPP): $5. Unmetered Access Option (SLIP/CSLIP/PPP includes free shell account): by credit card $27.50, by personal check $29.50.
Phone: 407-786-1145
Email: sales@iag.net

Global Datalink, Inc.

Cities: Orlando, Melbourne Brevard, Daytona Beach, Deland, New Smyrna, Flagler, FL
Area Codes: 407, 904
Rates: $9.95: Basic PPP, 50 hrs/mth, 1 email box. $14.95: Basic PPP, 100 hrs/mth, 1 email box. $19.95: Basic PPP, 250 hrs/mth, 1 email box. $16: Unlimited hours, 3 email boxes, 1-year contract. User Web pages: $5 setup plus $1/mth.
Phone: 407-841-5657
Email: support@gdi.net

TNN Services

Cities: Mims, Titusville, Port St. John, Cocoa, Cocoa Beach, Merritt Island, Rockledge, Melbourne, Palm Bay, FL
Area Codes: 407
Rates: 33.6K dial-up PPP: $5 for 10 hrs, $6/20, $7/30, $8/40, $9/50, $10/100, $15/200, $20/unlimted. No setup fee.
Phone: 407-634-5500
Email: info@tnn.net

PCS Online Services

Cities: Bradenton, FL
Area Codes: 941
Rates: 60 hrs/mth for $19.95. 100 hrs/mth for $29.95.
Phone: 941-795-6390
Email: info@mail.pcsonline.com

Athens' Isp, Inc.

Cities: Athens, Atlanta, GA
Area Codes: 404, 706, 770
Rates: 3 pseudo-flat-rate accounts for 20 hours

($12.50), 40 hours ($15), or 50 hours ($20). Unlimited access also available ($30).
Phone: 706-613-0611
Email: info@athens.net

MindSpring Enterprises

Cities: Atlanta, GA
Area Codes: 404
Rates: Lite: $6.95/mth for 5 hrs, additional hrs at $2/hr, startup fee $35, includes 5MB for personal Web/FTP space. Beat The Clock: $12.95 for unlimited use between 1 am and 5 pm, hrs outside that time $2/hr, startup fee $35, includes 5MB for personal Web/FTP space. Standard Plan: $14.95 for 20 hrs, additional hrs at $1/hr, startup fee $35, includes 5MB for personal Web/FTP space. Unlimited Access: $19.95 for unlimited use, startup fee $35, for individual use only, no Web/FTP space. The Works: $26.95 for unlimited uses, startup fee $35, for individual use only, includes 2 extra mailboxes and "vanity alias addresses," includes 10MB for personal Web/FTP space.
Phone: 800-719-4660
Email: support@mindspring.com

Avana Communications Corp

Cities: Atlanta, GA
Area Codes: 770
Rates: $17.95 flat-fee personal or business. $27.95 64K ISDN dial-up.
Phone: 770-353-2003
Email: info@avana.net

VIVIDNET

Cities: Atlanta, GA
Area Codes: 770
Rates: $21.99/mth with a $10 setup fee.
Phone: 770-933-0999
Email: info@vivid.net

Infinet (Ledger-Enquirer)

Cities: Columbus, GA
Area Codes: 706
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Telegraph Online)

Cities: Macon, GA
Area Codes: 912
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

DIBBS Internet Services, Inc.

Cities: Mobile, AL
Area Codes: 334
Rates: $19.95: unlimited access, 28Kbps, personal or nonprofit Web page, and more.
Phone: 334-661-6349
Email: info@dibbs.net

Renaissance Internet Services

Cities: Huntsville, AL
Area Codes: 205
Rates: Galileo Account: free setup, $10/mth for 10 prpaid prime-time (1 pm to 1 am) hrs, free access outside of prime time, 1MB storage, personal home page, 25MB bandwidth. Michelangelo Account: free setup, $19.95/mth for unlimited (not continuous) access, 5 MB storage, personal home page, 50 MB bandwidth. Gutenberg account: free setup, $50/mth for unlimited (not continuous) access, 10 MB storage, commercial homepage, 100MB bandwidth.
Phone: 205-535-2177
Email: info@ro.com

Infinet (coast net)

Cities: Biloxi, MS
Area Codes: 601
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Lanyap Internet Services

Cities: New Orleans, LA
Area Codes: 504
Rates: Untimed dial-up PPP: $25.
Phone: 504-522-0708
Email: info@lanyap.com

Northshore Internet

Cities: Mandeville, LA
Area Codes: 504
Rates: For rates see our Web site at http://www.ni-inc.com.
Phone: 800-4netwrk
Email: info@communique.net

Communique Inc.

Cities: New Orleans, Mandeville, Baton Rouge, Franklinton, Slidell, Reserve, LA
Area Codes: 504
Rates: Dial-up PPP or ISDN, unlimited access: $30/mth. Dial-up PPP or ISDN, measured access: $20 for 20 hrs, then $1.25/hr.
Phone: 504-527-6208
Email: help@communique.net

Prysm Technologies, Inc.

Cities: Shreveport, Minden, LA; Marshall, TX
Area Codes: 318, 903
Rates: Economy: $9.95 for 15 hours/mth. Basic: $17.95 for 40 hours/mth. Premium: $24.95 for unlimited time/mth. Static IP addresses available. College students and educators receive 20% discount.
Phone: 318-424-4638
Email: info@prysm.net

Infinet (Ohio.com)

Cities: Akron, OH
Area Codes: 330
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

RMRC, Ltd.: Reality Means Redefining Cyberspace

Cities: Cleveland, OH
Area Codes: 216
Rates: Personal Account: $20/mth, one-time $10 startup fee. Business Account: $40/mth first account, $30/mth second account, $20/mth third account, $10/mth fourth and subsequent accounts, one-time $20 startup fee.
Phone: 216-269-3839
Email: support@bbs2.rmrc.net

InfiNet - Infinite Systems, Ltd.

Cities: Cincinnati, Cleveland, Columbus, Dayton, Eaton, Hebron/Buckeye Lake, Lancaster, Middletown, Newark, Pataskala, Port Clinton, Toledo, OH
Area Codes: 513, 216, 614, 419
Rates: $15 initialization fee, $19.95–$24.95 monthly, flat rate.
Phone: 614-241-2410
Email: sales@infinet.com

NEOnet Online

Cities: Youngstown, OH
Area Codes: 330
Rates: Standard SLIP/PPP accounts $20/mth for unlimited access or $100 for 6 mths (includes one month free).
Phone: 330-758-9997
Email: sysop@neont.com

Infinet (Go Cincinnati)

Cities: Cincinnati, OH
Area Codes: 513
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Exodus Online Services

Cities: Cincinnati, OH
Area Codes: 513
Rates: $19.95/mth, unlimited access, no hourly rates or prime-time charges. Select your own user ID. 1MB Web page space included.
Phone: 513-522-0011
Email: info@eos.net

SOS2000.NET

Cities: Cincinnati, OH
Area Codes: 513
Rates: $4.95/mth (includes 5 hrs), $1.25 each additonal hr.
Phone: 513-821-2280
Email: rga863@sos2000.net

MichWeb Inc.

Cities: Cadillac, MI
Area Codes: 616

Rates: Unlimited PPP: $17/mth. 20 hrs: $10/mth.
Phone: 616-775-8416
Email: info@michWeb.net

Traverse Communication Co.

Cities: Traverse City, Leland, MI
Area Codes: 616
Rates: $20/mth unlimited.
Phone: 616-935-1705
Email: info@traverse.com

Iserv

Cities: Grand Rapids, Kalamazoo, Greenville, Battle Creek, Detroit, Holland, MI
Area Codes: 616, 810
Rates: WebStart: $9.95/mth includes 40 hrs/mth. WebPro: $17.95/mth includes 480 hrs/mth.
Phone: 616-281-5254
Email: info@iserv.net

Infinet (fortwayne.com)

Cities: Fort Wayne, IN
Area Codes: 219
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Online Michiana)

Cities: South Bend (Mishawaka), Elkhart, IN
Area Codes: 219
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Custom Logic Systems

Cities: Mishawaka, South Bend, IN
Area Codes: 219
Rates: $10-$25/mth flat rate.
Phone: 219-255-5201
Email: info@cl-sys.com

MDN Ltd.

Cities: Lafayette, IN
Area Codes: 317
Rates: Please examine http://www.mdn.com/ for current rates and packages. $15 startup fee includes software and 1MB storage for WWW. All prices are monthly. NetStarter: $4.95/first 10 hrs, $1/add'l. NetRunner: $16.95/first 40 hrs, $.60/add'l. NetMaster: $24.95 unlimited. Netaholic: $119.95 continuous.
Phone: 317-449-0539
Email: info@mdn.com

IQuest Internet, Inc.

Cities: Indianapolis, Anderson, Muncie, Bloomington, Columbus, IN; Chicago, IL
Area Codes: 317, 812, 312
Rates: 14.4 SLIP/PPP (Indianapolis): $15/mth. 28.8 SLIP/PPP (Indianapolis): $20/mth. 14.4/28.8 SLIP/PPP (all other areas) $20/mth. All accounts include120 hrs/mth. Additional hrs billed at $.50/hr.
Phone: 317-722-4600
Email: info@iquest.net

Kiva Networking

Cities: Bloomington, Bedford, New Castle, Conersville, IN
Area Codes: 812, 317
Rates: Personal use PPP account: $19.95 unmetered.
Phone: 800-819-8143
Email: info@kiva.net

InterNet eXchange

Cities: Rushville, Beardstown, IL
Area Codes: 516, 217
Rates: Standard PPP dial-up account: $19.95/mth with a $5 setup, $200/yr.
Phone: 212-935-3322

InterAccess Co.

Cities: Northbrook, Northbrook East, Oak Brook, Libertyville, Downtown Chicago, Schiller Park, Tinley Park, Wheaton, Hoffman Estates, Chicago Wabash, Chicago Irving, Aurora East, Kankakee, Bolingbrook, Oak Lawn, Calumet City, Joliet West, LaSalle, Crystal Lake, Zion, Fox Lake, Dundee, Wauconda, Geneva, IL
Area Codes: 847, 708, 312, 815
Rates: Timed Monthly: $10/mth for 5 hrs ($13/mth if you pay by check or P.O.), $2.05/hr each add'l hour. Flat Rate Monthly: unlimited time, $24.95/

mth ($30/mth if you pay by check or P.O.). Flat Rate Quarterly: unlimited time, $70/quarter ($73/qtr if you pay by check or P.O.). Setup fee $25 (includes Netscape Navigator 2.02).
Phone: 847-498-2542 x2
Email: info@interaccess.com

PYROtechnics

Cities: Palatine, IL
Area Codes: 847
Rates: Unlimited monthly SLIP/PPP: $18/mth. Unlimited quarterly SLIP/PPP: $45/mth.
Phone: 847-991-9345
Email: info@pyro.net

IntelliWorld (Edwardsville Publishing Company)

Cities: Edwardsville, IL
Area Codes: 618
Rates: $15/mth, unlimited usage (subscribers of *Edwardsville Intelligencer* newspaper get discounted rate of $5.95/mth, unlimited usage).
Phone: 618-656-4700 x 12
Email: administrator@edwpub.com

WorldWide Access

Cities: Chicago-Wabash, Downers Grove, Geneva, Hinsdale, Oak Lawn, Roselle, Arlington Heights, Deerfield, Des Plaines, Franklin Park, Skokie, Chicago-Humbolt, Chicago-Irving, Chicago-Kildare, Chicago-Loop, Chicago-South, Belwood, Bensenville, Elmhurst, Lombard, Naperville, Summit, Elk Grove Village, Northbrook, Schaumburg, Skokie, Vernon Hills, Wheeling, Rockford, IL; Milwaukee, WI
Area Codes: 312, 708, 847, 815, 414
Rates: SLIP/PPP account, unlimited access: $25/mth, $65/quarter, $255/yr. No hourly fee.
Phone: 312-803-9921
Email: info@wwa.com

TruCom Internet Services

Cities: St. Louis, St.Charles, MO
Area Codes: 314
Rates: $17.95/mth, $15 one-time setup fee. Setup fee waived for 6-month service plan. One-year service plan $191.40 ($15.95/mth) and no setup fee.
Phone: 314-382-4720
Email: postman@trucom.com

Digital Internet Access Link, Inc.

Cities: Springfield, Aurora, MO
Area Codes: 417
Rates: $14.95/mth or $39.95/quarter. No extra fees for time online. Additional email addresses are available for an additional fee.
Phone: 417-873-3425
Email: Webmaster@dialnet.net

DialNet Technologies

Cities: Springfield, Aurora, Branson (coming soon), MO
Area Codes: 417
Rates: Monthly $14.95, quarterly $39.95, yearly $150.
Phone: 417-873-3425
Email: help@dialnet.net

Exec-PC, Inc.

Cities: Milwaukee, Parkside, Madison, Appleton, Watertown, Greey Bay, Sheboygan, Oshkosh, WI; Rockford, IL
Area Codes: 608, 414, 815
Rates: $12/mth for 15 hrs of access/week. $20/mth for unlimited time/week.
Phone: 800-383-2721
Email: info@execpc.com

FullFeed Communications - WiSE

Cities: Milwaukee, Waukesha, North Lake, WI
Area Codes: 414
Rates: Individual/Family account, including single email address and full PPP Internet services: $20/mth for unlimited connect time. Additional disk space and email addresses extra.
Phone: 414-544-9829
Email: info@mke.fullfeed.com

Infinet (pioneerplanet)

Cities: Hudson (riverFalls), WI
Area Codes: 715
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (most on Madison)

Cities: Madison, WI
Area Codes: 608
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

FullFeed Madison

Cities: Madison, WI
Area Codes: 608
Rates: Basic Package: $18 setup + $12/mth, full Internet access via dial-up PPP or SLIP, facilities to publish Web pages, a static IP address, 3MB of disk space, 60 hrs/mth. Enhanced Package: $18 setup + $24/mth, PPP or SLIP, Web pages, static IP address, 3MB of disk space, 180 hrs/mth. Call for many other options.
Phone: 608-246-4239
Email: info@msn.fullfeed.com

SupraNet Communications, Inc.

Cities: Madison, WI
Area Codes: 608
Rates: Unmetered, high-availability PPP dial-up account: $30/mth , $30 one-time setup.
Phone: 608-836-0282
Email: connnect@supranet.net

Excel.Net, Inc.

Cities: Sheboygan, Plymouth, Fond du Lac, WI
Area Codes: 414
Rates: $10 for 10/hrs, $1/hr after. $20 for 60/hrs, $1/hr after. $40 for 120/hrs, $.50/hr after.
Phone: 414-452-0455
Email: info@excel.net

Global Dialog Internet

Cities: Madison, Reedsburg, Cambridge, Watertown, Johnson Creek, Oconomowoc, Milwaukee, WI
Area Codes: 608, 414
Rates: Starter: 20 hrs/mth, $10.95/mth. Unlimited: $18.95. One-time connection fee: $20. Rates slightly higher in some areas.
Phone: 800-482-4638 (223-0955 Madison)
Email: info@globaldialog.com

CORE Digital Communication Services

Cities: Stevens Point, WI
Area Codes: 715
Rates: $21.10/mth for unlimited access time.
Phone: 715-342-CORE
Email: info@coredcs.com

Desktop Media

Cities: Albert Lea, Albert Lea, Owatonna, Rochester, Faribault, Northfield, Austin, MN
Area Codes: 507
Rates: Varies by city.
Phone: 800-584-6685, 507-373-2155
Email: sales@deskmedia.com

US Internet Corp

Cities: Minneapolis, MN
Area Codes: 612
Rates: PPP account from $4.99 to $25 monthly.
Phone: 612-222-4638
Email: sales@usinternet.com

Sihope Communications

Cities: Minneapolis, MN
Area Codes: 612
Rates: 27.50/mth unlimited interactive use.
Phone: 612-829-9667
Email: info@sihope.com

Vector Internet Services, Inc.

Cities: Minneapolis, MN
Area Codes: 612
Rates: Analog modem: $24.95 for 200 hrs. ISDN: $45 for 60 hrs.
Phone: 612-288-0880
Email: info@visi.com

incNET Incorporated

Cities: Minneapolis, MN
Area Codes: 612
Rates: $29.95 unlimited access, includes 3 email addresses.
Phone: 612-946-3946
Email: jbaker@incnet.com

Infinet (PioneerPlanet)

Cities: Minneapolis, MN
Area Codes: 612
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Protocol Communications, Inc.

Cities: Minneapolis, MN
Area Codes: 612
Rates: Check out our rates on our home page at http://www.protocom.com/.
Phone: 612-623-9900
Email: info@protocom.com

Infinet (PioneerPlanet)

Cities: St. Paul, MN
Area Codes: 612
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Internet Revealed

Cities: Moline, IL; Davenport, IA
Area Codes: 309, 312
Rates: Single-user untimed access: $25/mth, $67.50/quarter, $120/semiannual. Additional family members may be added for $3.95/mth, $9/quarter, $15/semiannual.
Phone: 309-736-7424
Email: info@revealed.net

LISCO

Cities: Fairfield, Packwood, Libertyville, Ottumwa, Eddyville, Oskaloosa, Albia, Mystic, Cincinnati, Moravia, Seymour, Centerville, Lockridge, Olds, Salem, Mt. Pleasant, Mt. Union, Yarmouth, Washington, Westchester, New London, IA
Area Codes: 515, 319
Rates: We match or beat any of the nationally advertised unrestricted unlimited access rates available in each of the areas in which we offer service.
Phone: 515-472-5400
Email: help@lisco.com

Infinet (FYIowa)

Cities: Ceder Rapids, IA
Area Codes: 319
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (FYIowa)

Cities: Iowa City, IA
Area Codes: 319
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

JTM MultiMedia, Inc.

Cities: Des Moines, IA
Area Codes: 515
Rates: $30/mth, $165 for 6 mths, or $300/yr. Free installation at your site with 6-month and year billing. No other fees. Unlimited connect time/mth. Includes 2 email addresses, 8MB Web storage.
Phone: 515-277-1990
Email: techsupport@ecity.net

Dakota Internet Services, Inc.

Cities: Sioux Falls, SD
Area Codes: 605
Rates: $10: 10 hrs, 1.5 cents/additional minute. $15: 25 hrs, 1.5 cents/additional minute. $20: 50 hrs, 1.5 cents/additional minute. $30: 90 hrs, 1.5 cents/additional minute.
Phone: 605-371-1962
Email: service@dakota.net

Iway Internet Services

Cities: Sioux Falls, Aberdeen, Rapid City, Pierre, Vermillion, Yankton, SD; Sioux City, IA
Area Codes: 605, 712
Rates: $25 activation or $29.95 for fully liscenced Netscape Navigator 2.0.1 dial-up kit (includes activation). 10 hrs for $8.95/mth, $1.95/hr over. 50 hrs for $19.95/mth, $.95/hr over.
Phone: 605-331-4211
Email: info@iw.net

Internet Services of the Black Hills

Cities: Spearfish, Sturgis, Rapid City, SD
Area Codes: 605
Rates: $9.95 base includes 4 hrs, $1/hr to 23 hrs ($32.95) to 100 hrs.
Phone: 605-642-2244
Email: info@blackhills.com

Probe Technology Inc.

Cities: Omaha, NE
Area Codes: 402
Rates: $19.95/mth, unlimited access, single email account. $24.95/mth unlimited access, up to 5 email accounts.
Phone: 402-593-9800
Email: infobot@probe.net

Novia Internetworking

Cities: Omaha, NE; Council Bluffs, IA
Area Codes: 402
Rates: $9.95/mth: 20 hrs included, $1/hr over 20. $14.95/mth: 60 hrs included, $1/hr over 60. $19.95/mth: 200 hrs included, $1/hr over 200. $29.95/mth, unlimited access, $2/each additional mailbox.
Phone: 402-391-4005
Email: info@novia.net

Hubris Communications

Cities: Garden City, KS
Area Codes: 316
Rates: $10 for 10 hrs/mth. $20 for 50 hrs/mth. $30 for 100 hrs/mth.
Phone: 316-275-1900
Email: sales@gcnet.com

Silver Star Telephone Company

Cities: Freedom, WY
Area Codes: 307
Rates: $10: 10 hrs. $15: 20 hrs. $20: 50 hrs. $25: unlimited hrs. Group rates also available.
Phone: 307-883-2411
Email: sst@cyberhighway.net

Visionary Communications, Inc.

Cities: Gillette, WY
Area Codes: 307
Rates: $10/mth: 10 hrs. $25/mth: flat rate, $15 setup fee.
Phone: 307-682-1884
Email: help@vcn.com

WAVE Communications

Cities: Sheridan, Cody, Powell, WY
Area Codes: 307
Rates: 10 hrs/mth: $10. 30 hrs/mth: $19.95.
Phone: 307-674-4925
Email: jack@wave.sheridan.wy.us

Infinet (Big Sky Wire)

Cities: Billings, MT
Area Codes: 406
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Bitterroot Internet

Cities: Hamilton, MT
Area Codes: 406
Rates: Individual accounts: $19.95/mth or $198/yr, 1 email address, 3MB Web server storage, free personal page, no setup fees. Business accounts: $29.95/mth or $288/yr, 1 email address, 9MB Web server storage if we design Web site (4MB any other designer), free business page, no setup fees.
Phone: 406-363-0216
Email: support@bitterroot.net

Internet Connect Services

Cities: Missoula, Bitterroot Valley, Butte, MT
Area Codes: 406
Rates: PPP or SLIP, unlimited use: $19.95/mth.
Phone: 406-721-4952
Email: info@montana.com

EZLink Internet Access

Cities: Fort Collins, Loveland, Estes Park, Greeley, CO
Area Codes: 970
Rates: Unlimited access: $20/mth or less. Hourly access: 65 to 85 cents/hr (or less). Full service including SLIP, PPP, WWW, Telnet, FTP, mail, shell accounts, etc.
Phone: 970-482-0807
Email: info@ezlink.com

Front Range Internet

Cities: Colorado Springs, Denver, Fort Collins, Greeley, CO
Area Codes: 719, 303, 800
Rates: Unlimited time. Individual: $20 startup, $20/mth. Commercial: $30 startup, $30/mth.
Phone: 970-224-3668
Email: info@frii.com

Verinet Communications, Inc.

Cities: Fort Collins, CO
Area Codes: 970
Rates: $14.95 setup on all accounts. $19.95/mth for unlimited access. $9.95/mth for 10 hrs, each add'l hr $1.
Phone: 970-416-9152
Email: info@verinet.com

CSDC

Cities: Boulder, Denver, Longmont, CO
Area Codes: 303
Rates: $20/mth for 50 hrs. Add'l time $1/hr. $20 startup fee normally, but we'll reduce it to $5 if you mention this book!
Phone: 800-444-1671
Email: info@csd.net

E.Central

Cities: Denver, CO
Area Codes: 303
Rates: $7.95/mth for 20 hrs and $1.50/add'l hr. One-time $25 setup fee. 30-day money-back guarantee.
Phone: 303-830-0123
Email: access@ecentral.com

VailNet

Cities: Vail, CO
Area Codes: 970
Rates: $24.95 sign-up fee. $24.95/mth for up to 100 hrs. $249.50 for 12 mths of 100 hrs/mth. $1/hr surcharge for hours 101 and up in any given month.
Phone: 970-949-7774
Email: info@vail.net

Indra's Net, Inc.

Cities: Boulder, CO
Area Codes: 303
Rates: Basic Account: $5/mth, 2 free hrs/mth, $2/hr access fee. Plan 25: $25/mth, 30 free hrs/mth, $1/hr each add'l hr. Plan 50: $50/mth, 100 free hrs/mth, $.75/hr each add'l hr. No setup fee.
Phone: 303-546-9151
Email: help@indra.com

NetPlus

Cities: Fort Collins, Greeley, Boulder, CO
Area Codes: 970, 303
Rates: 4-for-4: 4 hrs/mth, $4, $1.25/add'l. Dial-50: 50 hrs/mth, $15, $1.25/add'l. DialPlus+: unlimited hrs/mth , $20.
Phone: 970-484-1933
Email: info@pageplus.com

Galaxy Star Systems

Cities: Tulsa, Afton, Bartlesville, Checotah, Claremore, Cushing, Eufaula, Grove, Henryetta, Ketchumn, Miami, Muskogee, Okmulgee, Pawhuska, Pryor, Tahlequah, Vinita, Oklahoma City, Ponca City, OK
Area Codes: 918, 405
Rates: $9.95: 5 hrs, $.04 over 5 hrs. $12.95: 15 hrs, $.02 over 15 hrs. $19.95: 60 hrs, $.01 over 60 hrs. $25 flat rate student/educator. $40 flat rate individual/company.
Phone: 918-835-4638 or 835-3655
Email: info@galstar.com

Ethos Internet Services

Cities: Oklahoma City, Tulsa, OK
Area Codes: 405, 918
Rates: $14.95/mth for unlimited dial-up. $99 for an entire year.
Phone: 888-WEB-HERO
Email: info@dallas.net

Flex.net

Cities: Houston, Conroe, TX
Area Codes: 713, 409
Rates: Personal unlimited 24-hour access with 1 email and 10MB on the server for Web site: $29.95/mth. Commercial unlimited 24-hour

access with 1 email and 10MB on the server: $49.95/mth.
Phone: 713-364-6514
Email: info@flex.net

Info-Highway International, Inc

Cities: Houston, The Woodlands, TX
Area Codes: 713
Rates: Unlimited access, setup $30, no time charges: monthly $29.95, free training classes. Quarterly $80.85, free software. Annually $299, 2 email addresses standard.
Phone: 713-447-7025
Email: support@infohwy.com

Real/Time Communications

Cities: Austin, TX
Area Codes: 512
Rates: One-time setup charge of $25 + tax, flat monthly rate of $20 + tax (no hourly charges).
Phone: 512-451-0046
Email: info@realtime.net

Texas.Net

Cities: San Antonio, Austin, Boerne, Georgetown, Dripping Springs, TX
Area Codes: 210, 512
Rates: Lonestar Unlimited PPP Account: $16.95/mth with one-time $19.95 setup fee. 33.6K unlimited dial-up.
Phone: 210-272-8111
Email: info@texas.net

Easy Internet (tm) Services

Cities: Waco, Austin, TX
Area Codes: 817, 512
Rates: Dial-up PPP accounts for $24/mth with unmetered access. One-time $24 startup fee.
Phone: 817-757-EASY
Email: info@easy.com

Open Communications, Inc

Cities: Austin, Tx
Area Codes: 512
Rates: Custom rates negotiated to fit customer requirements.
Phone: 512-250-5765
Email: info@easy.com

Infinet (Caller-Times)

Cities: Corpus Cristi, TX
Area Codes: 512
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Internet Connect Services,Inc.

Cities: Houston, Victoria, San Antonio, TX
Area Codes: 713, 512, 210
Rates: $28.95/mth unlimited dial-up access, or $9.95 for 5 hrs plus $.95/hr thereafter.
Phone: 800-840-3694
Email: info@icsi.net

NeoSoft, Inc.

Cities: Houston, TX; New Orleans, Mandeville, LA
Area Codes: 713, 504
Rates: $29.95/mth, flat rate. Yearly prepayments may receive additional discounts.
Phone: 888-NEOSOFT
Email: info@neosoft.com

Internet Direct, Inc.

Cities: San Antonio, TX
Area Codes: 210
Rates: PPP 28.8K modem is $19.95/mth, unlimited access.
Phone: 210-930-3359
Email: feedback@txdirect.net

Dallas Internet

Cities: Dallas, TX; Ft.Worth, Oklahoma City, Tulsa, OK
Area Codes: 214, 817, 405, 918
Rates: 20MB of disk space for business or personal use and unlimited dial-up for $24.95/mth.
Phone: 214-881-9595
Email: info@dallas.net

HiLine Internet Services, Inc.

Cities: Edinburg/McAllen/Pharr, Mission, Mercedes/Weslaco, Harlingen, Brownsville, TX
Area Codes: 210
Rates: Individuals: $29.95. Educators/Students: $24.95.
Phone: 210-316-4999
Email: info@hiline.net

FlashNet Communications

Cities: Fort Worth, Dallas, Houston, San Antonio, Austin, TX; Oklahoma City, OK; Albuquerque, NM; Tucson, AZ; Little Rock, AR
Area Codes: 817, 214, 713, 501, 505, 520, 210, 405, 512
Rates: $99/yr unlimited access: $25. One-time setup.
Phone: 800-352-7434
Email: info@flash.net

Southwest Cyberport

Cities: Albuquerque, Los Alamos/Santa Fe, NM
Area Codes: 505
Rates: $12 for 16 hrs. $20 for 40 hrs. $30 for 100 hrs.
Phone: 505-293-5967
Email: info@swcp.com

Zeke's General Store

Cities: Safford, AZ
Area Codes: 428, 348, 485 , 520
Rates: $22.95/mth (credit card), $24.95/mth (cash or check), $26.95/mth (paper invoice mailed), 30 hrs/mth, extra hrs 50 cents. Other plans available.
Phone: 520-428-1117
Email: zeke@zekes.com

AZLink Internet Services, Inc.

Cities: Phoenix, AZ
Area Codes: 602
Rates: PPP dial-up account: $25/mth, setup fee $20 (one-time).
Phone: 602-404-7300
Email: info@azlink.com

Crossroads Communications

Cities: Phoenix, AZ
Area Codes: 602
Rates: Personal PPP Dial-up: $19.95/mth by credit card with a one-time nonrefundable $10 setup fee. Business PPP Dial-up: $29.95/mth by credit card with a one-time nonrefundable $10 setup fee.
Phone: 602-813-9040
Email: info@xroads.com

Quantum Interlink

Cities: Provo, Salt Lake City, UT
Area Codes: 801
Rates: Beginner Accounts: $9.95/mth for 20 hours. Student Accounts: $12.95/mth for 50 hours. Standard Accounts: $19.95/mth unlimited. AutoCharge: Beginner $8.95/mth for 20 hrs, Student $11.50/mth for 50 hrs, Standard $17.95/mth unlimited. Business Accounts start at $35/mth.
Phone: 801-375-0233
Email: sysadmin@qi3.com

DirecTell Inc.

Cities: Park City, Heber Valley, UT
Area Codes: 801
Rates: $12 for 12 hrs/mth. $25 for 25 hrs/mth. $32 for 35 hrs/mth. $55 for 60 hrs/mth.
Phone: 801-647-5838
Email: support@ditell.com

Fibernet Corporation

Cities: Utah County, Salt Lake County, Ogden, Park City, UT
Area Codes: 801
Rates: Personal Unmetered: $18.95/mth. Business Unmetered: $24.95/mth + 5MB storage. Personal Guaranteed: $16.95/mth for 20 hrs (money-back guarantee). Business Guaranteed: $24.95/mth for 60 hrs (money-back guarantee).
Phone: 801-223-9576
Email: info@fiber.net

Infinet (Las Vegas Online)

Cities: Las Vegas, NV
Area Codes: 702
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Sierra-Net

Cities: Incline Village, Elko, Stateline, Minden, Fallon, NV; Tahoe City, San Diego, Chico, Redding, Truckee, Sacramento, South Lake Tahoe, CA
Area Codes: 702, 916, 619
Rates: $30/mth plus $30 setup: unlimited attended use. $300/yr, no setup: unlimited attended use.
Phone: 702-832-6911
Email: info@sierra.net

aNet Communications (artnet)

Cities: West Los Angeles, Los Angeles, CA, East Los Angeles, Van Nuys, Tarzana, Santa Ana, Irvine, CA
Area Codes: 310, 213, 818, 717, 714
Rates: Plan 1: $16, unlimited access, includes 2MB Web page, 10MB storage, $25 set p fee. Plan2: $3.50/mth, free hrs, $1 add'l hrs, 500K Web page, $10 setup fee.
Phone: 800-395-0692
Email: info@anet.net

SouthWest Nineteen Networks

Cities: Long Beach, Fullerton, Buena Park, Anaheim, Irvine, Capistrano Valley, Saddleback Valley, CA
Area Codes: 714
Rates: $20/mth for unlimited access with $20 setup fee.
Phone: 714-991-1919
Email: info@exo.com

Infinet (PT CONNECT)

Cities: Long Beach, CA
Area Codes: 310
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infoasis

Cities: San Rafael, CA
Area Codes: 415
Rates: $22/mth, $20 startup, 100 hrs.
Phone: 415-459-7991
Email: info@infoasis.com

KTB Internet Online

Cities: Glendale, N. Hollywood, Alhambra, Van Nuys, CA
Area Codes: 818
Rates: Flate rate, no hourly charges. Auto-bill credit card: $15/mth. Monthly invoice: $17.50/mth.
Phone: (818)240-6600
Email: info@ktb.net

VCNet

Cities: Camarillo, CA
Area Codes: 805
Rates: $20/mth, $20 startup fee, flat rate.
Phone: 805-383-3500
Email: info@vcnet.com

Imagine-NET Internet Services

Cities: Santa Ana, Saddleback Valley, CA
Area Codes: 714
Rates: 75 hrs for $24.95/mth + $19.95 setup fee, includes 2MB personal WWW site. 10 hrs for $9.95/mth + $19.95 setup fee.
Phone: 714-545-4932
Email: info@imagine-net.com

TST On Ramp

Cities: Pomona, CA
Area Codes: 909
Rates: $19.95 unlimited.
Phone: 909-620-7724
Email: info@tstonramp.com

FIX.NET

Cities: San Miguel, Paso Robles, Atascadero, San Luis Obispo, Santa Maria, Orcutt, CA
Area Codes: 805
Rates: Economy Package: $9.90 (CC only!), 10 hrs/mth + $.025/minute after 10 hrs, FTP and personal Web space. Standard Package: $19.95, 4 hrs/day (flat monthly rate), FTP and Web space. Advanced Package: $24.95, unlimited time, FTP and Web space.
Phone: 805-781-6766
Email: info@fix.net

Delta Internet Services, Inc.

Cities: Gardena, Encinitas, Anaheim, Lake Forest, Arcadia, Van Nuys, San Bernardino, Riverside, Arlington, Ontario, CA
Area Codes: 310, 619, 714, 818, 909,
Rates: Discovery Account: $19.95/mth flat rate, $24.95 sign-up. Discovery Sampler Account: $9.95/mth for 10 hrs, $24.95 sign-up.
Phone: 714-502-8490
Email: info@delta.net

Leonardo Internet

Cities: Santa Monica, CA
Area Codes: 310
Rates: $55 for 3 mths.

Phone: 310-395-5500
Email: info@leonardo.net

Monterey Bay Internet

Cities: Monterey, CA
Area Codes: 408
Rates: $17.95/mth for unlimited usage.
Phone: 408-642-6100
Email: info@mbay.net

Wesnnet Communications

Cities: Ventura, Santa Barbara, Simi/Thousand Oaks, Santa Paula, CA
Area Codes: 805
Rates: Unmetered PPP access: 33.6Kbps for $22/mth, $35 startup.
Phone: 805-289-1000
Email: info@west.net

Elite.Net

Cities: Merced, Livingston, Atwater, Le Grand, Planada, Winton, Turlock, CA
Area Codes: 209
Rates: $5 for 5 hrs/mth, extra hrs $1.50, $10 sign-up, 1MB. Full access, 28.8 modems: $15 for 150 hrs/mth, extra hrs $1.50, $29 sign-up, 1MB. Full access, includes home page and more: $25 flat-rate account, $29 sign-up, 5MB for Web, Gopher, FTP.
Phone: 888-2EliteNet
Email: info@elite.net

Subnet

Cities: Redlands, Riverside, Corona, CA
Area Codes: 909
Rates: Standard PPP: $25 setup, $22/mth. Student PPP: $25 setup, $18/mth. Business PPP: $35 setup, $30/mth.
Phone: 909-799-5184
Email: info@viasub.net

San Francisco Online (Televolve, Inc.)

Cities: San Francisco, CA
Area Codes: 415
Rates: $17.50/mth flat rate, $25 one-time startup. $50/quarterly + startup. $95/biannual + startup. $180/annual, startup fee waived.
Phone: 415-861-7712
Email: info@sfo.com

Idiom

Cities: Berkeley, Hayward, Newark, Oakland, Pleasanton, Redwood City, San Bruno, San Francisco, San Mateo, San Rafael, Tiburon, Walnut Creek, CA
Area Codes: 510, 415
Rates: Basic account: $20 setup + $20/mth, includes shell, a home page, includes 60 hrs, $.35/hr for more, 20MB disk space, $.25/MB/mth for more, 200MB/mth Web transfers, $.02/MB for more.
Phone: 510-658-5700
Email: info@idiom.com

DiscoverNet

Cities: Redlands, Riverside, Beaumont, Banning (pass area), Chino, Ontario, CA
Area Codes: 909
Rates: Personal accounts: $19.95, unlimited access, one-time service activation fee of $25 (5MB of space, email, etc). Commercial accounts: $50/mth, unlimited access, one-time fee of $50 (10MB space, email, etc).
Phone: 909-335-1209
Email: info@discover.net

North Bay Network

Cities: San Rafael, Sausalito, Nicasio, Rohnert Park, Cotati, CA
Area Codes: 415, 707,
Rates: Startup: $25. $20 for 50 hrs/mth, $1/hr over. $50 for 100 hrs/mth, $.50/hr over. Includes 2 email accounts; 1MB of server space for Web, FTP, etc.
Phone: 415-472-1600
Email: info@nbn.com

Local Net

Cities: San Bernardino, Highland, Ontario, Fontana, CA
Area Codes: 909
Rates: Level Pay PPP: flat monthly at $17.40/mth.
Phone: 909-475-5888
Email: info@local.net

CyberNet Ramp Online

Cities: Mendocino, Elk, Gualala, Fort Ross, Monte Rio, CA
Area Codes: 707
Rates: $19.95 for 50 hrs.
Phone: 707-937-1444
Email: info@mcn.org

Northcoast Internet

Cities: Cresent City, Eureka, Scotia, Pepperwood, Weott, Miranda, Garberville, Piercy, CA
Area Codes: 707
Rates: $10/mth for 20 hrs ($.50/hr thereafter) (educational only). $10/mth for 10 hrs ($1/hr thereafter). $25/mth for 150 hrs ($.50/hr thereafter).
Phone: 707-443-8696
Email: info@northcoast.com

Tri Valley Internet

Cities: Pleasanton, CA
Area Codes: 510
Rates: Standard PPP: $25/setup, $25/mth, unlimited. Starter2 PPP: $15/setup, $5.95/mth with 5 hrs, $2/hr.
Phone: 510-417-7600
Email: support@trivalley.com

Sacramento Network Access

Cities: Sacramento, CA
Area Codes: 916
Rates: Unlimited PPP or SLIP: $25 setup, $29.95/mth.
Phone: 916-565-4500 x1
Email: info@sna.com

NSNet

Cities: Sacramento , ElkGrove, Roseville /South Placer, Rocklin/Auburn, Cameron Park, Shingle Springs/Placerville, CA
Area Codes: 916
Rates: NetLite: $15/mth for 20 hrs, 2MB Web space. NetSuper: $25/mth untimed, 2MB Web space. No setup fee with personal accounts.
Phone: 916-856-1530
Email: info@ns.net

Ashford Communications

Cities: Torrance, CA
Area Codes: 310
Rates: $19.95/mth unlimited, $20 startup fee.
Phone: 310-323-2934
Email: info@ashford.com

KudoNet On-Line Services

Cities: Sunnyvale, Mountain View, Fremont, Campbell, CA
Area Codes: 408, 415, 510
Rates: PPP + shell: unlimited $29/mth, $30 setup. PPP: 20 hrs, $29.99/mth, $30 setup.
Phone: 408-738-1201
Email: info@kudonet.com

LanMinds

Cities: Berkeley, Belvedere, CA
Area Codes: 510, 415
Rates: Dial-up modem accounts: $25/mth unlimited access, $4.20 sign-up fee. LanMinds will waive the startup fee for anyone mentioning *Internet Starter Kit*.
Phone: 510-843-6389
Email: info@lanminds.com

Cruzio

Cities: Santa Cruz County, CA
Area Codes: 408
Rates: $19/mth, unlimited access. Includes 1MB free Web/FTP space.
Phone: 408-423-7635
Email: support@cruzio.com

Infinet (mercury center)

Cities: Palo Alto, CA
Area Codes: 415
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

Infinet (Mercury Center)

Cities: San Jose, Fremont, CA
Area Codes: 408, 510
Rates: $19.95/mth provides unlimited access. No time limits.
Phone: 800-948-6459
Email: support@infi.net

MediaCity

Cities: San Francisco, Redwood City, Palo Alto, San Jose, Fremont, CA; Reno, NV
Area Codes: 415, 408, 510, 702
Rates: Silver Account: $7.95/mth for 5 hrs, extra hrs $2. Gold Account: $9.95/mth for 10 hrs, extra hrs $2. Executive Account: $24.95/mth for 35 hrs, extra hrs $1.
Phone: 415-321-6800
Email: info@mediacity.com

Best Internet Communications

Cities: San Francisco, South San Francisco, San Mateo, Redwood City, Mountain View, San Jose /Santa Clara, Berkeley, Hayward, Fremont, Walnut Creek, CA
Area Codes: 415, 408, 510
Rates: $30/mth.
Phone: 415-940-7835
Email: info@best.com

CCnet

Cities: Walnut Creek, Oakland, San Ramon, Pittsburg, Fremont, San Jose, Palo Alto, San Francisco, CA
Area Codes: 510, 408, 415
Rates: $19.95/mth for 200 hrs, $25 setup fee. 50 cents/hr add'l.
Phone: 510-988-0680
Email: info@ccnet.com

Institute for Global Communications

Cities: San Francisco, CA
Area Codes: 415
Rates: No sign-up charge. Monthly subscription fee: $12.50/mth. SF Bay Area and DC: first 12 hrs/mth free, add'l hrs $1.50/hr. National via ACCESS1: first 12 hrs/mth $1/hr, add'l hrs $2.50/hr. Via SprintNet peak time (7 am-6 pm weekdays): first 12 hrs/mth $4/hr, add'l hrs $5.50/hr. Off-peak time: first 12 hrs/mth $2/hr, add'l hrs $3.50/hr. Via 800 number: first 12 hrs/mth $5/hr, add'l hrs $6.50/hr. Call for storage charges.
Phone: 415-561-6100
Email: igc-info@igc.org

SnowCrest Computer Specialties

Cities: Redding, Mt. Shasta, Yreka, Los Molinos, Lewiston, Ft. Jones, HappyCamp, Hamburg, CA
Area Codes: 916
Rates: Call for current pricing. Accounts include software, email box, and unlimited access time.
Phone: 916-926-6888 or 916-245-4698
Email: help@snowcrest.net

InfoStructure's mind.net

Cities: Southern OR
Area Codes: 541
Rates: $10 setup fee. $10 monthly for 15 hrs. $19 monthly for 125 hrs.
Phone: 541-488-1962
Email: info@mind.net

Data Research Group, Inc (Ordata.com)

Cities: Eugene, OR
Area Codes: 541
Rates: Setup $40 (we complete this at your house/ office), monthly $20 (40 hrs).
Phone: 541-465-3282
Email: dklindt@ordata.com

ProAxis Communications

Cities: Corvallis, Lebanon, Albany, OR
Area Codes: 541,
Rates: Standard PPP with 125 hours of access for $14.95/mth, includes email and 5MB of disk space for Web pages.
Phone: 541-757-0248
Email: info@proaxis.com
CDS Internet
Cities: Medford, OR
Area Codes: 541
Rates: $19.95 virtually unlimited. Includes shell.
Phone: 541-773-9600
Email: info@cdsnet.net

Hevanet Communications

Cities: Portland, OR
Area Codes: 503
Rates: $16/mth for up to 300 hrs PPP access.
Phone: 503-228-3520
Email: info@hevanet.com

EasyStreet Online Services

Cities: Portland, OR
Area Codes: 503
Rates: $19.95/mth for 40 hrs (analog or ISDN). $29.95/mth for unmetered analog. $29.95/mth for 60 hrs ISDN.
Phone: 800-555-1212
Email: info@easystreet.com

Northwest Power.com

Cities: Portland, OR
Area Codes: 503
Rates: $17.50/mth unlimited access PPP dial-up accounts. $35/mth unlimited access ISDN dial-up accounts.
Phone: 503-698-2554
Email: support@nwpower.com

Europa Communications, Inc.

Cities: Portland, OR
Area Codes: 503
Rates: 30 hrs/mth: 1 mth = $18, 3 mths = $52, 6 mths = $100, 12 mths = $196. 150 hrs/mth: 1 mth = $25, 3 mths = $73, 6 mths = $145, 12 mths = $280. One-time $10 setup fee (waived if you purchase 3 or more months right off the bat).
Phone: 503-222-9508
Email: info@europa.com

Teleport Internet Services

Cities: Portland, Salem, Eugene, Bend, Newport, Roseburg, Medford, Corvallis, South Beach, OR; Vancouver, Longview, WA
Area Codes: 503, 541, 360
Rates: Our regular account offers 30 hrs/mth for $180/yr. There are monthly, quarterly, and semiannual plans. Our deluxe account offers 120 hrs/mth for $250/yr.
Phone: 503-223-4245
Email: info@teleport.com

Transport Logic, LLC

Cities: Portland, Bend, Salem, Seaside, OR; Vancouver, WA
Area Codes: 503, 360
Rates: $15 for 30 hrs/mth. $25 for 120 hrs/mth. Includes 5MB WWW/FTP storage, $20 one-time setup fee.
Phone: 503-243-1940 (call for other cities)
Email: info@transport.com

CompuTech Internet Engineering Associates

Cities: Spokane, WA; Coeur d'Alene, ID
Area Codes: 509, 208
Rates: $24.95/mth: SLIP/PPP. 10% discount for 6-mth sign-up, 20% discount for 12-mth sign-up. Additional 20% discount for educators. 120 hrs, personal Web page 5MB, email and shell account included. Free Jumpstart class.
Phone: 800-784-3217
Email: info@iea.com

Internet On-Ramp, Inc.

Cities: Spokane, WA
Area Codes: 509
Rates: A 2-hour new user class and software is included with our $19.95 one-time setup fee. Intro Account: 10 hrs/mth $9.95, add'l hours $1.50/hr. Premier Account: 100 hrs/mth $24.95, add'l hours $.20/hr. Accounts include shell access, anonymous FTP, and Web publishing capabilities.
Phone: 509-455-HELP
Email: info@ior.com

Internet On-Ramp, Inc.

Cities: Spokane, WA
Area Codes: 509
Rates: Introductory account: $9.95 up to 10 hrs/mth, $1.50/hr above 10/mth. Premiere account: $24.95 up to 100 hrs/mth, $.20/hr above 10/mth. 10% discount for students.
Phone: 509-455-4357
Email: info@ior.com

OlympusNet

Cities: Port Townsend, Sequim, WA
Area Codes: 360
Rates: $75/quarter for 75 hrs/mth. 11:45 pm - 7:30 am free.
Phone: 360-385-0464
Email: info@olympus.net

Jet City Online

Cities: Seattle,WA
Area Codes: 206
Rates: Dial-up PPP: $25 startup fee + $25/mth or $250/yr. Includes 5 free email addresses, unlimited access, user-supported Web pages, 5MB storage for Web and mail, house calls, 2-week trial period.
Phone: 206-281-1774
Email: staff@jetcity.com

Premier1 Internet Services

Cities: Everett, WA
Area Codes: 360
Rates: PPP or SLIP account: $25 one-time setup charge, $28 monthly, $60 quarterly, $100 half-yearly.
Phone: 360-793-3658
Email: info@premier1.net

Pacific Rim Network, Inc.

Cities: Bellingham, Ferndale, Mount Vernon, Eastsound, WA
Area Codes: 360
Rates: PacRimPPP carries 40 hrs of service for $39.95. Additional hrs area available for $2/hr. Extra mailboxes are $5/mth.
Phone: 360-650-9707
Email: info@pacificrim.net

World Access Network, Inc.

Cities: Portland, OR; Vancouver, Camas, WA
Area Codes: 503, 360
Rates: 90 hrs/mth: $125/year. Unlimited hrs: $199/yr.
Phone: 360-263-8000
Email: wan@worldaccess.com

Northwest Nexus/halcyon.com

Cities: Primary, Seattle, Everett, Lynnwood, Olympia, Shelton, NorthBend/Eastside, Tacoma/Puyallup, Auburn, Mt. Vernon, FederalWay, Camano Island/Lakewood, Anacortes, Chehalis/Centralia, WA
Area Codes: 206, 360
Rates: $30/mth, $30 setup fee.
Phone: 800-539-3505, 206-455-3505
Email: info@halcyon.com

ISOMEDIA.COM

Cities: Seattle, Redmond, Federal Way, Lynnwood, WA
Area Codes: 206
Rates: ISOPoint PPP: $19.95/mth, flat rate. Quarterly and annual discounts available ($55/qtr, $200/yr).
Phone: 206-881-8769
Email: info@isomedia.com

Seanet Corp.

Cities: Seattle, Bellevue, Everett, Tacoma, Aberdeen, WA
Area Codes: 206, 360
Rates: Standard PPP Dial-Up: $20/mth, no setup fee, includes 40 hrs, no busy signals, $1/add'l hr. Premium PPP Dial-Up: $50/mth, no setup fee, includes 100 hrs, no busy signals, $1/add'l hr. Extra POP email box $5/mth.
Phone: 800-973-2638
Email: sales@seanet.com

WhidbeyNET

Cities: South Whidbey Island, North Whidbey Island, Camano Island, Snohomish Co., Point Roberts, WA
Area Codes: 360
Rates: Whidbey Island and Point Roberts: $20 setup, $21.50/mth. Camano Island and Snohomish Co.: $20 setup, $24/mth.
Phone: 800-880-0886
Email: info@whidbey.net

PTI NET

Cities: Juneau, Kodiak, Homer, Kenai/Soldotna, Sitka, Ketchikan, Cordova, AK
Area Codes: 907
Rates: $26.95 unlimited PPP dial-up in Juneau, Homer, Kenai/Soldotna. $34.95 unlimited PPP dial-up in Sitka, Kodiak, Ketchikan, and Cordova.
Phone: 800-PTINET4
Email: service@ptialaska.net

Internet Alaska

Cities: Anchorage, Fairbanks, Juneau, Kenai, Soldotna, Palmer, Wasilla, Valdez, Homer, AK
Area Codes: 907
Rates: $165 for 6 mths flat rate, includes Web space, unlimited access at 28.8K.

Phone: 907-562-4638
Email: info@alaska.net

LavaNet, Inc.

Cities: Honolulu, HI
Area Codes: 808
Rates: Startup fee for PPP accounts: $35. Two monthly rates available: flat-rate is $28/mth for virtually unlimited access; timed-rate plan is $14/mth with 10 hrs of access included and add'l hours $2/hr.
Phone: 808-545-7205
Email: info@lava.net

Maui Net

Cities: Maui, HI
Area Codes: 808
Rates: $20/mth flat fee, no hourly charges.
Phone: 800-875-2535
Email: info@maui.net

Interpath

Cities: NATIONWIDE
Area Codes: 800
Rates: SuperCruiser PPP: $29.95/mth, $25 setup, dynamic address, electronically billed. Weekender! PPP: $9.95/mth, 10 hrs, $2/extra hr, $25 setup, dynamic address, electronically billed, access from 6 pm Fri. through 6 am Mon.
Phone: 800-890-6305
Email: info@interpath.com

Carolina Online, Inc.

Cities: NATIONWIDE
Area Codes: 800
Rates: Intro: $10.99/mth, 10 hrs free, extra hrs $2.50. Basic: $19.99/mth, 50 hrs free, extra hrs $2. Personal Surfer: $29.99/mth, unlimited interactive. Executive: $39.99/mth, 120 hrs free, extra hrs $1. 10% discount for 6 mths paid up front: $215.95 (which is an average of $35.99/mth).
Phone: 864-375-0600
Email: info@carol.net

Iserv

Cities: NATIONWIDE
Area Codes: 800
Rates: WebStart: $9.95/mth includes 40 hrs/mth. WebPro: $17.95/mth includes 480 hrs/mth.
Phone: 616-281-5254
Email: info@iserv.net

Traverse Communication Co.

Cities: NATIONWIDE
Area Codes: 800
Rates: $20/mth unlimited.
Phone: 616-935-1705
Email: info@traverse.com

WinNET

Cities: NATIONWIDE
Area Codes: 800
Rates: $19.95/mth: ISDN access and 28.8 access, 100MB Web site and 10MB FTP site, 20 hrs direct dial, or 4 hrs 800 connect.
Phone: 800-589-5999 ext.3
Email: info@win.net

Institute for Global Communications

Cities: NATIONWIDE
Area Codes: 800
Rates: No sign-up charge. Monthly subscription fee: $12.50/mth. National via ACCESS1: first 12 hrs/mth $1/hr, add'l hrs $2.50/hr. Via SprintNet peak time (7 am–6 pm weekdays): first 12 hrs/mth $4/hr, add'l hrs $5.50/hr. Off-peak time: first 12 hrs/mth $2/hr, add'l hrs $3.50/hr. Via 800 number: first 12 hrs/mth $5/hr, add'l hrs $6.50/hr. Call for storage charges.
Phone: 415-561-6100
Email: igc-info@igc.org

Primenet Services for the Internet

Cities: Atlanta, GA; Baltimore, MD; Chicago, IL; Eau Claire, WI; El Paso, TX; Flagstaff, Phoenix, Casa Grande, Prescott, Sierra Vista, Tucson, Wickenburg, Yuma, AZ; Indianapolis, IN; Kansas City, MO; Los Angeles, Fresno, Oakland, Oceanside, Sacramento, San Bernardino, San

Diego, San Francisco, San Jose, Santa Ana, Victorville, CA; Madison, WI; Minneapolis/St.Paul, MN; Boise, Nampa, Payette, Sun Valley, ID; Philadelphia, PA; Toledo, OH; Vienna, VA; Washington D.C.
Area Codes: 404, 770, 410, 208, 520, 312, 847, 708, 715, 915, 209, 317, 816, 213, 818, 608, 612, 208, 510, 619, 215, 602, 916, 909, 619, 415, 408, 714, 419, 703
Rates: $20.95/mth: Phoenix, Tucson, Sierra Vista, Flagstaff, Prescott, Oakland, Sacramento, San Jose, San Francisco, San Diego, Atlanta, Chicago, Indianapolis, Baltimore, Kansas City, Philadelphia, Vienna. $24.95/mth:Casa Grande, Fresno, Los Angeles, Pomona, San Bernardino, San Juan Capistrano, Santa Ana, Minneapolis/St. Paul, El Paso, Eau Claire, Victorville, Boise, Nampa, Payette, Sun Valley. $25.95/mth: Wickenburg, Yuma, Toledo. All for 150 hrs/mth, $1/hr for additional time. $30 setup fee.
Phone: 800-463-8386
Email: info@primenet.com

Random Access, Inc.

Cities: Buffalo, Stanfordville, NY; Minneapolis, MN; Seattle, WA; Atlanta, GA; Cleveland, OH; St. Louis, MO; Tampa, FL; Orlando, FL; Newburgh, NY; Memphis, TN
Area Codes: 404, 716, 914, 612, 206, 770, 216, 314, 813, 407, 901
Rates: SLIP/PPP, unlimited: $25/mth, $30 setup fee.
Phone: 800-910-1190
Email: sales@randomc.com

Netrus

Cities: Miami, FL; Hollywood, CA; Deerfield, FL; Grand Rapids, MI
Area Codes: 305, 954, 616
Rates: $25/mth for unlimited access time (includes personal Web page with 5MB of space).
Phone: 800-638-7872
Email: Webmaster@netrus.net

North Shore Internet Services

Cities: Truro, NewGlasgow, NS, CANADA
Area Codes: 902,
Rates: $25 for 60 hrs, no charge for 11 pm – 8 am. One-hour free training. Other plans from $5 and up. Please call for current rates.
Phone: 902-928-0565
Email: support@nsis.com

Communications Accessibles Montreal

Cities: Montreal, QC, CANADA
Area Codes: 514
Rates: $25/mth for 100 hours of access (14.4 or 28.8).
Phone: 514-529-3000
Email: support@cam.org

@six.net

Cities: Montreal, QC, CANADA
Area Codes: 514
Rates: Platine: Max of 4 hrs/day with personal Web page: $24.95/mth, $1/additional hr. Gold: 50 hrs/mth with Web page: $19.95/mth, $0.75/additional hr. Silver: 20 hrs/mth: $13.95/mth, $1/additional hr. Bronze: 8 hrs/mth: $9.95/mth, $1.50/additional hr.
Phone: 514-936-3248
Email: info@six.net

ZooNet inc.

Cities: Montreal, QC, CANADA
Area Codes: 514
Rates: Panther: $14.95/mth for 20 hrs/mth. Tiger: $19.95/mth for 40 hrs/mth. Cheetah: $29.95/mth for 70 hrs/mth plus unlimited off-peak use (midnight to 7 am). Piggybank: $40 for a block of 50 hrs (no monthly limits). Tiger and Cheetah come with free space for personal Web page. No installation fees.
Phone: 514-935-6225
Email: info@zoo.net

Internet Connect Niagara Inc.

Cities: St. Catharines, ON, CANADA
Area Codes: 905
Rates: Block 100 hrs $25 startup fee $99 plus GST. Block 300 hrs $25 startup fee $199 plus GST. Unlimited access and corporate accounts please call.
Phone: 905-988-1700
Email: sales@niagara.com

Interlog Internet Services

Cities: Toronto, ON, CANADA
Area Codes: 416
Rates: Bronze: $5/mth, 6 hrs/mth, $0.95/extra hr. Silver: $15/mth, 45 hrs/mth, $.95/extra hr. Gold: $25/mth, 120 hrs/mth, $.95/extra hr. Platinum: $65/mth, 350 hrs/mth, $.95/extra hr.
Phone: 416-975-2655
Email: sales@interlog.com

ServiceTech, Inc.

Cities: Toronto, Ontario, CANADA
Area Codes: 716, 315, 800, 607, 416
Rates: $19.99/mth flat rate, unlimited usage. Substantial prepayment discounts available. All accounts include a static IP address. 10MB of Web and FTP space. We register domain names at no charge. Free software.
Phone: 800-454-4874
Email: info@servtech.com

Northumbria EAGLE

Cities: Cobourg, PortHope, ON, CANADA
Area Codes: 905
Rates: $29.99/mth = 90hrs/mth $19.99/mth = 25 hrs/mth. $50 = 50 hrs no expir. $22.50 one-time setup.
Phone: 905-373-9313
Email: info@eagle.ca

Information Gateway Services

Cities: Kitchener-Waterloo, ON, CANADA
Area Codes: 519
Rates: Personal Lite: $15/mth, 20 hrs, $.60/extra hr. Personal: $25/mth, 50 hrs, $.50/extra hr. Personal Plus: $40/mth, 90 hrs, $.40/extra hr. One-time activation fee of $25, includes SW.
Phone: 519-884-7200
Email: info@kw.igs.net

MBnet

Cities: Winnipeg, Manitoba, CANADA
Area Codes: 204
Rates: $25 annual feeplus $1/hr usage.
Phone: 204-474-7465
Email: admin@mbnet.mb.ca

Sunshine Net Inc.

Cities: Sunshine Coast, BC, CANADA
Area Codes: 604
Rates: Occasional: $15/mth includes up to 5 hrs , additional hrs $2/hr. Regular: $30/mth includes up to 60 hrs, additonal hrs $1/hr. Both accounts include a private FTP site and limited Web storage and service.
Phone: 604-886-4120
Email: admin@sunshine.net

Silk Internet

Cities: Kelowna, BC, CANADA
Area Codes: 604
Rates: $20 hookup fee for the first 2 weeks of access. Thereafter, $14.50/mth for 25 hrs of access/mth. Overtime charged at $2/hr. Also available by the year for $139.
Phone: 604-860-4202
Email: info@silk.net

Seanet Communications Corp.

Cities: Vancouver, BC, CANADA
Area Codes: 604
Rates: Standard PPP Dial-Up: $24.95/mth, no setup fee, includes 40 hrs, no busy signals, $1.50/add'l hr. Premium PPP Dial-Up: $62.50/mth, no setup fee, includes 100 hrs, no busy signals, $1.50/add'l hr. Extra POP email box $5.95/mth.
Phone: 800-973-2638
Email: sales@seanet.bc.ca

Canada Internet Direct

Cities: Vancouver, Victoria, Kamloops, Kelowna, Nanaimo, Abbotsford, BC; Calgary, Alberta; CANADA
Area Codes: 604, 403
Rates: Standard Package: 456 hrs of nonprime, 30 hrs of prime-time access monthly, $19.95/mth access fee (Vancouver, Calgary), $24.95/mth access fee (Kelowna, Kamloops, Nanaimo,

Abbotsford). Premium Packag: 456 hrs of nonprime, 50 hrs of prime-time access monthly, $24.95/mth access fee (Vancouver, Calgary), $29.95/mth access fee (Kelowna, Kamloops, Nanaimo, Abbotsford), $1.95/prime-time hr after 50 prime-time hrs used. $25 one-time nonrefundable setup fee. Plus regionally applicable taxes.
Phone: 800-232-4944
Email: cservice@direct.ca

Helix Internet

Cities: Vancouver, BC, CANADA
Area Codes: 604
Rates: Personal Accounts (single email account): $25 startup fee, 15 hrs/mth for $16.95, 100 hrs/mth for $29.95. Corporate Accounts (multiple email accounts): $100 startup fee, 15 hrs/mth for $26.95, 100 hrs/mth for $39.95.
Phone: 604-501-5430
Email: info@helix.net

Hypertech North

Cities: Whitehorse, Dawson City, Faro, WatsonLake, YT, CANADA
Area Codes: 403
Rates: Tier 1: 12-month single-user dial-up account, 36 hrs/mth: $240CDN. 12-month corporate single-user dial-up account, 36 hrs/mth: $500CDN—additional 12-month dial-up accounts $160CDN. 1-month single-user dial-up account, 36hrs/mth: $22.95CDN plus $67.50 setup fee. Tier 2: 12-month single-user dial-up account, 100 hrs/mth: $314CDN, $29.95CDN paid monthly. Tier 3: 12-month single-user dial-up account, unlimited hrs/mth: $540CDN, $49.95CDN paid monthly.
Phone: 403-668-7214
Email: admin@yukon.net

NetSpace S.A. de C.V.

Cities: Toluca, MEXICO
Area Codes: 72
Rates: Call or email.
Phone: (72) 19 4624
Email: info@netspace.com.mx

Interserv

Cities: Port of Spain, TRINIDAD
Rates: Flat rate $100 /mth unlimited access to Web, email, etc.
Phone: 809-637-6862
Email: sales@trinidad.net

RioLink Internet

Cities: Rio de Janeiro, BRASIL
Area Codes: 021
Rates: Subscription: R$30,00. 20hrs/mth: R$ 30,00. 40hrs/mth: R$ 50,00. 80hrs/mth: R$90,00. 200hrs/mth: R$ 200,00 (Subscription R 100,00). Additional hours: R$2,00/hr.
Phone: 55-21268-0717
Email: suporte@rio.com.br

PlaNet FreeNZ

Cities: Auckland, NEW ZEALAND
Area Codes: 09
Rates: Combo (UUCP/Shell/PPP): A single-user account with online, $382/yr free zone, 45hrs/mth, 20MB/mth (international data only); $202/6 mths, $35/mth. Lite (UUCP/Shell/PPP): A single-user account, free zone, $270/yr, 30 hrs/mth, 12 MB/mth, $25/mth. Business (PPP): Free 90hrs/mth, 30MB/mth, $45/mth, and 90 hrs/mth. Connection/Installation: 1) $75 (on-site visit support), 2) $50 (you visit us), 3) Free, self-install (experienced, users only). Call for other rates.
Phone: 025-770-173
Email: info@ak.planet.gen.nz

Access One

Cities: Canberra, Albury, Gosford, Newcastle, Sydney, Wollongong, Darwin, Brisbane, Bundaberg, Cairns, Gladstone, Mackay, Maroochydore, Rockhampton, Southport, Toowoomba, Townsville, Adelaide, Whyalla, Hobart, Launceston, Bairnsdale, Ballarat, Bendigo, Cobram, Echuca, Geelong, Hamilton, Melbourn, Mildura, Moe, Rosebud, Sale, Shepparton, Wangaratta, Wodonga, Perth, AUSTRALIA

Area Codes: 06, 060, 043, 049, 02, 042, 08, 07, 071, 070, 079, 074, 076, 077, 086, 002, 003, 051, 053, 054, 058, 052, 055, 03, 050, 059, 057
Rates: Flat $6.50/hr, Annual $79 + $38/month gives 7 hrs/week.
Phone: + 61-392391444
Email: info@aone.net.au

portal.net

Cities: Adelaide, SA, AUSTRALIA
Area Codes: 08
Rates: $20/mth for 14.4Kbps with 2 hrs/day access, extra time at $1/hr. $30/mth for 28.8Kbps with 2 hrs/day access, extra time at $1.50/hr.
Phone: (08) 2118331
Email: sales@portal.net.au

PowerUp Internet

Cities: Brisbane, AUSTRALIA
Area Codes: 073
Rates: $25/mth for 25 hours.
Phone: +61-738993366
Email: info@powerup.com.au

Kralizec

Cities: Sydney, Windsor, Penrith, AUSTRALIA
Area Codes: 02, 45, 47
Rates: Initial payment: $100 (includes $20 account creation charge, plus $80 prepayment for use).Ongoing charges: $1.50/hr for SLIP/PPP with a minimum of $15/mth.
Phone: +61-2-8371397
Email: info@zeta.org.au

First Link Internet Services Pty Ltd

Cities: Sydney, AUSTRALIA
Area Codes: 02
Rates: AUD$15 registration charge, AUD$30/mth flat rate without time or volume charging. Includes free noncommercial Web pages.
Phone: +61-2-8733577
Email: support@fl.net.au

Connect Infobahn Australia

Cities: Sydney, AUSTRALIA
Area Codes: 02
Rates: PPP economy class: AUD$29/mth flat rate.
Phone: +61-2-5662720
Email: info@cia.com.au

World Reach Pty Ltd

Cities: Sydney, AUSTRALIA
Area Codes: 02
Rates: $30/mth, 100 hours included, $2.50 per additional hour
Phone: (02) 4363588
Email: info@wr.com.au

ASAHI Net

Cities: Sapporo, Sendai, Niigata, Nagano, Utsunomiya, Tsukuba-Tsuchiura, Tokyo, Mitaka-Chofu, Tama,Tachikawa, Hachioji, Machida-Sagami, Tokorozawa, Chiba, Kawasaki, Yokohama, Hiratsuka, Yokosuka, Ichikawa-Matsudo, Funabashi, Kawaguchi-Asaka, Urawa-Omiya, Koshigaya, Kawagoe, Nagoya, Kofu, Osaka, Hirakata, Takatsuki, Kyoto, Kobe, Hiroshima, Fukuoka, KitaKyushu, Toyama, Takamatsu, JAPAN
Area Codes: 011, 022, 025, 026, 028, 0298, 03, 0422, 0423, 0425, 0426, 0427, 0429, 043, 044, 045, 0463, 0468, 0473, 0474, 048, 0489, 0492, 052, 0552, 06, 0720, 0726, 075, 0088, 082, 092, 0764, 0878
Rates: Initial sign-up: 4,500 yen. Monthly rate: 2,500 yen (includes 15 hrs online). Time over 15 hrs: 3 yen/minute.
Phone: 03-3666-2811
Email: e-info@asahi-net.or.jp

Global OnLine Japan

Cities: Tokyo, Osaka, Nagoya, Fukuoka, Yokohama, Okazaki, All JAPAN
Area Codes: 03, 06, 052, 092, 045, 0564, 0070
Rates: Analog PPP 35000 yen/yr, 38.4K PPP 40000 yen/yr. All accounts have a 5000 yen sign-up fee.
Phone: 03-5341-8200
Email: info@gol.com

MAK-Link

Cities: Lviv, UKRAINE
Area Codes: 0322
Rates: Setup fee: $30. Monthly fee: basic $15,

advanced $60. Additional POP account: $15/mth. Call for current pricing! With every account: 8MB of disk space for user files, 16 MB for email, WWW home page, software installation, training, etc.
Phone: 380 322598983
Email: info@link.lviv.ua

Internet Connection - ICON

Cities: Johannesburg, Gauteng, Durban, Natal, Cape Town, Western Cape, Pretoria, Gauteng, PortElizabeth, Eastern Cape, Bloemfontein, Free State, SOUTH AFRICA
Area Codes: 011, 031011, 021, 012, 041, 051
Rates: No connection fee. 1-month subscription: R 85. 6-month subscription: R475. 12-month subscription: R900. All subscriptions are for unlimited access/time/traffic.
Phone: 27-11447-6866
Email: info@icon.co.za

KilimNet

Cities: Istanbul, TURKEY
Area Codes: 216
Rates: Phone.
Phone: 90 216 33602 60
Email: info@kilim.com.tr

FirstNet

Cities: Whole CZECH REPUBLIC
Rates: 890 Czech crowns/mth ($30/mth)
Phone: 800-555-1212
Email: info@firstnet.cz

magnet Online Service

Cities: AUSTRIA (nationwide OES and non-OES)
Rates: Local-call flat-fee Internet access per PPP or SLIP dial-up for ATS 329 ($30)/mth. No additional charges! No time or volume-based fees. Free magnetWEB Internet CD-ROM with "all you need" software collection.
Phone: +43-1-585-1971
Email: info@magnet.at

transnet Internet Services

Cities: Munich, GERMANY
Area Codes: 89
Rates: Call or send email.
Phone: +49-89-44900128
Email: chris.se@trans.net

Magnet.Com AG

Cities: Basel, SWITZERLAND
Area Codes: 61
Rates: 40 Swiss Franks/mth for modem and ISDN dial-up.
Phone: ++41 61 41313 13
Email: friends@magnet.ch

Planet s.r.l.

Cities: Milano, ITALY
Area Codes: 02
Rates: Flat rate, 333.000lire/yr + 19%IVA for personal use. Flat rate, 666.000 lire/year + 19%IVA for business use.
Phone: +39-2-55013197
Email: info@planet.it

EUnet Belgium

Cities: Aalst, Antwerpen, Brugge, Brussel, Charleroi, Diest, Geel, Gent, Hasselt, Kortrijk, Leuven, Leuven, Liege, Mechelen, Mons, Namur, Oostende, Roeselare, Veurne, Wavre, BELGIUM
Area Codes: 053, 03, 050, 02, 071, 013, 014, 09, 011, 056, 016, 041, 015, 065, 059, 051, 058, 010
Rates: One-time setup fee: 1.500 BEF. 3 different subscription fees: 1) Connection Time Tariff: 500 BEF/mth + 4 BEF/min. 2) 30 Hours Free Tariff: 1.800 BEF/mth, over 30 hours + 4 BEF/mth, 3) Unlimited Use Tariff: 3.000 BEF/mth.
Phone: +32-16-2330 02
Email: info@Belgium.EU.net

PING Belgium

Cities: Aalst , Antwerpen, Brugge, Brussel, Chareleroi, Diest, Geel, Gent, Hasselt, Kortrijk, Leuven, Leuven, Liege, Mechelen, Mons, Namur, Nivelles, Oostende, Roeselare, Tongeren, Veurne, Waver, BELGIUM
Area Codes: 053, 03, 050, 02, 071, 013, 014, 09, 011, 056, 016, 016, 041, 015, 065, 081, 067, 059, 051, 012, 058, 010
Rates: 1) 1000 BEF setup fee, 900 BEF/mth. 2) Payment order, 1000 BEF setup fee, 810 BEF/mth. 3) No setup, 9.900 BEF/year. All prices for flat-fee account during nonoffice hours (5 pm - 9 am), weekends: 24h/24h flat-fee.
Phone: +32-70-233773
Email: info@ping.be

Appendix B Providers of Commercial Internet Access

Although we have put together a substantial list of Internet providers specifically for *Internet Starter Kit for Macintosh* (see Appendix A), you still might not find the one that best suits your needs. If not, look through the providers in the following list to see if there is one you want to contact. You will find all the information you need to contact these providers on your own.

Remember that the Internet Starter Kit Installer doesn't configure your Mac to work with these providers, so you must call or email to get the necessary configuration information. Most are more than happy to help you.

This list is the Providers of Commercial Internet Access (POCIA) Directory text version taken directly from the Internet. Note that it is copyrighted material that we have included with permission from the Celestin Company. Our thanks go to Celestin for providing this excellent resource for the Internet community.

---

file on a public BBS, you may do so. However, if you want to reproduce this file (in whole or in part) in a newsletter, book, article, or other commercial media, please contact me at celestin@celestin.com.

All of the information in this directory was supplied to Celestin Company by the service providers and is subject to change without notice. Celestin Company does not endorse any of the providers in this directory. If you do not see a provider listed for your area, please do not ask us about it, as we only know about providers in this directory. This directory is brought to you as a public service. Celestin Company does not receive any compensation from the providers listed here. Since Internet service providers come and go, and frequently change their offers, we strongly urge you to contact them for additional information and/or restrictions.

The latest version of this document is available at the following location: <ftp://ftp.celestin.com/biz/celestin/pocia/pocia.txt>.

You may also retrieve the latest copy (as well as additional information on Celestin Company and its products) using email. For information on how this works, send a blank message to: info@celestin.com.

If you have Web access, try <http://www.celestin.com/pocia/> for the hypertext version of this list, which includes addresses, telephone numbers, fax numbers, email addresses, and pricing.

May 1996

Domestic

Below is a listing of Internet service providers in the U.S. and Canada, sorted by area code. Fields are area code, service provider name, voice phone number, and email address for more information.

Free Service Providers

For the cost of a long-distance phone call, you can dial any of these Internet providers and give the Internet a try.

Name	Phone	Email
Free.org (shell,slip,ppp)	modem -> 715 743 1600	info@free.org
Free.I.Net (must dial via AT&T)	modem -> 801 471 2266	info@free.i.net
SLIPNET (shell,slip,ppp)	modem -> 217 792 2777	info@slip.net

Nationwide Service Providers

The following access providers provide service to more than just one part of the United States and Canada. Many of them provide service regardless of your geographic location but may charge a higher price than local service providers.

Name	Phone	Email
AGIS (Apex Global Information Services)	313 730 1130	info@agis.net
ANS	703 758 7700	info@ans.net
BBN Planet	617 873 2905	net-info@bbnplanet.com
Concentric Research Corporation	800 745 2747	info@cris.com
Connectivity Solutions, Inc.	800 585 0313	info@connection.net
CRL Network Services	415 837 5300	sales@crl.com
DataXchange Network, Inc	800 863 1550	info@dx.net
Delphi Internet Services Corporation	800 695 4005	info@delphi.com
EarthLink Network, Inc.	213 644 9500	sales@earthlink.net
Exodus Communications, Inc.	408 522 8450	info@exodus.net
4GL Corporation	713 589 8077	info@4gl.com
Global Connect, Inc.	804 229 4484	info@gc.net
Information Access Technologies (Holonet)	510 704 0160	info@holonet.net
Institute for Global Communications	415 442 0220	igc-info@igc.apc.org
Liberty Information Network	800 218 5157	info@liberty.com
MIDnet	800 682 5550	info@mid.net
Moran Communications	716 639 1254	info@moran.com
NETCOM On-Line Communications Services	408 554 8649	info@netcom.com
Netrex, Inc	800 3 NETREX	info@netrex.com
Network 99, Inc.	800 NET 99IP	net99@cluster.mcs.net
Performance Systems International	800 827 7482	all-info@psi.com
Portal Information Network	408 973 9111	info@portal.com
SprintLink - Nationwide 56K - 45M access	800 817 7755	info@sprint.net
The ThoughtPort Authority Inc.	800 ISP 6870	info@thoughtport.com
WareNet	714 348 3295	info@ware.net
Zocalo Engineering	510 540 8000	info@zocalo.net

Toll-Free Service Providers

These access providers enable you to dial a toll-free 800 number to connect to the Internet. Most of them charge for this privilege, but it may save you money over long-distance charges if you do not have local Internet access.

Name	Phone	Email
Allied Access Inc.	618 684 2255	sales@intrnet.net
ARInternet Corporation	301 459 7171	info@ari.net
American Information Systems, Inc.	708 413 8400	info@ais.net
Association for Computing Machinery	817 776 6876	account-info@acm.org
CICNet, Inc.	313 998 6103	info@cic.net
Cogent Software, Inc.	818 585 2788	info@cogsoft.com
Cyberius Online Inc.	613 233 1215	info@cyberus.ca
Colorado SuperNet, Inc.	303 296 8202	info@csn.org
EarthLink Network, Inc.	213 644 9500	sales@earthlink.net
Global Connect, Inc.	804 229 4484	info@gc.net
Internet Express	719 592 1240	info@usa.net
Iowa Network Services	800 546 6587	service@netins.net
Mnematics, Incorporated	914 359 4546	service@mne.com
Msen, Inc.	313 998 4562	info@msen.com
NeoSoft, Inc.	713 684 5969	info@neosoft.com
NETCOM On-Line Communications Services	408 554 8649	info@netcom.com
New Mexico Technet, Inc.	505 345 6555	granoff@technet.nm.org
Pacific Rim Network, Inc.	360 650 0442	info@pacificrim.net
Rocky Mountain Internet	800 900 7644	info@rmii.com
Safari Internet	954 537 9550	sales@safari.net
Synergy Communications, Inc.	800 345 9669	info@synergy.net
VivaNET, Inc.	800 836 UNIX	info@vivanet.com
VoiceNet	800 835 5710	info@voicenet.com
WLN	800 342 5956	info@wln.com

Regional Service Providers

These access providers specialize in particular regions, some as small as a town of a thousand people, others as large as the San Francisco Bay Area.

Area Code	Name	Phone	Email
201	Carroll-Net, Inc.	201 488 1332	info@carroll.com
201	Crystal Palace Networking, Inc.	201 300 0881	info@crystal.palace.net
201	Cybernex, Inc.	201 664 0419	info@bc.cybernex.net

Area Code	Name	Phone	Email
201	DIGEX	301 847 5000	sales@digex.net
201	EasyWay Communications Inc.	201 998 8991	sales@easyway.net
201	Eclipse Internet Access	800 483 1223	info@eclipse.net
201	Galaxy Networks	201 825 2310	info@galaxy.net
201	GBN InternetAccess	201 343 6427	gbninfo@gbn.net
201	INTAC Access Corporation	800 504 6822	info@intac.com
201	Interactive Networks, Inc.	201 881 1878	info@interactive.net
201	Intercall, Inc	800 758 7329	sales@intercall.com
201	The Internet Connection Corp.	201 435 4414	info@cnct.com
201	Internet Online Services	x226 -> 201 928 1000	help@ios.com
201	Lightning Internet Services, LLC	516 248 8400	sales@lightning.net
201	Mordor International BBS	201 433 4222	ritz@mordor.com
201	New York Net	718 776 6811	sales@new-york.net
201	NIC - Neighborhood Internet Connection	201 934 1445	info@nic.com
201	Openix - Open Internet Exchange	201 443 0400	info@openix.com
201	Planet Access Networks	201 691 4704	info@planet.net
201	ZONE One Network Exchange	212 824 4000	info@zone.net
202	American Information Network	410 855 2353	info@ai.net
202	ARInternet Corporation	301 459 7171	info@ari.net
202	ATCALL, Inc.	703 522 5252	harish@atcall.com
202	CAPCON Library Network	202 331 5771	info@capcon.net
202	Charm.Net	410 558 3900	info@charm.net
202	Cyber Services, Inc.	703 749 9590	info@cs.com
202	DIGEX	301 847 5000	sales@digex.net
202	Genuine Computing Resources	703 878 4680	info@gcr.com
202	I-Link Ltd	800 ILINK 99	info@i-link.net
202	I2020	804 330 5555	info@i2020.net
202	The Internet Access Company, TIAC	617 276 7200	info@tiac.net
202	Internet Interstate	301 652 4468	services@intr.net
202	Interpath	800 849 6305	info@interpath.net
202	KIVEX, Inc.	800 47 KIVEX	info@kivex.com
202	LaserNet	703 591 4232	info@laser.net
202	Quantum Networking Solutions, Inc.	805 538 2028	info@qnet.com
202	RadixNet Internet Services	301 567 9831	info@radix.net
202	Smartnet Internet Services, LLC	301 470 3400	info@smart.net
202	SONNETS, Inc.	703 502 8589	office@sonnets.net
202	UltraPlex Information Providers	301 598 6UPX	info@upx.net
202	Universal Telecomm Corporation	703 758 0550	root@utc.net
202	US Net, Incorporated	301 572 5926	info@us.net
202	World Web Limited	703 838 2000	info@worldweb.net
202	Xpress Internet Services	301 601 5050	info@xis.com

Area Code	Name	Phone	Email
203	Computerized Horizons	203 335 7431	sysop@fcc.com
203	Connix: Connecticut Internet Exchange	860 349 7059	office@connix.com
203	Continuum Communications, Inc.	203 885 3576	gph@q.continuum.net
203	Futuris Networks, Inc.	203 359 8868	info@futuris.net
203	imagine.com	860 527 9245	Postmaster @imagine.com
203	Internet84, LLC	203 830 2122	staff@i84.net
203	Lightning Internet Services, LLC	516 248 8400	sales@lightning.net
203	MCIX, Inc.	860 572 8720	info@mcix.com
203	Mindport Internet Services, Inc.	860 892 2081	staff@mindport.net
203	NETPLEX	203 233 1111	info@ntplx.net
203	North American Internet Company	800 952 INET	info@nai.net
203	Paradigm Communications, Inc.	203 250 7397	info@pcnet.com
203	ZONE One Network Exchange	212 824 4000	info@zone.net
204	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca
204	Gate West Communications	204 663 2931	info@gatewest.net
204	Pangea.CA, Inc.	204 985 9025	info@pangea.ca
205	AIRnet Internet Services, Inc.	800 247 6388	efelton@AIRnet.net
205	Community Internet Connect, Inc.	205 722 0199	info@cici.com
205	HiWAAY Information Services	205 533 3131	info@HiWAAY.net
205	Hub City Area Access	601 268 6156	info@hub1.hubcity.com
205	interQuest, Inc.	205 464 8280	info@iquest.com
205	MindSpring Enterprises, Inc.	800 719 4332	info@mindspring.com
205	Renaissance Internet Services	205 535 2113	info@ro.com
205	Scott Network Services, Inc.	205 987 5889	info@scott.net
206	Blarg! Online Services	206 782 6578	info@blarg.net
206	Cyberspace	206 281 5397	info@cyberspace.com
206	Digital Forest	206 487 6414	info@forest.net
206	Eskimo North	206 367 7457	nanook@eskimo.com
206	I-Link Ltd	800 ILINK 99	info@i-link.net
206	InEx Net	206 670 1131	info@inex.com
206	Interconnected Associates Inc. (IXA)	206 622 7337	mike@ixa.com
206	Internet Express	719 592 1240	info@usa.net
206	ISOMEDIA.COM	206 881 8769	info@isomedia.com
206	Northwest Nexus, Inc.	206 455 3505	info@nwnexus.wa.com
206	NorthWestNet	206 562 3000	info@nwnet.net
206	Olympic Computing Solutions	206 989 6698	ocs@oz.net
206	Oregon Information Technology Centeres	503 469 6699	hmaster @harborside.com
206	Pacific Rim Network, Inc.	x11 -> 360 650 0442	info@pacificrim.net
206	Seanet Online Services	206 343 7828	info@seanet.com

Area Code	Name	Phone	Email
206	SenseMedia	408 335 9400	sm@picosof.com
206	Structured Network Systems, Inc.	503 656 3530	info@structured.net
206	Teleport, Inc.	503 223 4245	info@teleport.com
206	Transport Logic	503 243 1940	sales@transport.com
206	WLN	800 342 5956	info@wln.com
207	Agate Internet Services	207 947 8248	ais@agate.net
207	The Internet Access Company, TIAC	617 276 7200	info@tiac.net
207	Internet Maine	207 780 0416	info@mainelink.net
207	MaineStreet Communications	207 657 5078	rainmaker@maine.com
207	Midcoast Internet Solutions	207 594 8277	accounts @midcoast.com
207	MV Communications, Inc.	603 429 2223	info@mv.mv.com
207	Northern Lights Internet Services	207 773 4941	jkilday@nlbbs.com
208	Micron Internet Services	208 368 5400	sales@micron.net
208	Minnesota Regional Network	612 342 2570	info@mr.net
208	NICOH Net	208 233 5802	info@nicoh.com
208	NorthWestNet	206 562 3000	info@nwnet.net
208	Primenet	602 870 1010	info@primenet.com
208	SRVnet	208 524 6237	nlp@srv.net
208	Structured Network Systems, Inc.	503 656 3530	info@structured.net
208	Transport Logic	503 243 1940	sales@transport.com
209	The Computer Depot	209 223 5043	admin@cdepot.net
209	Cybergate Information Services	209 486 4283	cis@cybergate.com
209	Infonet Communications, Inc.	209 446 2360	mikeb@icinet.net
209	InReach Internet Communications	800 446 7324	info@inreach.com
209	InterNex Tiara	408 496 5466	info@internex.net
209	Primenet	602 870 1010	info@primenet.com
209	ValleyNet Communications	209 486 8638	info@valleynet.com
209	West Coast Online	707 586 3060	info@calon.com
210	Connect International Inc.	210 341 2599	info@connecti.com
210	Delta Design and Development Inc.	800 763 8265	sales@deltaweb.com
210	The Eden Matrix	512 478 9900	info@eden.com
210	Hill-Country.Net	800 761 0092	sales@hcnetwork.com
210	I-Link Ltd	800 ILINK 99	info@i-link.net
210	Phoenix DataNet, Inc.	713 486 8337	info@phoenix.net
212	Advanced Standards, Inc advn.com	212 302 3366	kolian@advn.com
212	Alternet (UUNET Technologies, Inc.)	703 204 8000	info@alter.net
212	Blythe Systems	212 226 7171	infodesk@blythe.org
212	BrainLINK International	718 805 6559	info@brainlink.com
212	bway.net / Outernet, Inc.	212 982 9800	info@bway.net
212	Calyx Internet Access	212 475 5051	info@calyx.net

Area Code	Name	Phone	Email
212	Creative Data Consultants (SILLY.COM)	718 229 0489	info@silly.com
212	Cybernex, Inc.	201 664 0419	info@bc.cybernex.net
212	DIGEX	301 847 5000	sales@digex.net
212	Echo Communications Group	212 255 3839	info@echonyc.com
212	escape.com - Kazan Corp	212 888 8780	info@escape.com
212	I-Link Ltd	800 ILINK 99	info@i-link.net
212	Ingress Communications Inc.	212 679 2838	info@ingress.com
212	INTAC Access Corporation	800 504 6822	info@intac.com
212	Intellitech Walrus	212 406 5000	info@walrus.com
212	Interactive Networks, Inc.	201 881 1878	info@interactive.net
212	Intercall, Inc	800 758 7329	sales@intercall.com
212	Intercom Online Inc.	212 378 2202	info@intercom.com
212	The Internet Access Company, TIAC	617 276 7200	info@tiac.net
212	The Internet Connection Corp.	201 435 4414	info@cnct.com
212	Internet Online Services	x226 -> 201 928 1000	help@ios.com
212	Internet QuickLink Corp.	212 307 1669	info@quicklink.com
212	Interport Communications Corp.	212 989 1128	info@interport.net
212	Lightning Internet Services, LLC	516 248 8400	sales@lightning.net
212	Long Island Internet HeadQuarters	516 439 7800	support@pb.net
212	Mordor International BBS	201 433 4222	ritz@mordor.com
212	Mnematics, Incorporated	914 359 4546	service@mne.com
212	New World Data	718 962 1725	dmk@nwdc.com
212	New York Net	718 776 6811	sales@new-york.net
212	NY WEBB, Inc.	800 458 4660	wayne@webb.com
212	NYSERNet	800 493 4367	sales@nysernet.org
212	Panix (Public Access uNIX)	212 741 4400	info@panix.com
212	Phantom Access Technologies, Inc.	212 989 2418	bruce@phantom.com
212	Pipeline New York	212 267 3636	info@pipeline.com
212	Real Life Pictures RealNet	212 366 4434	reallife@walrus.com
212	Spacelab.Net	212 966 8844	mike@mxol.com
212	The ThoughtPort Authority Inc.	800 ISP 6870	info@thoughtport.com
212	ThoughtPort of New York City	212 645 7970	info@precipice.com
212	tunanet/InfoHouse	212 229 8224	info@tunanet.com
212	ZONE One Network Exchange	212 824 4000	info@zone.net
213	ArtNetwork	800 395 0692	info@artnet.net
213	Ashford Communications	310 323 2934	services@ashford.com
213	BeachNet Internet Access	310 823 3308	info@beachnet.com
213	Cogent Software, Inc.	818 585 2788	info@cogsoft.com
213	Cyberverse Online	310 643 3783	info@cyberverse.com
213	Delta Internet Services	714 778 0370	info@deltanet.com
213	DigiLink Network Services	310 542 7421	info@digilink.net

Area Code	Name	Phone	Email
213	DirectNet	213 383 3144	info@directnet.com
213	E-Z Net	213 738 9284	Info@e-znet.com
213	Electriciti	619 338 9000	info@powergrid.electriciti.com
213	Exodus Communications, Inc.	408 522 8450	info@exodus.net
213	Flamingo Communications Inc.	310 532 3533	sales@fcom.com
213	I-Link Ltd	800 ILINK 99	info@i-link.net
213	Instant Internet Corporation (InstaNet)	818 772 0097	charlyg@instanet.com
213	Interline Communication Group.	310 257 0960	Sales@interline.net
213	InterWorld Communications, Inc.	310 726 0500	sales@interworld.net
213	The Loop Internet Switch Co.	213 465 1311	info@loop.com
213	KAIWAN Internet	714 638 2139	info@kaiwan.com
213	KTB Internet Online	818 240 6600	info@ktb.net
213	Leonardo Internet	310 395 5500	jimp@leonardo.net
213	Liberty Information Network	800 218 5157	info@liberty.com
213	Network Intensive	714 450 8400	info@ni.net
213	Online-LA	310 967 8000	sales@online-la.com
213	OutWest Network Services	818 545 1996	info@outwest.net
213	Primenet	602 870 1010	info@primenet.com
213	QuickCom Internet Communcations	213 634 7735	info@quickcom.net
213	Saigon Enterprises	818 246 0689	info@saigon.net
213	ViaNet Communications	415 903 2242	info@via.net
214	Alternet (UUNET Technologies, Inc.)	703 204 8000	info@alter.net
214	ANET (American Internet)	800 776 8894	sales@anet-dfw.com
214	CompuTek	214 994 0190	info@computek.net
214	Connection Technologies - ConnectNet	214 490 7100	sales@connect.net
214	Delta Design and Development Inc.	800 763 8265	sales@deltaweb.com
214	DFW Internet Services, Inc.	817 332 5116	info@dfw.net
214	I-Link Ltd	800 ILINK 99	info@i-link.net
214	OnRamp Technologies, Inc.	214 746 4710	info@onramp.net
214	Texas Metronet, Inc.	214 705 2900	info@metronet.com
215	Cheap Net	302 993 8420	sammy@ravenet.com
215	Cynet, Inc.	888 CYNETPA	info@cynet.net
215	DIGEX	301 847 5000	sales@digex.net
215	epix	800 374 9669	karndt@epix.net
215	FishNet	610 337 9994	info@pond.com
215	GlobalQUEST, Inc.	610 696 8111	info@globalquest.net
215	Internet Tidal Wave	610 770 6187	steve@itw.com
215	InterNetworking Technologies	302 398 4369	itnt.com@itnt.com
215	The Magnetic Page	302 651 9753	info@magpage.com
215	Microserve Information Systems	717 779 4430	info@microserve.com

Area Code	Name	Phone	Email
215	Net Access	215 576 8669	support@netaxs.com
215	NetReach, Incorporated	215 283 2300	info@netreach.net
215	Network Analysis Group	800 624 9240	nag@good.freedom.net
215	OpNet	610 520 2880	info@op.net
215	RaveNet Systems Inc	302 993 8420	waltemus@ravenet.com
215	VivaNET, Inc.	800 836 UNIX	info@vivanet.com
215	VoiceNet	800 835 5710	info@voicenet.com
215	You Tools Corporation / FASTNET	610 954 5910	info@fast.net
216	APK Public Access UNI* Site	216 481 9436	info@wariat.org
216	Branch Information Services	313 741 4442	branch-info @branch.com
216	CanNet Internet Services	216 484 2260	info@cannet.com
216	CommercePark Interactive, Ltd.	216 523 2240	info@commercepark .com
216	ExchangeNet	216 261 4593	info@en.com
216	Gateway to Internet Services	216 656 5511	ytc@gwis.com
216	Multiverse, Inc.	216 344 3080	multiverse.com
216	New Age Consulting Service	216 524 3162	damin@nacs.net
216	OARnet (corporate clients only)	614 728 8100	info@oar.net
217	Allied Access Inc.	618 684 2255	sales@intrnet.net
217	Net66	217 328 0066	sales@net66.com
217	Shouting Ground Technologies, Inc.	217 351 7921	admin@shout.net
217	Sol Tec, Inc.	317 920 1SOL	info@soltec.com
218	Minnesota OnLine	612 225 1110	info@mn.state.net
218	Red River Net	701 232 2227	info@rrnet.com
218	Protocol Communications, Inc.	612 541 9900	info@protocom.com
219	CTLnet Internet Services	219 489 2854	info@ctlnet.com
219	Custom Logic Systems	219 255 5201	info@cl-sys.com
219	Wink Communications Group, Inc.	708 310 9465	sales@winkcomm.com
301	ABSnet Internet Services	410 361 8160	info@abs.net
301	American Information Network	410 855 2353	info@ai.net
301	ARInternet Corporation	301 459 7171	info@ari.net
301	ATCALL, Inc.	703 522 5252	harish@atcall.com
301	Charm.Net	410 558 3900	info@charm.net
301	Clark Internet Services, Inc. ClarkNet	410 995 0691	info@clark.net
301	Cyber Services, Inc.	703 749 9590	info@cs.com
301	DIGEX	301 847 5000	sales@digex.net
301	FredNet	301 631 5300	info@fred.net
301	Genuine Computing Resources	703 878 4680	info@gcr.com
301	Internet Interstate	301 652 4468	services@intr.net
301	KIVEX, Inc.	800 47 KIVEX	info@kivex.com
301	Kompleat Internet Services LLC	301 293 4333	netadmin@kis.net

Area Code	Name	Phone	Email
301	LaserNet	703 591 4232	info@laser.net
301	Quantum Networking Solutions, Inc.	805 538 2028	info@qnet.com
301	RadixNet Internet Services	301 567 9831	info@radix.net
301	Smartnet Internet Services, LLC	301 470 3400	info@smart.net
301	SONNETS, Inc.	703 502 8589	office@sonnets.net
301	SURAnet	301 982 4600	marketing@sura.net
301	UltraPlex Information Providers	301 598 6UPX	info@upx.net
301	Universal Telecomm Corporation	703 758 0550	root@utc.net
301	US Net, Incorporated	301 572 5926	info@us.net
301	World Web Limited	703 838 2000	info@worldweb.net
301	Xpress Internet Services	301 601 5050	info@xis.com
302	Cheap Net	302 993 8420	sammy@ravenet.com
302	Delaware Common Access Network	302 654 1019	info@dca.net
302	DIGEX	301 847 5000	sales@digex.net
302	First State Web, Inc.	302 234 0721	info@wittnet.com
302	InterNetworking Technologies	302 398 4369	itnt.com@itnt.com
302	The Magnetic Page	302 651 9753	info@magpage.com
302	RaveNet Systems Inc	302 993 8420	waltemus@ravenet.com
302	SSNet, Inc.	302 378 1386	info@ssnet.com
302	VoiceNet	800 835 5710	info@voicenet.com
303	ABWAM, Inc.	303 730 6050	info@entertain.com
303	Colorado SuperNet, Inc.	303 296 8202	info@csn.org
303	CSDC, Inc.	303 665 8053	support@ares.csd.net
303	The Denver Exchange, Inc.	303 455 4252	info@tde.com
303	Denver Internet Access Corp (DIAC)	303 745 9588	info@diac.com
303	ENVISIONET, Inc.	303 770 2408	info@envisionet.net
303	EZLink Internet Access	970 482 0807	ezadmin@ezlink.com
303	I-Link Ltd	800 ILINK 99	info@i-link.net
303	Indra's Net, Inc.	303 546 9151	info@indra.com
303	Internet Express	719 592 1240	info@usa.net
303	NETConnect	800 689 8001	office@tcd.net
303	NetWay 2001, Inc.	303 794 1000	info@netway.net
303	New Mexico Technet, Inc.	505 345 6555	granoff@technet.nm.org
303	Online Network Enterprises, Inc.	303 444 2522	info@netONE.com
303	Rocky Mountain Internet	800 900 7644	info@rmii.com
303	Shaman Exchange, Inc.	303 674 9784	info@dash.com
303	Stonehenge Internet Communications	800 RUN INET	info@henge.com
304	CityNet Corporation	800 881 CNET	info@citynet.net
304	RAM Technologies Inc.	800 950 1726	info@ramlink.net
305	Acquired Knowledge Systems, Inc.	305 525 2574	info@aksi.net
305	CyberGate, Inc.	305 428 4283	sales@gate.net

Area Code	Name	Phone	Email
305	Electronic Link	305 378 1128	info@elink.net
305	The EmiNet Domain	407 731 0222	info@emi.net
305	ICANECT	305 621 9200	sales@icanect.net
305	InteleCom Data Systems, Inc.	401 885 6855	info@ids.net
305	Internet Providers of Florida, Inc	305 273 7978	office@ipof.fla.net
305	Internet World Information Network	305 535 3090	webmaster@winnet.net
305	Magg Information Services, Inc.	407 642 9841	help@magg.net
305	NetMiami Internet Corporation	305 554 4463	picard@netmiami.com
305	Netpoint Communications, Inc.	305 891 1955	info@netpoint.net
305	Paradise Communications, Inc.	404 980 0078	info@paradise.net
305	PSS InterNet Services	800 463 8499	support@america.com
305	Safari Internet	954 537 9550	sales@safari.net
305	SatelNET Communications, Inc.	305 434 8738	admin@satelnet.org
305	Shadow Information Services, Inc.	305 594 2450	admin@shadow.net
305	WebIMAGE, an internet presence provider	407 723 0001	info@webimage.com
305	Zimmerman Communications	954 584 0199	bob@zim.com
306	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca
306	Quadrant Newmedia	306 664 9100	info@quadrant.net
307	CoffeyNet	307 234 5443	web@coffey.com
307	NETConnect	800 689 8001	office@tcd.net
307	wyoming.com	307 332 3030	info@wyoming.com
308	Synergy Communications, Inc.	800 345 9669	info@synergy.net
309	CICNet, Inc.	313 998 6103	info@cic.net
309	Driscoll Communications	309 367 2006	info@dris.com
309	Interactive Communications & Explorations	309 454 4638	icenet@ice.net
310	ArtNetwork	800 395 0692	info@artnet.net
310	Ashford Communications	310 323 2934	services@ashford.com
310	BeachNet Internet Access	310 823 3308	info@beachnet.com
310	Bravado Internet Services	310 656 3450	sales@bravado.net
310	Business Access Technologies	714 577 8978	Techs@batech.com
310	Cloverleaf Communications	714 895 3075	sales@cloverleaf.com
310	Cogent Software, Inc.	818 585 2788	info@cogsoft.com
310	CruzNet	714 680 6600	info@cruznet.net
310	Cyberverse Online	310 643 3783	info@cyberverse.com
310	Delta Internet Services	714 778 0370	info@deltanet.com
310	DigiLink Network Services	310 542 7421	info@digilink.net
310	Exodus Communications, Inc.	408 522 8450	info@exodus.net
310	E-Z Net	213 738 9284	Info@e-znet.com
310	Flamingo Communications Inc.	310 532 3533	sales@fcom.com
310	Instant Internet Corporation (InstaNet)	818 772 0097	charlyg@instanet.com
310	Interline Communication Group.	310 257 0960	Sales@interline.net

Area Code	Name	Phone	Email
310	InterWorld Communications, Inc.	310 726 0500	sales@interworld.net
310	KAIWAN Internet	714 638 2139	info@kaiwan.com
310	KTB Internet Online	818 240 6600	info@ktb.net
310	Leonardo Internet	310 395 5500	jimp@leonardo.net
310	Liberty Information Network	800 218 5157	info@liberty.com
310	Lightside, Inc.	818 858 9261	Lightside @Lightside.Com
310	The Loop Internet Switch Co.	213 465 1311	info@loop.com
310	Network Intensive	714 450 8400	info@ni.net
310	Online-LA	310 967 8000	sales@online-la.com
310	OutWest Network Services	818 545 1996	info@outwest.net
310	QuickCom Internet Communcations	213 634 7735	info@quickcom.net
310	QuickNet, Inc.	714 969 1091	sales@quick.net
310	Saigon Enterprises	818 246 0689	info@saigon.net
310	SoftAware	310 305 0275	info@softaware.com
310	Southland Internet Services	714 441 3000	info@southland.net
310	ViaNet Communications	415 903 2242	info@via.net
312	American Information Systems, Inc.	708 413 8400	info@ais.net
312	CICNet, Inc.	313 998 6103	info@cic.net
312	CIN.net Computerese Information Network	708 310 1188	info@cin.net
312	Compunet Technology Consultants	708 355 XNET	webmaster @ms.com-punet.com
312	InterAccess Co.	708 498 2542	info@interaccess.com
312	Interactive Network Systems, Inc.	312 881 3039	info@insnet.com
312	MCSNet	312 803 6271	info@mcs.net
312	MicroWeb Technology, Inc.	847 480 9715	sales@mtiweb.net
312	The Planet Group, Inc.	312 772 8333	info@www. planet-group.com
312	Ripco Communications, Inc.	312 477 6210	info@ripco.com
312	Tezcatlipoca, Inc.	312 850 0181	info@tezcat.com
312	The ThoughtPort Authority Inc.	800 ISP 6870	info@thoughtport.com
312	Wink Communications Group, Inc.	708 310 9465	sales@winkcomm.com
312	WorldWide Access	708 367 1870	info@wwa.com
312	XNet Information Systems	708 983 6064	info@xnet.com
313	Branch Information Services	313 741 4442	branch-info @branch.com
313	CICNet, Inc.	313 998 6103	info@cic.net
313	Great Lakes Information Systems	810 786 0454	info@glis.net
313	ICNET / Innovative Concepts	313 998 0090	info@ic.net
313	Isthmus Corporation	313 973 2100	info@izzy.net
313	Michigan Internet Cooperative Assn	810 355 1438	info@coop.mica.net
313	Mich.com, Inc.	810 478 4300	info@mich.com

Area Code	Name	Phone	Email
313	Msen, Inc.	313 998 4562	info@msen.com
313	RustNet, Inc.	810 650 6812	info@rust.net
313	Voyager Information Networks, Inc.	517 485 9068	help@voyager.net
314	accessU.S. Inc.	800 638 6373	info@accessus.net
314	Allied Access Inc.	618 684 2255	sales@intrnet.net
314	Inlink	314 432 0935	support@inlink.com
314	NeoSoft, Inc.	713 684 5969	info@neosoft.com
314	Online Information Access Network	618 692 9813	info@oia.net
314	MVP-Net, Inc.	314 731 2252	info@MO.NET
314	Saint Louis Internet Connections	314 241 iCON	info@icon-stl.net
314	SOCKET Internet Services Corporation	314 499 9131	office@socketis.net
314	Tetranet Communications, Inc.	314 256 4495	info@tetranet.net
314	The ThoughtPort Authority Inc.	800 ISP 6870	info@thoughtport.com
315	NYSERNet	800 493 4367	sales@nysernet.org
315	ServiceTech, Inc.	716 263 3360	info@servtech.com
315	Spectra.net	607 798 7300	info@spectra.net
315	Syracuse Internet	315 233 1948	info@vcomm.net
315	VivaNET, Inc.	800 836 UNIX	info@vivanet.com
316	Elysian Fields, Inc.	316 267 2636	info@elysian.net
316	Future Net, Inc.	316 652 0070	rgmann@fn.net
316	NetVision Technologies, Inc.	316 262 0012	info@nvt.net
316	SouthWind Internet Access, Inc.	316 263 7963	info@southwind.net
317	HolliCom Internet Services	317 883 4500	cale@holli.com
317	IQuest Internet, Inc.	317 259 5050	info@iquest.net
317	Metropolitan Data Networks Limited	317 449 0539	info@mdn.com
317	Net Direct	317 251 5252	kat@inetdirect.net
317	NetLink Communications, Inc.	317 463 4724	info@pop.nlci.com
317	Sol Tec, Inc.	317 920 1SOL	info@soltec.com
318	Linknet Internet Services	318 442 5465	rdalton@linknet.net
318	Net-Connect, Ltd.	318 234 4396	services @net-connect.net
319	Digital Horizons, Inc.	319 377 9755	admin@dhinternet.com
319	Freese-Notis Weather.Net	515 282 9310	hfreese@weather.net
319	ia.net	319 393 1095	info@ia.net
319	INTERLINK L.C.	319 524 2895	postmaster@interl.net
319	Iowa Network Services	800 546 6587	service@netins.net
334	Datasync Internet Services	601 872 0001	info@datasync.com
334	Gulf Coast Internet Company	904 438 5700	info@gulf.net
334	OnLine Montgomery	334 271 9576	rverble@bbs.olm.com
334	MindSpring Enterprises, Inc.	800 719 4332	info@mindspring.com
334	Scott Network Services, Inc.	205 987 5889	info@scott.net

Area Code	Name	Phone	Email
334	WSNetwork Communications Services, Inc.	334 263 5505	custserv@wsnet.com
360	The Bellingham Internet Cafe	360 650 0442	tonys@inet-cafe.com
360	Interconnected Associates Inc. (IXA)	206 622 7337	mike@ixa.com
360	NorthWest CommLink	360 336 0103	info@nwcl.net
360	NorthWestNet	206 562 3000	info@nwnet.net
360	Olympia Networking Services	360 753 3636	info@olywa.net
360	Olympic Net	360 692 0651	info@olympic.net
360	Olympus	360 385 0464	info@olympus.net
360	Pacifier Computers	360 693 2116	info@pacifier.com
360	Pacific Rim Network, Inc.	x11 -> 360 650 0442	info@pacificrim.net
360	Performa Services	360 426 0738	patrick@westsound.com
360	Premier1 Internet Services	360 793 3658	info@premier1.net
360	Skagit On-Line Services	360 755 0190	info@sos.net
360	Structured Network Systems, Inc.	503 656 3530	info@structured.net
360	Teleport, Inc.	503 223 4245	info@teleport.com
360	Transport Logic	503 243 1940	sales@transport.com
360	TSCNet Inc.	360 613 0708	info@tscnet.com
360	Whidbey Connections, Inc.	360 678 1070	info@whidbey.net
360	WLN	800 342 5956	info@wln.com
401	brainiac services inc.	401 539 9050	info@brainiac.com
401	CompUtopia	401 732 5588	allan@computopia.com
401	InteleCom Data Systems, Inc.	401 885 6855	info@ids.net
401	The Internet Access Company, TIAC	617 276 7200	info@tiac.net
401	The Internet Connection, Inc.	508 261 0383	info@ici.net
401	MCIX, Inc.	860 572 8720	info@mcix.com
401	Plymouth Commercial Internet Exchange	617 741 5900	info@pcix.com
401	Saturn Internet Corporation	617 451 9121	info@saturn.net
401	Web Services International Incorporated	401 846 8500	bill.fink@nccnet.com
402	Greater Omaha Public Access Unix Corp	402 558 5030	info@gonix.com
402	Internet Nebraska	402 434 8680	info@inetnebr.com
402	Iowa Network Services	800 546 6587	service@netins.net
402	Novia Internetworking	402 391 4005	info@novia.net
402	The Online Pitstop	402 291 1542	bob@top.net
402	Pioneer Internet	712 271 0101	info@pionet.net
402	ProLinx Communications, Inc.	402 551 3036	techsupport @nfinity.nfinity.com
402	Synergy Communications, Inc.	800 345 9669	info@synergy.net
402	Zelcom International, Incorporated	402 333 2441	administration-dept @zelcom.com
403	AGT Limited	800 608 1155	info@agt.net
403	Alberta SuperNet Inc.	403 441 3663	info@supernet.ab.ca

Area Code	Name	Phone	Email
403	CCI Networks	403 450 6787	info@ccinet.ab.ca
403	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca
403	Debug Computer Services	403 248 5798	root@debug.cuc.ab.ca
403	TST Consulting	403 529 1560	sales@TST-MedHat.com
403	UUNET Canada, Inc.	416 368 6621	info@uunet.ca
404	CyberNet Communications Corporation	404 518 5711	sfeingold@atlwin.com
404	Digital Service Consultants Inc.	770 455 9022	info@dscga.com
404	First Internet Resources	800 577 5969	jcarter@1stresource .com
404	I-Link Ltd	800 ILINK 99	info@i-link.net
404	Internet Atlanta	404 410 9000	info@atlanta.com
404	MindSpring Enterprises, Inc.	800 719 4332	info@mindspring.com
404	NetDepot Inc.	770 434 5595	info@netdepot.com
404	Paradise Communications, Inc.	404 980 0078	info@paradise.net
404	Random Access, Inc.	404 804 1190	sales@randomc.com
404	vividnet	770 933 0999	webadmin@vivid.net
405	Internet Oklahoma	405 721 1580	info@ionet.net
405	Questar Network Services	405 848 3228	info@qns.net
406	CyberPort Montana	406 863 3221	skippy@cyberport.net
406	Internet Montana	406 255 9699	support@comp-unltd .com
406	Montana Internet Cooperative	406 443 3347	admin@mt.net
406	Montana Online	406 721 4952	info@montana.com
406	NorthWestNet	206 562 3000	info@nwnet.net
407	Acquired Knowledge Systems, Inc.	305 525 2574	info@aksi.net
407	CyberGate, Inc.	305 428 4283	sales@gate.net
407	The EmiNet Domain	407 731 0222	info@emi.net
407	Florida Online	407 635 8888	info@digital.net
407	GS-Link Systems Inc.	407 671 8682	info@gslink.net
407	I-Link Ltd	800 ILINK 99	info@i-link.net
407	ICANECT	305 621 9200	sales@icanect.net
407	InteleCom Data Systems, Inc.	401 885 6855	info@ids.net
407	Internet Providers of Florida, Inc	305 273 7978	office@ipof.fla.net
407	InternetU	407 952 8487	info@iu.net
407	Magg Information Services, Inc.	407 642 9841	help@magg.net
407	MagicNet, Inc.	407 657 2202	info@magicnet.net
407	MetroLink Internet Services	407 726 6707	jtaylor@metrolink.net
407	PSS InterNet Services	800 463 8499	support@america.com
407	Shadow Information Services, Inc.	305 594 2450	admin@shadow.net
407	WAM / NetRunner	407 392 9422	wam@wamsyst.com
407	WebIMAGE, an internet presence provider	407 723 0001	info@webimage.com
408	A-Link Network Services, Inc.	408 720 6161	info@alink.net

Area Code	Name	Phone	Email
408	Aimnet Information Services	408 257 0900	info@aimnet.com
408	Alternet (UUNET Technologies, Inc.)	703 204 8000	info@alter.net
408	Bay Area Internet Solutions	408 447 8690	tjw00@bayarea.net
408	Brainstorm's Internet Power Connection	415 473-6411	info@brainstorm.net
408	BTR Communications Company	415 966 1429	support@btr.com
408	Click.Net	415 579 2535	info@click.net
408	Cruzio	408 423 1162	office@cruzio.com
408	Direct Network Access	510 649 6110	support@dnai.com
408	The Duck Pond Public Unix	modem->408 249 9630	postmaster@kfu.com
408	Electriciti	619 338 9000	info@powergrid .electriciti.com
408	Exodus Communications, Inc.	408 522 8450	info@exodus.net
408	GST Net	510 792 0768	info@gst.net
408	ICOnetworks	408 461 4638	info@ico.net
408	Idiom Consulting	510 658 5700	info@idiom.com
408	Infoserv Connections	408 335 5600	root@infoserv.com
408	Internet Avenue	408 727 0777	sales@ave.net
408	InterNex Tiara	408 496 5466	info@internex.net
408	ISP Networks	408 653 0100	info@isp.net
408	Liberty Information Network	800 218 5157	info@liberty.com
408	meernet	415 428 7111	info@meer.net
408	MIBX, Inc.	408 280 2022	info@mibx.net
408	Monterey Bay Internet	408 642 6100	info@mbay.net
408	NetGate Communications	408 565 9601	sales@netgate.net
408	Network Solutions	408 946 6895	info@inow.com
408	San Jose Co-op	408 978 3958	sales@sj-coop.net
408	Scruz-Net	408 457 5050	info@scruz.net
408	SenseMedia	408 335 9400	sm@picosof.com
408	South Valley Internet	408 683 4533	info@garlic.com
408	Silicon Valley Public Access Link	408 448 3071	abem@svpal.org
408	West Coast Online	707 586 3060	info@calon.com
408	zNET	619 755 7772	info@znet.com
408	Zocalo Engineering	510 540 8000	info@zocalo.net
409	Brazos Information Highway Services	409 693 9336	info@bihs.net
409	CVTV - Internet	800 247 8885	cyndyz@cvtv.net
409	Cybercom Corporation	409 268 0771	www@cy-net.net
409	Delta Design and Development Inc.	800 763 8265	sales@deltaweb.com
409	Fayette Area Internet Services	409 968 3999	mcooper@fais.net
409	Internet Connect Services, Inc.	512 572 9987	info@icsi.net
409	PERnet Communications, Inc.	409 729 4638	info@mail.pernet.net
409	Phoenix DataNet, Inc.	713 486 8337	info@phoenix.net
410	ABSnet Internet Services	410 361 8160	info@abs.net

Area Code	Name	Phone	Email
410	American Information Network	410 855 2353	info@ai.net
410	ARInternet Corporation	301 459 7171	info@ari.net
410	BayServe Technologies, Inc.	410 360 2216	sales@bayserve.net
410	CAPCON Library Network	202 331 5771	info@capcon.net
410	Charm.Net	410 558 3900	info@charm.net
410	Clark Internet Services, Inc. ClarkNet	410 995 0691	info@clark.net
410	Cyber Services, Inc.	703 749 9590	info@cs.com
410	DIGEX	410 847 5050	sales@digex.net
410	Internet Interstate	301 652 4468	services@intr.net
410	jaguNET Access Services	410 931 3157	info@jagunet.com
410	KIVEX, Inc.	800 47 KIVEX	info@kivex.com
410	Smartnet Internet Services, LLC	410 792 4555	info@smart.net
410	Softaid Internet Services Inc.	410 290 7763	sales@softaid.net
410	UltraPlex Information Providers	410 880 4604	info@upx.net
410	US Net, Incorporated	301 572 5926	info@us.net
412	CityNet, Inc.	412 481 5406	info@city-net.com
412	epix	800 374 9669	karndt@epix.net
412	FYI Networks	412 898 2323	info@fyi.net
412	Pittsburgh OnLine Inc.	412 681 6130	sales@pgh.net
412	Stargate Industries, Inc.	412 942 4218	info@sgi.net
412	Telerama Public Access Internet	412 481 3505	info@telerama.lm.com
412	The ThoughtPort Authority Inc.	800 ISP 6870	info@thoughtport.com
412	USA OnRamp	412 391 4382	info@usaor.com
412	Westmoreland Online Incorporated	412 830 4900	sales@westol.com
413	The Internet Access Company, TIAC	617 276 7200	info@tiac.net
413	Mallard Electronics, Inc.	413 732 0214	gheacock@map.com
413	ShaysNet.COM	413 772 3774	staff@shaysnet.com
413	SoVerNet, Inc.	802 463 2111	info@sover.net
413	the spa!, inc.	413 539 9818	info@the-spa.com
414	cedar systems	414 367 8596	jth@cedar.net
414	Excel.Net, Inc.	414 452 0455	manager@excel.net
414	Exec-PC, Inc.	414 789 4200	info@execpc.com
414	FullFeed Communications	608 246 4239	info@fullfeed.com
414	Internet Access LLC	414 648 3837	info@intaccess.com
414	MIX Communications	414 351 1868	info@mixcom.com
414	NetNet, Inc.	414 499 1339	info@netnet.net
414	The Peoples Telephone Company	414 326 3151	info@peoples.net
414	TRC Access	414 827 9111	info@trcaccess.net
414	Wink Communications Group, Inc.	708 310 9465	sales@winkcomm.com
415	A-Link Network Services, Inc.	408 720 6161	info@alink.net
415	Aimnet Information Services	408 257 0900	info@aimnet.com

Area Code	Name	Phone	Email
415	Alternet (UUNET Technologies, Inc.)	703 204 8000	info@alter.net
415	APlatform	415 941 2647	support@aplatform.com
415	Bay Area Internet Solutions	408 447 8690	tjw00@bayarea.net
415	Beckemeyer Development	510 530 9637	info@bdt.com
415	Brainstorm's Internet Power Connection	415 473-6411	info@brainstorm.net
415	BTR Communications Company	415 966 1429	support@btr.com
415	Click.Net	415 579 2535	info@click.net
415	Community ConneXion - NEXUS-Berkeley	510 549 1383	info@c2.org
415	Datatamers	415 367 7919	info@datatamers.com
415	Direct Network Access	510 649 6110	support@dnai.com
415	emf.net	510 704 2929	sales@emf.net
415	Exodus Communications, Inc.	408 522 8450	info@exodus.net
415	GST Net	510 792 0768	info@gst.net
415	I-Link Ltd	800 ILINK 99	info@i-link.net
415	Idiom Consulting	510 658 5700	info@idiom.com
415	InReach Internet Communications	800 446 7324	info@inreach.com
415	InterNex Tiara	408 496 5466	info@internex.net
415	ISP Networks	408 653 0100	info@isp.net
415	LanMinds, Inc.	510 843 6389	info@lanminds.com
415	Liberty Information Network	800 218 5157	info@liberty.com
415	LineX Communications	415 455 1650	info@linex.com
415	meernet	415 428 7111	info@meer.net
415	MobiusNet	415 821 0600	info@mobius.net
415	NetGate Communications	408 565 9601	sales@netgate.net
415	Network Solutions	408 946 6895	info@inow.com
415	QuakeNet	415 655 6607	info@quake.net
415	San Francisco Online (Televolve, Inc.)	415 861 7712	info@sfo.com
415	Sirius	415 284 4700	info@sirius.com
415	SLIPNET	415 281 3132	info@slip.net
415	Silicon Valley Public Access Link	408 448 3071	abem@svpal.org
415	Ultima Tool	415 775 8960	info@ultima.org
415	Value Net Internetwork Services	510 943 5769	info@value.net
415	ViaNet Communications	415 903 2242	info@via.net
415	The WELL	415 332 4335	info@well.com
415	22 Solutions	415 431 9903	info@catch22.com
415	West Coast Online	707 586 3060	info@calon.com
415	zNET	619 755 7772	info@znet.com
415	Zocalo Engineering	510 540 8000	info@zocalo.net
416	ComputerLink/Internet Direct	416 233 7150	info@idirect.com
416	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca
416	Globalserve Communications Inc.	416 210 2005	admin@globalserve

Area Code	Name	Phone	Email
			.on.ca
416	HookUp Communications	905 847 8000	info@hookup.net
416	Internex Online, Inc.	416 363 8676	support@io.org
416	InterLog Internet Services	416 975 2655	internet@interlog.com
416	Internet Light and Power	416 502 1512	staff@ilap.com
416	Magic Online Services International Inc.	416 591 6490	info@magic.ca
416	Neptune Internet Services	905 895 0898	info@neptune.on.ca
416	UUNET Canada, Inc.	416 368 6621	info@uunet.ca
417	DialNet (Digital Internet Access Link)	417 873 3425	sales@dialnet.net
417	Panther Creek Information Services	417 767 2126	info@pcis.net
417	Woodtech Information Systems, Inc.	417 886 0234	info@woodtech.com
418	autoroute.net	514 333 3145	info@autoroute.net
418	UUNET Canada, Inc.	416 368 6621	info@uunet.ca
419	Branch Information Services	313 741 4442	branch-info@branch .com
419	GlassNet Communications, LTD.	419 382 6800	info@glasscity.net
419	OARnet (corporate clients only)	614 728 8100	info@oar.net
419	Primenet	602 870 1010	info@primenet.com
423	accessU.S. Inc.	800 638 6373	info@accessus.net
423	MindSpring Enterprises, Inc.	800 719 4332	info@mindspring.com
423	Preferred Internet, Inc.	615 323 1142	info@preferred.com
423	Virtual Interactive Center	423 544 7902	info@vic.com
501	A2ZNET	901 854 1871	webmaster@a2znet.com
501	Aristotle Internet Access	501 374 4638	info@aristotle.net
501	Cloverleaf Technologies	903 832 1367	helpdesk@clover .cleaf.com
501	IntelliNet ISP	501 376 7676	info@intellinet.com
502	accessU.S. Inc.	800 638 6373	info@accessus.net
502	IgLou Internet Services	800 436 4456	info@iglou.com
502	Mikrotec Internet Services, Inc.	606 225 1488	info@mis.net
503	Alternet (UUNET Technologies, Inc.)	703 204 8000	info@alter.net
503	aracnet.com	503 626 8696	info@aracnet.com
503	aVastNet	503 263 0912	info@vastnet.com
503	Cascade Connection	503 282 8303	info@casconn.com
503	Cenornet	503 557 9047	info@cenornet.com
503	Colossus Inc.	x19 -> 312 528 1000	colossus@romney .mtjeff.com
503	Data Research Group, Inc.	503 465 3282	info@ordata.com
503	Gorge Networks	503 386 8300	postmaster@gorge.net
503	Europa	503 222 9508	info@europa.com
503	Hevanet Communications	503 228 3520	info@hevanet.com
503	I-Link Ltd	800 ILINK 99	info@i-link.net

Area Code	Name	Phone	Email
503	Interconnected Associates Inc. (IXA)	206 622 7337	mike@ixa.com
503	Internet Communications	503 848 8139	info@iccom.com
503	NorthWestNet	206 562 3000	info@nwnet.net
503	Open Door Networks, Inc.	503 488 4127	info@opendoor.com
503	Oregon Information Technology Centeres	503 469 6699	hmaster@harborside .com
503	Pacifier Computers	360 693 2116	info@pacifier.com
503	RainDrop Laboraties/Agora	503 293 1772	info@agora.rdrop.com
503	Structured Network Systems, Inc.	503 656 3530	info@structured.net
503	Teleport, Inc.	503 223 4245	info@teleport.com
503	Transport Logic	503 243 1940	sales@transport.com
503	WLN	800 342 5956	info@wln.com
504	AccessCom Internet Services	504 887 0022	info@accesscom.net
504	Communique Inc.	504 527 6200	info@communique.net
504	Cyberlink	504 277 4186	cladmin@eayor .cyberlink-no.com
504	Hollingsworth Information Services, Inc	504 769 2156	webmaster@rouge.net
504	Hub City Area Access	601 268 6156	info@hub1.hubcity.com
504	I-Link Ltd	800 ILINK 99	info@i-link.net
504	InterSurf Online, Inc.	504 755 0500	info@intersurf.net
504	JAMNet Internet Services,Inc.	504 361 3492	info@jis.net
504	NeoSoft, Inc.	713 684 5969	info@neosoft.com
505	Computer Systems Consulting	505 984 0085	info@spy.org
505	Hollyberry, Inc.	505 888 4624	info@hollyberry.com
505	Internet Direct, Inc.	800 879 3624	info@direct.net
505	Internet Express	719 592 1240	info@usa.net
505	Network Intensive	714 450 8400	info@ni.net
505	New Mexico Internet Access	505 877 0617	info@nmia.com
505	New Mexico Technet, Inc.	505 345 6555	granoff@technet.nm.org
505	Southwest Cyberport	505 271 0009	info@swcp.com
505	WhiteHorse Communications ,Inc.	915 584 6630	whc.net.html
505	ZyNet SouthWest	505 343 8846	zycor@zynet.com
506	Agate Internet Services	207 947 8248	ais@agate.net
506	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca
507	Desktop Media	507 373 2155	isp@dm.deskmedia.com
507	Internet Connections, Inc.	507 625 7320	info@ic.mankato.mn.us
507	Millennium Communications, Inc.	612 338 5509	info@millcomm.com
507	Minnesota OnLine	612 225 1110	info@mn.state.net
507	Minnesota Regional Network	612 342 2570	info@mr.net
507	Protocol Communications, Inc.	612 541 9900	info@protocom.com
508	Argo Communications	508 261 6121	info@argo.net

Area Code	Name	Phone	Email
508	Channel 1	617 864 0100	support@channel1.com
508	CompUtopia	401 732 5588	allan@computopia.com
508	The Destek Group, Inc.	603 635 3857	inquire@destek.net
508	Dream Communications	617 383 9200	info@dreamcom.com
508	Empire.Net, Inc.	603 889 1220	info@empire.net
508	FOURnet Information Network	508 291 2900	info@four.net
508	The Internet Access Company, TIAC	617 276 7200	info@tiac.net
508	The Internet Connection, Inc.	508 261 0383	info@ici.net
508	intuitive information, inc.	508 342 1100	info@iii.net
508	Kersur Technologies, Inc.	508 384 1404	info@kerser.net
508	MV Communications, Inc.	603 429 2223	info@mv.mv.com
508	PICTAC	508 999 1565	sales@pictac.com
508	Pioneer Global Telecommunications, Inc.	617 375 0200	info@pn.com
508	Plymouth Commercial Internet Exchange	617 741 5900	info@pcix.com
508	Saturn Internet Corporation	617 451 9121	info@saturn.net
508	Shore.Net	617 593 3110	info@shore.net
508	StarNet	508 922 8238	info@venus.star.net
508	TerraNet, Inc.	617 450 9000	info@terra.net
508	UltraNet Communications, Inc.	508 229 8400	info@ultranet.com
508	USAinternet, Inc.	800 236 9737	info@usa1.com
508	The World	617 739 0202	info@world.std.com
508	Wilder Systems, Inc.	617 933 8810	info@id.wing.net
509	Cascade Connections, Inc.	509 663 4259	carrie@cascade.net
509	Interconnected Associates Inc. (IXA)	206 622 7337	mike@ixa.com
509	Internet On-Ramp, Inc.	509 624 RAMP	info@on-ramp.ior.com
509	NorthWestNet	206 562 3000	info@nwnet.net
509	Structured Network Systems, Inc.	503 656 3530	info@structured.net
509	Transport Logic	503 243 1940	sales@transport.com
509	WLN	800 342 5956	info@wln.com
510	A-Link Network Services, Inc.	408 720 6161	info@alink.net
510	Aimnet Information Services	408 257 0900	info@aimnet.com
510	Alternet (UUNET Technologies, Inc.)	703 204 8000	info@alter.net
510	Beckemeyer Development	510 530 9637	info@bdt.com
510	BTR Communications Company	415 966 1429	support@btr.com
510	CCtrap Network Services	510 516 0315	steve@cctrap.com
510	Community ConneXion - NEXUS-Berkeley	510 549 1383	info@c2.org
510	Direct Network Access	510 649 6110	support@dnai.com
510	emf.net	510 704 2929	sales@emf.net
510	Exodus Communications, Inc.	408 522 8450	info@exodus.net
510	GST Net	510 792 0768	info@gst.net
510	Idiom Consulting	510 658 5700	info@idiom.com

Area Code	Name	Phone	Email
510	InterNex Tiara	408 496 5466	info@internex.net
510	LanMinds, Inc.	510 843 6389	info@lanminds.com
510	Liberty Information Network	800 218 5157	info@liberty.com
510	LineX Communications	415 455 1650	info@linex.com
510	MobiusNet	415 821 0600	info@mobius.net
510	Network Solutions	408 946 6895	info@inow.com
510	San Francisco Online (Televolve, Inc.)	415 861 7712	info@sfo.com
510	Sirius	415 284 4700	info@sirius.com
510	SLIPNET	415 281 3132	info@slip.net
510	22 Solutions	415 431 9903	info@catch22.com
510	Ultima Tool	415 775 8960	info@ultima.org
510	Value Net Internetwork Services	510 943 5769	info@value.net
510	West Coast Online	707 586 3060	info@calon.com
510	Zocalo Engineering	510 540 8000	info@zocalo.net
512	@sig.net	512 306 0700	sales@aus.sig.net
512	CVTV - Internet	800 247 8885	cyndyz@cvtv.net
512	Delta Design and Development Inc.	800 763 8265	sales@deltaweb.com
512	The Eden Matrix	512 478 9900	info@eden.com
512	Hill-Country.Net	800 761 0092	sales@hcnetwork.com
512	I-Link Ltd	800 ILINK 99	info@i-link.net
512	Illuminati Online	512 462 0999	info@io.com
512	Internet Connect Services, Inc.	512 572 9987	info@icsi.net
512	Onramp Access, Inc.	512 322 9200	info@onr.com
512	OuterNet Connection Strategies	512 345 3573	question@outer.net
512	Phoenix DataNet, Inc.	713 486 8337	info@phoenix.net
512	Real/Time Communications	512 451 0046	info@realtime.net
512	Turning Point Information Services, Inc.	512 499 8400	info@tpoint.net
512	Zilker Internet Park, Inc.	512 206 3850	info@zilker.net
513	The Dayton Network Access Company	513 237 6868	info@dnaco.net
513	IgLou Internet Services	800 436 4456	info@iglou.com
513	Internet Access Cincinnati	513 887 8877	info@iac.net
513	Local Internet Gateway Co.	510 503 9227	sdw@lig.net
513	OARnet (corporate clients only)	614 728 8100	info@oar.net
513	Premier Internet Cincinnati, Inc.	513 561 6245	pic@cinti.net
514	@Darwin.com	514 762 2208	darwin@darwin.qc.ca
514	Accent Internet	514 737 6077	admin@accent.net
514	autoroute.net	514 333 3145	info@autoroute.net
514	CiteNet Telecom Inc.	514 721 1351	info@citenet.net
514	Communication Accessibles Montreal	514 288 2581	info@cam.org
514	Communications Inter-Acces	514 367 0002	info@interax.net
514	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca

Area Code	Name	Phone	Email
514	Odyssee Internet	514 861 3432	info@odyssee.net
514	UUNET Canada, Inc.	416 368 6621	info@uunet.ca
515	Freese-Notis Weather.Net	515 282 9310	hfreese@weather.net
515	ia.net	319 393 1095	info@ia.net
515	Iowa Network Services	800 546 6587	service@netins.net
515	JTM MultiMedia, Inc.	515 277 1990	jtm@ecity.net
515	Minnesota OnLine	612 225 1110	info@mn.state.net
515	Synergy Communications, Inc.	800 345 9669	info@synergy.net
516	ASB Internet Services	516 981 1953	info@asb.com
516	bway.net / Outernet, Inc.	212 982 9800	info@bway.net
516	BrainLINK International	718 805 6559	info@brainlink.com
516	Creative Data Consultants (SILLY.COM)	718 229 0489	info@silly.com
516	DIGEX	410 847 5050	sales@digex.net
516	Echo Communications Group	212 255 3839	info@echonyc.com
516	INTAC Access Corporation	800 504 6822	info@intac.com
516	Intercom Online Inc.	212 378 2202	info@intercom.com
516	LI Net, Inc.	516 476 1168	info@li.net
516	Lightning Internet Services, LLC	516 248 8400	sales@lightning.net
516	Long Island Information, Inc.	516 294 0124	info@liii.com
516	Long Island Internet HeadQuarters	516 439 7800	support@pb.net
516	Network Internet Services	516 543 0234	info@netusa.net
516	New World Data	718 962 1725	dmk@nwdc.com
516	NYSERNet	800 493 4367	sales@nysernet.org
516	Panix (Public Access uNIX)	212 741 4400	info@panix.com
516	Pipeline New York	212 267 3636	info@pipeline.com
516	Real Life Pictures RealNet	212 366 4434	reallife@walrus.com
516	ZONE One Network Exchange	212 824 4000	info@zone.net
517	Branch Information Services	313 741 4442	branch-info @branch.com
517	Freeway Inc. (tm)	616 347 2400	info@freeway.net
517	The Internet Ramp	800 502 0620	newaccts@tir.com
517	Mich.com, Inc.	810 478 4300	info@mich.com
517	Msen, Inc.	313 998 4562	info@msen.com
517	Voyager Information Networks, Inc.	517 485 9068	help@voyager.net
518	AlbanyNet	518 462 6262	info@albany.net
518	epix	800 374 9669	karndt@epix.net
518	Global One, Inc.	518 452 1465	lorin@global1.net
518	Klink Net Communications	518 725 3000	admin@klink.net
518	NetHeaven	800 910 6671	info@netheaven.com
518	NYSERNet	800 493 4367	sales@nysernet.org
518	SoVerNet, Inc.	802 463 2111	info@sover.net

Area Code	Name	Phone	Email
518	Wizvax Communications	518 273 4325	info@wizvax.com
519	Electro-Byte Technologies	519 332 8235	info@ebtech.net
519	Execulink Internet Services Corporation	519 451 4288	info@execulink.com
519	FastLane.Net Ltd.	519 679 0908	info@fastlane.ca
519	headwaters network	519 940 9252	sales@headwaters.com
519	HookUp Communications	905 847 8000	info@hookup.net
519	HyperNet	519 652 3790	Admin@L2.lonet.ca
519	Information Gateway Services	519 884 7200	info@kw.igs.net
519	Inter*Com Information Services	519 679 1620	info@icis.on.ca
519	Magic Online Services International Inc.	416 591 6490	info@magic.ca
519	MGL Systems Computer Technologies Inc.	519 836 1295	info@mgl.ca
519	Network Enterprise Technology Inc.	905 525 4555	info@netinc.ca
519	UUNET Canada, Inc.	416 368 6621	info@uunet.ca
519	Windsor Infromation Network Company	519 945 9462	kim@wincom.net
520	InfoMagic, Inc	520 526 9565	info@infomagic.com
520	Internet Direct, Inc.	800 879 3624	info@direct.net
520	Opus One	602 324 0494	sales@opus1.com
520	Primenet	602 870 1010	info@primenet.com
520	RTD Systems & Networking, Inc.	602 318 0696	info@rtd.com
520	Sedona Internet Services, Inc.	520 204 2247	info@sedona.net
540	Cyber Services, Inc.	703 749 9590	info@cs.com
541	aVastNet	503 263 0912	info@vastnet.com
601	A2ZNET	901 854 1871	webmaster@a2znet.com
601	DATASTAR, Inc.	601 799 2439	Postmaster @datastar.net
601	Datasync Internet Services	601 872 0001	info@datasync.com
601	Gulfcoast On-Line Development, Inc.	601 864 2423	info@goldinc.com
601	Hub City Area Access	601 268 6156	info@hub1.hubcity.com
602	Crossroads Communications	602 813 9040	crossroads @xroads.com
602	I-Link Ltd	800 ILINK 99	info@i-link.net
602	InfoMagic, Inc	520 526 9565	info@infomagic.com
602	Internet Direct, Inc.	800 879 3624	info@direct.net
602	Internet Express	719 592 1240	info@usa.net
602	New Mexico Technet, Inc.	505 345 6555	granoff@technet.nm.org
602	Opus One	602 324 0494	sales@opus1.com
602	Phoenix Computer Specialists	602 265 9188	info@pcslink.com
602	Primenet	602 870 1010	info@primenet.com
602	RTD Systems & Networking, Inc.	602 318 0696	info@rtd.com
602	StarLink Internet Services	602 878 7001	sysop@starlink.com
602	Systems Solutions Inc.	602 955 5566	support@syspac.com

Area Code	Name	Phone	Email
603	Agate Internet Services	207 947 8248	ais@agate.net
603	Empire.Net, Inc.	603 889 1220	info@empire.net
603	The Destek Group, Inc.	603 635 3857	inquire@destek.net
603	The Internet Access Company, TIAC	617 276 7200	info@tiac.net
603	MV Communications, Inc.	603 429 2223	info@mv.mv.com
603	NETIS Public Access Internet	603 437 1811	epoole@leotech.mv.com
603	Rocket Science Computer Services, Inc.	603 334 6444	info@rscs.com
603	SoVerNet, Inc.	802 463 2111	info@sover.net
603	StarNet	508 922 8238	info@venus.star.net
603	UltraNet Communications, Inc.	508 229 8400	info@ultranet.com
604	AMT Solutions Group, Inc. Island Net	604 727 6030	info@islandnet.com
604	auroraNET Inc.	604 294 4357	sales@aurora.net
604	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca
604	Fairview Technology Centre Ltd.	604 498 4316	bwklatt@ftcnet.com
604	The InterNet Shop Inc.	604 376 3719	info@netshop.net
604	Mind Link!	604 534 5663	info@mindlink.bc.ca
604	Okanagan Internet Junction	604 549 1036	info@junction.net
604	Sunshine Net, Inc.	604 886 4120	admin@sunshine.net
604	UUNET Canada, Inc.	416 368 6621	info@uunet.ca
605	Internet Services of the Black Hills	605 642 2244	postmaster @blackhills.com
605	Pioneer Internet	712 271 0101	info@pionet.net
606	IgLou Internet Services	800 436 4456	info@iglou.com
606	Internet Access Cincinnati	513 887 8877	info@iac.net
606	Mikrotec Internet Services, Inc.	606 225 1488	info@mis.net
606	RAM Technologies Inc.	800 950 1726	info@ramlink.net
607	Art Matrix - Lightlink	607 277 0959	info@lightlink.com
607	Clarity Connect, Inc.	607 257 2070	chuck@baka.com
607	epix	800 374 9669	karndt@epix.net
607	NYSERNet	800 493 4367	sales@nysernet.org
607	ServiceTech, Inc.	716 263 3360	info@servtech.com
607	Spectra.net	607 798 7300	info@spectra.net
608	BOSSNet Internet Services	608 362 1340	mbusam@bossnt.com
608	Exec-PC, Inc.	414 789 4200	info@execpc.com
608	FullFeed Communications	608 246 4239	info@fullfeed.com
608	Inwave Internet Inc.	608 757 8055	support@inwave.com
608	Mid-Plains Internet	608 828 7873	info@midplains.net
609	CyberComm Online Services	908 506 6651	info@cybercomm.net
609	Cyberenet (Kaps, Inc.)	609 753 9840	access-sales @cyberenet.net
609	DIGEX	410 847 5050	sales@digex.net

Area Code	Name	Phone	Email
609	Eclipse Internet Access	800 483 1223	info@eclipse.net
609	InterActive Network Services	609 227 6380	info@jersey.net
609	K2NE Software	609 893 0673	vince-q@k2nesoft.com
609	Net Access	215 576 8669	support@netaxs.com
609	NetReach, Incorporated	215 283 2300	info@netreach.net
609	New Jersey Computer Connection	609 896 2799	info@listserv.njcc.com
609	Texel International	908 297 0290	info@texel.com
609	VoiceNet	800 835 5710	info@voicenet.com
610	Cheap Net	302 993 8420	sammy@ravenet.com
610	Cynet, Inc.	888 CYNETPA	info@cynet.net
610	DIGEX	410 847 5050	sales@digex.net
610	ENTER.Net	610 366 1300	info@enter.net
610	epix	800 374 9669	karndt@epix.net
610	FishNet	610 337 9994	info@pond.com
610	GlobalQUEST, Inc.	610 696 8111	info@globalquest.net
610	Internet Tidal Wave	610 770 6187	steve@itw.com
610	InterNetworking Technologies	302 398 4369	itnt.com@itnt.com
610	The Magnetic Page	302 651 9753	info@magpage.com
610	Microserve Information Systems	717 779 4430	info@microserve.com
610	Net Access	215 576 8669	support@netaxs.com
610	NetReach, Incorporated	215 283 2300	info@netreach.net
610	Network Analysis Group	800 624 9240	nag@good.freedom.net
610	Night Vision	610 366 9767	info@n-vision.com
610	SSNet, Inc.	302 378 1386	info@ssnet.com
610	Oasis Telecommunications, Inc.	610 439 8560	info@ot.com
610	OpNet	610 520 2880	info@op.net
610	RaveNet Systems Inc	302 993 8420	waltemus@ravenet.com
610	VivaNET, Inc.	800 836 UNIX	info@vivanet.com
610	VoiceNet	800 835 5710	info@voicenet.com
610	You Tools Corporation / FASTNET	610 954 5910	info@fast.net
612	Cloudnet	612 240 8243	info@cloudnet.com
612	DCC Inc.	612 378 4000	kgastony@dcc.com
612	Freese-Notis Weather.Net	515 282 9310	hfreese@weather.net
612	GlobalCom	612 920 9920	info@globalc.com
612	James River Group Inc	612 339 2521	jriver@jriver.jriver.COM
612	Millennium Communications, Inc.	612 338 5509	info@millcomm.com
612	Minnesota OnLine	612 225 1110	info@mn.state.net
612	Minnesota Regional Network	612 342 2570	info@mr.net
612	Orbis Internet Services, Inc.	612 645 9663	info@orbis.net
612	pclink.com	612 541 5656	infomatic@pclink.com
612	Primenet	602 870 1010	info@primenet.com

Area Code	Name	Phone	Email
612	Protocol Communications, Inc.	612 541 9900	info@protocom.com
612	Sihope Communications	612 829 9667	info@sihope.com
612	Sound Communications Internet	612 722 8470	root@scc.net
612	StarNet Communications, Inc.	612 941 9177	info@winternet.com
612	Synergy Communications, Inc.	800 345 9669	info@synergy.net
612	Vector Internet Services Inc.	612 288 0880	info@visi.com
613	autoroute.net	514 333 3145	info@autoroute.net
613	Cyberius Online Inc.	613 233 1215	info@cyberus.ca
613	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca
613	Information Gateway Services (Ottawa)	613 592 5619	info@igs.net
613	Interactive Telecom Inc.	613 727 5258	info@intertel.net
613	HookUp Communications	905 847 8000	info@hookup.net
613	Magma Communications Ltd.	613 228 3565	info@magmacom.com
613	o://info.web	613 225 3354	kevin@magi.com
613	UUNET Canada, Inc.	416 368 6621	info@uunet.ca
614	ASCInet (Columbus)	614 798 5321	info@ascinet.com
614	Branch Information Services	313 741 4442	branch-info @branch.com
614	Internet Access Cincinnati	513 887 8877	info@iac.net
614	OARnet (corporate clients only)	614 728 8100	info@oar.net
614	RAM Technologies Inc.	800 950 1726	info@ramlink.net
615	accessU.S. Inc.	800 638 6373	info@accessus.net
615	ERC, Inc. / The Edge	615 455 9915	staff@edge.ercnet.com
615	First Internet Resources	800 577 5969	jcarter@1stresource .com
615	GoldSword Systems	615 691 6498	info@goldsword.com
615	ISDN-Net Inc	615 377 7672	jdunlap@rex.isdn.net
615	MindSpring Enterprises, Inc.	800 719 4332	info@mindspring.com
615	Preferred Internet, Inc.	615 323 1142	info@preferred.com
615	The Telalink Corporation	615 321 9100	sales@telalink.net
615	The Tri-Cities Connection	615 378 5355	info@tricon.net
615	U.S. Internet	615 522 6788	info@usit.net
615	Virtual Interactive Center	423 544 7902	info@vic.com
616	Branch Information Services	313 741 4442	branch-info @branch.com
616	Freeway, Inc.	616 347 2400	info@freeway.net
616	I-2000, Inc.	616 455 0593	office@i2k.com
616	The iserv Co.	616 281 5254	info@iserv.net
616	Mich.com, Inc.	810 478 4300	info@mich.com
616	Msen, Inc.	313 998 4562	info@msen.com
616	NetLink Systems L.L.C.	616 345 LINK	info@serv01.net-link.net
616	Novagate Communications Corp.	616 847 0910	info@novagate.com

Area Code	Name	Phone	Email
616	RustNet, Inc.	810 650 6812	info@rust.net
616	Traverse Communication Company	616 935 1705	info@traverse.com
616	Voyager Information Networks, Inc.	517 485 9068	help@voyager.net
617	Alternet (UUNET Technologies, Inc.)	703 204 8000	info@alter.net
617	Argo Communications	508 261 6121	info@argo.net
617	Channel 1	617 864 0100	support@channel1.com
617	CompUtopia	401 732 5588	allan@computopia.com
617	COWZ Technologies	617 497 0058	system@cow.net
617	Cyber Access Internet Communications, Inc	617 396 0491	info@cybercom.net
617	Dream Communications	617 383 9200	info@dreamcom.com
617	FOURnet Information Network	508 291 2900	info@four.net
617	The Internet Access Company, TIAC	617 276 7200	info@tiac.net
617	The Internet Connection, Inc.	508 261 0383	info@ici.net
617	intuitive information, inc.	508 342 1100	info@iii.net
617	Pioneer Global Telecommunications, Inc.	617 375 0200	info@pn.com
617	Plymouth Commercial Internet Exchange	617 741 5900	info@pcix.com
617	Saturn Internet Corporation	617 451 9121	info@saturn.net
617	Shore.Net	617 593 3110	info@shore.net
617	TerraNet, Inc.	617 450 9000	info@terra.net
617	UltraNet Communications, Inc.	508 229 8400	info@ultranet.com
617	USAinternet, Inc.	800 236 9737	info@usa1.com
617	The World	617 739 0202	info@world.std.com
617	Wilder Systems, Inc.	617 933 8810	info@id.wing.net
617	The Xensei Corporation	617 376 6342	info@xensei.com
618	accessU.S. Inc.	800 638 6373	info@accessus.net
618	Allied Access Inc.	618 684 2255	sales@intrnet.net
618	Applied Personal Computing Inc.	618 632 7282	spider@apci.net
618	Online Information Access Network	618 692 9813	info@oia.net
618	MVP-Net, Inc.	314 731 2252	info@MO.NET
618	Saint Louis Internet Connections	314 241 iCON	info@icon-stl.net
619	CONNECTnet Internet Network Services	619 450 0254	info@connectnet.com
619	CTS Network Services	619 637 3637	info@cts.com
619	Cyberg8t Internet Services	909 398 4638	sales@cyberg8t.com
619	Delta Internet Services	714 778 0370	info@deltanet.com
619	The Cyberspace Station	619 634 2894	info@cyber.net
619	Electriciti	619 338 9000	info@powergrid .electriciti.com
619	I-Link Ltd	800 ILINK 99	info@i-link.net
619	Liberty Information Network	800 218 5157	info@liberty.com
619	Primenet	602 870 1010	info@primenet.com
619	RidgeNET	619 371 3501	saic@owens .ridgecrest.ca.us

Area Code	Name	Phone	Email
619	Sierra-Net	702 831 3353	giles@sierra.net
619	WANet, Software Design Associates, Inc.	619 679 5900	info@WANet.net
630	MicroWeb Technology, Inc.	847 480 9715	sales@mtiweb.net
701	NorthWestNet	206 562 3000	info@nwnet.net
701	Red River Net	701 232 2227	info@rrnet.com
702	@wizard.com	702 871 4461	info@wizard.com
702	Connectus, Inc.	702 323 2008	info@connectus.com
702	Great Basin Internet Services	702 829 2244	info@greatbasin.com
702	InterMind	702 878 6111	support@terminus .intermind.net
702	NETConnect	800 689 8001	office@tcd.net
702	Sierra-Net	702 831 3353	giles@sierra.net
702	Skylink Networks, Inc.	702 368 0700	sales@skylink.net
703	Alternet (UUNET Technologies, Inc.)	703 204 8000	info@alter.net
703	ARInternet Corporation	301 459 7171	info@ari.net
703	ATCALL, Inc.	703 522 5252	harish@atcall.com
703	CAPCON Library Network	202 331 5771	info@capcon.net
703	Charm.Net	410 558 3900	info@charm.net
703	Clark Internet Services, Inc. ClarkNet	410 995 0691	info@clark.net
703	Cyber Services, Inc.	703 749 9590	info@cs.com
703	DIGEX	410 847 5050	sales@digex.net
703	Genuine Computing Resources	703 878 4680	info@gcr.com
703	I2020	804 330 5555	info@i2020.net
703	Internet Interstate	301 652 4468	services@intr.net
703	Interpath	800 849 6305	info@interpath.net
703	KIVEX, Inc.	800 47 KIVEX	info@kivex.com
703	LaserNet	703 591 4232	info@laser.net
703	Preferred Internet, Inc.	615 323 1142	info@preferred.com
703	Quantum Networking Solutions, Inc.	805 538 2028	info@qnet.com
703	RadixNet Internet Services	301 567 9831	info@radix.net
703	Smartnet Internet Services, LLC	410 792 4555	info@smart.net
703	SONNETS, Inc.	703 502 8589	office@sonnets.net
703	UltraPlex Information Providers	410 880 4604	info@upx.net
703	Universal Telecomm Corporation	703 758 0550	root@utc.net
703	US Net, Incorporated	301 572 5926	info@us.net
703	World Web Limited	703 838 2000	info@worldweb.net
703	Xpress Internet Services	301 601 5050	info@xis.com
704	Interpath	800 849 6305	info@interpath.net
704	SunBelt.Net	803 328 1500	info@sunbelt.net
704	TelePlex Communications Inc	864 585 PLEX	info@teleplex.net
704	Vnet Internet Access	704 334 3282	info@vnet.net

Area Code	Name	Phone	Email
705	Barrie Connex Inc.	705 725 0819	info@bconnex.net
705	Magic Online Services International Inc.	416 591 6490	info@magic.ca
705	Mindemoya Computing	705 523 0243	info@mcd.on.ca
705	Neptune Internet Services	905 895 0898	info@neptune.on.ca
705	SooNet Corporation	705 253 4700	service@soonet.ca
706	Athens' ISP, Inc.	706 613 0611	info@athens.net
706	InteliNet	803 279 9775	administrator @intelinet.net
706	internet@Dalton	706 673 4715	support@dalton.net
706	Internet Atlanta	404 410 9000	info@atlanta.com
706	MindSpring Enterprises, Inc.	800 719 4332	info@mindspring.com
707	Beckemeyer Development	510 530 9637	info@bdt.com
707	CASTLES Information Network	707 422 7311	info@castles.com
707	Datatamers	415 367 7919	info@datatamers.com
707	Idiom Consulting	510 658 5700	info@idiom.com
707	InReach Internet Communications	800 446 7324	info@inreach.com
707	Liberty Information Network	800 218 5157	info@liberty.com
707	Value Net Internetwork Services	510 943 5769	info@value.net
707	West Coast Online	707 586 3060	info@calon.com
707	Zocalo Engineering	510 540 8000	info@zocalo.net
708	American Information Systems, Inc.	708 413 8400	info@ais.net
708	CICNet, Inc.	313 998 6103	info@cic.net
708	CIN.net Computerese Information Network	708 310 1188	info@cin.net
708	Compunet Technology Consultants	708 355 XNET	webmaster @ms.com-punet.com
708	I Connection, Inc.	708 662 0877	info@iconnect.net
708	InterAccess Co.	708 498 2542	info@interaccess.com
708	Interactive Network Systems, Inc.	312 881 3039	info@insnet.com
708	MCSNet	312 803 6271	info@mcs.net
708	MicroWeb Technology, Inc.	847 480 9715	sales@mtiweb.net
708	The Planet Group, Inc.	312 772 8333	info@www .planet-group.com
708	Ripco Communications, Inc.	312 477 6210	info@ripco.com
708	TensorNet Co.	708 665 3637	info@tensornet.com
708	Tezcatlipoca, Inc.	312 850 0181	info@tezcat.com
708	Wink Communications Group, Inc.	708 310 9465	sales@winkcomm.com
708	WorldWide Access	708 367 1870	info@wwa.com
708	XNet Information Systems	708 983 6064	info@xnet.com
709	InterActions Limited	709 745 4638	connect@nfld.com
712	Freese-Notis Weather.Net	515 282 9310	hfreese@weather.net
712	Greater Omaha Public Access Unix Corp	402 558 5030	info@gonix.com
712	ia.net	319 393 1095	info@ia.net

Area Code	Name	Phone	Email
712	Iowa Network Services	800 546 6587	service@netins.net
712	Novia Internetworking	402 391 4005	info@novia.net
712	The Online Pitstop	402 291 1542	bob@top.net
712	Pioneer Internet	712 271 0101	info@pionet.net
712	ProLinx Communications, Inc.	402 551 3036	techsupport @nfinity.nfinity.com
712	Synergy Communications, Inc.	800 345 9669	info@synergy.net
712	Zelcom International, Incorporated	402 333 2441	administration-dept@zelcom.com
713	Alternet (UUNET Technologies, Inc.)	703 204 8000	info@alter.net
713	The Black Box	713 480 2684	info@blkbox.com
713	Delta Design and Development Inc.	800 763 8265	sales@deltaweb.com
713	ELECTROTEX, Inc.	713 526 3456	info@electrotex.com
713	I-Link Ltd	800 ILINK 99	info@i-link.net
713	Internet Connect Services, Inc.	512 572 9987	info@icsi.net
713	NeoSoft, Inc.	713 684 5969	info@neosoft.com
713	OnRamp Technologies, Inc.	214 746 4710	info@onramp.net
713	Phoenix DataNet, Inc.	713 486 8337	info@phoenix.net
713	South Coast Computing Services, Inc.	713 917 5000	info@houston.net
713	USiS	713 682 1666	admin@usis.com
713	World Trade Network Inc.	713 965 0485	info@wt.net
714	Argonet	714 261 7511	postmaster@argonet.net
714	ArtNetwork	800 395 0692	info@artnet.net
714	Business Access Technologies	714 577 8978	Techs@batech.com
714	Cloverleaf Communications	714 895 3075	sales@cloverleaf.com
714	Cogent Software, Inc.	818 585 2788	info@cogsoft.com
714	CruzNet	714 680 6600	info@cruznet.net
714	DPC Systems Beach.Net	714 443 4172	connect@beach.net
714	Delta Internet Services	714 778 0370	info@deltanet.com
714	DigiLink Network Services	310 542 7421	info@digilink.net
714	EDM NetWORK	714 476 0416	info@edm.net
714	Electriciti	619 338 9000	info@powergrid .electriciti.com
714	Exodus Communications, Inc.	408 522 8450	info@exodus.net
714	InterNex Tiara	408 496 5466	info@internex.net
714	Interline Communication Group.	310 257 0960	Sales@interline.net
714	InterWorld Communications, Inc.	310 726 0500	sales@interworld.net
714	KAIWAN Internet	714 638 2139	info@kaiwan.com
714	Liberty Information Network	800 218 5157	info@liberty.com
714	Lightside, Inc.	818 858 9261	Lightside @Lightside.Com
714	The Loop Internet Switch Co.	213 465 1311	info@loop.com

Area Code	Name	Phone	Email
714	NetQuest	714 379 8228	info@net-quest.com
714	Network Intensive	714 450 8400	info@ni.net
714	OutWest Network Services	818 545 1996	info@outwest.net
714	Primenet	602 870 1010	info@primenet.com
714	QuickNet, Inc.	714 969 1091	sales@quick.net
714	Southland Internet Services	714 441 3000	info@southland.net
715	FullFeed Communications	608 246 4239	info@fullfeed.com
715	Minnesota OnLine	612 225 1110	info@mn.state.net
716	Blue Moon Online System Internet Svcs	716 447 5629	sales@net.bluemoon.net
716	BuffNET	800 463 6499	info@buffnet.net
716	E-Znet, Inc.	716 262 2485	
716	epix	800 374 9669	karndt@epix.net
716	NYSERNet	800 493 4367	sales@nysernet.org
716	ServiceTech, Inc.	716 263 3360	info@servtech.com
716	VivaNET, Inc.	800 836 UNIX	info@vivanet.com
717	epix	800 374 9669	karndt@epix.net
717	The Internet Cafe	717 344 1969	info@lydian .scranton.com
717	Keystone Information Access Systems	717 741 2626	office@yrkpa.kias.com
717	Microserve Information Systems	717 779 4430	info@microserve.com
717	Oasis Telecommunications, Inc.	610 439 8560	staff@oasis.ot.com
717	PenNet	717 368 1577	safrye@pennet.net
717	Red Rose SuperNet	800 222 2517	info@redrose.net
717	Spectra.net	607 798 7300	info@spectra.net
717	VoiceNet	800 835 5710	info@voicenet.com
717	You Tools Corporation / FASTNET	610 954 5910	info@fast.net
718	Advanced Standards, Inc. advn.com	212 302 3366	kolian@advn.com
718	Blythe Systems	212 226 7171	infodesk@blythe.org
718	BrainLINK International	718 805 6559	info@brainlink.com
718	bway.net / Outernet, Inc.	212 982 9800	info@bway.net
718	Creative Data Consultants (SILLY.COM)	718 229 0489	info@silly.com
718	Cybernex, Inc.	201 664 0419	info@bc.cybernex.net
718	DIGEX	410 847 5050	sales@digex.net
718	escape.com - Kazan Corp	212 888 8780	info@escape.com
718	Ingress Communications Inc.	212 679 2838	info@ingress.com
718	INTAC Access Corporation	800 504 6822	info@intac.com
718	Intellitech Walrus	212 406 5000	info@walrus.com
718	Intercall, Inc	800 758 7329	sales@intercall.com
718	Intercom Online Inc.	212 378 2202	info@intercom.com
718	Internet QuickLink Corp.	212 307 1669	info@quicklink.com
718	Interport Communications Corp.	212 989 1128	info@interport.net

Area Code	Name	Phone	Email
718	Lightning Internet Services, LLC	516 248 8400	sales@lightning.net
718	Long Island Information, Inc.	516 294 0124	info@liii.com
718	Long Island Internet HeadQuarters	516 439 7800	support@pb.net
718	Mnematics, Incorporated	914 359 4546	service@mne.com
718	Mordor International BBS	201 433 4222	ritz@mordor.com
718	New World Data	718 962 1725	dmk@nwdc.com
718	Panix (Public Access uNIX)	212 741 4400	info@panix.com
718	Phantom Access Technologies, Inc.	212 989 2418	bruce@phantom.com
718	Pipeline New York	212 267 3636	info@pipeline.com
718	Real Life Pictures RealNet	212 366 4434	reallife@walrus.com
718	Spacelab.Net	212 966 8844	mike@mxol.com
718	ThoughtPort of New York City	212 645 7970	info@precipice.com
718	tunanet/InfoHouse	212 229 8224	info@tunanet.com
718	ZONE One Network Exchange	212 824 4000	info@zone.net
719	Colorado SuperNet, Inc.	303 296 8202	info@csn.org
719	Internet Express	719 592 1240	info@usa.net
719	Old Colorado City Communications	719 528 5849	thefox@oldcolo.com
719	Rocky Mountain Internet	800 900 7644	info@rmii.com
770	Digital Service Consultants Inc.	770 455 9022	info@dscga.com
770	MindSpring Enterprises, Inc.	800 719 4332	info@mindspring.com
770	Paradise Communications, Inc.	404 980 0078	info@paradise.net
770	Random Access, Inc.	404 804 1190	sales@randomc.com
770	vividnet	770 933 0999	webadmin@vivid.net
801	I-Link Ltd	800 ILINK 99	info@i-link.net
801	Internet Technology Systems (ITS)	801 375 0538	admin@itsnet.com
801	NETConnect	800 689 8001	office@tcd.net
801	The ThoughtPort Authority Inc.	800 ISP 6870	info@thoughtport.com
801	Utah Wired/The Friendly Net	801 532 1117	sales@utw.com
801	Vyzynz International	801 568 0999	info@vii.com
801	XMission	801 539 0852	support@xmission.com
802	The Plainfield Bypass	802 426 3963	questions@plainfield .bypass.com
802	SoVerNet, Inc.	802 463 2111	info@sover.net
803	A World of Difference, Inc.	803 769 4488	info@awod.com
803	CetLink.Net	803 327 2754	info@cetlink.net
803	Global Vision Inc.	803 241 0901	info@globalvision.net
803	Hargray Telephone Company	803 686 5000	info@hargray.com
803	InteliNet	803 279 9775	administrator @intelinet.net
803	Interpath	800 849 6305	info@interpath.net
803	SIMS, Inc.	803 762 4956	info@sims.net

Area Code	Name	Phone	Email
803	South Carolina SuperNet, Inc.	803 212 4400	info@scsn.net
803	SunBelt.Net	803 328 1500	info@sunbelt.net
804	I2020	804 330 5555	info@i2020.net
804	Widomaker Communication Service	804 253 7621	bloyall@widowmaker.com
805	The Catalina BBS InterNet Services	fax->805 687 1185	help@catalina.org
805	The Central Connection	818 735 3000	info@centcon.com
805	Cogent Software, Inc.	818 585 2788	info@cogsoft.com
805	Delta Internet Services	714 778 0370	info@deltanet.com
805	Fishnet Internet Services, Inc	805 650 1844	info@fishnet.net
805	Hi-Desert Online	805 722 4119	sysop@hidesert.com
805	Instant Internet Corporation (InstaNet)	818 772 0097	charlyg@instanet.com
805	Interline Communication Group.	310 257 0960	Sales@interline.net
805	Internet Access of Ventura County	805 383 3500	info@vcnet.com
805	KAIWAN Internet	714 638 2139	info@kaiwan.com
805	KTB Internet Online	818 240 6600	info@ktb.net
805	Lancaster Internet (California)	805 943 2112	dennis@gargamel.ptw.com
805	Liberty Information Network	800 218 5157	info@liberty.com
805	The Loop Internet Switch Co.	213 465 1311	info@loop.com
805	Netport Internet Access	805 538 2860	info@netport.com
805	Network Intensive	714 450 8400	info@ni.net
805	OutWest Network Services	818 545 1996	OWInfo@outwest.com
805	Quantum Networking Solutions, Inc.	805 538 2028	info@qnet.com
805	Regional Alliance for Info Networking	805 967 7246	info@rain.org
805	Saigon Enterprises	818 246 0689	info@saigon.net
805	Silicon Beach Communications	805 730 7740	help@silcom.com
805	Tehachapi Mountain Internet	805 822 7803	info@tminet.com
805	ValleyNet Communications	209 486 8638	info@valleynet.com
805	WestNet Communications, Inc.	805 892 2133	info@west.net
806	HubNet	806 792 4482	info@HUB.ofthe.NET
806	OnRamp Technologies, Inc.	214 746 4710	info@onramp.net
807	Pronet Internet Services	807 622 5915	info@mail.procom.net
808	FlexNet Inc.	808 732 8849	info@aloha.com
808	Hawaii OnLine	808 533 6981	support@aloha.net
808	Inter-Pacific Network Services	808 935 5550	sales@interpac.net
808	LavaNet, Inc.	808 545 5282	info@lava.net
808	Pacific Information Exchange, Inc.	808 596 7494	info@pixi.com
810	Branch Information Services	313 741 4442	branch-info@branch.com
810	Freeway Inc. (tm)	616 347 2400	info@freeway.net

Area Code	Name	Phone	Email
810	Great Lakes Information Systems	810 786 0454	info@glis.net
810	ICNET / Innovative Concepts	313 998 0090	info@ic.net
810	The Internet Ramp	800 502 0620	newaccts@tir.com
810	Michigan Internet Cooperative Association	810 355 1438	info@coop.mica.net
810	Mich.com, Inc.	810 478 4300	info@mich.com
810	Msen, Inc.	313 998 4562	info@msen.com
810	RustNet, Inc.	810 650 6812	info@rust.net
810	Voyager Information Networks, Inc.	517 485 9068	help@voyager.net
812	accessU.S. Inc.	800 638 6373	info@accessus.net
812	HolliCom Internet Services	317 883 4500	cale@holli.com
812	IgLou Internet Services	800 436 4456	info@iglou.com
812	World Connection Services	812 479 1700	info@evansville.net
813	Bay-A-Net	813 988 7772	info@bayanet.com
813	Centurion Technology, Inc.	813 538 1919	info@tpa.cent.com
813	CFTnet	813 980 1317	sales@cftnet.com
813	CocoNet Corporation	813 945 0055	info@coconet.com
813	ComBase Communications	813 681 9020	info@combase.com
813	CyberGate, Inc.	305 428 4283	sales@gate.net
813	Florida Online	407 635 8888	info@digital.net
813	Intelligence Network Online, Inc.	x22 -> 813 442 0114	info@intnet.net
813	PacketWorks, Inc.	813 446 8826	info@packet.net
813	Shadow Information Services, Inc.	305 594 2450	admin@shadow.net
813	The ThoughtPort Authority Inc.	800 ISP 6870	info@thoughtport.com
813	WebIMAGE, an internet presence provider	407 723 0001	info@webimage.com
814	North Coast Internet	814 838 6386	info@ncinter.net
814	Penncom Internet Co.	814 723 4141	admin@penn.com
814	PenNet	717 368 1577	safrye@pennet.net
815	American Information Systems, Inc.	708 413 8400	info@ais.net
815	BOSSNet Internet Services	608 362 1340	mbusam@bossnt.com
815	CIN.net Computerese Information Network	708 310 1188	info@cin.net
815	InterAccess Co.	708 498 2542	info@interaccess.com
815	Inwave Internet Inc.	608 757 8055	support@inwave.com
815	The Software Farm	815 246 7295	info@softfarm.com
815	T.B.C. Online Data-Net	815 758 5040	info@tbcnet.com
815	Wink Communications Group, Inc.	708 310 9465	sales@winkcomm.com
816	fyi@unicom.net	913 383 8466	fyi@unicom.net
816	Interstate Networking Corporation	816 472 4949	staff@interstate.net
816	Primenet	602 870 1010	info@primenet.com
817	ANET (American Internet)	800 776 8894	sales@anet-dfw.com
817	Association for Computing Machinery	817 776 6876	account-info@acm.org
817	CompuTek	214 994 0190	info@computek.net

Area Code	Name	Phone	Email
817	Connection Technologies - ConnectNet	214 490 7100	sales@connect.net
817	Delta Design and Development Inc.	800 763 8265	sales@deltaweb.com
817	DFW Internet Services, Inc.	817 332 5116	info@dfw.net
817	OnRamp Technologies, Inc.	214 746 4710	info@onramp.net
817	Texas Metronet, Inc.	214 705 2900	info@metronet.com
817	WorldNet of Central Texas	817 526 8481	centraltexas@sat.net
818	ArtNetwork	800 395 0692	info@artnet.net
818	BeachNet Internet Access	310 823 3308	info@beachnet.com
818	The Central Connection	818 735 3000	info@centcon.com
818	Cogent Software, Inc.	818 585 2788	info@cogsoft.com
818	CruzNet	714 680 6600	info@cruznet.net
818	Cyberg8t Internet Services	909 398 4638	sales@cyberg8t.com
818	Cyberverse Online	310 643 3783	info@cyberverse.com
818	Delta Internet Services	714 778 0370	info@deltanet.com
818	DigiLink Network Services	310 542 7421	info@digilink.net
818	Exodus Communications, Inc.	408 522 8450	info@exodus.net
818	E-Z Net	213 738 9284	Info@e-znet.com
818	Flamingo Communications Inc.	310 532 3533	sales@fcom.com
818	Instant Internet Corporation (InstaNet)	818 772 0097	charlyg@instanet.com
818	Interline Communication Group.	310 257 0960	Sales@interline.net
818	InterNex Tiara	408 496 5466	info@internex.net
818	InterWorld Communications, Inc.	310 726 0500	sales@interworld.net
818	KAIWAN Internet	714 638 2139	info@kaiwan.com
818	KTB Internet Online	818 240 6600	info@ktb.net
818	Leonardo Internet	310 395 5500	jimp@leonardo.net
818	Liberty Information Network	800 218 5157	info@liberty.com
818	Lightside, Inc.	818 858 9261	Lightside @Lightside.Com
818	The Loop Internet Switch Co.	213 465 1311	info@loop.com
818	Network Intensive	714 450 8400	info@ni.net
818	Online-LA	310 967 8000	sales@online-la.com
818	OutWest Network Services	818 545 1996	info@outwest.net
818	Primenet	602 870 1010	info@primenet.com
818	QuickCom Internet Communcations	213 634 7735	info@quickcom.net
818	Regional Alliance for Info Networking	805 967 7246	info@rain.org
818	Saigon Enterprises	818 246 0689	info@saigon.net
818	ViaNet Communications	415 903 2242	info@via.net
819	Information Gateway Services (Ottawa)	613 592 5619	info@igs.net
819	Interactive Telecom Inc.	613 727 5258	info@intertel.net
819	Magma Communications Ltd.	613 228 3565	info@magmacom.com
819	o://info.web	613 225 3354	kevin@magi.com

Area Code	Name	Phone	Email
847	MicroWeb Technology, Inc.	847 480 9715	sales@mtiweb.net
860	Connix: Connecticut Internet Exchange	860 349 7059	office@connix.com
860	imagine.com	860 527 9245	Postmaster @imagine.com
860	The Internet Access Company, TIAC	617 276 7200	info@tiac.net
860	MCIX, Inc.	860 572 8720	info@mcix.com
860	Mindport Internet Services, Inc.	860 892 2081	staff@mindport.net
860	Paradigm Communications, Inc.	203 250 7397	info@pcnet.com
864	Global Vision Inc.	803 241 0901	info@globalvision.net
864	TelePlex Communications Inc	864 585 PLEX	info@teleplex.net
901	accessU.S. Inc.	800 638 6373	info@accessus.net
901	A2ZNET	901 854 1871	webmaster@a2znet.com
901	ISDN-Net Inc	615 377 7672	jdunlap@rex.isdn.net
901	Magibox Incorporated	901 757 7835	info@magibox.net
901	U.S. Internet	615 522 6788	info@usit.net
902	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca
903	The BALLISTIC Actionnet	903 533 0584	sales@ballistic.com
903	Cloverleaf Technologies	903 832 1367	helpdesk@clover .cleaf.com
903	Delta Design and Development Inc.	800 763 8265	sales@deltaweb.com
903	Phoenix DataNet, Inc.	713 486 8337	info@phoenix.net
903	Rapid Ramp, Inc.	903 759 0705	help@rapidramp.com
903	StarNet Online Systems	903 785 5533	lrhea@stargate .1starnet.com
904	CyberGate, Inc.	305 428 4283	sales@gate.net
904	Florida Online	407 635 8888	info@digital.net
904	Gulf Coast Internet Company	904 438 5700	info@gulf.net
904	Internet Connect Company	904 375 2912	info@atlantic.net
904	Jax Gateway to the World	904 730 7692	sales@gttw.com
904	MagicNet, Inc.	407 657 2202	info@magicnet.net
904	Polaris Network, Inc.	904 878 9745	staff@polaris.net
904	PSS InterNet Services	800 463 8499	support@america.com
904	SymNet	904 385 1061	info@symnet.net
904	WebIMAGE, An Internet Presence Provider	407 723 0001	info@webimage.com
905	ComputerLink/Internet Direct	416 233 7150	info@idirect.com
905	Cycor Communications Incorporated	902 892 7354	signup@cycor.ca
905	eagle.ca - Northumbria Associates	905 373 9313	info@eagle.ca
905	Globalserve Communications Inc.	905 337 0152	admin@globalserve .on.ca
905	HookUp Communications	905 847 8000	info@hookup.net
905	iCOM Internet Services	905 522 1220	sales@icom.ca

Area Code	Name	Phone	Email
905	InterLog Internet Services	416 975 2655	internet@interlog.com
905	Internet Access Worldwide	905 714 1400	info@iaw.on.ca
905	Internet Connect Niagara Inc	905 988 9909	info@niagara.com
905	Internex Online, Inc.	416 363 8676	support@io.org
905	Magic Online Services International Inc.	416 591 6490	info@magic.ca
905	Neptune Internet Services	905 895 0898	info@neptune.on.ca
905	Network Enterprise Technology Inc.	905 525 4555	info@netinc.ca
905	Times.net	905 775 4471	rfonger@times.net
905	Vaxxine Computer Systems Inc.	905 562 3500	admin@vaxxine.com
906	Branch Information Services	313 741 4442	branch-info @branch.com
906	Mich.com, Inc.	810 478 4300	info@mich.com
906	Msen, Inc.	313 998 4562	info@msen.com
906	The Portage at Micro + Computers	906 487 9832	admin@mail.portup.com
907	A-OnLine Information Services, Inc.	907 276 5453	info@aonline.com
907	Alaska Information Technology	907 258 1881	info@anc.ak.net
907	Internet Alaska	907 562 4638	info@alaska.net
907	Micronet Communications	907 333 8663	info@micronet.net
907	NorthWestNet	206 562 3000	info@nwnet.net
908	BLASTNET Internet Service	908 534 5881	mcp@blast.net
908	Castle Network, Inc.	908 548 8881	request@castle.net
908	CyberComm Online Services	908 506 6651	info@cybercomm.net
908	Crystal Palace Networking, Inc.	201 300 0881	info@crystal.palace.net
908	Cybernex, Inc.	201 664 0419	info@bc.cybernex.net
908	DIGEX	410 847 5050	sales@digex.net
908	Eclipse Internet Access	800 483 1223	info@eclipse.net
908	INTAC Access Corporation	800 504 6822	info@intac.com
908	Intercall, Inc	800 758 7329	sales@intercall.com
908	Internet For 'U'	800 NET WAY1	info@ifu.net
908	Internet Online Services	x226 -> 201 928 1000	help@ios.com
908	Lightning Internet Services, LLC	516 248 8400	sales@lightning.net
908	Openix - Open Internet Exchange	201 443 0400	info@openix.com
908	Planet Access Networks	201 691 4704	info@planet.net
908	TechnoCore Communications, Inc.	908 928 7400	info@thecore.com
908	Texel International	908 297 0290	info@texel.com
908	You Tools Corporation / FASTNET	610 954 5910	info@fast.net
909	Cogent Software, Inc.	818 585 2788	info@cogsoft.com
909	CONNECTnet Internet Network Services	619 450 0254	info@connectnet.com
909	CruzNet	714 680 6600	info@cruznet.net
909	Cyberg8t Internet Services	909 398 4638	sales@cyberg8t.com
909	DiscoverNet	909 335 1209	info@discover.net

Area Code	Name	Phone	Email
909	DPC Systems Beach.Net	714 443 4172	connect@beach.net
909	Delta Internet Services	714 778 0370	info@deltanet.com
909	EmpireNet	909 787 4969	support@empirenet.com
909	InterWorld Communications, Inc.	310 726 0500	sales@interworld.net
909	KAIWAN Internet	714 638 2139	info@kaiwan.com
909	Keyway Internet Access	909 933 3650	sales@keyway.net
909	Liberty Information Network	800 218 5157	info@liberty.com
909	Lightside, Inc.	818 858 9261	Lightside @Lightside.Com
909	Network Intensive	714 450 8400	info@ni.net
909	Primenet	602 870 1010	info@primenet.com
909	Saigon Enterprises	818 246 0689	info@saigon.net
909	ULTIMATE Internet Access	909 605 6789	sales@ultimate-access .net
910	Interpath	800 849 6305	info@interpath.net
910	KIVEX, Inc.	800 47 KIVEX	info@kivex.com
910	NetDepot Inc.	770 434 5595	info@netdepot.com
910	Netpath, Inc	910 226 0425	info@netpath.net
910	Red Barn Data Center	910 750 9809	tom@rbdc.rbdc.com
910	SpyderByte Communications	910 643 6999	info@spyder.net
910	Vnet Internet Access	704 334 3282	info@vnet.net
912	Hargray Telephone Company	803 686 5000	info@hargray.com
912	Homenet Communications, Inc.	912 329 8638	info@hom.net
912	Internet Atlanta	404 410 9000	info@atlanta.com
912	MindSpring Enterprises, Inc.	800 719 4332	info@mindspring.com
913	Flint Hills Computers, Inc.	913 776 4333	gil@flinthills.com
913	fyi@unicom.net	913 383 8466	fyi@unicom.net
913	Interstate Networking Corporation	816 472 4949	staff@interstate.net
913	Tri-Rivers Internet	913 826 2595	staff@tri.net
914	BrainLINK International	718 805 6559	info@brainlink.com
914	bway.net / Outernet, Inc.	212 982 9800	info@bway.net
914	Cloud 9 Internet	914 682 0626	info@cloud9.net
914	Computer Net	914 773 1130	paul@computer.net
914	Creative Data Consultants (SILLY.COM)	718 229 0489	info@silly.com
914	DIGEX	410 847 5050	sales@digex.net
914	epix	800 374 9669	karndt@epix.net
914	GBN InternetAccess	201 343 6427	gbninfo@gbn.net
914	ICU On-Line	914 627 3800	info@icu.com
914	INTAC Access Corporation	800 504 6822	info@intac.com
914	InteleCom Data Systems, Inc.	401 885 6855	info@ids.net
914	Intercom Online Inc.	212 378 2202	info@intercom.com

Area Code	Name	Phone	Email
914	Lightning Internet Services, LLC	516 248 8400	sales@lightning.net
914	LocalNet Online Services	914 949 7949	info@locnet.com
914	Long Island Internet HeadQuarters	516 439 7800	support@pb.net
914	MHVNet (Computer Solutions by Hawkinson)	914 473 0844	info@mhv.net
914	Mnematics, Incorporated	914 359 4546	service@mne.com
914	New World Data	718 962 1725	dmk@nwdc.com
914	NYSERNet	800 493 4367	sales@nysernet.org
914	Panix (Public Access uNIX)	212 741 4400	info@panix.com
914	Pipeline New York	212 267 3636	info@pipeline.com
914	Putnam Internet Services	914 225 3234	info@put.com
914	TZ-Link Internet	914 353 5443	info@j51.com
914	WestNet Internet Services	914 967 7816	info@westnet.com
914	ZONE One Network Exchange	212 824 4000	info@zone.net
915	Delta Design and Development Inc.	800 763 8265	sales@deltaweb.com
915	New Mexico Technet, Inc.	505 345 6555	granoff@technet.nm.org
915	Primenet	602 870 1010	info@primenet.com
915	TexNet Internet Services	915 857 1800	jcoving@tnis.net
915	WhiteHorse Communications ,Inc.	915 584 6630	whc.net.html
916	CASTLES Information Network	707 422 7311	info@castles.com
916	Connectus, Inc.	702 323 2008	info@connectus.com
916	Great Basin Internet Services	702 829 2244	info@greatbasin.com
916	mother.com	916 757 8070	info@mail.mother.com
916	InterStar Network Services	916 224 6866	gfrank@shasta.com
916	ORONET	916 477 6650	info@oro.net
916	NetLink Data-Communications, Inc	916 447 3025	info@netlink.net
916	Psyberware Internet Access	916 645 9451	info@psyber.com
916	R C Concepts Foothill-Net	916 367 3818	sales@foothill.net
916	Sacramento Network Access	916 565 4500	info@sna.com
916	Sierra-Net	702 831 3353	giles@sierra.net
916	SnowCrest Computer Specialties	916 926 2526	root@snowcrest.net
916	Sutter Yuba Internet Exchange	916 755 1751	dave@syix.com
916	TTCI.net	916 895 1609	info@ttci.net
916	VFR, Inc.	916 652 7237	vfr@vfr.net
916	West Coast Online	707 586 3060	info@calon.com
916	Zocalo Engineering	510 540 8000	info@zocalo.net
917	BrainLINK International	718 805 6559	info@brainlink.com
917	DIGEX	410 847 5050	sales@digex.net
917	ZONE One Network Exchange	212 824 4000	info@zone.net
918	Galaxy Star Systems	918 835 3655	info@galstar.com
918	Internet Oklahoma	918 583 1161	info@ionet.net

Area Code	Name	Phone	Email
918	South Coast Computing Services, Inc.	713 917 5000	info@houston.net
919	Interpath	800 849 6305	info@interpath.net
919	KIVEX, Inc.	800 47 KIVEX	info@kivex.com
919	MCS Internet Services	919 751 5777	shultz@mail.gld.com
919	Vnet Internet Access	704 334 3282	info@vnet.net
941	Centurion Technology, Inc.	813 538 1919	info@tpa.cent.com
941	Net Sarasota	941 371 1966	info@netsrq.com
941	PacketWorks, Inc.	813 446 8826	info@packet.net
941	USA Computers	941 939 5630	info@usacomputers.net
954	Acquired Knowledge Systems, Inc.	305 525 2574	info@aksi.net
954	ICANECT	305 621 9200	sales@icanect.net
954	Safari Internet	954 537 9550	sales@safari.net
954	Shadow Information Services, Inc.	305 594 2450	admin@shadow.net
954	Zimmerman Communications	954 584 0199	bob@zim.com
970	EZLink Internet Access	970 482 0807	ezadmin@ezlink.com
970	Frontier Internet, Inc.	970 385 4177	info@frontier.net
970	Rocky Mountain Internet	800 900 7644	info@rmii.com
970	Verinet Communications, Inc.	970 416 9152	info@verinet.com

Foreign

Below is a listing of Internet service providers in countries other than the U.S. and Canada, sorted by country. Fields are country, service provider name, voice phone number, and email address for more information.

Country	Name	Phone	Email
Antigua/Barbuda	Cable & Wireless (WI) Ltd.	+1 809 462 0840	scholla@candw.ag
Australia	AusNet Services Pty Ltd	+61 2 241 5888	sales@world.net
Australia	Byron Public Access	+61 18 823 541	admin@byron.apana.org.au
Australia	Corporate Internet Pty Ltd	+61 2 391 3489	admin@corpnet.com.au
Australia	DIALix Services	+61 2 948 6995	justin@sydney.dialix.oz.au
Australia	Global Data Access	+61 9 421 1222	info@ednet.com.au
Australia	Highway 1	+61 9 370 4584	info@highway1.com.au
Australia	Hilink Communications Pty	+61 3 9528 2018	info@hilink.com.au
Australia	Hunter Network Association	+61 49 621783	mbrown@hna.com.au
Australia	iiNet Technologies	+61 9 3071183	iinet@iinet.com.au
Australia	Kralizec Dialup Unix System	+61 2 837 1397	nick@kralizec.zeta.org.au
Australia	Informed Technology	+61 9 245 2279	info@it.com.au
Australia	The Message eXchange Pty Ltd	+61 2 550 5014	info@tmx.com.au

Area Code	Name	Phone	Email
Australia	Microplex Pty. Ltd.	+61 2 888 3685	info@mpx.com.au
Australia	Pegasus Networks Pty Ltd	+61 7 257 1111	fwhitmee@peg.apc.org
Australia	PPIT Pty. Ltd. (059 051 320)	+61 3 747 9823	info@ppit.com.au
Australia	Stour System Services	+61 9 571 1949	stour@stour.net.au
Australia	Winthrop Technology	+61 9 380 3564	wthelp@yarrow .wt.uwa.edu.au
Australia	Zip Australia Pty. Ltd.	+61 2 482 7015	info@zip.com.au
Austria	ARGE DATEN	+43 1 4897893	info@email.ad.or.at
Austria	EUnet EDV	+43 1 3174969	info@austria.eu.net
Austria	Hochschuelerschaft...	+43 1 586 1868	sysop@link-atu.comlink.apc.org
Austria	Net4You	+43 4242 257367	office@net4you.co.at
Austria	netwing	+43 5337 65315	info@netwing.at
Austria	PING EDV	+43 1 3194336	info@ping.at
Austria	simon media	+43 316 813 8240	info@sime.com
Austria	Vianet Austria Ltd.	+43 1 5892920	info@via.at
Bashkiria	UD JV 'DiasPro'	+7 3472 387454	iskander@diaspro .bashkiria.su
Belarus	Open Contact, Ltd.	+7 017 2206134	admin@brc.minsk.by
Belgium	EUnet Belgium NV	+32 16 236099	info@belgium.eu.net
Belgium	Infoboard Telematics	+32 2 475 22 99	info@infoboard.be
Belgium	INnet NV/SA	+32 14 319937	info@inbe.net
Belgium	KnoopPunt VZW	+32 9 2333 686	support@knooppunt.be
Belgium	Netropolis Belgium	+32 2 6493693	info@netropolis.be
Bulgaria	EUnet Bulgaria	+359 52 259135	info@bulgaria.eu.net
Denmark	DKnet / EUnet Denmark	+45 3917 9900	info@dknet.dk
Finland	Clinet Ltd	+358 0 437 5209	clinet@clinet.fi
Finland	EUnet Finland Ltd.	+358 0 400 2060	helpdesk@eunet.fi
France	CalvaCom	+33 1 3463 1919	fb101@calvacom.fr
France	French Data Network	+33 1 4797 5873	info@fdn.org
France	Internet Way	+33 1 4143 2110	info@iway.fr
France	OLEANE	+33 1 4328 3232	info-internet@oleane.net
France	REMCOMP SARL	+33 1 4479 0642	info@liber.net
Georgia	Mimosi Hard	+7 8832 232857	kisho@sanet.ge
Germany	bbTT Electronic Networks	+49 30 817 42 06	willem@b-2.de.contrib.net
Germany	ccn computer consultant net	+49 89 29164023	info@ccn.de
Germany	EUnet Germany GmbH	+49 231 972 2222	info@germany.eu.net
Germany	ILK INternet GmbH	+49 721 9100 0	info@ilk.de
Germany	Individual Network e.V.	+49 441 980 8556	in-info@individual.net
Germany	INS Inter Networking Systems	+49 2305 356505	info@ins.net
Germany	Internet PoP Frankfurt	+49 69 94439192	joerg@pop-frankfurt.com

Area Code	Name	Phone	Email
Germany	ISC Dr.-Ing. Nepustil	+49 7123 93102 1	Info@Nepustil.NET
Germany	Knipp Medien & Kommunikation	+49 231 9703 0	info@knipp.de
Germany	Lemke & Fuerst GbR	+49 711 7189847	info@lf.net
Germany	LyNet Kommunikation	+49 451 6101056	info@lynet.de
Germany	MUC.DE e.V.	+49 89 324 683 0	postmaster@muc.de
Germany	netways	+49 30 4036038 0	netways@netways.de
Germany	Onlineservice Nuernberg	+49 911 9933882	info@osn.de
Germany	PFM News & Mail Xlink POP	+49 171 331 0862	info@pfm.pfm-mainz.de
Germany	Point of Presence GmbH	+49 40 2519 2025	info@pop.de
Germany	POP Contrib.Net Netzdienste	+49 521 9683011	info@teuto.de
Germany	SpaceNet GmbH	+49 89 324 683 0	info@space.net
Germany	TouchNET GmbH	+49 89 5447 1111	info@touch.net
Germany	Westend GbR	+49 241 911879	info@westend.com
Ghana	Chonia Informatica	+233 21 66 94 20	info@ghana.net
Greece	Ariadne	+30 1 651 3392	dialup@leon.nrcps .ariadne-t.gr
Greece	Foundation of Research	+30 81 221171	forthnet-pr@forthnet.gr
Greece	Hellenic Informatics	+30 1 620 3040	info@hol.gr
Hong Kong	Asia On-Line Limited	+852 2866 6018	info@asiaonline.net
Hong Kong	Asia Pacific CompuNet Ltd	+852 2976 9995	info@ap.net.hk
Hong Kong	Hong Kong SuperNet	+852 358 7924	trouble@hk.super.net
Hungary	iSYS Hungary	+36 1 266 6090	info@isys.hu
Iceland	SURIS / ISnet	+354 1 694747	isnet-info@isnet.is
Ireland	Cork Internet Services	+353 21 277124	info@cis.ie
Ireland	Ieunet Limited	+353 1 679 0832	info@ieunet.ie
Ireland	Ireland On-Line	+353 91 592727	info@iol.ie
Israel	ACTCOM	+972 4 676115	office@actcom.co.il
Israel	Elronet	+972 313534	info@elron.net
Israel	NetMedia Ltd.	+972 2 795 861	info@netmedia.co.il
Israel	NetVision LTD.	+972 550330	info@netvision.net.il
Italy	Abacom s.a.s.	+39 434 660911	info@system.abacom.it
Italy	I.NET S.p.A.	+39 2 26162258	info@inet.it
Italy	ITnet S.p.A.	+39 10 6563324	info@it.net
Italy	Spin	+39 40 8992 286	info@spin.it
Italy	Tex.NET TELECOMUNICAZIONI	+39 574 35038	texnet@texnet.it
Italy	Video On Line	+39 70 659 625	info@vol.it
Jamaica	Jamaica Online Information	+1 809 960 8209	info@jol.com.jm
Japan	Asahi Net	+81 3 3666 2811	info@asahi-net.or.jp
Japan	Global OnLine	+81 3 5330 9380	info@gol.org
Japan	HA Telecom Corporation	+81 58 253 7641	info@hatelecom.or.jp
Japan	Internet Initiative Japan	+81 3 3580 3781	info@iij.ad.jp

Area Code	Name	Phone	Email
Japan	M.R.T., Inc.	+81 3 3255 8880	sysop@janis-tok.com
Japan	TWICS	+81 3 3351 5977	info@twics.com
Japan	Typhoon Inc.	+81 3 3757 2118	info@typhoon.co.jp
Kazakhstan	Bogas Soft Laboratory Co.	+7 322 262 4990	pasha@sl.semsk.su
Kuwait	Gulfnet Kuwait	+965 242 6728	info@kw.us.com
Latvia	LvNet-Teleport	+371 2 551133	vit@riga.lv
Latvia	Versia Ltd.	+371 2 417000	postmaster@vernet.lv
Lisboa	Esoterica	+716 2395	info@esoterica.com
Luxemburg	EUnet Luxemburg	+352 47 02 61 361	info@luxemburg.eu.net
Mexico	Datanet S.A. de C.V.	+52 5 1075400	info@data.net.mx
Mexico	Internet de Mexico S.A.	+52 5 3602931	info@mail.internet.com.mx
Netherlands	The Delft Connection	+31 15560079	info@void.tdcnet.nl
Netherlands	Hobbynet	+31 365361683	henk@hgatenl.hobby.nl
Netherlands	Holland Online	+31 71 40 16943	Sales@hol.nl
Netherlands	Internet Access Foundation	+31 5982 2720	mail-server@iafnl.iaf.nl
Netherlands	NEST	+31 206265566	info@nest.nl
Netherlands	NetLand	+31 206943664	info@netland.nl
Netherlands	NLnet (EUnet)	+31 206639366	info@nl.net
Netherlands	Psyline	+31 80445801	postmaster@psyline.nl
Netherlands	Simplex Networking	+31 206932433	skelmir@simplex.nl
Netherlands	Stichting XS4ALL	+31 206225222	helpdesk@xs4all.nl
New Zealand	Actrix Networks Limited	+64 4 389 6356	john@actrix.gen.nz
New Zealand	Efficient Software Limited	+64 3 4738274	bart@dunedin.es.co.nz
Norway	Oslonett A/S	+47 22 46 10 99	oslonett@oslonett.no
Poland	ATM	+48 22 6106073	szeloch@ikp.atm.com.pl
Poland	PDi Ltd. - Public Internet	+48 42 30 21 94	info@pdi.lodz.pl
Romania	EUnet Romania SRL	+40 1 312 6886	info@romania.eu.net
Russia	ELCOM	+7 092 223 2208	root@centre.elcom.ru
Russia	GlasNet	+7 95 262 7079	support@glas.apc.org
Russia	InterCommunications Ltd.	+7 8632 620562	postmaster@icomm.rnd.su
Russia	NEVAlink Ltd.	+7 812 592 3737	serg@arcom.spb.su
Russia	Relcom CO	+7 95 194 25 40	postmaster@ussr.eu.net
Russia	SvjazInform	+7 351 265 3600	pol@rich.chel.su
Singapore	Singapore Telecom Limited	+65 7308079	admin@singnet.com.sg
Slovakia	EUnet Slovakia s.r.o.	+42 7 839 404	info@Slovakia.EU.net
Slovenia	NIL, System Integration	+386 61 1405 183	info@slovenia.eu.net
South Africa	Aztec	+27 21 419 2690	info@aztec.co.za
South Africa	Internet Africa	+27 0800 020003	info@iaccess.za
South Africa	The Internet Solution	+27 11 447 5566	info@is.co.za
Spain	CESATEL	+34 81 252898	info@cesatel.es
Spain	INTERCOM S.T.A.	+34 3 5802846	info@intercom.es

Area Code	Name	Phone	Email
Spain	OFFCAMPUS SL	+34 1 577 3026	infonet@offcampus.es
Spain	Servicom	+34 93 580 9396	info@servicom.es
Sri Lanka	Information Laboratories	+94 1 61 1061	info@infolabs.is.lk
Sweden	NetGuide	+46 31 28 03 73	info@netg.se
Switzerland	EUnet AG, Zurich	+41 1 291 45 80	info@eunet.ch
Switzerland	EUnet SA, Geneva	+41 22 348 80 45	deffer@eunet.ch
Switzerland	Internet ProLink SA	+41 22 788 8555	info@iprolink.ch
Switzerland	SWITCH	+41 1 268 1515	postmaster@switch.ch
Tataretan	KAMAZ Incorporated	+7 8439 53 03 34	postmaster@kamaz.kazan.su
Ukraine	ConCom, Ltd.	+7 0572 27 69 13	igor@ktts.kharkov.ua
Ukraine	Crimea Communication Centre	+380 0652 257214	sem@snail.crimea.ua
Ukraine	Electronni Visti	+7 44 2713457	info%elvisti.kiev.ua@kiae.su
Ukraine	PACO Links Int'l Ltd.	+7 48 2200057	info@vista.odessa.ua
Ukraine	UkrCom-Kherson Ltd	+7 5522 64098	postmaster@ukrcom .kherson.ua
United Kingdom	Compulink (CIX Ltd)	+44 181 390 8446	cixadmin@cix .compulink.co.uk
United Kingdom	CONNECT - PC User Group	+44 181 863 1191	info@ibmpcug.co.uk
United Kingdom	Demon Internet Limited	+44 181 371 1000	internet@demon.net
United Kingdom	The Direct Connection	+44 81 313 0100	helpdesk@dircon.co.uk
United Kingdom	EUnet GB	+44 1227 266466	sales@britain.eu.net
United Kingdom	ExNet Systems Ltd.	+44 81 244 0077	info@exnet.com
United Kingdom	Frontier Internet Services	+44 171 242 3383	info@ftech.net
United Kingdom	GreenNet	+44 71 713 1941	support@gn.apc.org
United Kingdom	Lunatech Research	+44 1734 791900	info@luna.co.uk
United Kingdom	Pavilion Internet plc	+44 1273 606072	info@pavilion.co.uk
United Kingdom	Planet Online Ltd	+44 113 234 5566	info@theplanet.net
United Kingdom	Sound & Visions BBS	+44 1932 253131	info@span.com
United Kingdom	Utopia! Internet Ltd	+44 121 5614621	sales@utopia.co.uk
United Kingdom	WinNET (UK)	+44 181 863 1191	info@win-uk.ne
Venezuela	Internet Comunicaciones c.a.	+58 2 959 9550	info@ccs.internet.ve

Appendix C Glossary

Symbols

68K Used to differentiate Macintosh computers that use one of the 68000 family of processors from the newer Power Macintosh computers that use the PowerPC family of processors.

A

addressing A method of identifying a resource (such as a program) or piece of information (such as a file) on a network. Methods of addressing vary considerably from network to network.

alias In System 7, a file that "points to" another file, folder, or disk, and may generally be used in place of the original item. In network usage, alias usually refers to a simple name, location, or command that you can use in place of a more complex name, location, or command. Aliases are commonly used for email addresses, directories, and commands.

America Online A popular commercial information service with a graphical interface.

anonymous FTP site An **FTP** site that enables you to retrieve files if you use "anonymous" as your **userid** and your email address as your **password**.

anonymous remailer A program that takes **email** you send it, strips your identity out of the **header**, and sends it along to the address you specify.

AOL Shorthand for **America Online**. Each letter is pronounced separately.

Apple Remote Access See **ARA**.

AppleTalk A network protocol Apple developed to connect computers and peripherals over various different types of wiring.

ARA *Apple Remote Access*. A software program from Apple that enables one Mac to dial another Mac via a modem and, through AppleShare and/or Personal File Sharing, access local or network resources available to the "answering" Mac. (Common resources include shared directories, servers, and printers.)

Archie An Internet service that maintains, and enables users to search, a large database of files stored on **anonymous FTP sites**.

ARPA The U.S. governmental organization responsible for creating the beginnings of the Internet.

ARPAnet The proto-Internet network created by **ARPA**.

ASCII *American Standard Code for Information Interchange*. In the context of a file, an ASCII file is one that contains only "text" characters—numbers, letters, and standard punctuation. Although ASCII text can contain international characters available on the Mac ("upper ASCII"), these characters are not commonly supported by Internet services such as **email**, **Gopher**, and **FTP**.

attachments Files that are linked to a specific email message, just as you might paperclip a newspaper clipping to a **snail mail** letter.

.au The filename extension used by Sun au files, the most common audio file format used on the Internet.

.AVI The filename extension used by AVI movies, a Windows video format.

B

bandwidth Information theory used to express the amount of information that can flow through a given point at any given time. Some points have narrow bandwidth (indicating not much information can flow through at one time), and others have high bandwidth (indicating a great deal of information can flow through at one time). This term is commonly used in reference to "wasted bandwidth," indicating that some (or most) of the information flowing by a point is of no use to a user. This term can include overloading a site's network connection (thus curtailing other users' use of the lines) or including lengthy signature files in Usenet postings or discussion groups. "Wasted bandwidth" is often relative: What one person views as wasteful might be essential to someone else.

baud A measure of **modem** speed equal to one signal per second; 300 baud equals 300 bits per second (bps). But at higher speeds one signal can contain more than one bit, so a 9,600 baud modem is not a 9,600 bps modem. (The terms often are incorrectly used interchangeably.) See also **bps**.

BBS *Bulletin Board System*. A computer system that provides its users with files for downloading and areas for electronic discussions. Bulletin board systems usually are run by and for local users, although many now provide Internet email access.

.bin The filename extension used by **MacBinary** files.

binary In the context of a file, any file that contains nontextual data. (Images and applications are examples of binary files.)

BinHex The standard Macintosh format for converting a **binary** file into an **ASCII** file that can pass through email programs. (For those of you wondering how to pronounce it, "Bin" rhymes with "tin," and "Hex" rhymes with "sex," and the accent is on the first syllable.) See also **uucode**.

BITNET An academic large-scale computer network, primarily connecting academic institutions. BITNET is often expanded as the "Because It's Time" Network. A friend notes, "Actually, it seems that the definitive answer to what the BIT stands for is 'It has varied, and depends on who you asked and when.'"

body The part of an **email** message where you type your message, as opposed to the **header** or the **signature**.

bookmark A shortcut to a site on the Internet. See also **hotlist**.

bounce What **email** does when it doesn't go through—it comes back to you.

bps *bits per second*. The measurement of modem transmission speed. Not comparable to **baud** after 300 bps.

browser A client program that enables one to search, often somewhat randomly, through the information provided by a specific type of server. Generally used in relation to the **World Wide Web**.

BTW Common email and Usenet news abbreviation for the expression "*By the way*."

Bulletin Board System See **BBS**.

C

Call For Votes What happens after discussing whether a new newsgroup should be created.

CCL *Connection Control Language*. Used in **Apple Remote Access**, InterSLIP, and other communications programs, CCL is a scripting language that enables you to control your modem.

CERN The birthplace of the **World Wide Web**, although in real life CERN does high-energy physics research. Located in Geneva, Switzerland.

CFV See **Call For Votes**.

CGI See **Common Gateway Interface**.

channel In **IRC**, a section that theoretically has a specific discussion topic.

charter The document that lays out what topics a **newsgroup** will cover, what its name will be, and other relevant details.

CIS Stands for CompuServe Information Service, or simply CompuServe. Wags often replace the *S* with a *$*. See **CompuServe**.

ClariNet An alternate hierarchy of newsgroups that uses the same transmission routes as **Usenet** but carries commercial information from UPI and others. You or your provider must pay to read ClariNet news.

client The program or computer that requests information from a server computer or program. Examples of client programs include Anarchie, Eudora, and Netscape Navigator. Used in terms of client/server computing. See also **server**.

command line Where you type commands to an operating system such as DOS or Unix. Command-line operating systems can be powerful but are often a pain to work with, especially for Macintosh users used to a graphical interface. See **shell account**.

commercial services Computer information services such as **America Online** and **CompuServe** that charge for access to their information.

Common Gateway Interface A standard method for **Web** servers to communicate with other programs. For instance, a CGI enables WebSTAR to communicate with FileMaker Pro to serve information from a database via the Web.

compress To make a file smaller by removing redundant information.

CompuServe The oldest and second largest (after **AOL**) of the commercial services.

connect time The amount of time you are actually connected to and using the Internet. Because connect or telephone charges are based on this amount of time, you want to keep it as low as possible.

connection script A simple conversation between your Mac and your host machine that enables your Mac to log in automatically. Connection scripts usually involve a series of "send" and "expect" strings. Your host sends a login prompt; your Mac responds with your username. Your host sends a password prompt; your Mac responds with your password.

.cpt The filename extension used by files compressed by Compact Pro.

cracker An antisocial reject who enjoys breaking into computers and causing damage. For contrast, see **hacker**.

CREN Corporation for Research and Educational Networking. The nonprofit corporation that ran BITNET.

cross-posted What happens to a **Usenet** posting when you put several newsgroup names in the Newsgroups line. More efficient than posting multiple individual copies.

CSLIP Compressed SLIP. A type of **SLIP** account that uses compression to increase performance.

D

daemons Small programs in **Unix** that run frequently to see whether something has happened: if so, they act as they were programmed; if not, they go back to sleep.

DARPA Defense Advanced Research Projects Agency. Replaced **ARPA** and had a more military bent. Has since been renamed ARPA again.

debinhex The act of decoding a file in the **BinHex** format such that it's a usable Macintosh file.

dial up To call another computer via **modem**. The term is often lumped together as one word except when used as a verb.

dialup A connection or line reached by **modem**, as in "a dialup line."

digest A single message that contains multiple individual postings to a **mailing list** or **newsgroup**.

digital signature A method of verifying that something someone sent to you really came from the sender and not from someone else.

domain A level of hierarchy in a machine's full **domain name**. For instance, `tidbits.com` is in the `com` domain, as are many other machines.

domain name The name of an Internet machine, which corresponds with an **IP number**.

domain name server A computer that keeps track of names of other machines and their numeric IP addresses. When you refer to a machine by name, your domain name server translates that information appropriately into the numeric IP address necessary to make the connection.

domain name system The system that makes it possible for you to think in terms of names such as `penguin.tidbits.com`, whereas computers think in terms of `204.25.157.10`.

DOS An elderly operating system that is frequently helped across the street by Microsoft Windows.

download To retrieve a file from another machine to your Mac. See also **upload**.

downstream **Usenet** neighbors that are downstream from you get most of their news from your machine, in contrast to machines that are **upstream** from you.

dynamic addressing When your Mac gets its **IP number** for each session from the server to which you connect. Not to be confused with the Dynamically button in MacTCP, which picks an IP number from a range at random.

E

electronic mail or **email** Messages that travel through the networks rather than being committed to paper and making the arduous journey through the postal service.

emoticons A rather silly name for **smileys**.

Ethernet A type of local area network that is much faster than **LocalTalk**. Most Macs can use Ethernet by adding an Ethernet expansion card; some recent Macs come with Ethernet built-in.

.etx The filename extension for **setext** files, which are straight text files in a specific format that's easy to read online and can be decoded for even better display.

.exe The filename extension used by DOS programs. Files with this extension aren't generally usable on the Macintosh.

expire After a certain amount of time, **Usenet** postings can be set to expire, which means that they will be deleted even if they haven't been read, so that they don't waste space.

F

FAQ *Frequently Asked Questions*. Lists of commonly asked questions and their answers, often posted in newsgroups to reduce the number of novice questions. Read a FAQ list before asking a question, to make sure yours isn't a frequently asked one.

fat binary A program that runs in native mode on Power Macs, but also works on **68K** Macs.

feed Shorthand for a connection to another machine that sends you **email** and **news**. I might say, "I have a mail feed from Ed's machine."

filename extension A three-letter (usually) code at the end of a filename that indicates what type of file it is. Essential in non-Macintosh environments that lack icons or other methods of identifying files types.

file server A machine that provides files via a network. Perhaps because of time spent working on **BITNET**, I tend to use it as a synonym for **mail server**, or a machine that returns files that are requested via **email**.

file site Another name for an **FTP** site. A computer on which files are stored for anyone on the Internet to retrieve.

Finger A method of finding out information about someone else on the Internet.

firewall A security system that not only prevents intruders from entering, but also often prevents legitimate users from getting out to the Internet from the local network. A firewall usually has a single machine that's connected to the Internet and all Internet traffic must pass through that machine.

flame war A conflagration in which lots of people jump in on different sides of an argument and insult each other. Fun to watch briefly, but a major waste of **bandwidth**.

flaming The act of calling into question someone's thoughts, beliefs, and parentage simply because you don't agree with him or her. Don't do it.

flow control The process by which your modem and your Mac control the flow of information between themselves. Also known as handshaking, as in **hardware handshaking** and **software handshaking**.

followup An article on **Usenet** posted in reply to another article. The subject should stay the same so that readers can tell the two articles are related.

forms In the **Web**, online electronic forms that you can fill in.

frame relay A form of permanent Internet connection that's often cheaper than a **leased line**.

Freenet A way of accessing the Internet for free or for little money in a few communities around the world. Unfortunately, Freenets don't support graphical software such as Eudora, Anarchie, or Internet Explorer.

freeware Software that you can distribute freely and use for free, but for which the author often retains the copyright, which means that you can't modify it. See also **public domain** and **shareware**.

FTP File Transfer Protocol. One of the main ways in which you send and retrieve files from other machines on the Internet.

FTPmail A method of retrieving files stored on FTP sites via email.

fully qualified domain name A full **domain name**, such as `penguin.tidbits.com`. For contrast, see **unqualified domain name**.

FYI Abbreviation for the expression "*For your information*."

G

gateway A machine that exists on two networks, such as the Internet and BITNET, and that can transfer **email** between them.

GIF *Graphics Interchange Format*. A platform-independent file format developed by CompuServe, the GIF format is commonly used to distribute graphics on the Internet. Mighty battles have been waged over the pronunciation of this term, and although Robin Williams notes that it's pronounced "jiff" in her book *Jargon*, both of my glossary proofreaders flagged it as being pronounced with a hard *g*, as in "graphics." I surrender; pronounce it as you like.

.gif The filename extension given to **GIF** files.

GNU With apologies for the circular reference, GNU stands for "GNU's Not Unix." Developed by Richard Stallman and the Free Software Foundation, GNU is (or will be, when finished) a high-quality version of the Unix operating system that is free of charge and freely modifiable by its users. GNU software is distributed at no cost with source code. Many GNU applications and utilities are mainstays of the Unix community.

Gopher An information retrieval system created by the University of Minnesota.

.gz An extension used by **GNU's** version of **ZIP**, called **gzip**.

gzip **GNU's** version of the **ZIP** compression format.

H

hacker Someone who continually seeks to learn more about the inner workings of computer systems. For contrast, see **cracker**.

hardware handshaking The main way **modems** control the flow of information in and out of the Mac. Hardware handshaking requires a special cable, the proper settings in your connection software, and the correct **modem initialization string**.

Hayes-compatible A term used to describe modems that support the same basic command set for their initialization strings. Unfortunately, being Hayes-compatible doesn't mean much any more since most modern modems support many commands that aren't in the Hayes command set.

header The part of an **email** message or **Usenet** posting that contains information about the message, such as who it's from, when it was sent, and so on. Headers are mainly interesting when something doesn't work.

helper applications Programs that provide additional functionality to another program. For instance, FTP programs rely on StuffIt Expander, a helper application, to **debinhex** and **unstuff** files that you **download**.

home page In the **World Wide Web**, the document that is accessed first after launching a Web **browser**. Home page also generally refers to the main page for a site or for an individual.

host A computer that provides Internet services. The machine that you connect to at your provider is a host computer.

hotlist A list of shortcuts or **bookmarks** to your favorite sites on the Internet.

hotspot An area that you click to make something happen. Works much like a button, only is often less obviously a place to click.

.hqx The filename extension used for **BinHex** files.

HTML *HyperText Markup Language*. The language used to mark up text files with styles and **links** in order to create **Web pages** that **Web browsers** can view.

HTTP *HyperText Transfer Protocol*. The protocol used by the **World Wide Web**.

hypertext A term created by visionary Ted Nelson to describe nonlinear writing in which you follow associative paths through a world of textual documents. The most common use of hypertext these days is in the links on **Web pages**.

I

IAB See **Internet Architecture Board**.

IETF See **Internet Engineering Task Force**.

image map A graphic on a **Web page** that offers multiple, clickable **hotspots**. Each hotspot links to a different location.

IMAP *Interactive Mail Access Protocol*. A protocol for the storage and retrieval of email (much like **POP**, the Post Office Protocol). It's not in wide use yet.

IMHO Common **email** and **Usenet news** abbreviation for the expression "*In my humble opinion*."

Info-Mac Network A popular Internet resource that provides the Info-Mac Digest, a **discussion group** about Macintosh issues, and the Info-Mac Archive, a large **FTP** site (with many **mirror sites**) containing tons of Macintosh **freeware** and **shareware** files.

init string See **modem initialization string**.

intelligent agent A software program that can search numerous databases for information that interests you without your having to know what it is searching.

internet With a lowercase *i*, it's a group of connected networks.

Internet The collection of all the connected networks in the world. More specifically, the Internet is the set of networks that communicate via **TCP/IP**.

Internet Architecture Board A group of invited volunteers that manages certain aspects of the Internet, such as standards and address allocation.

Internet Engineering Task Force A volunteer organization that meets regularly to discuss problems facing the Internet.

Internet presence provider A company that doesn't provide access to the Internet for users, but for Internet servers. You might work with an Internet presence provider instead of getting a permanent Internet connection and running your own server.

Internet Relay Chat See **IRC**.

Internet service provider An organization that provides Internet access for individuals or other organizations, usually for a fee.

intranet A **local area network** that uses **TCP/IP** and can thus run all normal Internet programs. Intranets are restricted to internal organization networks.

IP *Internet Protocol*. The main protocol used on the Internet.

IP address Another name for **IP number**. Sometimes also used to refer to **domain name**.

IP number A four-part number that uniquely identifies a machine on the Internet. For instance, my IP number for `penguin.tidbits.com` is `204.57.157.10`. People generally use the name instead.

IRC *Internet Relay Chat*. A worldwide network of people talking to each other in real time over the Internet (via typing) rather than in person.

ISDN *Integrated Services Digital Network*. A high-speed digital telephone line.

ISDN modem A piece of hardware that enables you to connect a Mac to an **ISDN** line. ISDN modems are also sometimes called **terminal adapters** and are roughly equivalent to normal **modems**.

ISOC *The Internet Society*. A membership organization that supports the Internet and is the governing body to which the **IAB** reports.

J

Java A cross-platform programming language whose programs can be downloaded over the Internet.

JavaScript A scripting language supported by Netscape Navigator that has little to do with **Java**. JavaScript was previously known as LiveScript.

jargon The sometimes incomprehensible language used to talk about specialized topics. If you need help with computer jargon, check out *Jargon* by Robin Williams, a light-hearted and detailed trip through this industry.

JPEG *Joint Photographic Experts Group*. A group that has defined a compression scheme that reduces the size of image files by up to 20 times at the cost of slightly reduced image quality.

.jpeg or **.jpg** A filename extension used to mark **JPEG**-compressed images.

K

keyword A word that you use to search a database of information.

L

LAN See **local area network**.

leased line A permanent Internet connection that's available all the time.

line noise Static on a telephone line that causes trouble for modem connections.

link A way of connecting two **pages** on the **Web**. Clicking a link in one Web page displays the Web page specified by the link.

LISTSERV A powerful program for automating **mailing lists**.

local area network Often abbreviated *LAN*. Two or more computers connected together via network cables. If you have a Macintosh connected to a LaserWriter printer, you have a rudimentary local area network.

LocalTalk The local area networking hardware that Apple builds into every Macintosh.

login The process by which you identify yourself to a **host** computer. Usually involves a **userid** and a **password**.

lurkers Not a derogatory term. People who merely read discussions online without contributing to them.

M

MacBinary A file format that combines the three parts of a Macintosh file: the data fork, resource fork, and Finder information block. No other computers understand the normal

Macintosh file format, but they can transmit the MacBinary format without losing data. When you download a binary Macintosh file from another computer using the MacBinary format, your communications program automatically reassembles the file into a normal Macintosh file.

mail bombing The act of sending hundreds or thousands of messages to someone you think deserves the punishment for transgressions against the Internet. Highly discouraged.

mailing list A list of `people` who all receive **email** postings sent to the group. Mailing lists exist for all sorts of topics.

mail server A program that provides access to files via **email**. See also **file server**.

manually addressed An Internet account with a fixed **IP number**. Also known as **static addressing**.

metadata Information about information. Many methods of searching on the Internet rely on metadata, which lowers their efficacy.

middle-level domain More specific parts of the domain name. See **top-level domain**.

MIME *Multipurpose Internet Mail Extensions*. An Internet standard for transferring nontextual data, such as audio messages or pictures.

mirror site An **FTP** site that contains exactly the same contents as another site. Mirror sites help distribute the load from a single popular site.

modem Stands for "modulator-demodulator," because that's what it does, technically. In reality, a modem enables your computer to talk to another computer via the phone lines.

modem initialization string A string of commands sent to the **modem** by your Mac to configure it in certain ways. A common modem initialization (often abbreviated to "init") string is AT&F1.

moderator An overworked volunteer who reads all of the submissions to a **mailing list** or **newsgroup**, to make sure they are appropriate, before posting them.

monospaced font `A font whose characters are all the same width. Courier and Monaco are common monospaced fonts on the Macintosh. You generally want to use a monospaced font when reading text in email or Usenet news.`

.mov The filename extension used by **QuickTime** and **QuickTime VR** movies.

MPEG *Motion Picture Experts Group*. More commonly, a compression format for video. Files compressed with MPEG generally have the extension .mpeg or .mpg.

.mpeg or **.mpg** A filename extension used to mark **MPEG**-compressed video.

MTU *Maximum Transmission Unit*. A number that your system administrator must give you so that you can configure **SLIP**.

MUD *Multi-User Dungeon*, or sometimes *Multi-User Dimension*. A text-based alternate reality in which you can progress to a level at which you can modify the environment—mostly used for games, and extremely addictive.

MX record *Mail Exchange record*. An entry in a database that tells **domain name servers** where they should route **email** so that it gets to you.

N

NCSA *National Center for Supercomputing Applications*. A group that has produced a great deal of public domain software for the scientific community. It wrote NCSA Telnet and NCSA Mosaic for the Macintosh.

Network Information Center An organization that provides information about a network.

Network Time Protocol A protocol for transmitting the correct time around the Internet.

network time server The machine from which you set your clock using **Network Time Protocol**.

news Synonymous with **Usenet news**, or sometimes just **Usenet**.

newsgroup A discussion group on **Usenet** devoted to talking about a specific topic. Currently, over 16,000 newsgroups exist.

newsreader A program that helps you read **news** and provides capabilities for following or deleting **threads**.

NIC See **Network Information Center**.

nickname An easy-to-remember shortcut for an **email** address. Sometimes also called an **alias**.

NNTP *Net News Transport Protocol*. A transmission protocol for the transfer of **Usenet news**.

NSF *National Science Foundation*. The creators of the **NSFNET**.

NSFNET *National Science Foundation Network*. A high-speed network that linked users with supercomputer sites around the country.

O

offline When you aren't actually connected to another computer.

online When you are connected to another computer.

P

packet The smallest unit of information sent over the Internet. Everything sent over the Internet is broken into packets, sent, and reassembled on the receiving side.

page On the **Web**, the name for the basic document type.

password A secret word used to prevent other people from reading your **email** or using your Internet account.

PGP *Pretty Good Privacy.* An encryption system for keeping your electronic communications private. PGP uses a form of **public key encryption**.

Ph An Internet service that enables you to look up information about people.

plug-ins Generically, pieces of software that provide additional functionality to a program. Netscape Navigator and Microsoft Internet Explorer support plug-ins that extend their functionality.

POP *Post Office Protocol.* A protocol for the storage and retrieval of email. **Eudora** uses POP.

port In software, the act of converting code so that a program runs on more than one type of computer. In networking, a number that identifies a specific "channel" used by network services. **Gopher**, for instance, generally uses port 70, but occasionally is set to use other ports on various machines.

post To send a message to a **newsgroup** or **mailing list**.

Power Mac native Indicates that the program runs at full speed on Power Macintosh computers, but won't run on **68K** Macs at all. Also see **fat binary**.

PPC Indicates that a program contains code that runs only on Power Macintosh computers, which all use the PowerPC family of processors.

PPP *Point to Point Protocol.* A protocol functionally similar to **SLIP** that enables your Mac to pretend it is a full Internet machine, using only a **modem** and a normal telephone line.

proportionally spaced font A font whose characters vary in width, so that, for example, a *W* is wider than an *i*. Proportionally spaced fonts often work poorly when you're reading text in **email** or in **Usenet news**.

protocol A language that computers use when talking to each other.

provider See **Internet service provider.**

proxy server A computer that acts as an intermediary on Internet traffic between your Mac and the Internet.

public domain Software that you can use freely, distribute freely, and modify in any way you wish. See also **freeware** and **shareware**.

public key encryption A method of securely exchanging information. **PGP** uses public key encryption.

Q

QuickTime An Apple technology for time-based multiple-media data. QuickTime files can include text, sound, animation, and video, among other formats.

QuickTime VR An Apple technology based on **QuickTime** for displaying three-dimensional scenes and objects.

quoting The act of including parts of an original message in a reply. The standard character used to set off a quote from the rest of the text is a column of > (greater-than) characters along the left margin.

R

RealAudio A technology for sending **streaming** audio over the Internet so you don't have to download an entire file before you start listening to it.

Request for Comments Documents containing the standards, proposed standards, and other necessary details regarding the operation of the Internet.

Request for Discussion The part of the **newsgroup** creation process in which you propose a group and discussion begins.

RFC See **Request for Comments**.

RFD See **Request for Discussion**.

robot A program that scours the **Web** for information that it can put into a database that a **search engine** can use.

root directory The topmost directory that you can see. On the Mac, the root directory appears in a window after you double-click your hard disk icon.

rot13 A method of encoding possibly offensive postings on **Usenet** so that those who don't want to be offended can avoid accidentally seeing the posting. It works by converting each letter to a number (*a = 1*, *b = 2*, and so forth), adding 13 to the number, and then converting back into letters, rendering the file unreadable without deciphering.

S

.sea The filename extension used by most **self-extracting archives** on the Mac.

search engine A computer on the Internet that enables you to search a large database of information, usually a listing of the contents of other sites on the Internet.

self-extracting archive A compressed file or files encapsulated in a decompression program, so you don't need any other programs to expand the archive.

server A machine that makes services available on a network to **client** programs. For instance, a Web server makes **Web pages** available through the **HTTP** protocol.

service provider See **Internet service provider**.

setext *Structure-enhanced text*. A method of implicitly marking up text files to make them both easy to read online and readable by special browser software offline. Also used to refer to the files marked up in this fashion.

shareware A method of software distribution in which the software may be freely distributed, and you may try it before paying. If you decide to keep and use the program, you send your

payment directly to the shareware author. Also used to refer to the software distributed by this method. See also **freeware** and **public domain**.

shell account The oldest and ugliest method of accessing the Internet. Shell accounts require you to type cryptic commands to do anything, and can't display anything but text in a single font.

signature Several lines automatically appended to your **email** messages, usually listing your name and email address, sometimes along with witty sayings and **ASCII** graphics. Keep them short, and leave out the ASCII graphics.

.sit The filename extension used by files compressed with StuffIt.

SLIP *Serial Line Internet Protocol*. Like **PPP**, a protocol that lets your Mac pretend it is a full Internet machine using only a **modem** and a normal phone line. SLIP is older and less flexible than PPP.

smileys Collections of characters used in **email** and **Usenet news** and meant to replace body language, intonation, and complete physical presence. ;-)

SMTP *Simple Mail Transport Protocol*. The protocol used on the Internet to transfer **email**. Eudora uses SMTP to send email.

snail mail The standard name on the Internet for paper mail. **Email** can travel across the country in seconds, in marked contrast to old-style postal service mail (once my birthday present from my parents took a week to arrive).

software handshaking A form of flow control that doesn't require a special cable, but which also doesn't work with modern high speed modem connections. See **hardware handshaking** and **XON/XOFF**.

spamming The act of sending hundreds of inappropriate postings to **newsgroups** and **mailing lists**. Do it and you'll seriously regret it.

spider A program that visits multiple **Web sites** in order to index their contents for a **search engine**.

static addressing When your Mac is assigned a permanent **IP number**. Most commonly used on networks that are permanently connected to the Internet.

streaming The process by which an audio or video file is played as it is **downloaded**, rather than forcing you to wait until the entire thing has been downloaded.

system administrator The person who runs your host machine or network. Also known as the network administrator or administrator. Be very nice to this person.

T

T1 A high-speed leased-line link used on the Internet.

T3 An even higher-speed leased-line link used on the Internet.

tags Bits of specially formatted text in an **HTML** file that tell a **Web browser** how to display the file.

.tar The filename extension used by files made into an archive by the Unix Tar program, which stands for "Tape archive."

TCP *Transmission Control Protocol*. It works with **IP** to ensure that packets travel safely on the Internet.

TCP/IP The combination of *Transmission Control Protocol* and *Internet Protocol*. The base protocols on which the Internet is founded.

Telnet Can refer to a terminal emulation protocol that enables you to connect to other machines, or a program that implements this protocol on any of various platforms.

terminal A piece of hardware such as a **VT100** that enables you to interact with a character-based operating system such as **Unix**.

terminal adapter A piece of hardware used to connect a computer to an **ISDN** line. Terminal adapters are roughly equivalent to **modems**.

terminal emulator Software that enables a real computer, such as a Mac, to act like a dedicated **terminal**, such as a **VT100**.

text In terms of files, a file that contains characters only from the **ASCII** character set. In terms of **FTP**, a mode that assumes the files you will be transferring contain only ASCII characters.

thread A group of messages in a Usenet **newsgroup** that all share the same subject and topic, so you can easily read the entire thread or delete it, depending on your specific **newsreader**.

TidBITS A free weekly newsletter distributed solely over computer networks. *TidBITS* focuses on the Macintosh and the world of electronic communications. I'm the editor, so I think it's neat. Send email to `info@tidbits.com` for subscription information.

timeout After a certain amount of idle time, some connections will disconnect, hanging up the phone in the case of a **modem** connection.

top-level domain The most general part of a **domain name**, such as `com` or `uk`. See also **middle-level domain**.

true Internet connection An Internet connection based on **TCP/IP**.

.txt The filename extension generally used for straight **text** files that you can read (as opposed to text files that have been encoded by **BinHex** or **uuencode**).

U

Ulaw Another name for the Sun **au** audio file format.

Umich A popular **FTP** site with many **mirror sites** that carries lots of Macintosh **freeware** and **shareware**.

Unix An extremely popular, if utterly cryptic, operating system in wide use on computers on the Internet. Other operating systems work fine on the Internet, but Unix is probably the most common.

unqualified domain name The machine-specific part of a domain name, such as `penguin`, in `penguin.tidbits.com`. For contrast, see **fully qualified domain name**.

unstuff The act of expanding a file compressed by one of the StuffIt programs.

upload To send a file to another machine. Also see **download**.

upstream Machines that send you most of your **Usenet news** are said to be upstream from you. Machines that get most of their news from you are **downstream**.

URL *Uniform Resource Locator*. A method of giving an address to Internet resources such as **Web pages**. URL is pronounced "You Are Ell."

Usenet An anarchic network of sorts, composed of thousands of **newsgroups** covering every imaginable topic.

Usenet news The news that flows through Usenet. Sometimes abbreviated **Usenet** or **news**.

userid The name you use to log in to another computer. Synonymous with **username**.

username See **userid**. They're generally the same.

.uu The filename extension generally used by **uuencoded** files.

uucode A file format used for transferring **binary** files in email, which can only reliably carry **ASCII** files.

uuencode The act of creating a uuencoded file. See **uucode**.

UUCP *Unix to Unix CoPy*. UUCP is a small pun on the fact that the Unix copy command is cp. UUCP is an old transmission protocol that carries only **email** and **news**.

.uud A filename extension sometimes used by **uuencoded** files.

.uue Yet another filename extension sometimes used by **uuencoded** files.

V

v.34 Currently the fastest standard **modem** protocol. Although not required, almost all v.34 modems support all sorts of other protocols, including v.42 error correction and v.42bis data compression. Don't worry about the specifics; just try to match protocols with the modems you call.

virtual memory A method of using hard disk space to simulate RAM. Virtual memory may be necessary if you don't have enough memory to run all your Internet applications, but it can also cause problems with Internet connections.

VRML *Virtual Reality Modeling Language*. A method of defining a three-dimensional scene in such a way that a **Web browser** can download the VRML code and display the scene.

W

WAIS *Wide Area Information Servers*. A method of searching of databases on the Internet. WAIS was a major Internet service in the past, but has faded into the background now.

WAN See **wide area network**.

.WAV The filename extension used by the Windows WAVE audio file format.

Web See **World Wide Web**.

Web browser A program that enables you to browse through information on the **Web**.

Web catalog A categorized database of Web sites and descriptions.

Web page The basic document type on the **Web**.

Web site A collection of **Web pages**.

Whois An Internet service that enables you to find out more about a specific Internet **domain**.

wide area network A group of geographically separated computers connected via leased lines or satellite links. The Internet enables small organizations to simulate a wide area network without the cost of one.

World Wide Web The most popular Internet service for providing information via text, graphics, sounds, and movies. Often abbreviated to "the Web."

worm A program that copies itself from machine to machine on the Internet, potentially causing trouble. Also used to refer to programs that try to visit all the Web sites on the Internet to catalog their contents for a **search engine**.

X-Z

XON/XOFF Another name for **software handshaking** or software flow control. Use **hardware handshaking** instead.

.Z The filename extension used by files compressed with the Unix Compress program.

.z A filename extension used by files compressed with the Unix **Gzip** program.

.ZIP The filename extension used by files compressed into the ZIP format common on PCs.

Index

Symbols

A

B

D

E

F

G

H

J-K

L

M

O

P

Q

R

U

V

W

X-Y-Z