Electronic communications

E-mail is making its way to the IEEE

It's catching on at a fantastic pace and it's fun, it's efficient, and it's coming to the IEEE. It's called electronic mail—e-mail for short—and, though it's not always free, it is often cheaper than the telephone or postal service.

E-mail is the sending (and receiving) of messages from one computer to another over (usually) fast digital data links. Busy people will like it because it eliminates telephone tag and makes it easy for users to reply to and edit documents without retyping. It's ideal for communicating with friends and business colleagues. Some Sections already offer e-mail services to their members. And others are planning or discussing how to do so.

Already e-mail links the computer systems of many corporations, government agencies, universities, and others in a virtually worldwide interconnection of many different networks. These networks are being expanded every day.

The operating systems of these computers enable the machines to communicate internally within each network system and externally with computers that are part of the global interconnection. In addition, commercial companies provide e-mail services to those who would otherwise not have access. The IEEE is part of this worldwide interconnection with a node on the Internet network called ieee.org (no period).

Getting on this network is easy. All you need is a personal computer with a modem to connect you to one of the computer systems with e-mail capability. As for software, you will need one of the many PC software packages designed for the purpose. These have user-friendly installation guides and make connecting to the e-mail computer as easy as entering a simple key word of your choosing.

Once the e-mail software is installed, you will be able to contact other computers using the PC software you already have. This software will also help you maintain and edit your messages.

ACCESSING E-MAIL. You can access e-mail in several ways. If you work for an organization with a suitable computer system, you can possibly use your employer's e-mail capability. If your company gives you permission to use it, your cost may be zero or just a token amount.

Or, you may choose to subscribe to one of the commercial e-mail services. These typically provide users with a local telephone number to call from your PC using your modem. Monthly cost for modest use in the United States, for example, may be as low as $10.

You might also be able to take advantage of the e-mail services already being offered to members by some Sections. Regional e-mail coordinators—IEEE volunteers—are already in place in all 10 IEEE Regions. If you want to use the services available or would like to volunteer to help set them up, contact your local Section officers. If you are now using e-mail, you can obtain a copy of the IEEE E-Mail Guide by sending a message to email.guide@ieee.org (no period). This guide contains information on the IEEE e-mail services now available and also on how to contact the e-mail coordinators.

—Robert T.H. Alden

Bob Alden is chair of the IEEE e-mail Committee. His Internet number is r.alden@ieee.org (no period).

Paperless meetings on the way, too

The effort to bring e-mail to the IEEE's operations [see story above] is being handled by the subcommittee on e-mail of the Electronic Communications Steering Committee (ECSC). Chaired by Division I Director Kenneth R. Laker, the committee is charged with introducing all manner of electronic communications and media to the IEEE.

In December, for example, an experiment at the Board of Directors meeting in Phoenix, Ariz., will see whether attendees can do without the usual printed notebooks and work instead with notebook computers. Organized by the ECSC's subcommittee on paperless meetings, the experiment will rely on eight Board and staff members, all owners of notebook computers, who have volunteered for the test. All agenda and support materials for the meeting will be sent to them on floppy disks in ASCII and Word Perfect 5.1 formats.

This approach, if applied widely to IEEE meetings, could result in large savings in both materials and reproduction costs, as well as in postage costs incurred in distributing information to attendees before meetings, pointed out Laker.

Laker said he hoped a final report with recommendations for a system serving the entire Board could be prepared before year's end. The first completely paperless meeting could possibly be conducted at the initial 1993 Board meeting next February, he said. Information produced immediately before and during the meeting could be introduced into the system by means of a scanner, with new disks distributed as the meeting progressed.

Fanning to retire at year's end

Leo Fanning, for 13 years, 9 months, staff director of professional activities at the IEEE U.S. Activities office in Washington, D.C., has announced he will retire Dec. 31. With the office for 17 years in all, he has played a critical role in the organization and growth of the U.S. Activities Board (USAB), which was started only three years before he joined the Institute.

Earlier, Fanning helped organize the U.S. Peace Corps program in Latin America. For 10 years from 1957 on, he worked for the Peace Corps and the U.S. Agency for International Development in every Latin American country except Chile and Paraguay. He has also taught at Arizona State University and in the Phoenix school system, and he helped establish in 1968 the Health Services Division of Westinghouse Learning Corp., Washington, D.C.

"Leo has been a guiding light and inspiration to all of us who have been volunteers in professional activities," said USAB chairman Arvid G. Larson. "He has been able to bridge the difficulties faced by a professional organization like the IEEE in dealing with the real world of Washington."

Fanning next plans to increase his activities as a Jehovah's Witness and to visit with his eight grandchildren, all under six and only a 20–30-minute drive away in the Washington, D.C., area.

How to turn on to IEEE's e-mail service

E-mail is making its way to the IEEE, you were told in the last issue of THE INSTITUTE [November/December 1992, p. 8]. Now we want to tell our members how they may use it to contact each other, the Institute's staff, or many of the organization's entities. They can also use it to request and receive services electronically.

Members may access the IEEE's e-mail, begun in 1990 via the *ieee.org* node on Internet, through the local electronic mail capability they find most convenient. [The special report on electronic mail in *IEEE Spectrum*, October 1992, describes computer interconnection networks on p. 33.] Provided at the outset was a forwarding service to simplify the myriad world of computer mailbox addresses. The service relies on several types of so-called aliases. IEEE aliases are dummy addresses of the form *xxx.yyy@ieee.org*. (No Internet address ever ends with any punctuation, though the preceding sentence ends with a period.)

When a message arrives at the IEEE Internet node *ieee.org*, the message is automatically redirected (or forwarded) to the appropriate mailbox—whether it is at the IEEE service center or on the other side of the world. This forwarding address may change as people and equipment are relocated. However, this change is handled internally; the aliases remain the same.

PERSONAL ALIASES: Of the form *i.name@ieee.org*, personal aliases can be requested by IEEE volunteers. For example, the personal alias *m.sloan@ieee.org* is that of 1993 IEEE President Martha Sloan. An alias offers three advantages: it lists you in the IEEE E-mail Directory so others may find you; you need notify only one place of any changes in your e-mail address (*alias.update*@ieee.org); and it is usually much easier to remember and simpler to use than your real address. You can find out how to request a personal alias by sending a message to *info.forward@ieee.org*. Likewise, you can obtain a copy of the directory by sending a message to *directory.vols@ieee.org*.

SECTION ALIASES: Of the form *sec.name@ieee.org*, Section aliases may be set up by each IEEE Section. Sections are encouraged to do this so that their officers can be contacted electronically. As of November, 101 Sections had registered their local e-mail addresses with the IEEE. Example: *sec.toronto@ieee.org* is the alias of the Toronto Section.

To find out how to register your Section e-mail address, send a message to *info.startup@ieee.org*. Section aliases are listed in a directory at *directory.sec@ieee.org*.

SOCIETY ALIASES: Of the form *soc.name@ieee.org*, Society aliases may be set up by each IEEE Society. As of November, 11 Societies had registered their e-mail addresses. Example: *soc.comp@ieee.org* is the alias of the Computer Society. Society aliases are listed at *directory.soc@ieee.org*.

STUDENT BRANCH ALIASES: Of the form *sb.name@ieee.org*, Student Branch aliases may be set up by each Branch and 65 Branches were registered by last November. To find out how to register your Branch e-mail address, send a message to *info.startup@ieee.org*. Branch aliases are listed at *directory.sb@ieee.org*.

INFORMATION ALIASES: Of the form *info.topic@ieee.org*, 71 auto-response text files were available as of November. If an e-mail message (not really a message, but a request using a message format) is sent to an alias that begins with *info.*, the message content is discarded and an already written text file is automatically returned to the sender. For example, a message sent to the alias *info.directory@ieee.org* results in the return of information on how to obtain an e-mailed copy of the IEEE E-mail Directory. Also explained is how the directory is partitioned into modest-sized text files for ease of handling. These information text files are listed in an auto-response text file at *info.info@ieee.org*.

SERVICE ALIASES: Of the form *service@ieee.org*, these aliases enable members to request a service from the IEEE. For example, send a message to *membership.inquiry@ieee.org* if you have a question about your IEEE membership (maybe to find out why you got a dues bill long after your check was cashed, or to find out how to apply to upgrade your membership from associate to full member grade). As of November, 21 service aliases were available. These service aliases are listed in an auto-response text file at *info.services@ieee.org*.

REQUESTS TO STAFF: If you know the name of the staff person, send your message to his or her personal alias, which is usually of the form *i.name@ieee.org*. Example: *j.powers@ieee.org* is the alias of IEEE general manager John Powers. You can find out the aliases of IEEE staff in one of two ways: most departments have their staff listed

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Turn on to the IEEE's e-mail

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in an information file—the Field Services file is at *info.fs@ieee.org*; all staff (who use e-mail) are listed at *directory.staff@ieee.org*.

Now the IEEE is developing an electronic mail contact network, and it needs volunteers to help. Many IEEE members do not have easy or low-cost access to the Internet (directly or via the many interconnected networks), but do have access to a PC and a modem. IEEE Sections can provide local telephone call access to many of these members by operating a bulletin board service with local dial-up lines and an Internet connection. Please contact your local Section executive if you are willing to help put such a system into place. We expect that IEEE members will make increasing use of e-mail once its usefulness becomes apparent.

—Robert T.H. Alden

Bob Alden is chair of the IEEE E-mail Committee; r.alden@ieee.org *is his alias.*

1993 honors ceremonies

The 1993 IEEE Medals, Corporate Recognitions, Service Awards, and Honorary Membership will be presented and the new IEEE Fellows will be honored at the Sheraton Hotel and Towers in Chicago on Feb. 27. The occasion will also celebrate the 100th anniversary of the IEEE Chicago Section.

Sending an IEEE message via e-mail

In the last two issues of THE INSTITUTE [November/December, 1992, p. 8, and January/February, p. 8], we introduced a number of e-mail services that the IEEE offers to its members. In this issue, we discuss how members can use e-mail for sending mail messages that contain more than just a simple message composed on-line.

There are two types of formats for such messages: simple ASCII text, and everything else—such as technical papers or reports that contain graphics, charts, and printer enhancements. In preparing your e-mail message, you can use either a text editor or a word processor.

A word processor automatically embeds special control codes —like indenting, underlining, bolding, and so on—in between the text characters to enhance the printed output. These are nonprintable characters and will cause havoc if they appear in an e-mail message. In preparing your messages with a word processor, use the DOS text out option to remove all these special codes.

A text editor does not automatically put such codes in. To incorporate text that has already been written using a text editor (or a word processor with DOS text output), you must upload the text from your PC to the computer that contains your mail box (your e-mail computer). Your communications software package (the one installed on your PC) will usually have options to do this. The reverse process is called downloading.

KERMIT. You will also have to invoke a communications package on your e-mail computer. I use Kermit. I normally enter the command `kermit -r` when I want to upload, and `kermit -s` to download. Once your text has been uploaded, you can send it using the e-mail program.

To send anything other than simple text, first upload the item. Then on a Unix machine, use a pair of Unix commands: `uuencode` and `uudecode`. You can send almost

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Sending your e-mail messages

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any kind of file: wordprocessor, spreadsheet, database, graphics, and so on.

To send a file called **filename** to an address **xxx@yyy**, you first decide what you want the file to be called when it is finally decoded—maybe **fname**. Then enter the following command string: **uuencode filename fname xxx@yyy**. The file is automatically encoded (so the special control codes do not create problems) and then sent to the recipient's address. Before you do this, however, send a short message warning the recipient that the next message from you contains an encoded file and not a long readable message!

If you are the recipient of such a message, you have to (a) recognize that an encoded file is in your message list, (b) copy this message to your current directory on your e-mail computer and give it a name—say **mfile**, (c) exit from the e-mail program, (d) decode the file, and (e) download the decoded file.

To decode the file, enter the command string **uudecode mfile**. You will find that a new file now exists called **fname**. To up- or download nontext files, you must put your e-mail computer in binary mode. On my Unix-based machine, I use the command string **set term=binary**. Then I use the appropriate options in my communications package.

With these features, I can exchange any kind of computer file with my colleagues. I have found this to be very useful. If you know of other e-mail features that we should discuss in these pages, send me a message.—*Robert T.H. Alden*

Bob Alden is chair of the IEEE E-mail Committee. His alias is **r.alden@ieee.org**.

Information for IEEE e-mail

For a copy of the eight-page e-mail guide, send to: **email.guide@ieee.org**.

For an overview of e-mail services, send to: **info.email.services@ieee.org**.

Logging on to a remote computer

In the last issue of THE INSTITUTE, we discussed how to use e-mail to send files to another computer, and how to encode non-ASCII files so they can be sent without the special embedded control codes that can cause a lot of havoc in the e-mail system [March/April, p. 12].

In this article, we explore logging on to that other computer. Among other things, this access enables you to copy files from that remote computer to yours. I will also describe an IEEE service that lets you copy files from the IEEE computer. But first, I want to make several points:

• The IEEE's e-mail services are available to all members who wish to use them (and can use e-mail).

• I am writing these articles as a user of a DOS-based personal computer connected to a Unix-based workstation. If you have experience with other systems, I would appreciate

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Information for IEEE e-mail

For a copy of the eight-page e-mail guide, send to: "email.guide @ieee.org".

For an overview of e-mail services, send to: "info.email.services@ieee.org".

The IEEE's e-mail explained

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any suggestions that I might include in these articles.

• We can all benefit by sharing software (legally), so I invite any of you to tell me about software you have (or where it's located) that you think we should put on the IEEE computer for everyone to share.

• Finally, my apologies for an omission in the last article: the correct command string for "uuencode" is "uuencode filename fname | mail xxx.yyy". (Note: the quotes are being used to separate commands from text; type only the characters between the quotes.)

REMOTE LOG-ONS. There are two reasons to log on to a remote computer while you are logged on to the computer that handles your usual e-mail account. One is to use the other computer for tasks that it can do better than your own computer can. (For example, the other computer may contain specialized hardware or software.)

To do this, you need permission to log on, which means you must have obtained a log-on name and password. To reach this remote computer, use the Unix command "telnet" followed by the Internet Protocol (IP) address for the remote computer. The IP address is a set of 12 numbers in four groups of three separated by dots (leading zeros can be left out). The command string is "telnet 111.222.333.444".

The second reason for logging on to a remote computer is to copy files that are available for this purpose. Such files are stored in what is called an anonymous ftp (for file transfer program) directory. If such a directory exists on a particular computer, use the "ftp" command followed by the IP address for that computer. You will be prompted for your log-in name; respond with "anonymous". You will then be prompted for your password; respond with your full domain address.

NEXT STEP. Then you will probably use these four Unix commands:

• "ls -l", to list the files and subdirectories.

• "cd xxx", to change to subdirectory xxx.

• "get yyy", to copy the file yyy to your own computer.

• "quit", to return to your own computer.

Computers have both a name and an IP address. The name of the computer is in most e-mail addresses; it is the part after the "@". When you are using telnet or ftp, the IP address always works, but sometimes the machine name can be used. This depends on the specific Unix operating system and how it has been set up. You can get the IP address by using the Unix command "nslookup" followed by the machine name. In the case of the IEEE computer, the command "nslookup ftp.ieee.org" will return the IP address "140.98.1.1".

ftp VS. TELNET. Realize that anyone can log on to an anonymous ftp directory on a computer using ftp, but not everyone can use telnet because that implies you have an account and a password. Only the IEEE staff who maintain the IEEE computer have such access, so do not ask for an account! But you can use ftp.

You are likely to use "telnet" in a work-related environment where your employer arranges and pays for the usage on both computers. You can use the "ftp" command to copy data or program files. Many anonymous ftp directories are not easy to explore. You need to figure out what file is where.

HOW TO FIND A FILE. Here are a few tips to help. There may be an index. If the "ls" command shows a file called "index", copy it with the "get" command and look at it on your own computer. It is likely to be an index of files stored in the ftp directory. You need to be able to distinguish between directory names and file names. When using "ls -l" and looking at the entries, you will know an entry is a (sub)directory if the left-most character on a line is a "d".

If the file name ends with ".Z", it has been compressed and you must use the "uncompress" command. If the file name ends with ".tar", it has been archived (that is, a set of files has been combined into a single file) and you must use the "tar" command to restore the original set. These two features are often combined.

To find out more about these and other Unix commands, use the on-line manual feature that is part of the Unix system. For example, use "man tar" to learn about the "tar" command. There's a lot of stuff out there. Good hunting! —*Robert T.H. Alden*

Bob Alden is chair of the IEEE E-mail Committee. His alias is "r.alden@ieee.org".

Getting connected to the IEEE's e-mail

As e-mail users, IEEE members range from greenhorn to old hand. The experts leap from one command to another, but many others get stuck at the start. So let's look at some basics for those who want to use a PC for e-mail.

First, you'll need a computer plus either a modem to connect to any regular telephone line or an Ethernet card to connect to a local-area network (LAN). These are the commonest choices, though other ways are possible, including cellular phone technology. The computer may be a very simple, inexpensive IBM PC compatible, a fancy, high-priced PC, or an Apple or Mac—almost any computer will do. (Here the term PC will be used to describe any personal computer.)

You also need communications software, which is the program that helps you enter the phone number and the other details needed for connecting automatically to the phone line or LAN. It's often simplest to buy the software package along with your modem (either an internal card or an external box). Ask your retailer to ensure, though, that your PC, modem, and software are compatible. The more expensive versions usually offer more speed, flexibility, and convenience. Free software is available but tends to require more knowledge on your part. Most LAN connections are within corporate computer networks, so ask their network folks for help.

USER ID. You also need a user ID on some computer that has e-mail software (such as the Unix-based Mail program) and a connection to the Internet (or to a network that connects to the Internet). If the system administrator gives you permission, you will be told your user ID and password, plus the details you need to connect your PC to that computer.

Your address is a combination of your user ID and the e-mail computer address. Remember, the PC is your interface to the e-mail computer—it does not send or receive e-mail. However, you can purchase software that enables you to prepare messages off-line, file messages in folders and so on, and automatically dial up and transfer mail messages, so that you don't really notice you are connected to another computer.

How does one get a user ID on an e-mail computer? Several approaches are possible because computers with e-mail capability exist in a variety of situations, including commercial, corporate, government, university/college, Fidonet, Freenet, and IEEE Section setups.

COMMERCIAL. E-mail service providers such as Sprintmail (800-835-3638), MCImail (800-444-MAIL), and Compuserve (800-732-7246) offer e-mail and related services on a fee-for-service basis. These three have Internet gateways (or connections) and offer services in a number of countries (for example, Sprintmail in 50 countries and MCImail in 26). Generally, they provide local dial-up phone numbers (often listed in your phone book), a user ID and password, and a user guide. Costs vary with the length of your message and the time of day, as well as the type of services used. The monthly fee for moderate use may be on the order of $10–$25 in the United States. Check where you live to find out what it costs.

By using a "smart" communications package (often available from the service provider), you can economize by selecting when you connect and minimizing how long you stay connected. Services other than e-mail might include fax, postal or telex delivery, bulletin board use, and access to financial or airline schedule services.

AT YOUR WORKPLACE. Many employers such as corporations, utilities, and government departments have computer systems with e-mail capability and Internet access. Employees can often get permission to use these e-mail facilities, especially for IEEE-

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Guides to IEEE e-mail

For a copy of the IEEE's eight-page e-mail guide, send to: "email.guide@ieee.org".

For an overview of e-mail services, send to: "info.email.services@ieee.org".

E-mail eases communications for the IEEE

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related communication. It is worth inquiring about, and don't give up with the first refusal—you may find many of your co-workers are unaware of these facilities (or of recent changes). Some companies who have had internal e-mail for some time may have added an Internet connection as they became aware of the net's advantages. Usually no charge is made to the individual if permission is obtained. E-mail use occurs over terminals or networked PCs within the company. Sometimes there is external dial-up access.

SCHOOLS. Virtually all universities and an increasing number of colleges (and even some high schools) have computer systems with external network connections (Internet, Bitnet, UUCP, and so on). If you are a student (any age, full- or part-time), you can probably get an e-mail account just by asking. Some institutions charge a modest administration fee. Access is usually through terminals, networked PCs, and external dial-up. Where there is an IEEE student branch on campus, there is often close cooperation with the local IEEE Section, and you can sometimes work the IEEE connection to your advantage.

FIDONET. This is the e-mail equivalent of amateur radio—a network of independent system operators (sysops) who run relatively small computers with dial-up access. They exchange information by dialing up their neighbors at predetermined times. There are sporadic connections to the Internet for e-mail transfers. Some sysops run a free service, while some charge. This is generally the slowest form of e-mail service but may be an economical option worth considering.

FREENET. This service is offered in some cities, accessible sometimes in public libraries or city halls or via dial-up. Bulletin board, e-mail, and telnet services may be provided although they may not all be free.

According to Ed Krol, the original one is in Cleveland, OH (see his book, *The Whole Internet*, for more details). Richard Naylor e-mailed the information that IEEE members in Wellington, New Zealand, have free access to the CityNet (except for dial-in charges). This service includes e-mail and full Internet access. (In New Zealand, look for details in a file called citynet.zip on most bulletin boards.)

SECTION OFFERINGS. IEEE Section e-mail service is at present offered by a small but growing number of Sections. What is offered will depend on local conditions and may range from Fidonet to full Internet service. Generally, there is local dial-up to a bulletin board for browsing, with the option to read and send mail. If not, express your desire to have such a service, and if you can, volunteer to help the Section make it happen.

ALIASES. Please do not confuse IEEE e-mail aliases with actual e-mail addresses. The alias enables IEEE members who have an e-mail address to be listed in the IEEE e-mail directory by their alias. E-mail sent to the alias is forwarded by the IEEE to the actual e-mail address.

There are two advantages to having an alias. One, you are listed in the directory and can be found, and two, as long as you tell the IEEE about a future change of e-mail address, the alias will forward your e-mail. Send for details to "info.directory@ieee.org".

Note that "full Internet service" implies the ability to log on to a remote computer using "telnet" and "ftp" commands. Fidonet, Bitnet, and some other networks are characterized by a store-and-forward mode of operation that enables e-mail service (with varying degrees of reliability and speed) but precludes remote log-ons that permit a truly interactive mode.

There are a lot of choices out there. Pick the one that best suits your needs and pocket book.

—*Robert T.H. Alden*

Bob Alden is chair of the IEEE E-mail Committee. His alias is "r.alden@ieee.org". In the next issue of THE INSTITUTE, he will look at some fun things to do once you're comfortable using e-mail.

Boning up on e-mail

This is the fifth in a series of bimonthly articles on using e-mail written by Bob Alden [THE INSTITUTE, beginning November/December 1992, p. 12]. The IEEE E-mail Committee chair hopes the articles will introduce IEEE members to using e-mail or improve their ability to do so. So far, the response from members has been "very rewarding," according to Alden. "My thanks to all of you who have e-mailed or talked to me and offered helpful suggestions," he told THE INSTITUTE. "Please keep the dialog going; we all learn from these discussions. I am using many of your suggestions, including some in the accompanying article."

Those who have asked for electronic copies of these articles should send for the information text file at "info.email@ieee.org". (The e-mail message should go to the address inside the quotes.) No subject or message text need be entered, because both are ignored. However, one suggestion is to type in a single character in both so that your e-mail system will not refuse to send the e-mail message.

The IEEE staff has set up a system that automatically returns the information text file to the address of the sender of the initial message. Other files are available at other addresses. Send to "info.info @ieee.org" for information about information files. With the COMPmail service (provided to IEEE members by Sprintmail), use only the part of the address that precedes the "@" character.

For those who have asked for printed information, Alden has two suggestions. The best book he has seen is *The Whole Internet*, by Ed Krol (O'Reilly & Associates in Sebastopol, CA; 800-998-9938). Alden finds this book is extremely reader-friendly as it spans everyone from novice to expert. (The publisher has an e-mail address, "nuts @ora.com".)

Alternatively, after the July Sections Congress in Puerto Rico, every Section will possess diskettes containing helpful information and printed material relating to e-mail, as well as other topics.

Getting to know Archie, or finding files through Internet

This article, the sixth in THE INSTITUTE's e-mail series, looks at a powerful technique for finding information, wherever it is stored, on the computer networks of the worldwide Internet. It is assumed that you have an electronic mail account and a personal computer/modem or some other means with which to log on [July/August, p. 12].

Learning to use the technology takes time plus an investment in computer hardware and software. But the payback is ample: higher productivity, possibly enhanced employability, and the satisfaction of keeping up with new technology.

E-mail is the sending and receiving of either simple e-mail messages composed on-line or more complex messages that have been uploaded after being written and reviewed off-line. Even word processor or spreadsheet files can be sent by e-mail by means of encoding routines [March/April, p. 12].

Beyond e-mail are other tools of electronic communication. You may, for example, log on to a remote computer from your e-mail (or host) computer and copy files using the ftp command [May/June, p. 12]. Or you may work on that remote computer using the telnet command; for example, you might want to access a catalog program at a distant library to search for a publication.

Given the thousands of computer networks and the millions of computers, there is both a fine opportunity to access useful information and the very real challenge of finding it. This is where Archie and its friends come in.

ARCHIE. Archie is a service that permits you to find files stored on computers equipped with ftp servers and connected to the Internet. You define a string (which is a set of contiguous characters). Archie matches your string with any similar strings that exist in these ftp directories and returns the address of the computer and the complete file name.

Information about IEEE e-mail

For a copy of the IEEE's eight-page e-mail guide, send to "email.guide@ieee.org". For an overview of e-mail services, send to "info.email.services@ieee.org".

There is an excellent description of Archie in chapter 9 of Ed Krol's book *The Whole Internet* [July/August, p. 12]. Some of the U.S. Archie servers and their locations are:

- archie.rutgers.edu (NJ)
- archie.sura.net (MD)
- archie.unl.edu (NE)
- archie.ans.net (NY)

Some of the servers outside the United States are:

- archie.uqam.ca Canada
- archie.au Australia
- archie.switch.ch Switzerland
- archie.doc.ic.ac.uk United Kingdom
- archie.wide.ad.jp Japan

While the very first Archie server was located at McGill University, in Montreal, unfortunately, it is currently out of service. Archie servers regularly scan all the known ftp servers and copy their current ftp directory listings. Archie also provides tools for searching these directory listings for the files you want and sends you a list of the addresses of the computers where these files are stored. All Archie servers have the same information, so you are asked to use the one closest to you.

There are three ways to access Archie—by telnet, by e-mail, or by using the Archie command on your host machine (if Archie has been installed). Archie via Telnet is discussed next; the following issue of THE INSTITUTE will deal with accessing Archie via e-mail and via the Archie command.

ARCHIE VIA TELNET. If you have telnet capability and want to access Archie interactively (instead of sending an e-mail request), use the command "telnet archie.uqam.ca" (please substitute the address of the Archie server closest to you). If Archie has too many requests, you will get a message indicating that you cannot connect to Archie. Try later.

When you are connected, respond to the log-in prompt with "archie". You should then get the prompt "archie>" and are ready to enter Archie commands. Some of these are:

- help — for more information
- quit — to leave Archie
- show search — display rule for matching string to filename
- set search x — set rule for matching string to filename, where:

(Continued on p. 3, col. 1)

Archie finds files on the Internet

(Continued from p. 12, col. 2)

- x = exact — for an exact match (example: set search exact)
- x = regex — for a match using the Unix regular expression rule
- x = sub — for matching a substring (case insensitive)
- x = subcase — for matching a substring (case sensitive)
- whatis qqq — list filenames with keywords that match qqq
- prog zzz — list servers with filenames matching zzz
- mail — send the result of last search to host computer
- mail xxx@yyy — send the result of last search to xxx@yyy instead of to the host
- servers — list all known Archie servers
- site sss — list all files on ftp server named sss

The essence of Archie is to search for a match between the string you define (for example, zzz) and the files stored in the copies of the ftp directory listings for each computer. Setting the search matching rule is the first step. Unix is case sensitive so you have to decide if you want to make your search case-insensitive (for example, Archie = archie = ARCHIE and so on). The regular expression rule in Unix means you can use characters with special meanings.

The second step is to choose between a one-step search of the filenames using prog or a two-step process using whatis and then prog. In the two-step process, whatis finds all file names with keywords that match your string. Then you inspect these file names and decide which you want.

The advantage of using whatis is that it compares your string with strings in keyword descriptors, which tend to be more informative than the file names. Then you use prog to locate the computer that has your desired file. Once you locate the file, you leave Archie and copy the file using the ftp command. *—Robert T.H. Alden*

Bob Alden is IEEE E-mail Committee chair and a former IEEE Vice President. His alias: "r.alden@ieee.org".

Archie revisited: more on finding files with Internet

The previous article in THE INSTITUTE's e-mail series [August/September, p. 12] introduced Archie, a technique for finding information in computers connected to the Internet, and described how to access the service using telnet. This article deals with the two alternative means of access: e-mail and the Archie command.

ARCHIE VIA E-MAIL. Many e-mail users have access to the Internet for e-mail messaging but not for remote log-on with telnet and ftp commands. In these circumstances, use the e-mail access option. This option also takes less time for the user than an interactive Archie session.

To access Archie using e-mail, send a message to "archie@archie.uqam.ca" (remembering to substitute the address of the Archie server closest to you). You do not need a subject, which in any case would be ignored.

Your message should contain the Archie commands, one per line, starting in column one. If you send a one-line message containing the word help, you will get back a guide for accessing Archie via e-mail. If Archie cannot understand your message, you get the guide anyway.

If you have a signature file that is automatically appended at the end of your message, enter the Archie command quit as the last command line (to tell Archie you are finished). The e-mail version of Archie is a subset of the telnet version. The matching rule is always x = regex (see the list of telnet commands in the last issue). Some Archie e-mail commands are:

• help	send the guide for Archie via e-mail
• quit	denote end of set of commands
• path xxx@yyy	send the response to xxx@yyy instead of to your address
• compress	send response compressed and uuencoded
• whatis qqq	return filenames with keywords that match qqq
• prog zzz	return filenames matching zzz
• servers	return list of all known Archie servers
• site siteid	return list of all files on server siteid (domain name or IP address)

THE ARCHIE COMMAND. If Archie is installed on your host computer, you can use it with the command "archie modifiers string". It is more convenient than using telnet or e-mail, but less powerful because it has fewer search options. (You may be able to use either the telnet or e-mail versions to locate this program and then ftp it to your site and have your system administrator install it.) This version of Archie is equivalent to issuing the prog command in either the telnet or e-mail version, where the string in the command line is zzz.

Four of the modifiers define the matching rule (see the telnet section): -e, -r, -s, and -c. The modifier -e is equivalent to x = exact, and is the default setting. Only this modifier can be used with any other, in which case an exact match is done first. The modifier -r is equivalent to x = regex; -s is equivalent to x = sub; -c is equivalent to x = subcase.

In addition, -hname specifies the Archie server, where name = archie.sura.net or the Archie server closest to you. You can leave this modifier out if you can set an environment variable to define the machine (on Unix set ARCHIE_HOST to name).

The modifier -m sets the maximum number of match returns (default is 95), while -l (the numeral) sets a format of one line per match return. The latter is useful if you want to employ other commands to process the returned data (for example, using grep to select further).

Besides using modifiers, you can direct the returned data to a file fname by augmenting the command archie modifiers string > fname.

EXAMPLES. To find out where files relating to the program Kermit are located, use any of the following:

Using the Archie command (if Archie is installed on your host machine), "archie -s -m10 kermit" might be used to request up to 10 matches where any combination of upper- and lower-case letters of the string kermit are contained within a directory listing—including the actual file name and directory names in the path.

Alternatively, "archie -s -l ker-

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Information about IEEE e-mail

For a copy of the IEEE's eight-page e-mail guide, send to "email.guide @ieee.org". For an overview of e-mail services, send to "info.email. services@ieee.org".

File-finding on Internet

(Continued from p. 8, col. 2)

mit>Fred" would request up to 95 matches (the default) with the same matching rule on up to 95 separate lines, to be saved in a file called Fred in your current directory.

Using the e-mail version of Archie, send a two-line message to archie.au (if you live in or near Australia):

prog kermit
quit

The e-mail version uses the regex matching rule, and there is no way to restrict the number of matches. Or, using the telnet version of Archie, issue the same two commands as in the e-mail alternative after logging on. Or make use of additional features to make your search more sophisticated.

Note that electronic copies of THE INSTITUTE articles on e-mail and other e-mail–related items are now available. Send to info.email@ieee.org for details.

There is a world of information out there. As IEEE members, we must never forget that information technology is central to our business—whether we are in electronics or power, or in sales, service, manufacturing, or research. We can't afford to be left behind .

—Robert T.H. Alden

Bob Alden is chair of the IEEE E-mail Committee, and a former IEEE Vice President. His alias is "r.alden@ieee.org".

Gopher goes for other computer's files

Finally—a tool to make it easier for computer novices and experts alike to find information and use resources on other computers! The Internet Gopher is an interactive service that helps you browse through simple menus, read text files and e-mail yourself copies of them, find and copy software packages, and log on to other computers. Gopher requires full Internet connectivity, since the service employs both telnet and ftp (file transfer program) [see THE INSTITUTE, May/June 1993, p. 12]. (Electronic copies of INSTITUTE articles and e-mail-related items are now available; send to "info.email@ieee.org".)

In the last two issues of THE INSTITUTE, we looked at Archie, a service that finds out where files are stored on various computers around the world. Archie has the advantage of being accessible either by telnet or e-mail. Gopher does more than Archie but requires more system resources.

Chapter 11 of Ed Krol's book *The Whole Internet* has an excellent description of Gopher. The service, he says, was created at the University of Minnesota to help students find and use information on campus, acting as an electronic "go-fer." This concept spread rapidly. Hundreds of Gophers are now installed at universities, corporations, and government offices.

Krol lists two public Gopher clients: "consultant.micro.umn.edu" and "gopher.uiuc.edu"—both in the central United States; your local expert may know of one closer to you. The IEEE is developing a Gopher server for Institute-related information. A small pilot server is available at "gopher.ieee.org"; an improved version is in the works.

CLIENT, SERVER. There are two kinds of Gopher programs. The Gopher server contains all available information and resources; the Gopher client, which can be installed on any computer with full Internet connectivity, is the interface program that makes it possible to access the Gopher server by tailoring its input/output to the characteristics of your host computer. Gopher clients, excepting the so-called public ones, are available only to people with log-on permission on the computer hosting the client program.

The use of public Gopher clients is free of charge to anyone who can access them over the Internet. Not all Gopher services are free, however; some are available only to those who have contracted to pay for them. A related restriction when using public Gopher clients: since you do not have file-storage permission, you cannot send files to them. Experimenting with public Gopher clients is one way to learn about the system before you install a Gopher client on your host computer.

YOUR OWN GOPHER. To find out if your host computer has a Gopher client program installed, ask your system administrator, or enter the command "gopher" at the system prompt. If the client is not there, you get an error message; if it is, you connect to the default Gopher server.

Remember: your host computer must have full Internet service, meaning telnet and ftp capability. Software to install Gopher clients on a variety of computers and operating systems is available via ftp at "ftp.ieee.org" in directory "/gopher". The client must be installed by the system administrator.

Should you have a Gopher client installed, you can access the IEEE Gopher with the command "gopher gopher.ieee.org".

START-UP. To try out Gopher, telnet to a public Gopher client and use the log-in name "gopher". You will then see an overview menu with numbered entries. Select one of them using the number, the up/down arrows, your mouse, or whatever works for you; then hit Enter. There will likely be some on-screen help prompts. If the menu has more than one page, there will be commands to move between them (perhaps < or >). A slash (/) at the end of a line signifies that an entry is another menu or a directory. An arrow often indicates your location in the menu.

MENUS. The initial menu will probably include a mixture of local and general topics—for example, services at the host institution, Gopher and/or ftp sites, libraries, white pages, weather services, and frequently asked questions (FAQs). FAQs resemble Usenet news in the sense that there are categories of topics with questions and answers. Topics might include e-mail, bulletin board systems, Internet, computer languages, and so on. Some Gopher servers have a very general content, while others are quite specific.

Given the range of menu items,

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More about e-mail

For a copy of the IEEE's eight-page e-mail guide, contact "email.guide@ieee.org".

For a list of all available information, contact "info.email @ieee.org".

Novel ideas sought for Engineers Week

Washington, D.C.—Have you ever wondered why our profession's annual celebration is called "National Engineers Week" instead of "National Engineering Week"? Probably not. Yet this is a telling distinction, highlighting the fact that technology in the abstract does nothing; it takes people—engineers—to make technology work for the good of society.

That is also true of National Engineers Week itself, which this year takes place Feb. 20–26. The concept is great, the plans are impressive, and the goals noble, but public relations flacks alone won't make them a reality. Engineers—more than catchy newspaper ads, presidential proclamations, and Washington press conferences—must sell the profession to the U.S. public.

Even now, the hundreds of Section and local National Engineers Week committees spread throughout the land are busy making their yearly fests bigger and better than ever before. Is your gang trying to find new ideas for '94? Last year's local groups have some suggestions:

• *Drop dominos.* Engineers worked with school children in Herndon, Va., to lay out and set off a 30 000-domino pattern with engineering themes. Three local television stations covered the event.

• *Walk on water.* San Diego engineers conducted tours of engineering sites and walked on water for a local contest wearing shoes they had designed.

• *Take to the airwaves.* An Iowa Section underwrote Public Television's February broadcasts of "Nova," which included a National Engineers Week message.

• *Hang out at the mall.* A group of societies in Phoenix, Ariz., sponsored a weekend technology expo featuring dozens of hands-on exhibits, demonstrations, and interactive displays at a popular mall. This will be a special nationwide project of National Engineers Week '94.

There are dozens of other good ideas. If you have any questions, get in touch with me or Pender M. McCarter at IEEE-U.S. Activities' Washington office, 202-785-0017.

—Christopher Currie, IEEE–U.S. Activities

Gopher helps with information, resources

(Continued from p. 8, col. 3)

there are three basic ways to access these resources: you can read information, such as the FAQs; you can copy files from an ftp site; and you can access a remote service, such as a library catalog service, which normally requires a telnet command. The three key words are "read," "telnet," and "ftp."

Gopher's advantage is its simplicity. You find the service you want by browsing through on-screen menus. Once you identify it, you select it with the Enter key. Read, telnet, or ftp sessions are invoked automatically as needed.

READ. When you hit Enter on an item of text (usually indicated by a period at the end of the line) in a menu, the contents are displayed. If the item is too long to fit on a single screen, a paging mechanism comes into play. Depending on which Gopher you are using, you may need to hit the spacebar or the PgDn key, use a mouse, and so on. You may have a choice of e-mailing a copy of the text or saving it as a file in your filespace on the computer running the Gopher client; generally, this option is not permitted on a public Gopher.

One type of text information you can read is a phone book, or white pages, identified by the code <CSO> at the end of the line. (The code stands for the Computing Services Office at the University of Illinois, where this kind of service was developed.) Such databases already exist at some universities. The IEEE is working on one and will let you know when it is ready.

Another kind of text information is the indexed directory resource, identified by the code <?>. When you hit Enter to select such an item, you get a request to enter keywords for a search. If you know about that topic, you enter appropriate keywords.

TELNET. Menu items that are services requiring telnet access are identified by the code <TEL> at the end of the line.

For example, a library catalog service might be listed by the name of the university and the catalog program name. When you hit Enter to select this service, you first get a Gopher help screen. A second Enter then gets you the initial screen of the service.

Some services permit free access; some require permission (and charge for use). If you leave a service successfully, you return to Gopher. If you have difficulties during a telnet session, however, you may not be able to return—so be sure you read that Gopher help screen carefully!

FTP. Many entries are ftp sites. If you select one, the next menu is a set of directories, which may be repeated a number of times. Eventually you see a menu of files; selecting one makes a prompt appear. Depending on the characteristics of the Gopher client you are using, you may be able to read, e-mail, or copy automatically using ftp. Some Gopher servers use Archie and build an indexed directory resource, which makes more sophisticated searches possible.

More and more information is being made available electronically. Network connections are becoming faster and more widespread, reliable, and transparent. Tools are being developed to access this information more effectively. The Internet Gopher is one of these tools. Learning about them is essential to remaining a productive engineer in the electronic age.

If you have full Internet capability, think about using Gopher and the other Internet resources. If you do not, think about the strategic advantages to yourself and your employer if you did.

—Robert T.H. Alden

Bob Alden is chair of the IEEE E-mail Committee and a former IEEE Vice President. His alias is "r.alden@ieee.org".

IEEE announces overnight air express service

IEEE members can now save money on overnight air express service, thanks to a new agreement between the Institute and Airborne Express. Upon enrolling in the program, any member who is a resident of the United States need pay only $9.25 for an 8-oz overnight express letter sent virtually anywhere in the country. Other carriers charge up to $6.25 more.

To enroll, call 1-800-642-4292 and quote your IEEE member number.

'Dear Gopher' replies

The Gopher article in the last issue of THE INSTITUTE [January/February, p. 8] has prompted a number of questions, four of which I answer here.

• *Does the IEEE have other Gophers?*
Yes, the IEEE has more than one Gopher. The IEEE Computer Society, the Institute's largest Society with about 100 000 members, recently implemented a Gopher service with an Internet node called "info.computer.org". The Gopher service contains a lot of useful information about Computer Society activities, including tables of contents of transactions, abstracts, conference listings, and names of staff and volunteer contacts. You can access the CS Gopher from the IEEE Gopher under "Other IEEE Gopher servers" or directly using "gopher info.computer.org".

• *Does Gopher replace Compmail, the commercial service used by many IEEE members and volunteers?*
No, Gopher does not replace Compmail or any other Internet access

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Obtaining information on the IEEE's e-mail

For a copy of the IEEE's eight-page e-mail guide, send to "email.guide@ieee.org". For a list of all available information, send to "info.email@ieee.org".

Answers about e-mail's Gopher

(Continued from p. 12, col. 3)

provider. Gopher is a service you can use if you have a "full" Internet connection. Compmail is only an e-mail service provider; it does not provide a full-service Internet connection. Compmail was made available to IEEE members by the IEEE Computer Society to provide commercial (fee-for-service) e-mail service for those who could not obtain the service from a local university or an employer. At that time, the IEEE was essentially using e-mail only.

• *Why can't I access Gopher from my e-mail service?*

You cannot access Gopher from your e-mail because many e-mail service providers lack what is called full Internet access (FIA). FIA means a real-time connection between your host computer and a remote computer. (If you use a PC, you probably connect to a host where you have a "login id" using either a modem or an Ethernet connection.)

With FIA you can log on to the remote computer and use it as if it were your local host. Without FIA you can still send or receive e-mail messages across network connections but you cannot connect to the remote computer. For example, some networks are kept separate for security reasons. E-mail messages are stored on a tape or disk while the drive is connected to one network, then the tape or disk is taken to a drive on another (physically separate) network and the messages are sent on that network after being scanned for viruses or other undesirable characteristics.

The IEEE is talking with Internet service providers about providing not only e-mail service but also full Internet (e-mail, ftp, and telnet) access, which is needed to use Gopher, as well. The Institute is trying to negotiate attractive user fees for members who may wish to subscribe to such services.

• *Does Gopher replace the autoresponse text file service provided by the IEEE?*

The answer here is yes—in that Gopher provides a simple way to view the information text files that IEEE makes available at the "ieee.org" node on Internet—and no, in that not all IEEE members and volunteers have FIA. Actually, so few people have FIA that the IEEE provides these text files via e-mail. Since some readers have asked how this works, here is an explanation.

You can see the following statement in the accompanying box: for a list of all (IEEE e-mail) information, send to "info.email@ieee.org". If you send an e-mail message to the address in quotes, a text file is automatically sent back to your e-mail address. Your messages need not include either a subject or any content because they are not read—only your return address is.

The address in quotes is a dummy address, or alias, in e-mail terminology. Software at the ieee.org node uses the part in front of the "@" character to locate the text file and send it back. This text file contains a list of additional aliases, each with a short phrase describing the information associated with that alias. In some cases the information is a further set of aliases and descriptors; in others it is a text file, such as the IEEE's e-mail guide or one of the e-mail articles that have appeared in THE INSTITUTE. These items are always available for you to look at.

In the next article, we'll examine how you will be able to sign up with the IEEE and ask that items in a specific category be e-mailed to you as soon as they are available—for example, conference announcements from an IEEE Society.

—*Robert T.H. Alden*

Bob Alden is chair of the IEEE E-mail Committee, and a former IEEE Vice President. His alias is "r.alden@ieee.org". His address is Robert T.H. (Bob) Alden, Power Research Laboratory, McMaster University, Hamilton, ON Canada L8S 4K1; 905-525-9140, ext. 24033; fax, 905-521-2922.

Obituaries

Pötzl, inspiratio

(Continued from p. 10, col. 5)

He joined the Japan Broadcasting Corp. (NHK) in 1933, serving as a staff engineer until 1951. He then worked as head of acoustics and audio research in the NHK Laboratories (1951–56), as deputy director of engineering (1956–58), and as research director (1958–61). In 1961 he moved to Sony Corp., where he was engineering director (1961–62), head of the Sony Research Center and managing director of research and development (1962–73), and corporate advisor (1973–93). He encouraged Sony's general support of the IEEE, especially membership of its employees.

Shima was named an IEEE Fellow "for contributions to acoustics, broadcasting, and studio analysis," and in 1984 the Institute gave him its Centennial Medal. He received numerous awards from the Japanese, including the Ranju Hosho medal of honor from His Majesty the Emperor of Japan in 1967.

Hans W. Pötzl (SM), noted for his contributions to education and to research in the field of semiconductor physics and device modeling, died on Nov. 2 at the age of 64.

One of the pioneer members of the IEEE in Vienna, Pötzl had held the chair in physical electronics at the city's Technische Universitat since 1966. His research dealt with microwave effects in semiconductors and with the modeling of semiconductor devices, and he developed profound and innovative courses in semiconductor electronics and physical electronics.

Many of Pötzl's former students

Fileserver and listproc: more ways to get information

In previous issues of THE INSTITUTE, we have looked at three ways to get information electronically from the IEEE: the use of e-mail aliases, ftp, and gopher. Both gopher and ftp allow you to get text files that are available using e-mail, but they require more system features—features that many of our members either do not have or do not wish to use.

The IEEE is now using two tools to help you get information you need by e-mail: fileserver and listproc.

FILESERVER. Using fileserver can simplify the task of getting ASCII text files by e-mail. If you have used IEEE e-mail aliases to get these text files, you are aware that you need to send a separate e-mail message for each one you want. But now you can send an e-mail message to "fileserver@ieee.org" and include as many items as you like, one per line. [Note that double quotes are used here to identify complete commands or addresses; type only the characters between the quotes.] This means you now send to only one address and include the file name (or names) in the message content, instead of sending a dummy message (with no content) to IEEE aliases (where the part preceding the @ character is the file name).

Some hints: if your e-mail software requires a subject, put any character in the subject line; otherwise leave it blank. Type the file name carefully, starting in the first column of the message and on the first line (every character must be correct); additional file names can be put on additional lines; and blank lines are interpreted as the end of the message. If your e-mail software adds a signature file at the end of each message, leave two blank lines after the last file name line to denote the end of your request.

For example, if you use the file name "info.email", you get the file containing file names and descriptors of information the IEEE has about e-mail. Once you read this file, you can send a single message with as many individual file names as you wish, one per line. These files will be returned to you as a set of e-mail messages.

LISTPROC. You can use listproc to sign up on a mailing list to automatically receive certain text files as they are made available, or to sign up to be a participant in a discussion group.

To sign up, send an e-mail message to "listproc@ieee.org" and put your request in the body of the message, as follows "subscribe listname yourname". Your name is required so that the IEEE knows for certain who you are since e-mail addresses are sometimes cryptic. The address from which you sent the request is saved and will be used in sending you future items.

The name of the particular list you want to join is listname. You get off the list by sending the message "unsubscribe listname". Messages are archived, that is, they are stored for a time so that you can find them using listproc features. You can get more information about listproc by placing the word "help" on a line of the message you are sending. To get a listing of the current mailing lists, place the word "lists" on another line of your message.

MAILING LISTS. The IEEE is developing three kinds of mailing lists: public, private, and private with public input.

Public lists are used for receiving information (in the form of e-mail messages) regularly. Anyone can get on the list by sending a subscribe message. Some IEEE newsletters are now being distributed electronically in this manner. Using this system, the IEEE will soon distribute conference announcements and tables of contents of publications. Look for announcements for these services from your Society, Section, or Region, or from the IEEE. Messages are archived in case you are missing some.

Private lists enable groups of IEEE volunteers to receive messages from one source. Private lists can be requested (set up) by the chair of a volunteer group, task force, committee, and so on through the staff member responsible for that group. Individuals cannot subscribe to get on these lists. Messages sent to any of these lists by members or others not on the list will be discarded. Messages are not archived.

Private lists with public input resemble private lists except that messages sent to the list by anyone will be distributed to everyone on the list. Messages are not archived.

DISCUSSION GROUPS. The IEEE is developing three kinds of discussion groups: unmoderated, moderated, and private.

Unmoderated discussion groups are wide open, uncensored forums intended for specific topics. Anyone can become a member of the group by subscribing. Any subscriber can send to the group, but only members of the group receive messages sent to the group. Messages are archived.

Moderated discussion groups are controlled forums on specific topics. Anyone can become a member of the group by subscribing. Any subscriber can send messages, but the messages are moderated before being re-sent to the members of the group, or they may be rejected. Messages are archived.

Private discussion groups are uncensored forums for internal discussion among members of a group—for example, a volunteer and/or staff committee or task force. The membership of the group is determined by the group leader. Messages are not archived.

More detailed information about fileserver or listproc is available by simply sending a message to "fileserver@ieee.org" or to

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Information about the IEEE's e-mail

For a copy of the IEEE's eight-page e-mail guide, send to "email.guide@ieee.org". For a list of all available information, send to "info.email@ieee.org" or use "fileserver@ieee.org".

Files by e-mail

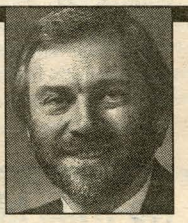
(Continued from p. 12, col. 5)

"listproc@ieee.org" and placing the word "help" in the body of the message. Proposed definitions for the lists and groups mentioned above can be found in the file "info.lists.groups". Also, the file "info.email" has been recently updated. —*Robert T.H. Alden*

Bob Alden is chair of the IEEE E-mail Committee, and a former IEEE Vice President. His alias is "r.alden@ieee.org".

traveling the information highway

with Bob Alden



How can I get connected to the Internet?

How can I get connected to the Internet? This is the question I most often get. IEEE staff are also often asked whether IEEE provides log-in IDs (an Internet connection) for members. Good questions. Let's address them in this article.

Several years ago, IEEE decided on a strategy that was based on the fact that we have over 300 000 members in over 100 countries. It was felt that costs would be prohibitive if IEEE developed a free-to-all members' service that was centrally based at the Operations Center in Piscataway, N.J. (USA). So the idea was to develop a distributed service using the Internet and the myriad of networks (including commercial service providers) that connect to it. Some of these networks have high-speed full-Internet-access connections to the Internet. Others do not.

Without full Internet access—which means you cannot use FTP or telnet—you cannot access Gopher or similar kinds of sophisticated software. Networks without full Internet access may introduce time delays, restrictions on the length of e-mail messages, problems with the "return address" not working, and charges for "unwanted" messages sent to you. For many, these networks have worked well, but for some, these problems are severe. Given the range of circumstances of IEEE members, there is no one solution for everyone. For example, while IEEE is developing its Gopher-based services, we intend to continue to offer e-mail message access to information for those members who only have e-mail access to IEEE.

FREE LOG-IN. If you work for a corporation, government agency, or educational institution that has a full-Internet-access connection to the company computer system, then you may be able to get a free log-in ID (account) on that computer system just by asking. Some companies use e-mail internally without an outside connection for security reasons. Some companies will pay for an external e-mail service for their employees because they are aware of the benefits. It is usually best for the individual to use only one e-mail system for both company and personal use. If you are prepared to pay for an Internet access service, you can contact one of the many vendors that now supply such services. In the rest of this article, I will look at alternatives to company-based or vendor-based e-mail access.

IEEE has not provided 800 number (free to the user) access for two reasons, as I understand: the anticipated cost to IEEE that would have to be covered by a dues increase; and the difficulty in providing uniform 800 coverage worldwide. If you feel strongly that IEEE should do this, contact any member of the IEEE Board of Directors—if they get sufficient input I am sure they will respond.

The American Society of Mechanical Engineers (ASME) offers an interesting service that one of our members, Robin Hunziker, has told me about (thanks, Robin). The ASME has a bulletin board system (BBS) with software that enables members to use a program on their own PC to prepare e-mail messages and compress them off-line; then call up the ASME BBS number, upload this set of messages, download any incoming messages, other files, etc. in a compressed format, and disconnect; then uncompress and read off-line. The user pays for the phone call, but the cost is minimized due to the automated compression process. The ASME BBS software maintains the set of mailboxes on the central computer and, using the "high-speed" telephone connection, enables a large number of members to have e-mail access at "minimum" cost. Is this a service you think IEEE should offer? You can e-mail your comments or suggestions for new e-mail (and other forms of electronic communications) services to "new.email.services@ieee.org" or mail them to the address at the end of this article.

FREENETS. Some cities have developed freenets. These are usually Internet access services provided free of charge to citizens of the city, town, or municipality that administers and pays for them. Here is a scenario as an example to describe the situation and lead into the opportunity for IEEE members:

The city administration is approached by a group of citizens who propose that the city should develop an electronic communications facility for the public so that they can access the information highway. Sometimes this initiative starts within the city council, or the public library, or the local university, or some other group. The freenet consists of a computer (or a set of networked computers) with terminals and/or PCs placed in public areas, e.g., city hall, branches of the public library. Dial-up lines are made available. A Gopher server is included which contains information about public services, building regulations, bus timetables, etc. There are links to the public library catalog, the local university or college Gopher, and so on. Some services can be accessed with a guest log-on; others require a log-on ID. Local residents can apply for a log-on ID, using a combination of electronic inquiry and application form retrieval and a mailed (not e-mailed) application. Internet rules require that users are registered and must be held responsible for adhering to Internet usage policies. Thus, citizens can access local government information and other community services as well as linking to the Internet.

The Ottawa Section (Canada) has taken advantage of the Ottawa Freenet and has encouraged its members to obtain log-on IDs so that they can receive their section newsletter via e-mail. Plans are in the works to add automated fax distribution for those without PCs. Section members can access prior issues of the newsletter and other IEEE information, as well as accessing the main IEEE Gopher in Piscataway, N.J. (USA).

The first freenet was established in Cleveland (USA) and there are other USA Freenets in Buffalo, Cincinnati, Denver, Elyria, Peoria, Medina, Tallahassee, and Youngstown. The only others I know of outside the United States are in Wellington (NZ) and Victoria (Canada). I was unaware of any plans for a freenet in my home section of Hamilton until I asked and found out that this was indeed under discussion. I also found out that, as IEEE members, we are considered ideal volunteers to help investigate, propose possible implementations, help with the approval process and ultimately in the setting up and running of the freenet. I believe we have a real opportunity not only to contribute to our local communities, but also to help our fellow members obtain Internet access.

DISCUSSION GROUP. Since the IEEE members who can most effectively do this already have Internet access, we have set up an e-mail discussion group on this topic so that any interested IEEE members can join this group (see the May/June 1994 issue of THE INSTITUTE for more information on discussion groups within IEEE) and share their experiences. If you have information to share, or wish to receive all the messages on this topic, send a subscribe message to "listproc@ieee.org" and place the following command on the first line of the message: "subscribe freenets-d your-name". You can unsubscribe any time by sending the message "unsubscribe freenets-d". I urge all interested members to work with your local section executive committee and explore the possibilities of establishing a freenet in your area.

If your local community does not, and is not likely to, have a freenet, then one alternative is for the local IEEE entity (section/chapter/student branch) to set up its own computer with dial-up access and create a local BBS. Several sections either have done this or are planning to do so. Another alternative, suggested by Jim Britt (thank you, Jim) is to join an existing BBS in your local area. Jim has done this in the Boston area and notes it costs him about $100 per year with no limit on use. He asks that IEEE start to compile a list of such bulletin board services. Other members have asked me to set up a mechanism whereby interested members can share information and software. So, let's do it.

We have recently set up an e-mail discussion group called "secbbs-d". I invite all of you who are interested in such a local facility to join this discussion group by sending a subscribe message to "listproc@ieee.org" and place the command "subscribe secbbs-d your-name" in the message. For this to work, it is critical that members with experience in setting up a BBS send messages to the group and share their knowledge. Let's include non-IEEE-run BBSs in this discussion. I would like someone to volunteer to be the "main guide" for this project by agreeing to monitor this discussion group and build up a database of knowledge from the messages that are sent to the group. If you are interested, please send me an e-mail message.

Both of these discussion groups are wide open, uncensored forums intended for the specific topics noted. Anyone can become a member of the group by subscribing. Only subscribers can send to the group and only members of the group receive messages sent to the group. Messages are archived so you can browse through previously sent messages.

For those of you who would like to send suggestions, but cannot send e-mail messages, please use the following address: E-Mail Suggestions, Regional Activities Department, IEEE Operations Center, 445 Hoes Lane, PO Box 1331, Piscataway, New Jersey, USA 08855-1331.

We need as many solutions as we can find to assist all IEEE members to be able to link into the information highway, as it is called in the popular press. Whatever we call it, it is our technology and we should have the means to use it for the benefit of all of our members. That's what IEEE is all about. Let's communicate among ourselves, share our experiences, and collectively benefit.

Bob Alden is chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. His alias is "r.alden@ieee.org".

For a list of text files about IEEE's information highway, send a message to "info.email@ieee.org"; for a text version of IEEE's eight-page e-mail guide, send a message to "email.guide@ieee.org"; or use the IEEE's Gopher or Fileserver services. (Do not type the " ", which are used to delineate addresses and command strings in these articles.)

traveling the information highway

with Bob Alden

Mosaic and the Web: the more sophisticated Internet

This article was prompted by John Koper and several other IEEE members who contacted me after the appearance of the first gopher article (THE INSTITUTE, Jan./Feb. 1994) and said, "Great article, but have you tried Mosaic..."

In this article, I take an introductory look at some of the newer developments that are descending upon us like wildfire. Some key words are: World Wide Web, hypertext, hypermedia, Hgopher, and Mosaic. What does this all mean? Should we get excited? Are there significant opportunities?

As we entered the '90s, e-mail seemed a big step forward in communicating and accessing information. It was mainly text and point to point. As we head for the middle of this decade, our information retrieval potential is exploding. The sheer volume of electronically stored information requires the ability to search efficiently. Mere simply formatted text is being replaced by a mix of elegantly presented text, graphics and sound. This material can be combined in virtually real time using resources available around the globe. New tools are being developed to handle this explosion of information. The Web and Mosaic are two of those tools.

SERVERS AND CLIENTS. Let's start with the difference between servers and clients. A server is a package of organized information on a computer system. The client is the program you use to connect to the server. There are gopher servers and web servers; the web server is more complex than the gopher server. The client you need to connect to a web server has to have more features than one that you use to connect to a gopher server.

We will first discuss the web server as an extension of a gopher server. Later we will discuss clients that can connect you with gopher and web servers.

GOPHER LIMITATIONS. Each gopher server contains a so-called root directory, which is the top-level menu of information. You connect to the gopher at this point. The root directory contains the names of the next-level directories. This process continues for any number of levels. Text files and other forms of information and resources are listed in the various directories. To go from one item of information to another, you may have to backtrack through this tree structure.

There are several difficulties. One is the problem of naming and organizing the directories meaningfully. Another is the reality that many items fit equally well in many directories. Also, as the size (and complexity) of the gopher increases, the number of steps to find a particular item increases. We can solve the latter problem, if we need to repeatedly trace the same path, by using "bookmarks." You add a bookmark beside an item (by hitting the "a" key). The next time you use gopher, you call the bookmark screen (by hitting the "v" key), and select one of your bookmarks.

The bookmark idea is particularly useful if the second item is on a different server from the first. Most gopher servers interconnect to other gopher servers for much of the information they list. This avoids duplication of information and simplifies the process of updating. In computer jargon, one gopher is "hooked" to another gopher. The transfer from one server to another is often transparent to you, but may introduce a time delay.

WEB SERVERS. World Wide Web (or WWW or W cubed or simply the Web) is an extension of the gopher concept. In text files that you read on a web server, certain words are highlighted. If you select a highlighted word, you are transferred to another text file that is likely to be in a different directory and possibly on a different server (computer). This implies that the difference between text files and directories is blurred. Most important: duplicate entries are eliminated.

For a list of text files about IEEE's information highway, send a message to "info.email@ieee.org"; for a text version of IEEE's eight-page e-mail guide, send a message to "email.guide@ieee.org"; or use the IEEE's gopher or fileserver services. (Do not type the " ", which are used to delineate addresses and command strings in these articles.)

A document that contains text with highlighted words and hidden imbedded commands that cause the transfer to another document (file) is referred to as a hypertext document. We use a hypertext editor to produce the document. The next step is hypermedia. The hypermedia document contains, besides highlighted words, special symbols used to display graphics files or play soundtracks.

The word "hypertext" is attributed to Ted Nelson, the founder of the Xanadu Project in the mid-'60s. The Web was started in 1991 at the European Center for Nuclear Physics (CERN) in Geneva, Switzerland.

Web servers can exist on their own or be imbedded in gopher servers. You connect to a web server by connecting to what is called a home page. At present, many so-called WWW home pages are in very early stages of development and some hypertext or hypermedia features are extremely limited or may not work. Also, there are often long delays while graphics or sound files are transferred.

WHAT YOU NEED. The use of hypermedia features requires more system resources than those needed for gopher, and incredibly more than for e-mail. However, the potential is exciting and the availability of such tools will likely drive the development of higher-capacity networks and more sophisticated software to make use of these tools. Which brings us to the question: Now that we know what the Web is, how do we access it?

You need full Internet access and the right kind of hardware and software to explore or browse the World Wide Web. To access these features in the Web you need—for example—a PC with color monitor and sound card running Mosaic software under Windows, all connected via a high-speed local area network to the Internet. NCSA recommends that your PC be a 486/33MHz with 8 Mb RAM.

I know that the "for example" is a bit of a cop-out, but I have learned that there will always be more variations in software and hardware than one person can ever keep track of. What I am about to discuss is my own experience. If some of you have other, very different experiences which you think our readers would find useful, please send me an e-mail message with the details.

CLIENT SOFTWARE. You need a client to access a server. I am presently using three clients: Gopher, Hgopher, and Mosaic. The Gopher client is a program that runs on the host computer where I have my e-mail account. This client is a program that runs under the Unix operating system on our Silicon Graphics (SGI) workstation. Our system manager obtained the software from anonymous ftp at "boombox.micro.umn.edu"—that's the University of Minnesota, birthplace of Gopher. I log on in the usual manner and type "gopher" at the Unix prompt. The default convention is that I connect to our on-site gopher. If I type "gopher gopher.ieee.org", I connect to the main IEEE gopher server. In my view, this is your basic gopher access package. You can access it remotely using a modem and dial-up line. It's simple and it works.

I have also installed (this is a euphemism for saying that I asked our system manager, Bruce Chiarot, to do this) an Hgopher client on my PC. This software was available from our computer systems support group at my company (a university). The client connects directly to the on-site gopher server by default. I had to get permission to have my PC authorized for off-site access, since the gopher server connects to the Internet. I cannot dial up from outside to use Hgopher. Hgopher runs in Windows, so I click on the Hgopher icon and see the root directory of our local gopher. This display is in color with several visually pleasing enhancements, but not operationally very different from my basic gopher client.

MOSAIC. We (meaning Bruce again) recently installed Mosaic, which allowed me to sample the intrigues of the Web. Installation was not simple—even for Bruce. Since my Mosaic runs under Windows on my PC, I needed off-site access permission, as in the preceding case. Again, I cannot use an external dial-up unless I am running an Internet access protocol, such as SLIP. SLIP (Serial Line Internet Protocol) enables you to use a phone line and modems to connect your PC to the Internet, instead of connecting as a terminal to another computer (workstation) that is directly connected to the Internet. We obtained the Mosaic software from ftp.ncsa.uiuc.edu. The National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign is the developer of Mosaic. We found that we had to use the NCSA-exclusive TCP drivers instead of the ones we were using (Beame and Whiteside). This means that I have to reboot with changed autoexec.bat and config.sys files whenever I want to use Mosaic.

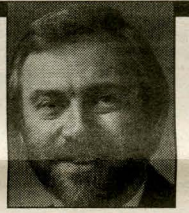
We discovered that Microsoft does not provide the appropriate software to play the ".au" sound files that are sent from the web servers we tried. Then we discovered that NCSA has a zipped file "wplany.zip" which contains the exe file that we installed under Windows. We also had to carefully edit the mosaic.ini file and put it in the Windows home directory. The result was worth the effort, in that we could view pleasingly presented hypertext with graphics and sound. The initial Mosaic screen has Windows-based menus that allow the user to select from a variety of gopher or web servers.

Mosaic clients are available for Unix and VMS platforms, and Macs and PCs. There are also other browsers—client software developed to aid the browsing of web and gopher-style servers. Resources such as the web server and clients like Mosaic provide us with the opportunity to work cooperatively in any part of the world where the Internet exists, and organize access to information. Given the global range of the IEEE, our network of technical specialists, and our linkages between industry, education and government, what an opportunity there is for IEEE members to work together, to share advances, and stay ahead in an economic environment that can be so damaging to those who fall behind!

Bob Alden is chair of the IEEE Electronic Communications Steering Committee and a former IEEE vice president. His alias is "r.alden@ieee.org".

traveling the information highway

with Bob Alden



The Web: a new way to deliver technical information

This article is prompted by Bob Lucky's "Reflections" article (*IEEE Spectrum*, May 1994, page 18) entitled "Keeping up." We had an e-mail chat after I read that article. We concluded that it is sad that IEEE spends so much effort producing technical articles that so few of our members read. I have also received a plea from Allen Dayton that IEEE speed up its conversion to electronic distribution so that he does not have to receive so much paper. IEEE is converting from paper to electronic form - but is conversion enough?

Don't misunderstand me. Technical articles are important for our members, for our industry, and for the IEEE. It is the quality of the technical content in IEEE publications and the consistency of this quality that has given the IEEE its well-deserved reputation as the premier technical society in the world. That said, it is true that very few of our members want to read these articles.

Technical articles are traditionally published in Transactions. In the past, societies sent Transactions to every member. When societies made these Transactions optional and gave members their choice, the overwhelming majority said "thanks but no" to receiving them. Is there a way to format these articles so that more members want to read them?

Let's look at what we do now, then how the Information Highway can lead us to a new way of doing our business of producing technical articles.

CURRENT FORMAT. Currently, each volume of any IEEE Transactions contains more articles than any one person is interested in reading. Each article is supposed to stand alone. Each generally contains an introduction, background, theory, results, discussion, conclusions, references, etc. There tends to be a six-pack syndrome. We regard anything less than six pages as not being substantive. Some of our papers are hard to read. This is due in part to the length and need to be complete, and the fact that engineers tend to write using the third person and passive tense. Many Theory sections repeat, inconsistently, what someone else already wrote. Wow, do we work hard to fill those six pages!

Think about those long, detailed, comprehensive engineering reports we write or read. However, for the boss, there is an executive summary. Why ? Because the boss is too busy to read all that stuff—and needs only the key information.

What does this tell us? Perhaps that we need to make our written material user-friendly—just like the newer software packages that have become popular.

We all have time constraints. We need technical material presented the way users need it. We need the key information up front, and access to supporting material, as we need it, when we need it.

FUTURE FORMAT. Using hypertext (and hypermedia to include graphics and even sound), we can produce articles that are available on a compact disk or over the network using a web server. We can read articles on a CD using a personal computer with a CD-ROM. For the network delivery, we need a full Internet access connection and client software like Mosaic on our computer.

There are advantages to each of these delivery choices. The CD offers a simple way for the IEEE to "sell" the product (i.e., recover the cost of production through membership-related charges or sell at a higher price to nonmembers), but restricts the amount of material connected through the hypertext links. This method of delivery does not limit distribution to those with a full Internet access connection. Network delivery requires some kind of password-controlled access to limit use to those who have paid for the service. But it has the advantage of a much higher limit to the material linked.

What might a technical article look like if written in hypertext? First of all, there is never one article but a set of articles that are dynamically linked and updated. Each article is about a page in length. We first scan (read quickly) the entire article to see what is there and whether we are interested. If we are hooked, we go back to the beginning and read carefully to understand the details.

The introduction is short and states what is to be done, why, and generally how. It also contains a review of the necessary background that is short because key words are highlighted. Each highlighted word is a link to another article. There is no list of references at the end of the article because any reference is immediately available. Clicking on a highlighted word brings that article to our screen to read. We can read that background article if we wish, and go further back if necessary. Returning to our original article, we continue to read.

The theory section may be next. In cases where the article uses previously developed theory, a few short sentences put that theory into perspective, and clicking on the appropriate highlighted word takes us to the original theory development. There will be a reference to nomenclature. Again, clicking on the highlighted word provides the nomenclature list. This is consistent for this set of articles. Perhaps such an article is only written by a task force of the relevant technical committee.

The results section is succinct and explains the significance. Clicking on certain icons provides a graphics window with the relevant drawing (or appropriate media display). The discussion contains highlighted words. We can click and bring up relevant results from other articles. The conclusion completes the article. Additional items such as acknowledgements, bibliography, appendices, author biographies, etc. can be viewed by clicking on highlighted words.

THE WEB. What is the result of this electronic construction? It is a resource that is set up to help us find the information we need. Higher-level surveys of the literature organize material by subject area. This leads the reader into specific technical specialties. The cross linking of web structures (as the name implies) enables many entries to the same specific area from different starting points.

Once into the set of articles, we can read quickly and absorb trends and/or specific results if we are aware of the background and current practice. Alternatively, if we are relatively new to the field, we can easily access the necessary background and read similar papers without duplication of "boilerplate" and differing conventions.

Producing this kind of new format for technical articles will not be easy. Is it worth the effort? Are there better ways to use these developing technologies for our own benefit? How can we improve our organization and distribution of technical material? Your input is needed. If IEEE is to serve your needs in this area, we need to know what you want and how you want it. The editor of THE INSTITUTE is always looking for responses to this and other columns.

For a list of text files about IEEE's information highway, send a message to "info.email@ieee.org"; for a text version of IEEE's eight-page e-mail guide, send a message to "email.guide@ieee.org"; or use the IEEE's gopher or fileserver services. (Do not type the " ", which are used to delineate addresses and command strings in these articles.)

Bob Alden is chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. His alias is "r.alden@ieee.org".

traveling the information highway

with Bob Alden

How can I get connected to the Internet? Part 2

Here is a response to members' comments about the July column entitled "How can I get connected to the Internet?" (THE INSTITUTE, July 1994, page 6). Many readers are asking for information about getting connected by paying for such a service if there is no free service available to them. Here are the answers to these questions.

First, let's briefly review the low– or no-cost possibilities just in case some readers can take advantage of them. Then we'll look at the issues involved. Elsewhere on this page we begin to list some of the e-mail and other electronic communication service providers, including a new service that IEEE is announcing.

FREE-TO-YOU SERVICE. If you work for an employer who is paying for e-mail or full Internet services, management may allow you to use this service at no direct (or a reduced) cost to you—particularly if your IEEE activities are considered beneficial. If you are connected with a university, college or school, you may be able to get a log-on ID on that computer system that is likely connected to the Internet. If you live in an area where a freenet or a local IEEE section BBS exists, you can probably get a free or low-cost log-on ID. Other organizations may offer similar services. Fidonet is the e-mail equivalent of a ham radio network and is worth exploring. Here's a super low-cost idea from Dan Driscoll right off my e-mail: as an RPI (Troy, N.Y., USA) alumnus, he has a user ID on the university computer for $30/year.

FEE-FOR-SERVICE. There are many service providers who will provide e-mail and other electronic communication services for a contracted fee. This is a rapidly expanding service industry: services offered and costs are changing all the time. My intent here is to help you know what questions to ask and understand the answers. There are a variety of options that may be available to you, depending on where you live or work and which service providers offer service in your area. I invite those of you who know of other service providers to let me know via e-mail so I can relay that information on this page.

E-MAIL OR FIS. Some service providers offer a variety of services including an e-mail-only connection to the Internet. Other providers offer what is called Full Internet Service (FIS), which means you can use FTP and telnet commands. FTP (file transfer protocol) enables you to copy files (legally) from other computers with an FTP directory containing executable program files, word processor, spreadsheet and database files. Telnet is a program that enables you to log on to another computer and use programs stored on that computer, e.g., library catalog access.

If the service provider has FIS, find out if Gopher and Web servers can be accessed. In other words, does the service provider have client programs you can run to access Gopher, etc.? FIS means a real-time connection with the Internet, whereas an e-mail-only service means a restricted gateway to the Internet which may result in any number of problems. Some of these are: long time delays for your message to cross the gateway, problems with replies to messages not being delivered and restrictions on the length of e-mail messages. You may prefer the simpler service of e-mail only (which should be cheaper, but beware that it might be "old fashioned" and more difficult to use), or you may want FIS and access to a Web client such as Mosaic for resource browsing.

LOCAL ACCESS. Some providers offer an 800 number that you use to access their service. Others provide Public Data Network (PDN) access which means that you dial a (usually) local number to connect to a data network. Sprintnet and Tymnet are two examples in the U.S. Datapac is an example in Canada. The remainder provide one or more local numbers and you have to pay any phone charges to get to that number. PDN and 800 services are only available in certain parts of the world.

CONNECTION SPEED. Some providers have 1,200 bps connections, others have 2,400, 4,800, 9,600, 14,400, etc. The higher the number, the faster the connection. You really need 9,600 as a minimum if you plan to use Gopher or Mosaic. Some providers offer a SLIP (serial line Internet protocol) connection which allows you to connect your PC directly to the Internet (with your own IP address) so you can run Mosaic from your PC.

CHARGES. There are usually several components. There may be a connect-time charge —the clock starts when you log on and stops when you log off. There may be different rates for peak and off-peak hours. There may be a surcharge if you live in a different country from the service provider—sometimes this is due to your country's tax rules and not to the service provider. There may be a minimum monthly charge. There may be discounts for heavy use. There may be charges for messages received (even if you do not want them) in addition to charges for messages sent. There may be charges for storage—each message may incur charges for every day (or part of a day) it is in your mailbox.

Charges may depend on the length of each message. If you choose to subscribe to some of the thousands of lists, you may be surprised at the amount of mail you get. There may be a number of electronic services other than e-mail for which there are additional charges, e.g., news reading, airline schedules, etc. Your connect-time charges may be higher if you have Gopher, Web and other client software packages. There may be a start-up cost. There may be software packages and manuals with specific charges—check whether these are optional or required. Can you use other software?

Many users find it very cost effective to get a software package that allows them to prepare messages and replies off-line and automatically dial up, log on, send outgoing mail, receive incoming mail and log off. This minimizes the connect time and can sometimes be automated to perform the dial-up at preselected times in off-peak periods. Using browsing tools and news readers on the Internet can be very interesting and informative but may add significantly to your monthly cost. Bottom line—check very carefully what you are agreeing to pay for, and monitor your use so you do not get an unpleasant surprise when the bill arrives.

For a list of text files about IEEE's information highway, send a message to "info.email@ieee.org"; for a text version of IEEE's eight-page e-mail guide, send a message to "email.guide@ieee.org"; or use the IEEE's gopher or fileserver services. (Do not type the " ", which are used to delineate addresses and command strings in these articles.)

FINDING SERVICE PROVIDERS. There are many books in your local computer store or book store that describe the Internet, e-mail, Internet Gopher, World Wide Web and providers of various services. However, many of these books list access providers but not service providers. Internet access providers may only provide the connection for companies and individuals to connect their computer systems to the Internet. This kind of service might cost anywhere from a few thousand US$ per year up to US$50,000. The higher price enables thousands of users to be connected.

E-mail and full Internet service providers offer individuals a personal log-on ID from about US$10 per month and up, depending on the amount and type of use. This is the kind of service many of you are saying that you need. The table on this page lists some of the companies that offer log-on IDs. You will note that one of these is called IEEEnet, which is a new service that is being introduced on an experimental basis.

PDIAL. Most of the other entries in the table are taken from PDIAL (Public Dial-up Internet Access List). This list is about 30 pages in length. It is produced by Peter Kaminski, who states that the list can be freely distributed for noncommercial purposes. He makes no representation about the suitability or accuracy of the document. The information is provided "as is" without express or implied warranty. Please be so advised. Since 70 percent of our sections have e-mail connections with IEEE, I suggest that you contact your local section for the most recent copy, since the volunteers who use e-mail there can obtain it via e-mail. Here is how: Send an e-mail message to "info-deli-server@netcom.com". Include one or more of the following commands: "send pdial" to receive the current version of PDIAL, "subscribe pdial" to receive new versions automatically, "subscribe info-deli-news" to get updates and news items.

IEEENET. IEEE is responding to requests from members to make a commercial log-on ID service available on an experimental basis. IEEE is working with a commercial service provider with the intent that this provider (not IEEE) will offer log-on IDs with FIS for IEEE members who elect this service. This service is expected to be known as IEEEnet. IEEE believes that this service will be attractive to many IEEE members. However, we recognize that the needs of IEEE members vary greatly and that it is difficult for one service provider to serve our 330,000 members in 150 countries. This service is expected to be offered on a limited basis starting in the first quarter of 1995. IEEE intends to monitor the performance of this service and evaluate the satisfaction level of IEEE members who choose to try it out before making the transition from experimental to long-term basis.

Further information can be obtained using the telephone or fax numbers and e-mail address shown. Please investigate carefully and pick the service provider that you feel best suits your needs.

YOUR INPUT. If you are using a service that you would like to recommend to other IEEE members, please e-mail me the information and, if possible, include the following details: name of service provider; contact telephone, fax and e-mail address; access area via local call, 800, PDN service; connection speed; SLIP service; e-mail or FIS; minimum monthly cost; hourly connect rate. See the table below for some examples.

Bob Alden is chair of the IEEE Electronic Communications Steering Committee and a former IEEE vice president. His alias is "r.alden@ieee.org".

Partial list of e-mail/Internet service providers

Service provider	Tel no. for information	Fax no. for information	E-mail address for information	Local call or PDN or 800 #	bps max	E-mail or FIS	SLIP $/mo	Min $/mo	$/hr basic
UUNet Canada	(800) INET123 US & CA (416) 368-6621	(416) 368-1350	info@uunet.ca	10 cities in Canada	14,400 ISDN	FIS	Yes, C$50	C$20	C$6
UK PC User Group	44 (081) 8631191	44 (081) 8636095	info@ibmpcug.co.uk	London, England	14,400	FIS	No	£15	None
Individual Network	49-2131-64190	49-2131-605652	in.info@individual.net	36 cities in Germany	2,400	FIS	Yes	DM15-30	NA
Delphi	(617) 491-3393	(617) 441-4903	info@delphi.com	PDN	14,400	E-mail	No	US$10	US$9
JvNCNet (G E S)	(800) 35tiger	(609) 897-7310	info@jvnc.net	8 NE US cities + 800#	14,400	FIS	Yes, US$99	US$19	US$10
PSILink	(703) 709-0300	(703) 620-4586	all-info@psi.com	US & CA PDN	2,400 9,600	E-mail, FTP, Netnews	No	US$19 US$29	Varies
Netcom	(800) 501-8649 (408) 554-8649	NA	info@netcom.com	19 US cities	14,400	FIS	Yes, US$160	US$20	US$2
CompuServe	(800) 848-8199	(614) 529-1699	NA	US & Canada	14,400	E-mail, Netnews	No	US$9	US$9 US$35
IEEEnet	(908) 562-6390	(908) 981-0027	info.ieeenet@ieee.org	US & CA 800#	14,400	FIS	Yes	TBD	TBD

THE INSTITUTE posted on IEEE's gopher

PISCATAWAY, N.J., USA—The IEEE newspaper, THE INSTITUTE (TI), is now available electronically through the IEEE Gopher.

Beginning with the October issue, the full text of each editorial item in the issue is being posted on the gopher. Each issue is posted the week it is mailed. For example, the December issue of TI will be posted on the gopher in the last week of November. Gopher postings are text-only versions of editorial material, and include no ads or inserts.

Interested readers can access THE INSTITUTE by accessing "gopher.ieee.org". The path to TI files is through "Products, Services, and Information/ Publishing Department."

Circuit cookbook available on-line

EDMONTON, Canada—The University of Alberta runs a "circuit cookbook" archive at the anonymous FTP site "bode.ee.ualberta.ca".

The purpose of the archive is to provide electronics enthusiasts with a place to share circuit ideas with each other. In addition to "cookbook" designs, there are also "complete" circuits available. Files range from construction details for a Yagi antenna to a serial port IR remote controller. Users can search for schematics through a file containing one-line descriptions of each entry. Questions about the archive should be directed to Dan Charrois at "charro@eel.ualberta.ca".

traveling the information highway

with Bob Alden

Responding to my electronic mailbag ...

Both our TI editor, Ken Moore, and your fellow traveler, Bob Alden, are delighted with the interaction that this column is eliciting. We had hoped that THE INSTITUTE would serve as a conduit to provide you with useful information. You, our readers, are making this happen in an exciting dynamic way. In this issue, and in the future, I will dip into my electronic mailbag and respond to your questions and share your input.

GETTING CONNECTED. The key question for many members is how to get connected to the Internet. This means getting a log-on ID on a computer that is directly or indirectly connected to the Internet. In the October issue I addressed the question of purchasing a log-on ID from a commercial service provider (CSP). We included a table of several CSPs. In this issue we add four more CSPs to the table. I must emphasize that the price structure for these services is very complex. Each CSP has different service choices and charging mechanisms. We are providing the information in these tables to indicate the kinds of choices available and who you can contact to find out more.

MORE FREENETS. Bob Creighton contributes information about the National Public Telecomputing Network (NPTN) in Cleveland, Ohio, USA. This is a coordinating body for freenet organizations worldwide and offers help on starting a freenet. NPTN maintains a list of existing freenets and organizing committees on an anonymous FTP host "nptn.org" in directory "pub/info.nptn". The July 6, 1994 version of this list includes eight countries (with 41 states in the USA), and gives voice and e-mail contacts for 77 educational/community organizations and affiliates on-line as well as for 118 organizing committees. For more information, send an e-mail message to "info@nptn.org".

Audrey Brewer writes: "Just wanted to let you know that the Dayton (Ohio, USA) area has a freenet sponsored by University of Dayton (phone lines), Wright State University (computer space and administration) and DEC (donated an Alpha machine). It's been active since about Nov. '93 and we can get to the ieee.org, acm.org, etc. No telneting or direct FTP ... usage has increased to the point that the 16 lines are usually busy from 9-11 p.m.—it's easier to get in during working hours."

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. For a list of these files, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message. The text file will automatically be returned to you. Read this file, then send for the files you want.

For more about fileserver, include the word "help" on a separate line of the message. Gopher and anonymous FTP can also be used. (Do not type the " ", which are used to delineate addresses, names and command strings in these articles.)

Frank Moore, one of our IEEE staff executives and an IEEE member, contributes an item from Edupage: The state of Maryland, USA, now offers residents Internet access for $35 a year for e-mail, $100 a year for other services such as FTP and Gopher, plus the cost of a local phone call. The project is funded partially by a US$2 million government grant and is run by the state's public library system (*Internet World*, October 1994, page 10.)

Some of the above are included in the NPTN list, others are not—so there are even more freenet opportunities out there. One of these is brought to my attention by Bob Greenfield, who has written up the South Saskatchewan Section experience in an article that I hope to share with you in future. He writes, in part: "The Great Plains Free-Net, Regina, Saskatchewan, Canada, is an organizing committee whose mandate is to create a working community computing resource by May 1995. We expect this computer system to be similar to many others in existence or being planned. An additional objective is to serve all of Saskatchewan not served by another freenet. For additional information about the Great Plains Free-Net, contact Neale Partington at "sec.sosaskatchewan@ieee.org"."

MORE IEEE E-MAIL INFORMATION. One of our Belgian members, Rudy Eyberg, asks that more IEEE e-mail addresses be included in TI, together with explanations about getting information about specific subjects. Ken and I agree with Rudy and pledge to do precisely this. (TI's "F1 help directory," usually appearing on page 2 of each issue, began including e-mail addresses with the September issue.)

IEEE LOGOS. Pam Elliott, University of Missouri Columbia Student Branch, requests electronic copies of our IEEE logo for use with meeting announcements. Dave Margrave, George Mason University, requests the same item for his student branch WWW home page. Electronic copies of the IEEE logo in EPS, TIFF and GIF formats are now available via anonymous ftp at "ftp.ieee.org" in directory "/info/software/logos".

TWO TIPS. Bill Evans asks: "How do I change the real e-mail address to which my IEEE e-mail alias points?" Answer: Send the information in an e-mail message to "alias.update@ieee.org". Ron Alexander, with a CompuServe address, notes that, for his fellow CompuServe users, getting connected to the Internet means typing "internet:" in front of the e-mail address.

WEBS. There has been a lot of response to the two Web articles (August and September '94 TI issues). I will revisit this topic in the next issue, but in the meantime, we have set up an e-mail discussion group "web-d@ieee.org". If you are interested, please subscribe and participate.

THANK YOUS. Many of you have e-mailed suggestions and compliments about these articles. I do try to answer all of your messages individually. Sometimes the pressures of my nonvolunteer job and the volume of e-mail causes a backlog. Occasionally, the vagaries of e-mail connections foil my attempts to send replies. I thank you all now. Please keep the ideas flowing. Together we can help each other, and our industry, to be more productive. That's what the IEEE is all about.

Robert T.H. (Bob) Alden is chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. He welcomes your input via e-mail at "r.alden@ieee.org".

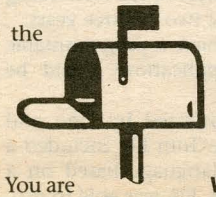
Partial list of e-mail/Internet service providers

Service provider	Tel no. for information	Fax no. for information	E-mail address for information	Local call or PDN or 800 #	bps max	E-mail or FIS	SLIP $/mo	Min $/mo	$/hr basic
UUNet Canada	(800) INET123 US & CA (416) 368-6621	(416) 368-1350	info@uunet.ca	10 cities in Canada	14,400 ISDN	FIS	Yes, C$50	C$20	C$6
UK PC User Group	44 (081) 8631191	44 (081) 8636095	info@ibmpcug.co.uk	London, England	14,400	FIS	No	£15	None
Individual Network	49-2131-64190	49-2131-605652	in.info@individual.net	36 cities in Germany	2,400	FIS	Yes	DM15-30	NA
Delphi	(617) 491-3393	(617) 441-4903	info@delphi.com	PDN	14,400	E-mail	No	US$10	US$9
JvNCNet (G E S)	(800) 35tiger	(609) 897-7310	info@jvnc.net	8 NE US cities + 800#	14,400	FIS	Yes, US$99	US$19	US$10
PSILink	(703) 709-0300	(703) 620-4586	all-info@psi.com	US & CA PDN	2,400 9,600	E-mail, FTP, Netnews	No	US$19 US$29	Varies
Netcom	(800) 501-8649 (408) 554-8649	NA	info@netcom.com	19 US cities	14,400	FIS	Yes, US$160	US$20	US$2
CompuServe	(800) 848-8199	(614) 529-1699	NA	US & Canada	14,400	E-mail, Netnews	No	US$9	NA
IEEEnet	(908) 562-6390	(908) 981-0027	info.ieeenet@ieee.org	US & CA 800#	14,400	FIS	Yes	TBD	TBD
MCIMail	(800) 388-4118	(818) 753-9472	4790749@mcimail.com	800 #	9,600	E-mail	No	No	Varies
SprintMail	(800) 736-1130	(800) 359-4011	NA	Local # + 800 #	9,600	E-mail	No	US$20	US$14
AT&TMail	(800) 631-8097	NA	NA	Local # + 800 #	9,600	E-mail	No	US$3	Cost of message
America OnLine	(800) 827-6364	NA	NA	Local #	9,600	E-mail, Gopher, Netnews	No	US$10 for 5 hours	US$3.50 after 5 hours

traveling the information highway

with Bob Alden

More from the electronic mailbag ...



I am continuing last month's mode of dipping into my electronic mailbag, sharing the responses I am getting from you, and responding to more of your questions. The September issue carried my column on using hypermedia to format technical papers with either World Wide Web (WWW) or CDs for electronic delivery. The response has been great. You are saying clearly that IEEE should move into high gear in this direction. Yes, readers, IEEE is developing a Web home page with links to the many parts of IEEE. We have set up an e-mail discussion group "web-d@ieee.org" that you can subscribe to (no charge) if you are interested. I am pleased to include the first item in this column for Macintosh users, supplied by one of our members.

WEB FOR PAPERS. Huub Bakker from Palmerston North, New Zealand, writes: "I've just read your article in the September THE INSTITUTE on the use of hypermedia to distribute the *IEEE Transactions*. All I can say is *Yes, please*! As a recently joined member who has just received three *Spectrums*, a THE INSTITUTE and three *IEEE Transactions*, all in one week, I am somewhat appalled at the amount of bookshelving that I will need within the next few months! Seriously, though, I think your suggestion is obvious when pointed out, and is an excellent use for the new hypermedia software available. The use of search engines will make the whole task of literature searches much easier, especially when the original paper is on-line as well.

"The only suggestion I have to make concerns the distribution medium. If you are going to distribute over the network with password-controlled access, you might also consider the need to encrypt data packets; a suitable network analyzer would make short work of collecting any unencrypted transmissions."

Allen Dayton writes: "I think we should move faster to provide electronic services. I am tired of getting journals and them taking up storage space. I think even Gopher is okay, but the IEEE should put in a WWW server for Mosaic. I am running it and I think it is great. I am surprised at the number of government organizations that are going to WWW servers. We should put all IEEE documents on it. I believe that we should go to CD-ROM for all journals and proceedings ASAP. We should not even publish paper copies of journals any more. This is the end of the 20th century and we are moving into the 21st century in a few short years. I believe that the period between now and then should be a transition period and by then, *no more paper*! (We might have to make an exception for the Milcom classified proceedings, as some organizations may not have Tempest-approved computers with CD-ROM drives.)

"Mosaic is great and the multimedia capabilities are super. Even they will improve with faster computers such as the Power PC. Then we can download video 'movies.' This allows more capability than paper ever did. I notice that the SIGRAPH is putting out CD-ROM proceedings.

"We must get the IEEE to move quickly to web servers and—very important—each of the societies and groups must also use it. Many times the societies and groups go off in their own direction. I think this would be bad for IEEE, but I can't blame them if the IEEE does nothing or is too late. Likewise on the use of optical disk for conference proceedings and journals. I think the day of the paper copy of journals and proceedings is over."

WEB CLIENTS. Doug Hughes, Auburn University, writes: "If you haven't already, you should try Cello from Cornell. It is also a WWW client browser. I haven't personally tried it myself, because I do most of my work on SunOS/Solaris. Also, you may want to get the WWW FAQ if you haven't already. If you'd like a copy, it's frequently posted to alt.answers and the WWW newsgroups. Cello is available at 'ftp://ftp.law.cornell.edu/pub/LII/cello'."

Bob Teague, Beame & Whiteside Software, writes: "I just read your article in the August issue of TI. The article was fine, but I was disappointed that you said that you were not able to use our drivers to run Mosaic. We have many customers using Mosaic on our drivers and I have worked with some of them. I, personally, use Mosaic 2.0 Alpha 4 without problems, and have also used Mosaic version 1. There have been some problems with earlier versions in some environments. The 3.1 version of our code has some specific fixes to make Mosaic run better."

I agree with Bob Teague. Since I wrote that article, we received an update of the BW software which worked okay. This is just one example of the fact that the electronic communications environment is constantly changing.

MAC MOSAIC. Michael Kluskens, Washington, DC, writes: "Per your request for information from readers, I'll outline installing Mosaic on a Mac. First, if you already have an Ethernet connection to the Internet from your Mac, then installing Mosaic is simple, assuming you're already using the Ethernet connection. The Mosaic application for the Mac can be obtained from "ftp.ncsa.uiuc.edu" in the directory "/Mac/Mosaic". You need a program like "StuffIt Expander" to decompress the application, as well as any others you obtain from most Mac FTP sites.

"The directory also contains the helper applications that Mosaic uses occasionally. They're not critical to have; you can get along just fine without them when you're starting out. I currently have the following: StuffIt Expander, JPEGView 3.3, MacCompress 3.2, Simple Player, SoundMachine 2.1, Sparkle 2.0.2. The file 'QuickStart.Txt' lists information about some of these and other helper applications.

"Assuming you have an Ethernet cable to connect to, Ethernet connections to Macs typically are done in one of two ways. First, some Macs come with Ethernet built in; then all you need is the adapter to connect the Mac's Ethernet port (typically AAUI) to whatever cable you have in your office. For Macs without built-in Ethernet, there are Ethernet cards which fit in the various Macs and connect to different types of Ethernet cables. If you don't have an Ethernet cable to connect to, the alternative is SLIP or PPP just like in your article (PPP is similar to SLIP).

"Mosaic runs fine with the Apple-supplied TCP driver (MacTCP), which soon will be shipping with all-new Macs as part of System 7.5. For the rest of us, MacTCP comes with several communications programs (Versa Term is the one I have). It may be ordered directly from Apple; older versions used to be distributed with several shareware programs available on Internet, or many sites have site licenses. Actually, I don't know if there are any other TCP drivers for the Mac. There are no setup files that need to be edited for the Mac version of Mosaic."

GETTING CONNECTED. Bob Mangold writes to tell about a service he uses in western Pennsylvania, USA: "Telerama Public Access Internet; for information: voice, (412) 481-3505; fax, (412) 481-8568; e-mail; 'sysop@telerama.lm.com'; FIS; 28,800 kb; $20/mo with unlimited connect time, SLIP/PPP; $10 one-time set-up fee; three hours of free SLIP/PPP connect per day in basic rate, additional hours: $2/hr. I have found Telerama to be a very reliable Internet provider at the lowest price I have found anywhere. It has opened the world to me. I am only a very satisfied user and am in no way connected with Telerama."

IEEE HISTORY CENTER. The IEEE Center for the History of Electrical Engineering is located at Rutgers University in New Brunswick, N.J., USA. Their summer '94 newsletter describes several projects ranging from an IEE-IEEE exhibit, through several books, to the availability of historical T-shirts. Their e-mail contact is "history@ieee.org".

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

MORE IEEE INFO. Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. For a list of these files, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message. The text file will automatically be returned to you. Read this file, then send for the files you want.

The text file "info.info" is a more general document that enables you to find out about all IEEE information files. The text file "info.services" helps you find out about the IEEE services that are available electronically.

Do not type the " ", which are used to delineate addresses, names and command strings in these articles. For more about fileserver, include the word "help" on a separate line of the message.

Gopher and anonymous FTP can also be used. If you have access to a gopher client, type "gopher gopher.ieee.org" at the system prompt. To use FTP, type "ftp ftp.ieee.org" at the system prompt. Hint: you need to understand Unix commands and conventions to use FTP effectively; Gopher is menu-driven and much easier for novices.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. He welcomes your input via e-mail at "r.alden@ieee.org".

traveling the information highway

with Bob Alden

The IEEE World-Wide Web comes to life

We start the new year with a bang. IEEE now has a World-Wide Web server in operation and THE INSTITUTE is the first product to use our new capability. If you are reading this newspaper in its printed and mailed format, you are reading it after many Internet browsers have viewed it electronically. There is now a better way for those members who prefer the electronic medium. This is especially significant for our members who live a long way from the central United States, where THE INSTITUTE is printed and mailed, and for whom THE INSTITUTE arrives too late to be timely. I would like to note my appreciation to our Publications Department staff who have pushed to bring THE INSTITUTE on line in this manner—in particular, Phyllis Hall, Tom Bontrager and Ken Moore.

HOW TO ACCESS. There are two levels of access to the Web. Both require full Internet access—which means more than an e-mail connection. If you are using a personal computer and have one with a 486/33MHz processor with 8 Mb RAM, or a Mac of equivalent capability, with a local area network (LAN) or serial line Internet protocol (SLIP) connection, then you can use the Mosaic graphics-oriented browser. You can get a copy of Mosaic using file transfer protocol (FTP) from "ftp.ncsa.uiuc.edu:/PC/Mosaic" (the part before the colon is the site address and the part after is the directory). Then you install it on your PC and run it under Windows. Please see my August 1994 column in THE INSTITUTE for more information about Mosaic and the Web. There are also versions for Mac and workstation users. Mosaic allows you, if you have all the bells and whistles, to connect to any Web server, read hypertext, view graphics, listen to sound clips and move around the Web by using a mouse to click on highlighted key words.

If you have a simpler personal computer that does not run Windows, or if you cannot connect to the Internet using a LAN or by dialing up using SLIP, then you may be able to use Lynx to access the Web.

USING LYNX. Lynx is a text-only browser developed at the University of Kansas. Lynx runs on the host computer where you have your log-in ID, not on your PC. My thanks to Bob Greiner, who suggested Lynx as a faster way to access the Web, and to Joe Clark, who wrote a nice article in the Toronto Star about Lynx. Ron Vetter, Chris Spell and Charles Ward wrote a super article on Mosaic and the World-Wide Web in the October issue of the IEEE Computer Society's magazine, *Computer*. In that article, they list FTP sites for a variety of software. I took their advice and got a copy of Lynx from "ftp2.cc.ukans.edu:/pub/WWW/lynx". Don't forget that upper and lower case characters are different in Unix, so type carefully. My system administrator installed the Lynx software in about five minutes. I logged in and typed "lynx" at the system prompt. It worked like a charm. Let's see what Lynx does and why it may be for you. You may want to see if Lynx is available on your host computer, and if not, ask your system administrator to get and install it.

With Lynx you cannot view graphics or listen to sound clips, but you can read hypertext, place the cursor on highlighted words using the arrow keys and move around the Web by pressing the enter key. Lynx is much faster than Mosaic because it does not transfer the large files needed to display graphics or produce sound on your computer. Some people who have both Mosaic and Lynx choose to use Lynx because of its speed. In many cases, the text content is much more significant than the graphics and sound.

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

THE IEEE WEB. All Web servers have what are called home pages. The Web home page corresponds to the root directory in gopher. To connect to the IEEE Gopher, we type "gopher gopher.ieee.org" from the system command prompt after logging in. To access the IEEE Web server with Lynx, we type "lynx http://www.ieee.org/" from the system command prompt after logging in. Using Mosaic, we start up Mosaic in Windows, click on "File", "Open URL", and enter "http://www.ieee.org/" into the window. The http stands for HyperText Transfer Protocol. URL stands for Uniform Resource Locator and is the equivalent of the Web server address.

What do we see next—the IEEE Web home page. We view this page and using either mouse or arrow keys (depending on whether we are using Mosaic or Lynx) we can move around the screen or scroll to see more. The text is displayed in an attractive manner because it is written in HTML (HyperText Markup Language). Some words are highlighted and if we click (or hit enter if we are using Lynx), we see the screen contents change as we are taken through the Web to view a different file. There may be a time delay as the next file may be on a computer in another country (anywhere on the Internet) and that file has to be downloaded to your PC where you are running Mosaic (or to your host running Lynx). There may be some graphics, an IEEE logo, a photograph, a pie chart, for example. These we will not see if we are using Lynx.

The highlighted words may take us to view other files—such as the various articles in THE INSTITUTE—or they may take us to other home pages, such as home pages for IEEE societies that have created their own Web servers. Each of these will have their own URL so that you can go directly to the home page of your choice or see the variety of home pages that will develop over time. THE INSTITUTE has its own URL "http://www.ieee.org/ti.html". Browsers have the capability to store lots of different URLs so that you can select as needed. Some of these URLs can be very long and difficult to type in correctly.

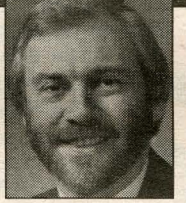
For those of you Internet browsers who are reading this column electronically, did I get it right? Remember, I wrote this long before I saw it electronically. For those of you who are reading the printed word, would browsing electronically be useful for you? Now that we have a complete electronic publication option for THE INSTITUTE, where do we go from here?

PRINTED FORMAT. Does IEEE continue to mail printed versions of THE INSTITUTE to the membership? For some time—yes. In the future—this is a question for you and the IEEE Board of Directors. Should IEEE members have the option to receive the printed version if they have access to the Web document? Think about what you want. Let your favorite IEEE director know your views. Some of you can't wait to reduce the amount of paper you get from IEEE. But others are not so keen to drop the printed format, either because they do not have access to this technology or because they do not want to. We have started something here. This is the first IEEE publication for the general membership to be delivered electronically.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. He welcomes your input via e-mail at "r.alden@ieee.org".

traveling the information highway

with Bob Alden



The Internet: A decentralized network of networks

Last month I reported that THE INSTITUTE was being published on the Internet as of Jan. 1. I discussed ways to read our newspaper electronically using Mosaic or Lynx clients. This is only possible if you have electronic access from where you are to where THE INSTITUTE exists electronically—on a World-Wide Web server located on an IEEE computer in Piscataway, N.J., USA. That computer is now connected to the Internet backbone via a T1 line. Let's look at what this means to you in terms of being able to access technical information from IEEE. If you have used Mosaic, Lynx or other client software that can link to and display hypertext documents, and if in particular you have connected to the URL (Uniform Resource Locator—that's Web talk for an address!) "http://www.ieee.org/", you have looked at the IEEE home page. On that home page you have seen that something major is happening—many doors will shortly be opened. All IEEE technical societies and other entities will be able to post or publish information that is available immediately. Some are already doing just that! No longer do we need to wait for the postal service to deliver.

For those of you who use the Internet regularly, it becomes as familiar as the highway one takes to home or work every day. For some, it is still a mystery yet to be unraveled. Even for some who have access to Mosaic or Gopher clients and have learned to click or hit "return" and see the various screens unfold, it is still a mystery. It is as if we are being driven in a bus and allowed to tell the driver which way to turn as we gaze in wonderment out the window. Such is the enabling power of the latest software that can be installed for us. Why is it that some of us do not seem to be able to access some of these new and powerful features? Some understanding of the Internet is useful in working out what we can have access to and what we need to do to get that access. The history of the Internet is helpful in understanding how it has evolved and how it works.

BIRTH OF THE INTERNET. What we know today as the Internet started in 1969 in the United States as a network to link four computer sites that were conducting research for the U.S. Department of Defense. These sites were the Stanford Research Institute, the University of Utah, and the Universities of California at Los Angeles and Santa Barbara. This fledgling network became known first as ARPAnet, then DARPAnet, for the Defense Advanced Research Projects Agency that issued the request for a proposal for the network's development. The speed of that network was limited by the interconnection lines that allowed data transmission of up to about 56 kilobits per second (kb/s). This is equivalent to about three full screens of text per second or about four times the speed of a 14.4 kb/s modem. The initial IEEE connection to the Internet was a leased line with a 56-kb/s capacity.

By the early '70s, the number of sites had grown from the initial four to about 50, and by the early '80s to a couple of hundred. During the '80s this number increased rapidly. In 1987, when the number of sites was measured in the thousands, the National Science Foundation (NSF) sponsored a so-called "backbone" connection with a capacity of 1.5 Mb/s (a factor of 30 times faster, or 90 full screens of text per second) and DARPAnet began the transformation into NSFnet. These connections are known as T1 lines. By 1991, T3 lines were introduced with capacities of 45 Mb/s (another factor of 30 for a capacity of some 3,000 full screens of text per second) to connect hundreds of thousands of sites. The 1994 figure is about a couple of million sites with an average of 10 users per site, or 20 million users. Initially the sites were mainframe computers with perhaps a hundred users per machine. Today, we have a range of computers connected, some mainframes and many workstations with anywhere from a dozen users to a single individual.

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CONNECTED NETWORKS. While this backbone was developing, so was the plethora of regional networks with their own relatively lower capacity (or speed), their own administration and operating policies and their connections to the high-speed backbone. These connections to the backbone generally fall into one of two categories. So-called full Internet connectivity implies that the connection is transparent to the user. If you have the right hardware, software and permissions, you can connect your computer on one network to a computer on the other network and use any of the Internet tools, such as browsing on servers for text or graphics information, transferring files or using a library catalog program. Some networks only have a limited connection to the Internet. For example, the most limited connection is the transferring of electronic mail messages by collecting messages on a magnetic tape and physically transferring this tape to a computer on another network. Some networks, while they have a full physical connection, choose to offer limited services.

◆ BITNET (called the Because It's There network or Because It's Time, depending on who you ask) developed as a network of primarily university-based computer interconnections with a store-and-forward mode of passing e-mail messages from one tape drive to another. This network served some 2,000 nodes in about 50 countries. Today, many parts of the original BITNET have merged into local networks with full Internet connectivity.

◆ The UUCP network grew as Unix systems operators communicated with each other using the UUCP (Unix-to-Unix CoPy protocol). This group developed extensive use of electronic mail and discussion groups—the now familiar Usenet News.

◆ Fidonet developed as independent bulletin board system operators (sysops) created local dial-up services as modems became popular. These sysops developed the practice of passing groups of personal messages and files to their closest neighbors over phone lines in the middle of the night when traffic and rates were low. There are now connections to the Internet at various places; however, the essence of this network is still intermittent message-passing. Burt Juda at IEEE maintains one of these Fidonet connections.

◆ The Canadian (CAnet) and European Advanced Research (EARN) networks were the first regional networks outside the United States, and they have been followed by many others. They can perhaps best be described as Internet extension networks with varying degrees of connectivity—the CAnet has three totally transparent connections to the NSFnet backbone (another example of redundancy). Both within and outside the United States, these regional networks offer connection to the Internet—usually to other organizations, which in turn offer log-in services to individuals. Thus, the customers of these regional networks are the universities, colleges, government departments, corporations and commercial service providers, all of whom have large computer systems with many individual users.

The other major group of networks is the set of commercial service providers (CSPs) such as America OnLine, AT&Tmail, CompuServe, Delphi, Genie, MCImail, Prodigy, etc. Many of these began with a set of customers who wanted primarily to access information services and secondly to communicate. These CSPs served their own customers, often with one computer in a central location and the use of rented public data networks to provide local access. Connection to the Internet often did not exist or only existed as a limited e-mail transfer mechanism. More recently, many of these CSPs have started to offer Internet access as a primary service.

The Internet is truly a network of networks. At present the so-called backbone, the NSFnet, is located in the United States, and there are dedicated links to other parts of the world. As the use of the Internet grows, we can expect growth of the backbone in both capacity and geography.

The Internet is experiencing unprecedented growth. For most of its life, which is only 25 years from that initial connection of four computer centers, it has been the purview of the computer experts. Less than two years ago, the public (through the popular press) discovered it. What was a growth phenomenon has become an explosion. Public participation is incredible, as are the demands of these users. We only have to understand that one small graphics file is equivalent to dozens of full screens of text to realize that the demands of Web clients will both stress the existing system and likely drive the next level of capacity expansion.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. He welcomes your input via e-mail at "r.alden@ieee.org".

traveling the information highway

with Bob Alden

Members send tips for accessing the Web

By now, many of you are aware that THE INSTITUTE is now available electronically. If you can send e-mail to the Internet, you can get the text of the articles via e-mail. If you can log on to a server that offers the Lynx program, you can browse the text of the articles in an on-line mode. If you can run Mosaic or Netscape on your PC or Mac, you can browse text, graphics (and sound clips) in an on-line mode.

The same IEEE server that hosts THE INSTITUTE also hosts material provided by IEEE societies, sections, chapters, student branches, and the IEEE Operations Center—more about these in future issues.

What is member reaction to IEEE's use of Web technology? It seems that most folks like it! Here are some of our members' reactions and tips for accessing the Web.

GETTING CONNECTED. *Don Williams* writes: "I just read your article on 'Traveling the Information Highway.' I would just like to say it was short and sweet. I would also like to say that your article had just enough inertia to push me onto the information highway. I already had a SLIP connection set up with the university I attend, so I ftp'ed Mosaic and Win32s with OLE over to my PC and I was on the Internet in no time. After a little practice, I plan to catch some major waves (surf's up).

"I write to voice my opinion about the need to maintain a printed publication. Although I know I will be surfing over to THE INSTITUTE using Mosaic, there are many of us who do not have access to the Internet for electronic access to THE INSTITUTE and other publications. So let's not limit the breadth of our scientific environment by pushing fully electronic publications just yet. Although electronic publication would be great for me, I would like to stand up for those who don't and will not have access to this technology for a few years yet.

"Keep writing those articles. Additionally, I know I wouldn't have responded to your article if it were not for e-mail. So let us push the technological aids, but at the same time, let us not forget about those who live far from the beach and don't own surfboards. I don't know anyone on the [IEEE] Board of Directors, so I would appreciate it if you forward this message appropriately."

Al Scalone writes: "I thoroughly enjoy your column in THE INSTITUTE regarding Internet issues. I might say that it was your column that made me take the plunge and sign on. I know that occasionally you mention some of your readers' experiences so I thought I would pass mine along. I signed on to the Netcom service and am very happy I did. Netcom really is a painless way to get full Internet access with virtually no headaches. The great part to a new user is that the service includes Windows-based software (Netcruiser) which makes all Internet services a point-and-click experience. I had read about the need to download software to get this level of convenience and was turned off at the prospect of having to do too much experimenting in order to accomplish the simple task of learning my way around the Internet.

"Another great aspect of Netcom is their fee policy. Although their basic fee is US$20 a month (which sounds a bit high), this includes 40 hours of prime time usage and unlimited off-peak usage. At first I thought this would not be sufficient but my experience is that I never use anywhere near this amount of time. Again, this all adds up to a really hassle-free service. The only negative that I have found has been a lack of local access numbers (although in my case they have now started up a local number in my area). Now that I have learned some of the finer points of what the Internet is all about I may at some point try another service. In the meantime, Netcom surely appears to be a nearly ideal way for a new user without access to an Internet server to log on. (Note that I am in no way associated with Netcom and that this purely a commentary for your benefit and that of your readers.)"

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[*Bob Alden's note:* Don has university access, but Al did not and has found an Internet access provider that made it easy for him. The number of companies with Internet access is growing rapidly—the Internet Society reports that about 50 percent of Fortune 500 companies are on the Internet and that two thirds of Internet users work for major corporations!]

WEB BROWSERS. *Blake Wood* writes: "Bob—I've enjoyed your articles in THE INSTITUTE. In the January edition, you say "Lynx is much faster than Mosaic because it does not transfer the large files needed to display graphics or produce sound ... True, but you can get the same effect on Mosaic by simply turning off 'Display In-line Images.' Although I've not used Lynx, I suspect that with in-line images turned off, Mosaic and Lynx would run at the same speed.

"I checked out the Mosaic version of THE INSTITUTE. Very nice. I like having an on-line version of it, but am not sure I want to give up my hard copy, for two reasons. First, I get and read the hard copy at home, typically with my morning bowl of Cheerios. Kind of hard to do that with a computer, and I have enough things to read at work already. Second, I can browse a hard copy much faster than I can an on-line version. It takes me about 30 seconds to make a first pass through THE INSTITUTE to determine if there's anything I want to look at more closely. It would take, perhaps, 10 minutes to do the same with an on-line version.

"If the decision is made to go exclusively to an on-line version, I have a recommendation: IEEE members should be notified via e-mail when each new issue is available. Out of sight, out of mind. I'm not likely to check every day to see if a new issue is out, and if it only comes to mind to look every other week or so, I've lost the "timeliness" advantage of on-line access that you mention in your column."

Mark Stout writes: "I thought you might like to clarify a couple points about WWW browsers in your next column.

"1. The implied requirement of a 486/33 with 8MB is grossly overstated. I have tested the 32-bit version of NCSA Windows Mosaic on a 4MB machine with no problems. According to the user documentation, it has been tested on a 386/16 with 4MB, yielding reasonable performance. This makes perfect sense, since with a 14.4 kb/s modem, the SLIP connection is by far the biggest bottleneck. Some of the earlier 32-bit versions of NCSA Windows Mosaic were real memory hogs, with poor performance on 4MB machines, but they have addressed this in later versions.

"2. For best overall performance for SLIP connection browsing, Mosaic Communications' Netscape is really the way to go. It boasts background downloads of images after the text and links have already been made available. It is freeware for academic users, and shareware for commercial users, available from "http://www.mcom.com". I have tested this on a 386/16 4MB PC with fine performance, far faster than NCSA Windows Mosaic on a 486/33 with 8MB. Netscape is also available for Mac and X-Windows.

"3. If users want higher performance over low-speed connections while using NCSA Windows Mosaic, they can always disable "Display In-line Images" for Lynx-like speed with far superior ease of use. There are similar options for the Mac and X-Windows version. Users who have access to both but choose Lynx are not very knowledgeable about Mosaic configuration. Web browsing gives new life to "low-powered" 386's that most people would just as soon write off."

Bill Evans writes: "As always, I enjoy your articles on e-mail and the Internet. Regarding the most recent one in the January 1995 issue of THE INSTITUTE, I have a comment on Lynx. I agree that it has some advantages over Mosaic. I thought you might be interested in a program which gives graphical capability to Lynx users. I made this discovery recently with a program called Slipknot. Slipknot allows someone with a Lynx capability (but no Mosaic, SLIP, PPP, etc.) to get displays of much of the material in the images on Lynx. It really works with a normal shell Unix account over modem connections and you do not need PPP or SLIP. The place to write to for SlipKnot info is "slipknot@micromind.com"; "slp-staff@micromind.com" is the technical support address. The actual file can be retrieved from: "ftp://oak.oakland.edu/SimTel/-win3/internet/slnot100.zip" and the cost is US$29.95."

E-MAIL ACCESS. *Jim Bassett* writes: "For people with only e-mail access (like me), WWW home pages are available via e-mail. Send a message to "listproc@www0.cern.ch" with "www <URL>" in the body of the message. Replace <URL> with the URL of the home page you want to read, for example: "www http://www.ieee.org/". Obviously, graphics are not sent, but the links are numbered at the end of the file, so going to the hypertext links of interest is straightforward. I've tried it several times and response time is usually less than five minutes."

I tried it. It works. It is as simple and fast as Jim suggests. If you put only "www" in the message, omitting a URL, you will get a three-page help file. I recommend you do just that.

This means that everyone who sends e-mail to the Internet can read the text of THE INSTITUTE as soon as it is posted. Don't forget, our URL is "http://www.-ieee.org/ti.html".

Since many of you have asked, the text of my columns prior to 1995 are available via e-mail and Gopher (see accompanying box) and via the Web since January '95.

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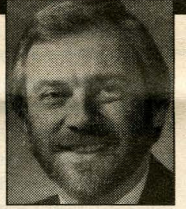
traveling the information highway

with Bob Alden



Three ways to access the Internet

As we get interested in using Web clients to access World Wide Web servers and explore the world of nicely formatted text, graphic and sound segments, we need to understand the kind of access to the Internet that we have or may wish to have.

I started my information highway travels in 1988 using a commercial e-mail service. I eventually discovered that the limitations that I found so frustrating were due to the kind of service and the characteristics of the gateway to the Internet that this company provided. In fact, that gateway seemed more like a back alley that was partially blocked, so that any access was in spite of the system.

I quickly looked for alternatives and found that my employer (a university) could provide me with full Internet access while I was at work. My office PC could be connected via a local area network to the computer system which was connected to the Internet. I also learned that I could dial up the same computer system from home; however, even though I was using the same kind of PC, somehow I had much less capability.

A few weeks ago, I started experimenting with a so-called SLIP/PPP connection. I found that I had almost the same capabilities with my home PC as with my office PC. My first system had only a limited e-mail capability, my second had everything and my third went from poor to excellent as soon as I organized a SLIP/PPP connection. What causes these large differences?

TYPES OF ACCESS. There are three. First, some basics. Then I will look at each one in detail:

1. Gateway access: Your access to the Internet is from another network to which your PC is connected.

2. Remote terminal access: Your PC is connected via a modem to a host on the Internet.

3. Full Internet access: Your PC is a node on the Internet (via LAN, SLIP, PPP). Before going into the details, here are a few definitions.

Here I am using the term "PC" to mean any personal computer: Mac, IBM PC, IBM PC (mostly!)-compatible, or non-IBM-compatible. These PCs can be running DOS (with or without Windows), Unix or virtually any other operating system, including the Mac OS. However, the more obscure the operating system, the more difficult it may be to find the communications software you need. By "host" I mean any computer that is connected to the Internet and offers external log-ins.

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LAN, RT, SLIP AND PPP. LAN stands for local area network—a method of connecting computers (hosts and PCs) together, usually within a corporate entity. If the distances become large, the term wide area network (WAN) is used, the technology is different, but the effect is the same. Each of these computers is a node on the network. RT stands for remote terminal—a physical connection (hard-wired or modem/telephone line/modem) to a host that treats your PC as a dumb terminal. SLIP stands for Serial Line Internet Protocol—a connection protocol that enables your PC to become a node on the Internet over a modem/telephone line/modem connection. PPP stands for Point-to-Point Protocol—a newer version of SLIP. (It is a more general protocol that includes SLIP, but we are in danger of getting too technical, so that will suffice.)

GATEWAY ACCESS. If your log-on ID is on a public network like BITnet or a commercial network like Sprint, it is often the gateway (connection) between this network and the Internet that determines what Internet services you can access. These limitations may be caused by technical or business considerations. Your computer may be "gagged" by your network/gateway. BITnet is a store-and-forward network, hence the limitation is technical. Sprint (used under the name "Compmail" for the past several years by some IEEE volunteers) is an example of a network that was initially developed for e-mail and other services for subscribers who wanted such services. Full Internet access was simply not the intended service. The emerging IEEEnet (soon to be offered to IEEE members on a fee-for-service basis by the service provider) is a network that has been designed to offer full Internet access and services that are consistent with that goal. So, if you have (or are planning to have) a log-on ID on such a network, find out which services are available. See the next two sections.

REMOTE TERMINAL ACCESS. Generally, with this type of access, you dial through a modem and log on to a host computer which is connected to the Internet. Your host usually runs e-mail, telnet, and FTP software, as well as Gopher, Lynx, etc. *if* these programs are installed. You pass commands to the host. The host treats your PC as a dumb terminal, and as a consequence you likely do not have unrestricted full-screen text editing. You also have the double downloading dilemma!

For example, suppose you are using the host's gopher client to access the IEEE's gopher server, and you elect to download (using e-mail or FTP) a file from the IEEE computer to you. It arrives, not at your PC, but at your host computer. Then you have to download the file from your host computer to your PC—and that can be time-consuming and tricky.

FULL INTERNET ACCESS. There are several ways to do this—using a computer (host) with a Unix or VMS (etc.) operating system and connected to the Internet, or using a PC connected via a LAN to a host, or using a PC with a SLIP or PPP connection via a modem to a host. Your computer/PC runs e-mail, telnet, FTP, Gopher, Mosaic, etc.—depending on what software you have installed. Your computer/PC is a node on the Internet. Your PC can use all its power—full-screen editing, saving to your hard or floppy drives, printing to your printer, etc.

I have recently experimented with two SLIP connections. One connects my home PC to the Internet using software obtained from my employer's computer support group. The other connects a notebook PC to the Internet using IEEEnet.

I found the IEEEnet software really easy to use. Both connections work well, and I love the ability to check my e-mail from almost anywhere I am likely to be, transfer files easily, use my full-screen editor, access Web servers, and all that great stuff that the Internet provides.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Coordinating Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ontario, Canada. He welcomes your input via e-mail at "r.alden@ieee.org".

traveling the information highway

with Bob Alden

Expectations — a reality check

It is late in the 19th century and twilight has arrived as I sit down in my home in London, England, write a short letter, and drop it in the post box at the corner of my street. I expect that it will be delivered tomorrow morning and that I will likely get a reply later that day. My friend lives at the other end of the country, but the railway service is very fast and dependable. Mail sorting is done on the train, and I have come to depend on twice-a-day delivery. Since I am in a privileged class and can read and write, I can access this postal system, which for me seems very inexpensive. How times have changed from the days when mail was carried via horseback!

For me, this is an extremely fast way to communicate, although I am never really sure if my mail has been delivered. Little do I know that telephone technology is emerging and I will be able to send my voice across the miles and hear the voice of my friend immediately acknowledging my message. What should I expect? Will I be impressed by that new technology or will I be frustrated by the loss of privacy that instant access will bring? One person's delight is often another's aversion.

INFORMATION AGE. Well, a few more years go by and new technological advances occur. The age of the so-called information highway is beginning. This highway starts with computer operators in the '50s who begin to communicate among themselves using weird specialized languages and obscure protocols. These secretive rituals slowly spread to other computer users as non-operators are permitted to touch and then control the new breed of smaller, simpler computers. The invention of the modem causes a quantum leap in accessibility, and the number of computer techies grows.

The Internet is born from roots of military secrecy and academic researchers engaged in hush-hush projects. Other academics become interested in the rapidly expanding world of computers that do less computing but process words, draw pictures and exchange electronic mail messages. Then innovative business leaders realize they can develop and sell information services that access airline schedules, stock market listings, weather reports, on-line dictionaries and the like, along with some e-mail exchanges among fellow subscribers. The result — the commercial fee-for-service networks and a whole new breed of nontechnical users.

Then the media discovers the Internet. Almost everyone knows about the Internet. Freenets are developed. Internet access services are developed. Extensions to the Internet are developed. Millions of people start to use the Internet. More and more users transfer larger and larger files more frequently. What would happen if that many people suddenly discovered the automobile (at the price of a PC) and started to use a system of roads and gas stations that had been designed for a very small subset of the population?

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A DIGITAL WORLD. Today, we are integrated in an electronic communications world that spans the globe, and offers a myriad of services — some for payment, some free. We can come to expect that since this new world is digital, it must be accurate, reliable and very low-cost. Perhaps. In some cases. At times. Yes, e-mail is transferred across the Internet in split seconds. However, if it crosses a boundary between the Internet and a relatively restricted network or hits a bottleneck, there can be delays of seconds, minutes or hours — just like leaving a superhighway and encountering a toll booth, customs checkpoint, road construction or a washout.

Perhaps your e-mail is delivered promptly. Who will read it? Is that person busy, out of town or overworked? Maybe he or she simply does not know what is needed to answer you. We need to distinguish between our expectations of the communications technology and our expectations of the people with whom we communicate. By the way, you can often double-check the address of a recipient or see when that person last logged on. It's called the finger command and is used as follows. From the system prompt, type "finger name@host", where host is the computer address and name is either the first name, surname or the log-on ID. You usually get back all matches to "name" on the computer "host" as well as when the person last logged on and if they have unread mail.

LOST MAIL. Perhaps your e-mail did not arrive. The vastness of the Internet is also a liability. With a small, closed network, the network/system manager knows all possible users and can tell you if you did not send to one of a relatively small number of known recipients. There is no worldwide Internet system manager — unless we wish to enter the realm of religious speculation. But that may be more dangerous than getting too technical!

WEB WARNINGS. The world of text has expanded to include graphics and sound clips. The advent of the World Wide Web and the free availability of Web browsers on FTP sites is leading to a topsy-turvy expansion of Web sites. Everybody is putting up "home pages." This is exciting in one sense, but it has to be tempered with the realization that most of the current Web sites and services are experimental. An example of this involves an address I quoted in the March issue of THE INSTITUTE. I noted that it is possible to use e-mail to access the text of Web pages by sending a message to "listproc@www0.cern.ch". Shortly after I wrote that column, that address changed to "agora@mail.w3.org"! My thanks to many of you who helped us discover both the problem and the solution.

Do not be surprised if there is very little content after the home page. Many of the "clickable" keywords lead only to a "under construction" sign or an "unavailable" message. Do not be surprised if the graphics seem to take forever to download. Many people use the option — present in most browsers — to turn off the automatic downloading of graphics. Beware of content accuracy or timeliness — it is much easier for an enthusiastic individual to post information once than to set up a system within the company to responsibly manage that information-posting over time. At IEEE we have only recently hired our first-ever director of electronic communications with a specific mandate to do just that — manage our rapidly expanding use of electronic communications services. We welcome Tom Brisco.

CHALLENGES. These are interesting times — exciting to some, frustrating to others. We have a lot of new technology with the potential to help us communicate widely, quickly and efficiently. But to reach this potential, we need to improve the bandwidth of our communication channels, we need to improve the software packages we use to access this technology, and we need to adapt how we do the business of creating, managing and accessing the content. Changing the mindset of the people involved and coping with the new responsibilities that this developing technology brings is perhaps the most difficult part. To have realistic expectations, we need to understand the current infrastructure limitations.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Coordinating Committee and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ontario, Canada. He welcomes your input via e-mail at "r.alden@ieee.org".

traveling the information highway

with Bob Alden

FTP: copying files — the options

There are two ways to get the software you need to navigate the information highway: purchasing software packages when you buy your computer or afterwards, and using FTP (file transfer protocol) to copy files from the many anonymous FTP sites on the Internet. Many readers are asking for FTP site locations and how to use FTP. Let's look at the alternatives — and yes, there are alternatives for you to consider. The choice depends on what you have in terms of network, connection and software.

FTP. This acronym could stand for Frustratingly Tricky Process or Friendly Transfer Pal. The basic FTP process is a Unix procedure. If you are familiar with Unix commands, you will likely not have a problem. Modern software packages, especially those that are Windows-based, take the pain out of using FTP for those users who are not Unix-conversant. The various gopher and Web clients also tend to make copying files fairly simple. Realize that you can copy any kind of file — ASCII text, word processor, spreadsheet, database, graphic, program, or a set of routines that need to be assembled. The files may be ready-to-use, compressed, or sets of files that have been tarred, which means they have been bundled together as a single file. The latter two techniques enable simpler and faster copying.

BASIC FTP. If you are using the original Unix procedure of typing "ftp sitename" from the Unix prompt, you need to know the Unix FTP commands, "ls" to list the contents of a directory, "cd" to change to a different directory, "get" to copy a file from "sitename" to a directory on your computer, and "quit" to leave the FTP process and return to the Unix prompt. Two of these commands, "ls" and "get," have a variety of command options, so you need to know about the Unix help command, "man" — short for manual — to look up what these options are and how to use them.

After you are connected, you have to log on. If you already have an account on the remote site, you enter your user ID in response to the name prompt. Then enter your password (which came with your account authorization) in response to the password prompt. This is just the same as logging on to your regular host computer.

If you don't have an account there and if it is an anonymous FTP site — which means anyone can log on — then you enter "anonymous" in response to the name prompt and your full e-mail address "name@machine" in response to the password prompt. Anonymous FTP sites usually require that users identify themselves in this way.

After you are logged on, you type the FTP commands to find and copy files. You use this method if you are logged on to a host machine with remote terminal access and if your host machine has an Internet connection that supports FTP — usually this means you have full Internet access. (Please see the April issue of THE INSTITUTE for an explanation of different kinds of Internet access.)

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

WINDOWS FTP. If you can click on an FTP icon, you are likely using a user-friendly Mac or Windows-based FTP package. Here you usually have the advantage of immediately seeing a split screen separating the local and remote locations. A simple window gives prompts for you to enter the remote sitename, your name and your password. Your log-on procedure requires the same information as in the previous paragraph, but it is simpler to use (in my experience).

The display of directories and file names is user-friendly and you have control of the screen so you do not lose sight of file names that scroll off the top of the screen. Copying a file is as simple as clicking on and dragging a file icon from one of the split screens to the other. You are usually prompted to indicate whether the transfer should be in binary or ASCII text form. I tend to use binary in all cases. You use this method if your computer is connected to the Internet directly, not as a remote terminal. If you are using a PC and modem, you need a SLIP or PPP connection. (Please see THE INSTITUTE, April 1995 for an explanation of these terms).

E-MAIL FTP. If your access to the Internet is via a network that does not support FTP service, but does enable you to send to and receive e-mail messages from the Internet, then you can use e-mail messaging to achieve the same objective of looking at FTP directories and copying files. This is only possible if the FTP site has set up software to provide this service. I decided to see if I could find one of these sites, since some of you have asked me. I found a reference that pointed me to the University of California at Irvine, Calif., USA and then to Clarkson University, N.Y., USA. These are two sites that offer this service. I am currently trying to find a listing of such sites. If any of our readers can help me with such a source, I will publish the location. To find out about this service, send a message to "archive-server@sun.soe.clarkson.edu" and place the word "help" in the subject line. The content of the message is irrelevant, as it is ignored. You should get back a four-page listing that describes all the commands and instructions on how to construct a message and use this service. The other address I tried is "archive-server@ics.uci.edu". After checking both sites several times, it seems that the second site is more reliable.

If you are copying an ASCII text file from a Unix machine to a DOS machine, you need to convert from Unix to DOS format. (Unix files may appear as one long line in some DOS-based editors, so you need to add carriage returns.). There are Unix-to-DOS and DOS-to-Unix conversion routines to do this.

SITE INFO. In previous columns, I have noted specific anonymous FTP sites where software is available. IEEE has its own FTP site, "ftp.ieee.org", but in general does not copy software from other sites and make it available to you at the IEEE site. The reason is the problem of software updates. By referring you to the originating site, we believe you have the best chance of obtaining the latest version. To assist you in tracking these site addresses — and they do change occasionally — I have prepared an ASCII text file called "info.highway.update". It will be updated as the need arises and should be more current than older issues of this column. This file is listed in the file "info.email" mentioned in the insert box with this column.

THE NAME. In closing, I want to address another issue that some of you have raised — the name of this column. Some of our readers are unhappy with the use of the phrase "information highway" and would prefer I use the word "Internet" instead. Let me try to put my choice in perspective. I do not use the phrase "information superhighway." I believe that phrase is overused by the public media and used in a context that is too broad for engineers. Within engineering circles, it properly means very high-speed, wide-bandwidth paths that, at present, only exist in a few experimental locations. The Internet implies the network (of networks — see THE INSTITUTE, February 1995) which is the communication channel. There is debate as to whether the name should only apply to the so-called Internet backbone, primarily in the United States, or should include regional networks, BITnet, EARN, etc., which have varied degrees of connection capabilities with the Internet backbone.

There is also the question of focus. Within IEEE we are concerned with the use of the network, the tools to access this network, the tools to produce specialized technical and general information, and the understanding necessary for success. IEEE members work together in society and section activities to help each other become more productive. From my viewpoint, we are fellow travelers in search of information.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Coordinating Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ontario, Canada. He welcomes your input via e-mail at "r.alden@ieee.org".

traveling the information highway

with Bob Alden

Not surfing the Net

The term "surfing the Net" implies browsing the Internet using software such as Mosaic and hopping from one server to another, yet another and another ... This is the purview of the young who have lots of patience and time and who are used to learning by exploration. Most engineers have neither the patience nor the time. For many, the day is governed by billable hours and the evening is divided by competing interests. For many users, there is also the cost of connect time — browsing can be interesting but very expensive. Bottom line: If you have the time and interest, Net surfing can be fun and fascinating.

However, if you want to find some information quickly, or if you want to learn about a new service, you are looking for some pointers to speed you on your way. Over the course of developing and writing this column, I have logged on to many different sites and tried a variety of servers. This column presents a compilation of this information, updated to include changes that have occurred since publication and corrected to fix a few errors. There are a few additional site addresses that I have collected along the way, including some that were submitted in letters to the editor.

This information is also available in a file called "info.highway.update" that I referred to in my June 1995 column. In a sense, it also represents a brief overview of the kinds of electronic communications services that we have discussed in THE INSTITUTE.

This information is provided on an as-is basis for use by IEEE members. While I personally attempt to provide information that is correct at the time (please realize that THE INSTITUTE is completed six weeks before the date of publication), neither I nor the IEEE can guarantee that all this information is correct and appropriate for every user. Also, any of the addresses or commands may be modified or discontinued by their respective site management. Some file transfer protocol (FTP) site addresses include a directory (after the colon). There are often separate directories for Unix, Mac or Windows applications.

LOGOS: IEEE members may copy logos from the IEEE FTP site and use them as IEEE volunteers working in a recognized IEEE entity (e.g., a section newsletter). Any other use is a violation of copyright law.

An ASCII text file for each of these Information Highway articles is provided for use by IEEE members. The file-naming convention is, by example, ti94.1 for issue number 1 (January/February) of THE INSTITUTE in 1994 . Any IEEE member may copy these files for noncommercial purposes and reproduce them in full, provided that the IEEE is identified as the source and the year and month of the issue of THE INSTITUTE is quoted.

In the list below, the first (left) column is a brief descriptor of the entity or service. The second column is the address you log on to or send to. The third (if present) is a comment or the command you place on the first line of the message, where appropriate; this is to get help on how to use the service. The reference in square brackets is to the relevant article in THE INSTITUTE.

Since the contents of the articles are available from IEEE servers via e-mail, as well as Gopher and Web, please do not write to me to ask how to use or access these addresses. To find out how to obtain copies of these files, send a message to "fileserver@ieee.org" and place the file name "info.email" (without the quotes) at the start of the first line of the message. Please send any corrections to this information to me at "r.alden@ieee.org".

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Coordinating Committee and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ontario, Canada. He welcomes your input via e-mail at "r.alden@ieee.org".

A list of tools and resources for electronic communications

FTP servers [ti93.3]

Cello software [ti94.9]	ftp.law.cornell.edu:/pub/LII/cello
Freenet site info [ti94.9]	nptn.org:/pub/nptn/nptninfo/
Gopher software	boombox.micro.umn.edu:/pub/pc/
IEEE logos [ti95.8]	ftp.ieee.org:/info/software/logos
Internet connectivity [ti95.2]	ftp.cs.wisc.edu
Lynx software [ti95.1]	ftp2.cc.ukans.edu:/pub/WWW/lynx
MacWeb software [ti95.2]	ftp.einet.net:/einet/mac/ macweb/macweb.latest.sea.hqx
Mosaic software [ti94.5] [ti94.9]	ftp.ncsa.uiuc.edu:/Web/Mosaic/Windows/ ftp.ncsa.uiuc.edu:/Mac/Mosaic
Netscape software [ti95.5]	ftp.netscape.com (1)

Web servers [ti94.5]

IEEE [ti95.1]	http://www.ieee.org/
IEEE's THE INSTITUTE [ti95.1]	http://www.ieee.org/ti.html
IEEE Computer Society [ti95.3]	http://www.computer.org/
IEEE Canada	http://ieee.ca/
IEE (UK)	http://www.iee.org.uk/
Internet info [ti95.2]	http://www.internic.net/
Original WWW server [ti94.5]	http://info.cern.ch/

Archie servers [ti93.5]

Australia	archie.au
Canada	archie.uqam.ca
Japan	archie.wide.ad.jp
Switzerland	archie.switch.ch
United Kingdom	archie.doc.ic.ac.uk
United States (NJ)	archie.rutgers.edu
United States (NY)	archie.ans.net
United States (MD)	archie.sura.net
United States (NE)	archie.unl.edu
Original Archie server	archie.mcgill.ca (not currently active)

Gopher servers [ti94.1]

CAnet info	nstn.ns.ca
IEEE info	gopher.ieee.org
Internet info	gopher.internic.net
Original Gopher server	gopher.micro.umn.edu

Telnet servers [ti93.3]

Internet databases	ds.internic.net
Internet registration	rs.internic.net
Public Gopher clients	consultant.micro.umn.edu (in U.S.A.) gopher.ebone.net (in Europe) info.anu.edu.au (in Australia) tolten.puc.cl (in South America)

All of the above addresses (called URLs for World Wide Web) are ones that you log on to.

The following discussion group aliases are ones to which you send messages for distribution to the members of the group. To become a member of a discussion group, you send a subscribe-message to the list manager (the IEEE currently uses "majordomo" and previously used "listproc".)

Mailing lists are set up so members of the list can receive messages sent by the owner of the list. To become a member of a mailing list, you also send a subscribe-message to the list manager (the IEEE currently uses "majordomo" and previously used "listproc".)

IEEE discussion groups [ti94.4]

Freenets [ti94.4]	freenets-d@ieee.org
IEEE Section BBS [ti94.4]	secbbs-d@ieee.org
World Wide Web [ti94.8]	web-d@ieee.org

In the following aliases or addresses, if the third column contains the phrase "*Note:* message is read," you have to compose your request as a message that will be read by a person.

For all others, either the message content is ignored and a pre-written text file is automatically returned to you, or the command(s) you have inserted as the message content is automatically parsed and implemented, if you have typed the command(s) exactly. (Some processes require the command to be placed in the subject line instead of in the message. See note where this applies.)

E-mail aliases [ti93.1]

Order any publication	askieee@ieee.org	*Note:* message is read
Info on your membership	member.services@ieee.org	*Note:* message is read
Info on EInet	einet-info@einet.net	
Info on NPTN (freenets) [ti94.8]	info@nptn.org	

Fileservers and list managers [ti94.3]

Archie via e-mail [ti93.5]	archie@archie.au	help
FTP via e-mail [ti95.6]	archive-server@ics.uci.edu	help (in subject line)
IEEE fileserver help [ti94.3]	fileserver@ieee.org	help
E-mail and electronic communications info [ti93.4]	fileserver@ieee.org	info.email
IEEE alias directories [ti93.1] (staff, members/volunteers, sections, societies and student branches)	fileserver@ieee.org	info.directory (2)
IEEE alias update info [ti94.8]	fileserver@ieee.org	info.alias.update
IEEE e-mail guide [ti92.6] (for volunteers)	fileserver@ieee.org	email.guide@ieee.org
IEEEnet info (not yet available)	fileserver@ieee.org	info.ieeenet
IEEE list manager help [ti94.3]	majordomo@ieee.org (3)	help
◆Subscribe to list		subscribe xxx-d
◆Unsubscribe from list		unsubscribe xxx-d
Internet tutorial	listserv@ua1vm.ua.edu	get week1 package F=mail
NIXPUB info	mail-server@bts.com	get PUB nixpub.long **or** get PUB nixpub.short
PDIAL info [ti94.7]	pdial@infomania.com	
◆current version	info-deli-server@netcom.com	send pdial
◆updates and news	info-deli-server@netcom.com	subscribe info-deli-news
Web pages via e-mail [ti95.3]	agora@mail.w3.ch (4)	www

Details on changes

(1) Netscape software address is ftp.netscape.com for v1.1 (May '95) ftp.mcom.com was quoted earlier for v1.0 (Feb. '95)
(2) info.forward changed to info.directory (Feb.'93)
(3) listproc@ieee.org changed to majordomo@ieee.org (July '94)
(4) listproc@www0.cern.ch changed to agora@mail.w3.org (Feb.'95)

traveling the information highway

with Bob Alden

Producing Web pages

Most years, my wife and I spend a couple of weeks visiting family in England. Part of that holiday is always spent browsing one of our favorite bookstores in London — Dillons. Six huge floors of books on virtually every subject. Each year, I have watched the "Internet" section grow from a subset of the Electrical Engineering/-Computer Science collection to a large department of its own.

Last year, August 1994, I noted there were no books on the Internet that were written by non-North American authors. This past May I found two. One book is called "Internet Access — A guide for the U.K. and Ireland" by John Smith of the University of Bath, England, and published by Thompson Publishing. A first pass of the contents suggests to me that Internet access is developing rapidly in that part of the world.

The other is entitled "World-Wide Web, Mosaic and More." Written by Jason J. Manger of Surrey, England, and published by McGraw-Hill in August 1994, it is an excellent book that explains how to write Web pages and view them using Mosaic or Cello. I read several chapters, then used a simple text editor to write my Web pages and Mosaic to view them (I also used Netscape and confirmed it worked as well).

I learned enough from this book to realize that producing a set of Web pages is fun and fairly straightforward. One of the first things I learned is that a Web page is an ASCII text file with imbedded commands called tags. Such a file is called a hypertext document. Usually there is a set of related Web pages (files); the starting page of this set is called the home page. Before I get into the details of these tags and what they do, I will look at the overall process.

GETTING STARTED. To get started you need a computer with two kinds of software — one to write the Web pages and another to view them. You can do this on a Mac, a PC running Windows or a Unix workstation. I will describe the process from my experience using my PC with Windows. I hope that Mac users will find the information sufficiently relevant to be useful. I tend to assume that users of Unix-based systems are more computer-literate and will not be looking for the operational details. I hope that is okay!

If you prefer to use a word processor instead of a text editor, you will need to save the files in ASCII format or use one of the templates that may be available for your word processor. I am told there is one for Word. I saw the WordPerfect template in use and I downloaded it by following the instructions on the home page at "http://wp.novell.com/-elecpub/intpub.htm". It took a good 15 minutes or more to download, so be prepared to do something else while you wait.

THREE STEPS. I think of three steps to produce on-line working Web pages. Step 1 is to develop and test them on a PC in an off-line mode (not connected to the Internet). Step 2 is to convert and move these files (Web pages) from the PC to the computer hosting the Web server where your files will be located. I could have developed and tested on-line, but since our server is Unix-based, I chose to work in a DOS environment for the major editing of step 1. Step 3 is modifying the files to keep the content current. To do this, I used a Unix editor for minor on-line modifications.

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

This month I will look at some of the basic concepts in step 1.

STEP 1. Off-Line Development. After reading Chapter 2 of Jason's book "An HTML Primer," I prepared an ASCII file containing a sample set of codes (please see Fig. 1). This served two purposes: to remind me of the general format and some of the tags I would likely use often, and to provide a file from which I could copy and edit each time. Let's look at the tags in Fig. 1 and see what they do.

A tag is a command placed between the symbols "<" and ">". Tags are either single or paired. An example of a single tag is <p> which denotes the end of a paragraph. This is needed since all carriage returns are ignored as the line length is determined by the size of the window that the user selects. Paired tags have a "/" to signify the second of the pair. For example <html> and </html> are used to denote the start and end of a hypertext document.

HEADER. <head> and </head> denote the start and end of the header section. This contains the title, also defined by tags, which appears as the title of the window displaying the Web page.

BODY. The rest of the document is the body, which contains everything else. <body> and </body> denote the start and end of the body section. This seems like overkill to me, but I understand that you may have problems in future if you do not include it. The body contains paragraphs of text and highlighted phrases that are the links to other pages. At the end, there should be two standard items, the name of the author of the page and the date the page was last revised (or the date the page becomes obsolete).

```
<html> <head> <title> Replace with the title </title> </head> <body>
<h1> Replace with a level 1 heading </h1> <br> ..... place text here
<ul> title of a set of bulleted items
<li> first bullet
<li> second bullet </ul> <p>
<a href="file:///e|\ieee\web\fname.htm"> highlighted text </a> <p>
<address> Author: Robert T.H. (Bob) Alden: r.alden@ieee.org </address> <p>
<i> Date of latest revision: Tue 23 May 1995 </i> </body> </html>
```

Fig. 1. Sample Hypertext File

FORMATTING TAGS.
 denotes the end of a line. <p> denotes the end of a paragraph. The pair <h1> and </h1> defines a heading. The number following the "h" can be from "1" to "7" and denotes a range of heading styles. These styles are defined in your copy of Mosaic (or whatever browser you are using), but generally <h1> is the largest and <h7> is the smallest. The pair and define the use of italics. The set <ul> ...   defines a set of bulleted items. If you replace <ul> and by <ol> and , the items are numbered sequentially instead of being bulleted.

LINK TAGS. Hypertext links are defined by the tag set " bbb " where "aaa" is replaced by the URL (Uniform Resource Locator, which means the place where the other document is located) and "bbb" is replaced by the text to be highlighted as the visible identifier for the link. Figure 1 shows a DOS file location format (drive, path, file name), since I store the files on my PC during step 1.

AN EXAMPLE. Figure 2 shows the file I created using my text editor and copying the lines of text from my sample file (Fig. 1) to create the correct format and tag codes. The specific textual information is added as required. You can view the source code (as in Fig. 2) for any Web page you are reading by selecting "File" then "Document Source" from the Mosaic screen menu. This code is for an artificial home page that combines some of my home page with information that normally appears at the end of this column. The URLs for the 1995 columns are the actual ones in case you want to try them. Also, the URL for my real home page is:
"http://power.eng.mcmaster.ca/alden/alden.html".

The corresponding screen that one observes using a Web browser such as Mosaic is illustrated in Fig. 3. If you create a file exactly as in Fig. 2 and view it using Mosaic, you should see the screen depicted in Fig. 3. To do this, and assuming that you have named your file "test.htm," and you have it on drive "d" in directory "www," then you click on the "File" menu, then the "Open URL" menu, and type "file:///d|www\test.htm" into the URL window and press "Enter." After all, that is exactly what I did to make sure my example was correct! If there are differences, flip back and forth between Mosaic and your editor until you get it right. Note that you can not click sucessfully on the hypertext links until you install your file on the network. But that is part of a future issue. Till then, happy surfing!

```
<html> <head> <title> Bob Alden's Home Page </title> </head>
<body> I am currently the chair of the IEEE Electronic
Communications Coordinating Committee, and a former IEEE
vice president. In my other life, I am the director of the Power
Research Laboratory at McMaster University in Hamilton, Ontario,
Canada. I welcome your input via e-mail at "r.alden@ieee.org".<p>
I currently write a column entitled <i> "traveling the information
highway with Bob Alden" </i> which appears regularly in THE
INSTITUTE (the news supplement to IEEE Spectrum). <p>
Since January 1995, these articles are on the Web: <ul>
<li> <a href="http://www.ieee.org/INST/jan95/inf_hwy.html">
January 1995 </a> <br>
<li> <a href="http://www.ieee.org/INST/feb95/inf_hwy.html">
February 1995 </a> <br>
<li> <a href="http://www.ieee.org/INST/mar95/inf_hwy.html">
March 1995 </a> <br>
<li> <a href="http://www.ieee.org/INST/apr95/inf_hwy.html">
April 1995 </a> <br>
<li> <a href="http://www.ieee.org/INST/may95/inf_hwy.html">
May 1995 </a> <br>
<li> <a href="http://www.ieee.org/INST/jun95/inf_hwy.html">
June 1995 </a> <br>
<li> <a href="http://www.ieee.org/INST/jul95/inf_hwy.html">
July 1995 </a> <br> </ul> <p>
<address> Author: Robert T.H. (Bob) Alden:
r.alden@ieee.org</address> <p>
<i> Date of latest revision: Fri 16 Jun 1995 </i> </body> </html>
```

Fig. 2. Document Source

I am currently the chair of the IEEE Electronic Communications Coordinating Committee, and a former IEEE vice president. In my other life, I am the director of the Power Research Laboratory at McMaster University in Hamilton, Ontario, Canada. I welcome your input via e-mail at "r.alden@ieee.org".

I currently write a column entitled *"traveling the information highway with Bob Alden"* which appears regularly in THE INSTITUTE (the news supplement to IEEE Spectrum).

Since Jan 1994, these articles are on the Web:

- January 1995
- February 1995
- March 1995
- April 1995
- May 1995
- June 1995
- July 1995

Author: Robert T.H. (Bob) Alden: r.alden@ieee.org

Date of latest revision: Fri 16 Jun 1995

Fig. 3. Document As Viewed

traveling the information highway

with Bob Alden

Producing Web pages, part II

In the August issue I introduced the task of producing Web pages and divided that task into three steps; (1) to develop and test Web pages in an off-line mode (not connected to the Internet) on a PC, (2) to convert and move these files (Web pages) from the PC to the computer hosting the Web server where the files will be located, (3) to modify these files to keep the content current.

In this issue I will look at steps 2 and 3, but first let me share four responses from our readers to that August column, which addressed step 1.

Dan Ward correctly notes that you need WordPerfect version 6.1 to use the WordPerfect HTML template.

Kent Butler writes, "I thought you might like to be made aware of another book on Web page creation. There is a book called 'HTML Publishing on the Internet' by Brent Heslop and Larry Budnick. It cost me US$49.95 at Barnes and Noble. It comes with a CD-ROM with several different programs and sample pages, pictures, etc. To get a preview of what the book looks like and the latest software, access the Online Companion via the World Wide Web at 'http://www.vmedia.com/piw.html'."

David Delanod writes, "I read with interest your recent column on producing Web pages. I have recently started editing pages for local documentation and have run across an HTML editor called HoTMetaL that I have had a lot of success with. There is a SPARC and Windows version available, including a free version to try out. You can access it via FTP at 'ftp.ncsa.uiuc.edu/Web/html/hotmetal' or access 'http://www.sq.com/products/-hotmetal/hmp-org.htm' on the Web."

Susan Brotman writes "I don't always have the time to plow through the books on 'how to do...' Therefore, I especially appreciate articles that give concise and accurate examples and the gist of programming, especially Unix stuff. Your column on producing Web pages is a great example of useful information to me. Thanks. One tag I noticed that you didn't expand on was the address tag. I searched some source code of HTMLs, the tag produced italic text automatically, but didn't provide much else. I thought perhaps one could select and reply to it. So why use it?"

Please look back at the second to last line in Fig. 3 of the August column to see the use of the address tag Susan refers to. Susan's thought is correct, if one has the right browser. Netscape works. Mosaic does not — at least, in the versions I have used. Always remember that Web technology is developing rapidly — don't expect consistency!

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

Now let's look at steps 2 and 3 to continue our overview of how to produce Web pages. By the way, this overview assumes that the Web server is on a computer with a Unix operating system. While this is the most common situation, other operating systems can be used.

STEP 2. *Moving Your Pages On-Line.* To put this section in perspective, I note that in the August column, I created my pages off-line using an ASCII text editor (DOS) and viewed them using Mosaic (any Web browser will work). By flipping back and forth between my text editor and Web browser, I was able to modify the hypertext document until it displayed as I wanted it to. The next step is to convert this ASCII text file, which is stored in a directory on my PC, to a Unix file stored on the Unix machine hosting the Web server (the computer where the HTML file will be stored for access over the Internet).

Before you can do this, however, you need to have been given write permission for the directory on the Web server where your files will be stored and accessed. See your system manager (or someone with superuser authority). You will also need to use a couple of Unix commands. (I will give these commands explicitly.)

Using the same example as in the August issue, the DOS file is "test.htm" in directory "www" on drive "d". HTML files must be given the extension ".html" in order to be read by browsers using the URL (Uniform Resource Locator) convention. To transform the DOS file on the PC to a Unix file on the Web server, four separate processes are needed.

(1) Convert from DOS to Unix format. I use a DOS utility called "dos2unix". The command is "dos2unix test.htm".

(2) Upload (copy the file) from the PC to the Web server. Our system manager has installed utilities so that I can access my Unix directory as if it were a DOS drive similar to those on my PC. I can upload by simply using a DOS file manager to copy from my PC drive to the simulated drive. If I did not have this feature, I would use FTP to transfer. (Please see THE INSTITUTE, June 1995 issue to read about FTP — file transfer protocol.) If you use FTP in ASCII mode, the DOS/Unix format differences are handled automatically, so you can skip step 1.

(3) Rename the file to change the extension from ".htm" to ".html" using the Unix command "mv test.htm test.html"

(4) Give the file "world read" permission using the Unix command "chmod 644 test.html". Under the Unix operating system each and every file is assigned permissions for users to read, write and execute. Users are categorized into owners, members of a group, or everyone else (the world). The argument "644" specifies that everyone can read the file, but only the owner can write (edit or delete) the file. You may not need to do this step, but I prefer to make sure.

If everything has gone correctly, your Web page is now live on the Internet and you (and everyone else) can view it using a Web browser.

If the file "test.html" is in directory "alden" on machine "power.eng.mcmaster.ca" (the directory for my home page where I have read/write/execute permission) the URL would be "http://power.eng.mcmaster.ca/alden/test.html". The format of this URL is different from the one used to view the development file on the PC (see the example in the August issue).

The directory "alden" is actually a subdirectory of the directory "www" where the system manager has created the Web server. On our machine, the full path specification is "usr/local/www/alden/test.html", but the URL only needs the portion following the Web server directory.

STEP 3. *On-Line Modifications.* Once you have an active home page, you need to keep it current by editing the contents. To do this, I use a Unix editor for these on-line modifications. I use "vi," which is the standard full screen editor that is embedded in virtually all Unix operating systems. Some say it is clumsy, others view it as a classic. I decided to learn enough of it to get by and I have not yet been on a Unix machine where it was not available. The alternative to using a Unix editor is to download the file to your PC, convert to DOS format, edit, and repeat the four processes to put it back as a Unix file on the server.

WEB DOCUMENTATION. Tom Bontrager, our IEEE Webmaster, has compiled some very useful information for writing Web pages and submitting items to the IEEE. For on-line reading, access the IEEE home page "http://www.ieee.org" and click on "IEEE Web Documentation" near the end of the page. Tom has provided a good set of rules to follow — in keeping with the IEEE tradition of establishing and promulgating standards for technical procedures. The last clickable item on the home page is "IEEE mail form" which provides a very convenient way to send requests to IEEE staff about a wide range of things — membership, products (including standards), services, etc.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Coordinating Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org".

traveling the information highway

with Bob Alden

More about FTP

In the June issue I discussed various options for using FTP — file transfer protocol — to copy files from someone else's machine to yours or vice-versa. This month I want to share some feedback I received from that column.

EASIER WITH WINDOWS. I commented that the newer FTP icons that exist on many Mac- or Windows-based systems make the job of using FTP much easier than it used to be when one used the basic FTP command that is part of the Unix operating system. Several Unix users reminded me that X-Windows, which runs under Unix, offers the same convenience. I agree. Let me just add that if you are buying a new computer system or upgrading your present one, and if you are not familiar with electronic communications tools, e-mail, FTP, etc., the window style of environment will make your life a lot easier. For example, obtaining a copy of a file is as easy as dragging the file's icon from the window containing the remote list of files into the window containing the local list of files.

E-MAIL FTP. Several readers responded to my request for information on FTP sites that support the use of e-mail messages to request file transfers. This technique enables users who cannot use FTP but who can send e-mail messages to be able to transfer files between machines.

BITFTP. Bob McGann writes, "One source I've used for months with little or no problems is the BITFTP facility out of Princeton University. They've been able to transfer many files to my Compuserve account and are able to split files as needed to accommodate Compuserve's limitation on block sizes. To get an initial help file, send an e-mail message to 'BITFTP@pucc.princeton.edu' with 'help' as the body. The subject can be left blank. You will receive about six pages of information on how to construct the e-mail messages needed to command the BITFTP interface. The help file is fairly concise and I don't think many people will have a hard time understanding it."

My thanks to Bob McGann and also Brice Wightman and Santiago Fisher for the Princeton site tip. I followed their suggestions and sent for the help file. Since the Princeton site offers a service that enables you to access other sites via e-mail, I will quote here the example from that help file and explain how to use this service:

```
FTP nis.nsf.net
USER anonymous
cd introducing.the.internet
get intro.to.ip
get network.gold
get where.to.start
get zen.ps
get zen.txt
QUIT
```

This example illustrates nine lines that you can enter as the body of your message to "bitftp@pucc.princeton.edu".

The first line contains the command "ftp site" and is the instruction to connect to and open an FTP session on a remote site (nis.nsf.net in the example). Alternatively, to connect to the IEEE FTP server use the command "FTP ftp.ieee.org".

The second line is the log-in command for a site which offers anonymous FTP log-in service. If you want to FTP from a site where you have obtained log-in permission — for example with a log-in ID "freD" and password "Xy5#", then the second line would be "USER freD Xy5#".

The third line is to change to a subdirectory called "introducing.the.internet". The next five lines are commands to get (or copy) the five files that are in that subdirectory. The last line is the quit command to leave the FTP session. The commands to change directories and get files imply that you know the names of the files you want and in which directory they are stored. There is often an index file in the log-in directory that lists file names and paths. On the IEEE FTP server the file is named "info-index.paths".

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

As this is such a very useful service it is often busy, so expect delays ranging from minutes to several days! There are other commands you can use to list files, or change the transfer mode or the size of the files that are sent (long files are subdivided for mailing). These are described in the help file.

FTP SITES. To get a list of sites that offer anonymous FTP log-ins, send an e-mail message to "bitftp@pucc.princeton.edu" with "FTPLIST" on the first line of your message.

FROM GERMANY. Ralf Widera writes: "I can provide you with some addresses of FTP servers that are also accessible via e-mail. All of them provide a help function if you place 'help' in the subject or body of your message. Most of them send the help anyway, if they receive a message they do not understand:

- ftpmail@decwrl.dec.com
- archive-server@Germany.EU.net
- ftpmail@ftp.uni-stuttgart.de
- mail-server@cs.tu-berlin.de
- archive-server@ibr.cs.tu-bs.de
- mailserver@LEO.ORG

"The server at 'ftpmail@ftp.uni-stuttgart.de' allows not only access to a local FTP server, but can also open any FTP server. You only have to send the commands in the body of the message. Again, the 'help' is very useful for that. I know that most of the above addresses are in Germany but U.S. members can try 'ftpmail@decwrl.dec.com'."

IEEE LOGOS. Some time ago, I wrote that IEEE logos are available via FTP from IEEE (THE INSTITUTE, July 1995). Many of you have experienced difficulties in getting them. It seems that IEEE staff removed the files without telling me. When I checked to see why, I found out that there was a reason that relates to trademark issues. Bill Hagen is our manager of IEEE copyrights and trademarks. He and Tom Brisco, our director of electronic communications, are working on a long-term solution that will likely involve an electronic catalog of logos and formats and a mechanism for obtaining the logos. Before too long, we expect that IEEE members will have electronic access to selected IEEE servers that will not be accessible to nonmembers. In the meantime, any IEEE member who needs an IEEE logo for a valid reason as an IEEE volunteer should contact Bill Hagen at "w.hagen@ieee.org".

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Coordinating Committee and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ontario, Canada. He welcomes your input via e-mail at "r.alden@ieee.org".

traveling the information highway

with Bob Alden

Web access — now simple and useful

The very beginnings of computer-based communication belonged to the world of computer system experts. Today, computer-based services are part of everyday life. Obtaining information from the Web is now as simple as getting cash from automated bank machines. This column is specifically for those of you who have not tried the Web yet, and who have (or may purchase) a computer (Mac or PC-with-Windows) and have (or may obtain) a connection to the Internet. If you haven't made the decision to access the Web yet, I offer the thought that it may be fairly easy and useful for you to do just that. Let me explain why.

Modern software packages have taken most of the technical trickery out of using electronic communications. Web browsers are arguably the best example of this. A typical browser requires one initial set-up, which can be done at the store where you purchase your system or upgrade your software, and you type in a few characters and are on your way. These characters form the URL (Uniform Resource Locator), which is the standardized convention for defining the address of the home page that you wish to visit. The rest is viewing graphics and text on the screen and clicking on highlighted portions of the screen to select other options.

AN IEEE EXAMPLE. In previous columns I have discussed some of the information that IEEE members can access from the IEEE home page — to view this page you enter the characters between the double quotes "http://www.ieee.org". This set of characters is called the URL. You do not have to understand it, you only have to type it into the box that is presented on the screen and hit "return."

Suppose we are interested in one of our technical society conference announcements — I'll use the upcoming Power Engineering Society summer meeting as an example. Let's assume that, as a member of that society, I know that traditionally there is a conference every summer. Perhaps I want to check the location and dates so I can think about attending.

On the IEEE home page I find the heading "IEEE's Technical Societies" and click on the highlighted phrase "Web pages." Very shortly, I am viewing a list of the IEEE technical societies. I click on the heading "Power Engineering Society," my screen display changes, and I see the topic I am looking for — "PES Meetings 1995-2001." I can see that the next summer meeting is being held in Denver, Colo., USA, between July 28 and Aug. 1, 1996.

There are many other kinds of information I can find as quickly and easily. Here are a few personal examples that you can try out, or use the ideas to find the corresponding URL for your particular need. Not all of these will be available in your area yet. To give you an indication of how rapidly availability is changing, the examples I am using have only been available for a few weeks or months.

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

Here is my overview list. First, some pages of interest to me as a professional in electric power engineering: my professional engineering association, a listing of power engineering consultants, and a national science and engineering research funding agency. Finally, some pages of non-work interest: a listing of phone numbers for take-out ("take-away" in some parts of the world) food, and then some recipes. I will also tell you how I found out about each one.

PROFESSIONAL ENGINEERS. I was reading *Engineering Dimensions* , the magazine published by Professional Engineers Ontario, the organization that licenses me. This magazine told me that the URL for their new home page is "http://www.peo.on.ca". I found some under-construction messages (often the case for the first year of any set of Web pages) and several information items of interest. If you are licensed, you likely get a similar publication. Watch for this kind of announcement.

CONSULTANTS. In the same magazine (as part of an article on the information highway and sites of interest to professional engineers), I discovered that BC Hydro not only has its own home page describing its activities, but also maintain a listing of electric utilities and consultants in Canada, the United States and elsewhere. The URL is "http://unixg.ubc.ca:780/~bchydro/addr/utility_addresses.html".

RESEARCH FUNDING. As the director of a research laboratory, I am always interested in funding opportunities. The lab is university-based, in Canada, so we are very much involved with the Natural Sciences and Engineering Research Council of Canada. A recent council publication alerted me to the existence of an NSERC home page. The URL was listed as "http://www.nserc.ca". You can often guess the URL correctly once you figure out the conventions typically used. This set of Web pages was full of contact names, e-mail addresses and telephone numbers that are useful to me and my research colleagues.

FOOD. While browsing my daily paper — The Globe and Mail — one morning, I spotted a Web site guide with an ad entitled "Looking for a new restaurant" and offering over 4,000 restaurants. The URL was given as "http://www.dine.net". It seems that sponsorship of this site is related to the local restaurant association. I tried it, clicked on words like "Italian," "delivery," etc. and viewed a large list, mostly of pizza places, with street addresses and phone numbers. Pizza Hut was the chain with the most entries — perhaps an indication of their view of the importance of corporate presence.

I understand that there will shortly be the capability to fill in an order form and skip the telephone ordering phase. Perhaps some of you have already accessed such a service.

If you prefer to cook at home, try "http://www.eat.com" for pasta-related recipes. My source is The Sunday Times – London, England, last May. These pages are written with a nice blend of content, humor and (restrained) commercial message.

My main message here is not the detail but the trend. Businesses, professional organizations and individuals are making their presence known on the Internet. Web-page creators are providing information about their own activities and, in some cases, providing links to related activities. These links make the host page more attractive and hence more likely to be visited.

My colleagues and I have done this with our home page (Power Research Laboratory), which is accessible from my personal home page. You may want to start to build your own list of URLs that can help you in your search for the information you need in your professional or personal life. With modern tools, you do not need to be a computer whiz. You can take advantage of today's software and commercial interests to help you to access the Web easily.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Coordinating Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "http://power.eng.mcmaster.ca/alden/alden.html".

traveling the information highway

with Bob Alden

Electronic communications and IEEE members

January 1996 is the one-year anniversary of our Web presence. One year ago THE INSTITUTE went live on the Web. Now, one year later, we have a new address, or URL (Uniform Resource Locator): "http://www.institute.ieee.org/ti.html". To view this column directly on its Web page, use "http://www.institute.ieee.org/INST/jan96/inf_hwy.html".

The IEEE is learning how to find out what our members need. This is not an easy task, given the technical, geographic and personal diversity of our membership. Recently the IEEE set up an office of institutional research with Henry Shein as the director. We decided to ask his help in designing a questionnaire on electronic communications (EC). Tom Brisco and his staff in our EC department got together with Henry, and the result was a survey of about 30 questions sent to a thousand members selected randomly. The sample includes all regions, age groups and employment categories. The preliminary results are in, and the following comments are based on about 300 responses.

You might wonder whether the results of a survey sent to members about their familiarity with, and use of, electronic communications would be biased because those more familiar with this technology would be more likely to respond than those who were less familiar. To check for bias, I compared the results of our EC survey with the 1994 IEEE member survey results. This survey was sent to about five times as many members as our survey and included questions on electronic communications as a subset. I see very similar trends in the two surveys and conclude that there is not a computer-user bias in our survey.

WHY A SURVEY? To find out what EC services you are asking the IEEE to provide and what level of awareness and training in EC techniques you say you have. Bottom line: most IEEE members are computer users and are likely ahead of most other segments of the general population. There is a clear member need for the IEEE to continue to develop EC services. There is also a clear message that members expect the IEEE to offer high-quality, secure service.

Let's look at the trend of the results in some specific areas. You can view the actual survey results on the Web — see the end of this column.

Access to a computer. The overwhelming majority (about 90 percent) of respondents report access to a computer at office and home. The most common types of operating systems: PC/Windows, followed by Mac, and then Unix. There is a higher proportion of Unix systems at work relative to home.

Access to a modem. Of those reporting computer access, more than half have access to a modem at the office and more than three-quarters at home. The most common modem speed is 14.4 kb/s, followed by 28.8 kb/s. ISDN (Integrated Services Digital Network) access is pretty minimal at present and almost entirely restricted to the office.

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

E-mail usage. Three-quarters of respondents report that they use e-mail at either their home and/or the office. Of these, about half have access in both places, and most of the rest have the access at work.

Internet access. Two-thirds report Internet access at the office. Of these, about two-thirds have full Internet access (FIA) and the rest have either e-mail only or partial Internet access. Of those without access, one-third plan to obtain access in the future. At home, the proportions are one-half, one-fifth and one-third. When asked about the amount per month they were willing to pay for FIA, the responses were split as follows: about half, US$5-US$10; a quarter, US$10-US$30; most of the rest, nothing. A very few were prepared to pay more than US$30.

Internet usage. Let's look at the number of hours each month that respondents say they access the Internet. First, at work: one-third do not access at all, one-third for less than 10 hours, one-sixth between 10 and 30 hours, and less than one-sixth for more than 30 hours. Within the home, usage follows a similar pattern but at a somewhat lower level.

International access. Half the respondents say that international access is important; fewer than one-third say it is unimportant.

Travel access. Half indicate a desire for access while traveling; one-third indicate no such desire (and the rest do not travel).

IEEE SERVICES. Several questions relate to current and potential IEEE electronic services. Here are the responses.

Current services. Are members familiar with current IEEE Internet services? The overwhelming answer is no. This is not surprising, since most of these services are only just getting started. However, the IEEE needs to focus on letting you — the member — know about new Internet services. One of those services is the set of IEEE Web pages where new Internet services are most likely to be described. Only a fifth of respondents indicate they have accessed these pages, whereas about half of the respondents have access capability at either home or work.

Ordering. Only a sixth have ordered products electronically, but virtually all of those were satisfied with this kind of ordering capability. When asked if they would order from IEEE electronically, half said yes; a sixth, no; and close to half were unsure. This latter number is not surprising since most respondents have no experience with this method.

Membership renewal. About half of the respondents indicated a desire to renew their IEEE membership electronically.

Information. When asked if IEEE should offer more information electronically, about half said yes, with printing; very few said yes to on-line only or not at all; and a quarter were unsure. The items most often checked were abstracts and indexes, journals and newsletters.

Discussions. More than half indicated a desire to have electronic discussion forums on specific areas of interest. Two-thirds expect to use the Internet to communicate with other engineers.

On-line directory. Respondents were fairly evenly divided when asked if they wanted to be listed in an on-line directory (choices were yes, no, and undecided). The no's were overwhelming, if such a listing were to be associated with a cost.

CONCERNS. On the question of security and confidentiality issues when using the Internet, respondents indicated that these were major concerns. More than half were very much concerned and a third more were somewhat concerned with security. The corresponding proportions for confidentiality were one-half and one-third. This suggests that the IEEE needs to ensure that future transactions over the Internet should be carefully planned to meet the expectations of an informed membership.

SURVEY RESULTS. I used preliminary results of the survey, available Nov. 7. More recent results are posted on the Web at "http://www.institute.ieee.org/INST/jan96/ecsurvey.html" if you want to see the full and latest details.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "http://power.eng.mcmaster.ca/alden/alden.html".

New telecom network springs up in Canada

TORONTO—A new high-speed telecommunications network has been established across Canada providing both Internet service and broadband Asynchronous Transfer Mode research and development capabilities. The C$140 million network combines CA*net, the Canadian Internet backbone, with the CANARIE National Test Network.

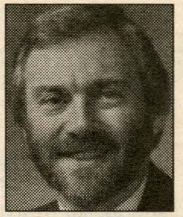
CANARIE Inc. acted as the facilitator in establishing the new network. Bell Advanced Communications, a wholly owned subsidiary of Bell Canada, will deploy and manage the network as part of its ATM offering and will provide the CA*net circuits and much of the National Test Network bandwidth. Unitel Communications Inc. will provide the remainder of the test network bandwidth, while Cisco Systems Canada and Newbridge Networks will provide routing and switching equipment. The network has service agreements with 12 provincial and municipal broadband research networks and 13 Internet service providers, with the latter connecting through CA*net.

—Bryan Drummond

IEEE Member, TInet/Chelsea, Quebec, Canada

traveling the information highway

with Bob Alden



Modem vs. Ethernet Internet access

Last month, in the January 1996 issue of THE INSTITUTE, I looked at the initial results of the questionnaire on electronic communications (EC) that was sent to a thousand IEEE members. It is clear from the results that many members are connecting to the Internet at both home and work. The connection from home is almost always via a modem and a telephone line. The kind of connection at work will likely depend on whether the company (private or public sector) has a computer system with Internet access. If the company has such a computer system, your PC may be connected via an Ethernet cable; if not, then your connection is likely via a modem and telephone line to an Internet service provider.

In this column, I will look at the differences between these two linking mechanisms — Ethernet and modem. There are also differences depending on whether you are sending e-mail messages or browsing the Web, because the resource requirements are so different. We will look at each of these two applications in turn, but first it is useful to look at the common point — your Internet connection.

YOUR INTERNET CONNECTION. Let's start with a typical company network. This assumes the company has a computer system that is connected in some kind of network. This company may be the one you work for and which provides you with Internet access as part of your job, or it may be the company whose business is to provide Internet access on a fee-for-service basis.

◆ **Ethernet.** Ethernet is the name of a type of cable commonly used to connect computers in a local area network (LAN). These computers are located on-site in the company. This cable provides a high-speed and wide-bandwidth path for the data flow between the computers. In most cases the company connection to the Internet also has high speed and wide bandwidth — but not necessarily! Thus we need to distinguish between connection speed within the LAN, and between the LAN and the Internet.

◆ **Modems.** Off-site computers are normally connected to the company computer system by the use of telephone lines and modems which are much slower than Ethernet cables. The difference in speed can be anywhere from 1,000:1 to 10:1. The upper ratio applies when the Ethernet connection is lightly loaded. Even when the Ethernet is heavily loaded, it is still an order of magnitude faster than the telephone line/modem combination. The Ethernet link is faster because it is digital and most telephone lines are analog. The newer ISDN (integrated services digital network) telephone systems are digital and much faster than their analog counterparts. (Only about 1 percent of survey respondents report having ISDN service). Modems perform the analog-digital conversion and this adds to the slowdown.

A LAN typically connects a number (perhaps 20) of personal computers (PCs) of virtually any kind (IBM or IBM-compatible, Mac, or small Sun, Silicon Graphics or H-P workstations, etc.) to several servers within a department or group. This set of computers is also connected to the rest of the company computer system. There is often a modem pool to connect off-site PCs to the LAN. The servers may perform one or more of several functions, acting as a common source of software packages for word processing, spreadsheet and database applications, file storage and backup, as well as being the host machine for electronic mail (e-mail).

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This host is usually a computer running Unix. Unix is the most common operating system (OS) that enables several users to use the machine at one time (multi-user) and individual users to run several programs at the same time (multitasking). The Unix OS includes a basic e-mail program, sendmail, that utilizes the Simple Mail Transport Protocol (SMTP).

On systems that provide true "full Internet access," all the EC tasks — e-mail, telnet, FTP (file transfer protocol) use the same underlying TCP/IP (transmission control protocol and Internet protocol). This use of standard protocols is the key reason why users can interact with each other using a wide variety of hardware and software over the Internet. The use of proprietary software by some commercial service providers restricts what users can do.

E-MAIL. The e-mail package that you and I use can be located on either the host or the PC. PINE and the older ELM package are installed on the host. PCmail and Eudora are examples of e-mail packages that are installed on PCs. If your PC happens to run Unix, you have the choice of a Unix-based package. All of these packages interact with the basic sendmail program that connects with the network while providing you with user-friendly features. The amount of information that is passed between your PC and the host is relatively small. The host is always connected to the network and stores the mail it receives until you power up your PC and decide what to do with it.

To use e-mail, you need a terminal emulation software package on your PC that connects with the host — for example, ProComm and BW220. These packages either help you send commands to the e-mail package on the host (PINE, ELM, etc.) or help your PC-based e-mail package (Eudora, etc.) interact with the basic sendmail program.

◆ **Ethernet.** If you are connected via a fast Ethernet cable and you do not pay for connect time, you may not be concerned about the time it takes to be connected to the host and perform message composing, editing, reading, and so on.

◆ **Modem.** If you are connected via a relatively slower telephone line and modem combination, or if you pay for connect time, you may prefer to use a PC-based e-mail package that enables you to prepare and read messages off-line at your leisure and connect briefly to transmit messages between PC and host. In either case, the newer, faster modems with data compression and automatic error correction may well be worth the extra investment. The data compression typically gives you an effective speed increase of four times.

WEB BROWSERS. Installed on PCs, these are based on Windows (not DOS), Mac OS, or X-Windows (Unix). The most common examples are Netscape and Mosaic. Their use requires your PC to be connected as a node on the Internet, which means that your PC must be assigned an IP (Internet Protocol) address by your system manager. This is the person who controls your access to the Internet and authorizes your log-on ID.

◆ **Ethernet.** If you are connected via Ethernet to a company LAN, you will have a permanent IP address. This is a fast connection that will not cause delays in screen writing (especially when the Web page contains high-density graphics). The major causes of delay are most likely the network bandwidth limitations and traffic congestion. Some Web server sites are overloaded because a lot of users access their pages. Some sites have not installed a connection to the Internet that is adequate for the traffic they are generating.

◆ **Modem.** If you are connected via a modem, you need either a permanent IP address or a temporary one that is assigned each time you log on. You also need a SLIP (Serial Line Internet Protocol) or PPP (Point to Point Protocol) connection. PPP is a newer and more general protocol than SLIP.

Such a SLIP or PPP connection requires two conditions — one, you have a communications software package on your PC that supports a SLIP or PPP connection; two, the network that provides your Internet connection has a modem pool that supports the SLIP or PPP. A third condition (in reality a precursor to condition two) is that the network must have a full Internet access (or service) connection to the Internet.

SUMMARY. There are two main causes of delays — traffic congestion and modems. Some users turn off the graphics display, an option in their Web browser. This may be effective in speeding up your display response time if the graphics are only "window dressing." However, some Web pages are using graphics for content and you may lose important information. Installing the hardware and software that is right for you takes both time and money. If you have an Ethernet connection at work and a telephone/modem connection at home, you will need different software to match the differing requirements.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/alden/alden.html".

traveling the information highway

with Bob Alden

For engineers, two books about the Internet

Here are two books I have found interesting reading. The first one is a real help to get you started down that information highway. The second is a real find for those of you who want to know more about how the Internet really works and need the kind of information that is not found in books usually stocked in the Internet section of your local bookstore.

THE INTRODUCTION. Called "The Internet for Scientists and Engineers," it is now published by IEEE Press (Order No. PP5371-QEE) and costs IEEE members US$28. The author is Brian J. Thomas, who is manager of new media development at one of IEEE's sister societies, the International Society for Optical Engineering (SPIE). You may have seen some promotional material for this book in recent IEEE publications. The version I have is the earlier one published by SPIE. The book contains about 450 pages with a good mix of facts and explanations about the Internet and how to use it.

If you are wondering if you should buy a copy, here is a quick runthrough of the contents. These are divided into three parts; let's look at each part in turn.

Part I, the first 200 pages, is called "Internet Access, Tools, and Navigation" and contains the explanatory chapters. First — an introduction to the Internet, getting on line, your first log-on, a basic explanation of electronic mail; this provides a good starting point for the novice. Then e-mail servers, discussion lists, files and formats, telnet, FTP, and Usenet news. The last three chapters are tools for searching on-line databases and the World Wide Web.

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

Part II is about 175 pages and called "Science Resources on the Internet." Science in this instance ranges alphabetically from Aeronautics and Aerospace to Virtual Reality, with Computer Science, Electronics and Electrical Engineering, and Energy in the middle. In each category, Brian covers relevant content in Usenet newsgroups, frequently asked questions, discussion lists, as well as FTP, Gopher, WWW, and telnet sites. Browsing this part gives the reader a good sense or overview of the kind of material available. Since Brian has focused on scientific as opposed to popular content, many of our members may find this a refreshing alternative to the media hype that often concentrates on the sick and the sexy.

Part III, another 50 pages, contains two appendices. One covers personal computer basics — where to get and how to install the software you need to actually use your Windows-based PC or your Mac. The other appendix is on Internet service providers; it includes some lists of providers and tells how to get up-to-date lists. There is also a useful glossary and bibliography.

THE TECHNICAL RESOURCE. This one is called "Internet System Handbook" and was published by Addison-Wesley in 1993. Edited by Daniel C. Lynch and Marshall T. Rose, it contains close to 800 pages. As they say in their preface, this book is written by the very people who made it all happen. The authors describe and explain the framework of the electronic infrastructure that is the Internet.

The overview of the Internet is more detailed than in many books. The technical explanations begin with basic messaging and routing protocols and move into fundamental e-mail, FTP and telnet technologies. This is followed by chapters on routers, host networking, architectural security and creating new applications.

The infrastructure section includes chapters on directory services, network management and tools for Internet backbone and components; followed by chapters on Internet Protocol network performance and operational security.

The last section looks at the success of the Internet and the consequences of that success and the resulting evolution. The final chapter provides a detailed and annotated bibliography.

Not a book for the casual user but a very special reference that is full of information and insight by those who had the foresight to create the Internet as we know it today.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Coordinating Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org." His home page is "http://power.eng.mcmaster.ca/alden/alden.html".

traveling the information highway

with Bob Alden

Using mailing lists

Group aliases, discussion groups and mailing lists are techniques that make it easy to send e-mail messages to lots of people. If used properly, they are very convenient for everyone. If not, their use can be annoying and counter-productive. I have the feeling that many people who use e-mail do not understand how to use these electronic communication services. This month I will focus on the use of mailing lists. But first, a short paragraph to distinguish between discussion groups and mailing lists.

A mailing list should be used to send messages to people who are on that list by the "owner" of that list. No one else should be able to send to that list — either directly or by replying. Discussion groups are for people to discuss — i.e., receive messages on the topic for which that group was established, reply to the group, see the other replies, etc.

These lists and groups can have different characteristics which can be determined when they are set up. All of these (lists and groups) are processed by a computer program called a list manager. These programs can exist on virtually all computer networks. The IEEE uses a program called "majordomo," which I will describe. About two years ago, in the May/June 1994 issue of THE INSTITUTE, I described a different program which the IEEE used at that time. (It was called "listproc").

Members can use majordomo for several purposes: to join a list (this is called subscribing), to get off a list (called unsubscribing), to find out what lists are available or to find out how to use the majordomo commands.

IEEE USES. IEEE volunteers and staff also use majordomo to help them manage lists in their IEEE activities. For example, volunteers in sections, chapters, societies, standards groups, technical working committees, professional activities committees and virtually any set of IEEE folks you can think of can use it. One of the characteristics that makes IEEE great is the decentralized way of doing things, and majordomo is a facility that enables a volunteer to manage a service at the IEEE Operations Center from his or her own personal computer.

Alternatively, if you (or a friend of yours) are the system manager of a host computer, you are likely aware that the software for list management (majordomo, listproc, etc.) is available from various FTP sites and can be obtained and installed on your system. Those who can do that sort of thing know about it, and I will leave it at that — except to note that any list management service provided on the IEEE computer system can also be provided at any other site by people with access to that site.

SUBSCRIBING. You can use the IEEE list manager — called majordomo — to subscribe to mailing lists and automatically receive certain ASCII text files as they are made available.

Suppose the name of the list you want to join is "listname". To subscribe, send an e-mail message to "majordomo@ieee.org" and put your request in the body of the message by typing "subscribe listname". The address from which you sent the request is used to send you the files. You should begin to receive mailings starting with the next one sent out. You get off the list by sending the message "unsubscribe listname".

Messages are archived for some lists — that is, they are stored for a time so that you can find them using the majordomo commands.

Each of the above words or phrases in double quotes (do not type these quotes) is a command to majordomo. Put each command on a separate line.

To find out more about the majordomo commands, put the word "help" on a separate line of your message. To get a listing of all current lists, place the word "lists" on another line of your message. Put the word "end" on the line after the last command, especially if your e-mail package adds a "signature" at the end of each e-mail message. (A "signature" is the e-mail equivalent of letterhead in that it usually contains information on who you are and how to reach you — your title, telephone and fax numbers, street address, etc. It is automatically added at the end of your message — you usually create it using your e-mail processing software when you set it up initially.)

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

Each IEEE list is managed by an "owner" who may be a volunteer or a staff member. A volunteer becomes an owner through a staff member associated with the volunteer activity. The list management may include one or more of the following: controlling who is on the list; sending all messages to the list; reviewing messages sent to the list; and setting the archiving parameters. The question of which tasks are appropriate depends on the nature of the list or group.

If you want to send a message to the owner of a list, you send your message to "owner-listname@ieee.org" where the characters "listname" are replaced with the name of the list (as in "subscribe listname").

KINDS OF MAILING LISTS. There are two kinds of mailing lists, public and private. Public lists are used for receiving information (in the form of e-mail messages) regularly. Anyone can get on the list by sending a subscribe message. Some IEEE newsletters are now being distributed electronically in this manner. Using this system, the IEEE can also distribute conference announcements and tables of contents of publications. Look for announcements for these services from your society, section, region or from the IEEE. Messages are archived in case you are missing some.

Private lists enable groups of IEEE volunteers to receive messages from one source. Private lists can be requested (set up) by the chair of a volunteer group, task force, committee and so on through the staff member responsible for that group. Individuals cannot subscribe to get on these lists. Messages sent to any of these lists by members or others not on the list will be discarded. Messages are not archived.

SETTING UP MAILING LISTS. If you want to create a mailing list using the IEEE's majordomo for an IEEE entity in which you are a volunteer, send an e-mail message to the entity's IEEE staff support person, who will set up the procedure for you to be the "owner" of that list. If you ask for a private list, you will be able to create and edit the list of recipients, and you will send all messages to those recipients. For example, perhaps you want to circulate a newsletter only to members of your group.

If you ask for a public list, you send all messages to the list and you receive copies of all subscribe-request messages from people who have decided to subscribe (so you know who is on your list). You might use this kind of list to mail a monthly newsletter in which you are promoting certain services exclusively to members of your society, and you hope nonmembers will see this information and want to join your society.

Most people who receive e-mail prefer to receive short messages. It is usually a good idea to include short descriptions and indicate how more detailed items can be obtained. For example, you may want to advertise a conference, give the pertinent details — what, when, where — and include a service alias for interested people to send to and receive a registration kit. In this case, the service alias implies that you have arranged for a text file (the registration kit) to be automatically sent any time anyone sends a message to that address (alias).

The above is appropriate if you intend to provide information. If you want to generate discussion and you hope people will respond, then you should set up a discussion group, not a mailing list — more on that topic next time.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "http://power.eng.mcmaster.ca/alden/alden.html".

traveling the information highway

with Bob Alden

Using discussion groups

In the last issue of THE INSTITUTE, I pointed out the difference between discussion groups and mailing lists, and then focused on how to use mailing lists. This column addresses the companion set — discussion groups. Discussion — exchange of information, sharing of experiences, the ability to easily ask a question of one's peers — is at the heart of IEEE and its groups of members.

First, let me just review the essential difference between discussion groups and mailing lists. A mailing list should be used by the "owner" of the list to send messages to people who are on that list. No one else should be able to send to that list. Discussion groups are for people to receive messages from, and reply to, those who want to discuss the topic for which that group was established.

These lists and groups can have different characteristics which can be determined when they are set up. All of these lists and groups are processed by a computer program called a list manager. These programs can exist on virtually all computer networks. The IEEE uses the program "majordomo."

Since this month's topic is discussion groups, I will now describe the different types of groups (that can be managed using majordomo), and how to join, leave or interact with one of these groups. Then I will look at how to set up and manage a group.

DISCUSSION GROUPS. Discussion groups are set up so members of the group can receive messages sent by each other and anyone else. To become a member of a discussion group, you send a subscribe-message to the list manager — the same one as for mailing lists. The commands and procedures are the same, but the names of IEEE discussion groups have a "-d" at the end to distinguish them from mailing lists.

One of these discussion groups is called "secbbs-d". This group has been set up for people interested in IEEE section-based bulletin board systems. To subscribe (become a member of this discussion group), you send a message to "majordomo@ieee.org" and put the keywords "subscribe secbbs-d" on the first line of your message (followed by a blank line). You should begin to receive messages for that group starting with the next one sent out. To cancel your subscription, send another message, but use "unsubscribe secbbs-d". If you do not want to join the group, but you want to send the members of this group a message, send your message to "secbbs-d@ieee.org". If you want to send a message to the owner of this group, send your message to "owner-secbbs-d@ieee.org".

The three kinds of discussion groups are: unmoderated, moderated and private.

◆ **Unmoderated** discussion groups are wide-open, uncensored forums intended for specific topics. Anyone can become a member of the group by subscribing. Anyone can send to the group, but only members of the group receive messages sent to the group. Replies are sent to the group. Messages are not archived.

◆ **Moderated** discussion groups are controlled forums on specific topics. Anyone can become a member of the group by subscribing. Anyone can send messages, but the messages are reviewed by the group owner before being resent (as-is or edited) to the members of the group, or rejected. Replies are also directed to the group owner. This is the e-mail counterpart to letters to the editor. Messages are archived in special cases and where the group owner has arranged for the appropriate file storage.

◆ **Private** discussion groups are uncensored forums for internal discussion among members of a group — for example, a volunteer and/or staff committee or task force. The membership of the group is determined by the group leader. Messages sent to any of these groups by people not in the group will be discarded. Messages are not archived.

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SETTING UP DISCUSSION GROUPS. If you want to use the IEEE's majordomo to create a discussion group for an IEEE entity in which you are a volunteer, send an e-mail message to the IEEE staff person associated with your entity. This staff person will set up the process for you to become the owner of this new discussion group. (Normally the lead volunteer — section chair, society president, etc. — knows who the staff person is or how to find out.)

If you ask for an unmoderated discussion group, you get copies of all subscribe and unsubscribe request messages.

If you ask for a moderated discussion group, you get copies of all subscribe and unsubscribe request messages and all messages for the group, and you have to vet/edit/reject them.

If you ask for a private discussion group, you create and update the list of people in the group. You must use the actual e-mail addresses for the members (and not aliases — IEEE or otherwise).

If a discussion group is not used for some period of time — six months or so — the owner will get an automatic request to indicate if the group is still needed. If there is no response in one month, the group will automatically be removed.

GROUP ALIASES. Why not use group aliases? There is a simple and practical answer to this question: management, or more accurately, the lack of management tools. In the past, individual IEEE volunteers have asked IEEE staff to set up a group alias. A message is sent to the group, and people can reply using either a simple reply or a group reply (to the whole list). However, that volunteer cannot change the membership of that group alias, members of that group cannot unsubscribe, and others cannot subscribe. All of these activities must be done by an IEEE staff member. Given the extensive use of e-mail and the need for group memberships that change relatively often, such a scheme is impractical. Therefore, no new group aliases are being formed and existing ones are being phased out. They are being replaced by the appropriate mailing list or discussion group.

INDIVIDUAL IEEE ALIASES are useful in that other IEEE members can find out how to contact you by looking in the IEEE e-mail directories. Similarly, IEEE members can use majordomo commands to find out what groups exist.

The reality is that we are learning how to better use e-mail messaging procedures and tools like file server and majordomo to help IEEE members, volunteers and staff. As always, keeping track of these tools and how best to use them is quite a challenge.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/alden/alden.html".

traveling the information highway

with Bob Alden

Business on the Internet

Why has the business world discovered the Internet? Over the past year or so, the number of corporate home pages has exploded. These pages present the corporate image, display products and services, provide contact information and increasingly enable on-line transactions. Many of our members are aware of this phenomenon. Some members are considering their own Internet presence, and some of you are asking for information about doing business on the Internet.

Corporations are discovering that, if they do it right, Web pages on the Internet allow them to disseminate information, communicate with their customers (to and from), provide services and complete transactions — almost anywhere in the world. They are deciding that the Internet is the modern way for them to do a significant part of their business.

Recently I decided to expand my own home page set and create additional Web pages with links to some of these corporate pages. I started to record URLs (uniform resource locators or, more simply, Web addresses) when I came across them in magazines, newspapers and television advertisements. For me, placing these Web addresses on my own Web pages with suitable explanatory text is much more effective than using the bookmark feature in my Web browser. I am organizing my access to both corporate and other Web addresses. I am also improving my access to e-mail addresses that I regularly use by incorporating them in my pages as well. My personal Web pages have become an important tool for me in my own professional activities.

I had previously purchased two books by Jim Carroll and Rick Broadhead on the Internet — the "Canadian Internet Handbook," and the "Canadian Internet Directory." I noticed, inside the cover, a Web page address for their books at "http://www.handbook.com". I looked at it and decided it was a pretty good marketing tool.

While reading that Web page, I realized that they had written a third book called "The Canadian Internet Advantage — Opportunities for Business and Other Organizations." It is published by Prentice Hall Canada, ISBN 0-13-226598-2. This book provides a good overview of corporate presence and strategies for business on the Internet. I included into my set a number of the Web addresses they quoted and used their book as the basis for this column. A key feature of this book is the use of many corporate Web page examples to illustrate various aspects of an effective Internet business strategy.

CORPORATE ADDRESSES. Very often you can guess the Web address by inserting the name or common abbreviation for the company between "http://www." and ".com". This is true in the U.S. In other countries there is often a country code or a mix of "com" or "co" and the two-digit country code. Some examples are "hyatt" and "marriott" for hotel chains, "usair" for airlines ("www. aircanada.ca" for a Canadian airline), "americanexpress" and "mastercard" for financial services (go ahead and try "visa" — it works too).

Computer hardware examples are "acer, compaq, dell, epson, hp, ibm, intel, sun, ti, toshiba," etc. Computer software package examples are "corel, delrina, lotus, microsoft, quarterdeck" and so on.

Internet service providers tend to end with ".com" or ".net". Examples are "www.aol.com, www.att.com, www.cerf.net, www.compuserve.com, www.delphi.co.uk (in the U.K.), www.hookup.net (in Canada), www.mci.com and www.msn.com (for microsoft network), www.netcom.com, www.prodigy.com, www.psi.net, www.racsa.co.cr (in Costa Rica), www.sprint.com, and www.uunet.com".

Looking for a new car? The automobile site "www.yahoo.com/Recreation/Automobiles" by Yahoo is an example of a Web page that links you to many sites. Or try "lincol nvehicles, saturncars, toyota, volvocars," etc. Want to order a pizza, find some interesting recipes to try at home, look up what is showing at a movie theater before you travel to one of many U.S. and Canadian cities? The list of products or services to buy is really quite amazing — considering that most of these sites did not exist a year ago.

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QUALITY PAGES. Jim Carroll and Rick Broadhead examine a large selection of sites in order to discuss the characteristics that make a high-quality Web page set. There are two limitations to always bear in mind. The screen presentation is dependent on the characteristics of the viewer's browser as well as the bandwidth of the path between the server (where the pages are stored) and the client (where the pages are viewed). Some of the newer features, background patterns and colors may not show on older browsers.

It is becoming quite common to see a simple home page that contains a choice between subsequent pages that are (a) designed to take advantage of Netscape 2 features (especially split screens — more than one scrollable window) or (b) designed to work with simpler browsers. It is also common to see a choice provided between minimum use of graphics and a lot of graphics — which may take forever to load if your connection (path) is of low capacity or clogged with traffic. This latter choice is much more effective than forcing the user to turn off the "display graphics" option in the browser.

15 STEPS. The authors suggest a 15-step Internet strategy, including these issues:

1. Get on line — to learn what is out there and how things are being done.

2. Determine the state of Internet planning in your organization; avoid duplication and coordinate efforts.

3. Determine the scope of your Internet strategy. Is it your entire company or selected parts?

4. Understand how your industry and market are responding to the Internet; look for successes and failures, relevant conferences and discussion groups. Are your customers using the Internet?

5. Determine the extent of Internet knowledge in your organization and educate accordingly; consider the understanding of senior management and the impact of the Internet on your way of doing business.

6. Determine your organization's Internet objectives; relate to your business goals and objectives, define the objectives you want to meet using the Internet.

7. Be a good Internet citizen — understand the Internet culture, the hatred of junk mail, the sharing of information, the availability of some free services, giving something back to the Internet.

8. Define the benefits of the Internet — cost savings, improved corporate image, improved communications, improved customer satisfaction (leading to increased sales) and new markets. Define how you will measure success.

9. Develop an Internet vision for your company — what it will be used for, how it relates to your business strategies, the benefits that will accrue.

10. Determine the Internet tools you will use — e-mail, fileserver, mailing lists, discussion groups, Usenet newsgroups, the Web.

11. Determine how you will use these tools; compare advantages and disadvantages of each tool for each of your customer groups (accessibility of e-mail vs. flexibility of Web).

12. Determine how to implement your Internet strategy — hire a contractor, use (or develop) in-house expertise, purchase third-party services.

13. Define the costs of establishing Internet services; consider both equipment and training.

14. Add the finishing touches — marketing, legal issues.

15. Create your plan, establish time lines and go.

A badly designed or poorly maintained set of Web pages is just as damaging to your business as any other lapse in customer relations or poor business practices. Doing it right — doing business on the Internet — means understanding the Internet culture, understanding the technology and adapting how one does one's business to take advantage of the enormous potential.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/alden".

traveling the information highway

with Bob Alden

Using e-mail aliases

Electronic mail is not only efficient, but it can be very convenient if the appropriate tools are used to create and send messages. One of these convenience tools is the use of aliases to simplify the often complex and differing addressing schemes. In the April and May issues of this column, I looked at the use of mailing lists and discussion groups. In those columns I attempted to point out where one should not use e-mail aliases. Here I will focus on where aliases can and should be used.

E-mail aliases, correctly used, simplify the process for the user and provide excellent management tools for service providers — especially for volunteer leaders and staff in organizations such as the IEEE.

ALIASES. E-mail aliases are dummy addresses that are interpreted by e-mail handling software. They can be used in a number of ways — to make your own address simpler for others to use or to make sending messages to other people (individually or as a group) more convenient.

◆ A single alias to simplify your own e-mail address on a business card. I use the alias "alden@mcmaster.ca" instead of my real address, which is "alden@power.eng.mcmaster.ca". My Internet service provider (the university computer network manager, in my case) sets up these kinds of aliases for staff.

The way this works is as follows: e-mail arriving at the Internet site "mcmaster.ca" is processed by a mail server that performs a table look-up in an alias list, finds the actual address for the alias "alden" and redirects the mail to that address. If I were to use a different mail server from the machine (computer) called "power," I would notify my service provider of my new address, and someone in that group would change my entry in the alias list so that e-mail messages would be redirected to the correct address. This is a key aspect of any alias — if the alias is not kept up to date, the alias becomes a nuisance and a hindrance to everyone, instead of a help.

◆ A single alias to locate a company service when different people may be assigned to answer the mail. For example, IEEE uses "member.services@ieee.org" as the alias for staff in that department. The alias is generic, so members do not have to keep track of who works in that department. The IEEE staff sets up these kinds of aliases.

◆ A single alias to simplify remembering and typing of a complex e-mail address for someone to whom you send e-mail. For example, "jane" might be the alias for "73297.64963_HY56-56@compuserve.com". You would set up this kind of alias using your e-mail software package. Sometimes aliases are called nicknames.

◆ A group alias to make sending messages to several people much simpler. You can use both addresses and aliases within a group alias — for example "adcom" might be the group alias for four people on a committee: "jane," "fred," "w.read@ieee.org" and "alden@mcmaster.ca". You would also set up this kind of alias using your e-mail software package. Only you can use this alias. If you want other people to send to this group, set up a discussion group. (Please see my May 1996 column.)

Text files containing previous articles on e-mail and other aspects of IEEE's information highway are available via e-mail. To find out more, send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

IEEE ALIASES. An IEEE alias gives you a simple dummy address that will not change as you change your Internet service provider or the e-mail server you use to host your e-mail service. This is really an e-mail forwarding service that IEEE provides to members, especially volunteers. If you have an IEEE e-mail alias, any messages arriving at the IEEE node "ieee.org" for you are automatically redirected to your real e-mail address.

Why would you consider having an IEEE e-mail alias? There are several advantages — but only if you want people to find you (and some people don't). The first one is that you are also listed in the IEEE e-mail directory, which means that other people — anyone with access to the Internet — can look you up and send you e-mail. There are currently five distinct parts to this directory; staff, members/volunteers, sections, societies and student branches.

The second advantage is that the IEEE e-mail alias is easy to remember and use. The convention is to use your first initial, followed by a period, followed by your last name, followed by "@ieee.org". If someone else with the same initial and last name already is using that alias, then an alternative close to this pattern is used.

The third advantage relates to the nature of IEEE members and volunteers: they are generally mobile and active. Their addresses tend to change frequently and there is such a wide variety of e-mail-addressing customs that it is hard for other people to keep track of them without making mistakes.

How do you obtain an IEEE e-mail alias? If you are an IEEE member or volunteer, send to "aliases@ieee.org" an e-mail message containing the following information:

◆ your e-mail address
◆ your last name
◆ your first name
◆ your daytime phone number
◆ your fax number (if available)
◆ your IEEE member number (if you are a non-member volunteer, e.g., working on a standards group, please ask your group chair — who will be an IEEE member — to process your request)
◆ your current major IEEE volunteer activity (committee positions, etc.), if applicable — limited to 30 characters, including spaces.

UPDATING. How do you update your IEEE e-mail alias? Send to "alias.update@ieee.org" an e-mail message containing the updated information in exactly the same format as above. Include all items, even though some may not have changed. If your address changes, update — otherwise you will not receive your messages.

You can also set up aliases for IEEE sections, student branches and societies. To find out more about directories, send a message to "fileserver@ieee.org" and include the key word "info.directory" in your message.

AUTOMATED SERVICE ALIASES. These are used to provide service automatically. No person reads the messages sent to one of these aliases. To use this type of service, you send a message to one of these aliases. You include very specific keywords in the body of the message and nothing else. It is best if you put your first keyword at the start of the first line. If you have more than one request, put each one on a separate line. Then leave a blank line after your last entry. (Blank lines are often interpreted as the end of your request.) The keyword(s) you have inserted as the message content is automatically parsed and processed — if you have typed the keyword(s) exactly. Perhaps a prewritten text file is automatically returned to you, or some other service is initiated. Some systems require the command to be placed in the subject line instead of in the message.

Generally, if you insert the word "help" (without the double quotes), a text file is returned to you that explains how to use the system. With some systems, if your message can not be interpreted, the help file is returned.

Messages sent to "fileserver@ieee.org" are processed in this way. If you include the keyword "info.email" you will receive a list of the text files that the IEEE makes available in this manner about e-mail (and other forms of electronic communications).

SIGNATURES. Signatures are short files that are appended to the end of your e-mail message. Generally, you create them with your e-mail package when you are setting up how you will handle e-mail. They are equivalent to letterhead (except they appear at the end, not the start of your message, so they do not get confused with the message headers containing the "To:, From:," etc.) in that they usually contain information about the sender of the message — for example, telephone and fax numbers, postal address, position in a company or organization.

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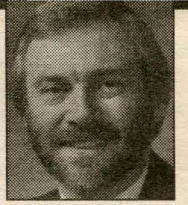

IEEE sections on the Web

We are starting to see our sections and societies using the Web. In this issue, I look at two of our sections — one is small and rural, the other large and urban.

CHINA LAKE is an IEEE section of about 250 members located in the Mojave Desert in California, USA. Bob McGahern, the section's education and student activities chair, sent me the following information that I am pleased to pass along. If you thought that a section with a small, widely dispersed membership and relatively few resources could not have a home page, think again! Here are Bob McGahern's words:

"The China Lake Section of IEEE is pleased to announce an "open house" at its new Internet home page located at URL "http://www1.ridgecrest.ca.us/~mcgahern/ieee_edu.htm" or through links from a couple of other IEEE Web sites. We currently have three Web pages under construction with more on the way in the coming months. At the moment we have a Main Education Home Page, which has hyperlinks to our Current Events page, as well as a Member Services page.

"Our main page is intended as a general-purpose source of miscellaneous electrical engineering and computer science information. We've placed hyperlinks to a variety of educational institutions such as colleges, libraries and distance-learning organizations, in addition to a few more subtle forms of educational material, like on-line engineering magazines, design competitions and various interesting engineering design projects currently underway within industry and the Defense Department. In addition, we provide links to various engineering suppliers, as well as links to Web pages dedicated to VIPs such as Thomas Edison, Charles Babbage, Nikola Tesla and George Boole.

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"Our Current Events page provides a no-frills, up-to-date listing of our (ever-evolving) 1996 calendar of events. This page changes frequently, as we usually arrange a monthly luncheon meeting with a guest speaker on various engineering topics. In addition, this year we are also running a series of short (30- to 90-minute) monthly video lectures on a trial basis. From this page you can see for yourself why the China Lake Section has won the Los Angeles Council Section Attendance Award the last two years in a row!

"At this time, our Member Services page in still in its infant stage, but it does provide an electronic version of our local newsletter, hyperlinks to several IEEE home pages and convenient e-mail links to a list of IEEE offices. We're looking to add additional IEEE information to this page all the time, so let us know if there is something we are missing here!

"I should also point out that this page owes its very existence to Bob Alden, the "Information Highway" columnist in THE INSTITUTE. His clear and timely articles on the ways and means of creating Web pages prompted me to peck away at my keyboard and try to get one on line! At China Lake, we're trying to use the information in his other articles (e-mail, mailing lists, etc.) too, as they always prove to be very helpful. So, many thanks go out to Bob Alden from the China Lake Section. Keep up the good work, Bob!

"So make a point to check us out one of these days! Our Web pages are still in engineering development and any comments or suggestions would be welcomed and very appreciated. Catch the wave at IEEE – China Lake!"

THE CHICAGO SECTION has about 7,200 members located in the city of Chicago, in the U.S. state of Illinois. Many of us who travel by air in North America pass through O'Hare Airport — the busiest one in the world! Chicago is not only the IEEE's first-ever section, but one of the most active. My thanks to 1995-96 Section Chair Jack Sherman for keeping me up to date with the section's many accomplishments. Its Web page set includes pages for each of its 16 chapters, as well as some interesting links to non-IEEE pages. Check the Chicago pages for your link to the IRS (the tax collector in the United States). The Chicago Section URL is "http://ieee.fnal.gov/".

OTHER SECTIONS. To locate section Web pages, view the Region Home Pages list on the IEEE Web server at "http://www.ieee.org/reg_pags.html", select a region and click on the section home pages that are linked there.

If you are thinking of producing a home page for your section or chapter, or improving an existing one, I suggest you look to see what other IEEE volunteers have done. While the China Lake Section is small, they have some great ideas that you might want to adapt for your own use. One of the advantages of Web technology is that it is so easy to learn from others.

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traveling the information highway

with Bob Alden

Internet Relay Chat — #ieee

My vocabulary of electronic communications terms is forever expanding. Here is a new addition: #ieee. This is a different kind of electronic discussion group. It does not use majordomo, which has been the subject of several recent issues of this column, but it is a form of e-mail messaging.

First of all, my thanks to Oliver Keitmann, who is an engineering student at the Ruhr-University in Bochum, Germany. Oliver is currently the vice chair of the IEEE student branch at Bochum as well as the manager of channel #ieee. Oliver sent me an e-mail message suggesting the topic of IRC (Internet Relay Chat). He very kindly sent me additional information upon which this column is based.

CHANNEL #IEEE is organized by the IEEE student branch at Bochum and is designed for the interchange of news from student branches around the world. The URL (uniform resource locator) for the home page for channel #ieee is "http://www.lwe.ruhr-uni-bochum.de/ieee/chann_e.htm". This page includes a list of regular channel users from Germany, England and Panama. This page also links to the IEEE home page, as well as the Bochum student branch and Oliver's home pages, which have both German and English versions.

I quote from Oliver's messages to me, so you can learn about IRC from a person who has set up one of these channels and is currently using it:

"INTERNET RELAY CHAT (IRC) is a kind of online discussion on some servers. The first idea was to use 'talk.' But you can only talk to one other person at a time. From this dilemma, IRC was designed. On IRC, you can talk live to as many people as you want — all over the world. It is a kind of telephone conference via the Internet. The best way to suggest what IRC is, is to mention you are in a big room with other people. This room represents the so-called channel. You can talk to all of the people in the room (the normal behavior on IRC) or talk secretly to one special person (talk-like, also possible on IRC). You can even make file transfers by 'dcc,' but I didn't try yet.

"The organization of the IRC is that there are linked servers, which build a net, e.g., the EFNet, the Undernet. On these servers are channels available (from each linked server), in which the discussion takes place. Here is an example:

"We (student branch Bochum) organized the channel #ieee ('#' stands for a global channel, '&' for a local one). We have chosen the Undernet because it is more stable than the EFNet. Now every person with Internet access and an IRC client can join the Undernet, then the channel #ieee, and get in live contact with other student branches from all over the world. Examples for contacts: Passau (Germany), Sri Lanka, Panama, England, USA, Malaysia. Our core times are Thursdays from 1500 to 2200 MET (GMT + two hours). Then there is normally one of us on line; at other times there may be someone else on line.

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IRC COMMANDS. "The most common commands are:

/server xxx — Change to the specified server (/join us.undernet.org)

/join xxx — Join the specified channel (/join #ieee)

/who * — Checking who is on the channel

/quit — Quit the connection

"For further information, read the FAQs on the Undernet and IRC that are available, or contact me. If you like, we can meet on IRC as a test.

"Ciao, Oliver."

That is part of Oliver's message. He also included part of the FAQ, which I found very informative. I decided to look for the FAQ myself. I used the search engine Lycos (www.lycos.com) and entered the word "undernet". The first URL located was the "official home page" for the Undernet, but I could not link to it. The second URL was for Paul Grant's FAQ (part 1) on the Undernet (http://www.gibson.com/info/irc/faq.html).

This version is in seven parts:

1.1 What is the undernet?
1.2 Why does it exist?
1.3 How do I get to it?
1.4 How do I get help?
1.5 Why is it so quiet?
1.6 The future?
1.7 Undernet Server List

Part 1.4 explains the help available on line using the /help command as well as listing the UseNet newsgroups "alt.irc.undernet" and "alt.irc.questions". Part 1.7 lists 15 servers in the USA, two in Canada, one in Mexico, 10 in Europe, and one in Australia.

There is also a part 2 on the Web, which is written by Mandar Mirashi ("http://math-www.uio.no/faq/irc/undernet-faq/part.html") and other related links that come up as a result of the search.

GETTING STARTED. You need client software, which you can obtain from anonymous FTP servers such as (for the PC Windows version) "ftp://cs-ftp.bu.edu/irc/clients/pc/windows/mirc". You also need to connect to an IRC server such as "irc.bu.edu", "mickey.cc.utexas.edu", or "irc.mcgill.ca". (These sources are from the book described below.) I downloaded the software into a new directory. (It took 10 or 15 minutes.) I unzipped the file using pkunzip, and installed the program (mirc32.exe) using the "create a new shortcut" procedure in Windows 95. I then made my PPP connection to the Internet, and clicked on my new icon. I selected the server "us.undernet.org" and joined channel #ieee. Oliver was not connected at that time, so I will try again. Hey, it works!

ON-LINE DICTIONARY. One of our members, Mitchell Shnier, has recently published a "Dictionary of PC Hardware and Data Communications Terms" (O'Reilly & Associates, Inc., April 1996). I thought it would be dull reading — not so!

It is a great source of useful information and compact explanations of Internet-related terms. In late July, the on-line version of the dictionary, as well as some parts of the text, became available at "http://www.ora.com/reference/dictionary/". Try it, I think you will like it. Mitchell's home page URL is "http://ourworld.compuserve.com/homepages/Mitchell_Shnier".

FROM THE WRITER. This is my 35th article of a series which started in the Nov./Dec. 1992 issue of THE INSTITUTE. I have missed only one issue — last September's. That was due to a major fire in our home. After one year, we are finally wrapping up the major reconstruction.

Writing this column is fun and made much easier by help from our readers. We have all benefited from the experiences that many of you — our loyal IEEE volunteers — have contributed. The previous issue of this column was based on information contributed by one of IEEE's section volunteers. This month's title was triggered by one of our student members. If you have been involved in an electronic communications project that you think might be of interest to other IEEE members, please send me an e-mail message and tell me about it.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/alden".

traveling the information highway

with Bob Alden

IEEE societies use the Web to effect change

In August I took part in the Chapters Congress of the IEEE Power Engineering Society (PES). This congress assembled the chairs of the PES chapters as primary voting delegates, together with the PES governing board and several of the PES staff. The objective was to obtain "grassroots" input to the governing board on a wide variety of topics. The delegates attended a social get-together on the first evening, then spent two days of intense discussion of issues (with some tutorial-type sessions), and finally voted to produce a prioritized list of recommendations. It is a very effective example of democracy in action. This congress was patterned after the IEEE Sections Congresses, which have been held every three years since 1984. This was the first time an IEEE technical society has held this kind of event.

I was invited to be the facilitator on the topic of electronic communications, and together with Harold Ruchelman — a volunteer with considerable experience in producing section and chapter newsletters — we shared the topic of communicating with members and potential members. We had a lot of fun and great interactions with chapter volunteers from around the world. For my presentation, I used a laptop with an LCD overhead projector attachment and a modem connection to the Internet to view a set of Web pages on the theme, "Five steps to an effective electronic communications strategy." You can view these pages at "power.eng.mcmaster.ca/alden/denver/ec_strat.html".

PUBLICATION POLICY. Before I focus on the concerns and recommendations of the delegates, I want to set the stage by reviewing a major change that this society has recently implemented. The Power Engineering Society has traditionally required all papers to be presented at a conference prior to publication. This policy was intended to assure that full discussion of the paper could be included at the time of publication. The recently concluded summer meeting was the last such general meeting with mandatory presentation. The new policy states that accepted papers will have their titles and abstracts published in the *Power Engineering Review* and on the Web, and made available via fax-on-demand. The full paper will be available for purchase from the IEEE Customer Service Center.

The use of the Web and FOD enables a sufficiently rapid response so that publication delays can be reduced while retaining the opportunity for peer review and discussion. The society has also recently increased its use of the Web for communicating with its members (and others), as well as making more use of e-mail for communicating between volunteers. The society has also tasked one of its governing board members, Hans Puttgen, to investigate the implications of implementing discussion groups within the PES.

There were three parallel sessions entitled "Emerging Issues." I attended the one chaired by PES President Bob Dent. Under the heading of "Dissemination of Information," his lead-off topics were Web pages, fax-on-demand and e-mail.

FAX-ON-DEMAND. For those of you not familiar with the term fax-on-demand, this is a service whereby you can receive faxes on a specific topic. You need a fax machine with a telephone handset. You phone the number of the FOD service. You respond to a voice menu by pressing number keys to select your choice. You receive the fax(es) and pay the phone bill — both for requesting and receiving. The IEEE Regional Activities Department set up the IEEE FOD service, called RABFacts; its number is 1-908-562-6555. Regional Activities has expanded RABFacts for use by other IEEE entities — one phone number with multiple lines does it all. The PES service is known as Powerfax and is described on the Web at "http://www.ieee.org/power/powerfax.htm".

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CHAPTER NEEDS. So the delegates arrived, most knowing something about the changes taking place, and many already using or starting to use more and more electronic communication (EC) tools. Let's look at what they wanted PES and/or IEEE to do for them at the local chapter level.

◆ **Education and training.** Basic and advanced training in EC techniques. In the basic category for members: how to use e-mail and Web software to communicate and obtain information; how to use mailing lists and discussion groups properly. In the advanced category for volunteers: how to set up and manage mailing lists and discussion groups; how to create and maintain Web pages.

◆ **Facilities.** Provide IEEE-managed servers for chapters to keep and maintain their own Web pages. Support development of e-mail discussion groups for chapters, working groups and technical committees. Make tools available to assist chapter volunteers in maintaining and disseminating information. Make the IEEE home page more member-friendly. Put more information on the Web — Distinguished Lecturer Program, conference manuals, chapter manuals, directories, etc. Put membership applications on the Web.

◆ **Money matters.** Provide seed funding for development of chapter Web sites and improved e-mail communications at the chapter level. Negotiate reduced rates for Internet access from providers.

BOTTOM LINE. I was impressed with the group synergy of these chapter volunteers. They picked up on the fact that the PES governing board members were there to listen and take their concerns and recommendations seriously. Many issues were discussed. I have only relayed those related to electronic communications. I came away with the feeling that I witnessed a major rebirth of a society, in which these "grassroots" members knew what they wanted to do as volunteers, discussed what was important to them, made some critical priority choices and went back to their chapters to help move their society ahead.

Two final comments: One, the chapters congress experience — an enabling opportunity that, I hope, other societies will seriously consider; two, the impact of Web and other EC technologies — the society management has begun to use the Internet to change the way PES does business, and the chapter volunteers made it clear they not only approve, but want similar changes at the local level, and they came up with clear guidelines for implementation.

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traveling the information highway

with Bob Alden

Web page writing with Corel's WordPerfect 7

Initially most IEEE-related Web pages were produced by IEEE staff members. We are increasingly seeing links to section and society Web sites that are being developed by IEEE members. It has become fairly common practice for Internet service providers to offer file space for home pages of their customers, and many IEEE members are now producing their own personal home pages.

Software developers are responding to this situation by providing tools to help in the writing of Web pages. Netscape Navigator Gold has an HTML (hypertext markup language) editor. Microsoft provides no-charge add-in software called the Internet Assistant that can be downloaded and used with Microsoft's word processor, called Word. Corel, having acquired WordPerfect from Novell, has recently released Version 7 (WP7) for Windows 95. This latest version builds in the use of HTML as a selectable input/output format. I tried the Netscape HTML editor but did not like it. I tried WP7 and liked it.

Having been a WordPerfect user for several years, I was interested to see what Corel had done to this software product. What with the sale of WordPerfect to Novell, and then the subsequent resale to Corel, I was among the users who wondered if this was the demise or renewal of this product. I have to say I am delighted — for me it has been worth the wait, not only for the Web-related features but in other ways as well.

WEB SITE MAINTENANCE. I am using WP7 to maintain my own Web pages and those for our department. We expect that as our department Web site grows, several of our staff will be maintaining specific content portions of the site.

Managing the content is a very different task from managing the server itself. The two tasks require very different skills. Before the advent of HTML editors, Web page creation and editing typically required a knowledge of the Unix operating system and its (to the non-expert) particular eccentricities. Today, one can easily build Web page editing skills on a general knowledge of word processor commands and processes.

To create an effective environment, we are upgrading our staff's PCs to run Windows 95 and installing WP7 on each staff PC. We have also asked our system manager to set up a linking mechanism so that the working directory on the Unix machine "ece.eng.mcmaster.ca" appears as a local drive on each staff PC. This "local drive access" is effective within our department's local area network but not from home via telephone/modem connection. Without the local drive access, one downloads sufficient HTML files that are hypertext-linked, develops new files or edits existing files, then uploads, using FTP (file transfer protocol) — a somewhat longer process.

We are converting to Windows 95 for three reasons: our Windows-based programs seem more stable, we have the flexibility to use longer filenames with better understanding, and we can use WP7. With this setup, we can use four-character ".html" extensions, not worry about the difference between Unix and DOS file formats, and our staff will continue to use their own PCs while maintaining HTML files that are stored on our Unix-based Web server. The additional training to learn the HTML editing commands is minimal.

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EDITING HTML WITH WP7. When you open a file and select HTML format, the power bar changes and provides tools that are appropriate for editing HTML documents. For example, the font selection converts to a selection of heading levels or paragraph styles such as bulleted lists. A hypertext link creator/editor appears, and so on. The menu bar and tool bar are converted in a similar fashion. As an example, the "Format" menu has features to set the background color as well as the color of plain text and hypertext links. The table feature becomes a mechanism for formatting Web pages — useful, since the concept of the tab does not exist in HTML.

GETTING STARTED. Let's assume you have WordPerfect 7 running under Windows 95 on your computer, and you have no HTML files as yet. Suppose you have a WordPerfect file that you or someone else has prepared which contains most of the content that you want to display as an HTML document (using a Web browser). You open this file in the usual way — click on "File," then "Open," and select the appropriate directory and the file. Now click again on "File" and then click on "Internet Publisher." Then select the box "Format as a Web Document." Up pops an advisory window to remind you that you are restricted to using Web-compatible formats and features. Click "OK" or the "Disable" box to permanently disable this window. The power bar display changes to one appropriate for editing HTML files.

If you do nothing except save this file now — adding no heading or list formats; font attributes such as bolding or italicizing; or hypertext links, etc. — you will have created an HTML document in a basic format. One feature to be aware of is that all Web browsers ignore all hard returns and replace multiple spaces with a single space. If paragraph tags are not inserted, your entire file becomes a single paragraph! To save your file, click on "File," "Publish to," and "HTML." Up pops another window containing a directory path and file name for saving. Click "OK" after you accept or edit the file name and path. Alternatively, click on "File," then "Save," and a window is displayed where you select either WordPerfect or HTML or "Other" format. Select "HTML" and click on "OK." That's it! You have just produced a Web page.

Don't close your file or exit WordPerfect until you have viewed your new Web page. The next step is to bring up your browser — I use Netscape Navigator 3. Click on "File," then "Open," then select your new HTML file in the directory where you just saved it. By having both WordPerfect and your browser open at the same time, you can alternate between editing and viewing until you are satisfied with the result.

ADDING HYPERTEXT FEATURES. The next step is to add headings in a larger font size. To do this, block the text, click on "Font/Size," and select from one of the seven heading choices. The selection of bullet or numbered lists is in the same window. To use bold, italic, underline and other enhancements, block the text, click on "Font Attributes" and select. Color for the background, regular text, and hypertext links can be selected by similar block and click techniques. Creating tables remains a simple click and drag procedure. To create a hypertext link, block the text, click on "Hypertext," select "Create Link," select "Document," and type in the URL (uniform resource locator, which is the Web address) for the document you want to link to.

EDITING EXISTING HTML FILES. You can also open an existing HTML file — click on "File," then "Open" and select the file in the appropriate directory. Up comes a window in which you must confirm that you want to convert this file from HTML format (so you can bring it into WordPerfect — later , when you want to save the file, you convert back to HTML format). Click on "OK" and watch the power bar display change to one appropriate for editing your HTML file. You then get an advisory window to remind you that you are now restricted to using Web-compatible formats and features — you have the option to disable this window if that is your wish. Continue editing, saving and viewing as described above.

There are lots more features in many Web pages that newer browsers can recognize. Some of these features require specialized knowledge and tools to implement. But the basics — creating and formatting Web pages that are easy to read, structured to focus attention, and linked to other Web pages — these tasks can be performed by non-computer experts who are used to producing documents in a word processor environment. In my view, the significant breakthrough is that the production of Web pages has been brought back within the grasp of people who have learned the art of producing quality printed material. Hopefully this will result in higher quality Web pages and more efficient Web page production and maintenance. That having been said, the bottom line is that creating and maintaining Web pages just got a whole lot easier.

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traveling the information highway

with Bob Alden

Global employment tools

The Internet is enabling the broadening of the distribution of employment information and services. Use of the Internet can open new doors to employment opportunities for both potential employees and employers. The professional activities arm of the IEEE has been learning how to harness the power of the Internet for several years. Let's look at what the IEEE and others are doing in this important arena.

IEEE-USA. The IEEE-USA National Job Listing Service recently started its third year of operation. IEEE Vice President – Professional Activities Joel Snyder extols this Internet-based employment service as "the ideal vehicle for companies experiencing difficulty finding qualified technical talent in today's tighter engineering labor market."

According to Chris Currie of IEEE-USA, the National Job Listing Service has experienced explosive growth in its first two years of existence. He notes that during the first half of 1996, nearly 75,000 visitors logged on to this free member service, which has posted several thousand job openings since it began.

He also told me that, as widely reported during the recent employment-based immigration debate, some companies have complained publicly that they have been unable to find enough qualified electrotechnologists in the United States; and that a few large high-tech corporations even claimed they had 1,000 or more unfilled technical positions.

The Web address for the IEEE-USA National Job Listing Service is "www.ieee.org/jobs.html". For more information on the service, or to post job openings, contact IEEE-USA's Bill Anderson at 1-202-785-0017, ext. 330, or "w.anderson@ieee.org".

When you log on, you will find Web, Gopher and e-mail versions of regional listings of job openings within the Unites States. There are also jobs posted for non-U.S. locations. You will also find on-line tools to help you compare salaries in different cities and review prospects for specific occupations, and links to a large number of non-IEEE servers with job-related information and services. You can also post your own resume.

Starting with the corporate shift to globalization and building on the global expansion of the Internet, there is an opportunity to build on the IEEE-USA initiative and begin to link into other employment postings and services that are growing at a fantastic rate. Let's look at some of these sites — the Web version of this column has the live links in place, but you can enter the addresses from the printed version into your Web browser. Just type "http://" followed by any of the Web addresses given between double quotes (don't type the quotes) into the Location window of your Web browser and hit the "enter" key.

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OTHER SERVERS. The Monster Board "www.monster.com" is an example of a server set up for employment postings. This site offers services similar to those of IEEE-USA. You can search job listings by country — in the USA. by state and city, in Canada by province, and in 14 other countries. There are also links to separate Monster Board sites in the U.K. and Australia, as well as one to La Presse — the major French language newspaper in Quebec, Canada.

CORPORATE SERVERS. Many corporate Web sites not only provide information about their products and/or services but also post job openings — for example, Corel Corp. at "www.corel.com". Click on Human Resources and select job opportunities, listed separately in the United States and Canada. Or try the IBM server at "www.ibm.com", click on About IBM, then click on Employment, then select a country — Canada, Germany, Netherlands, Japan, South Africa, Switzerland, United Kingdom, United States. I chose United States and realized I could find out about specific job openings, job opportunities by discipline, "hot" job categories, and I could submit my resume by entering information about me into a Web form. The General Electric site at "www.ge.com" has an Inside GE link, from which I could select Work, then Professional Opportunities, then pick from 17 business groups. I picked one and found four specific jobs available in two cities along with detailed job descriptions and information about how to apply.

Some corporate Web sites provide information that you can study prior to submitting an application — and thus be better informed about possible positions and be able to tailor your resume to highlight relevant experience, strengths and interests. One example of this is the Nortel Corp. — formerly known as Northern Telecom — at "www.nortel.com". Log on to their site, click on Career Opportunities and select North America or Europe, then look at the descriptions provided on such topics as type of work, skills required and locations where jobs are available.

Some even provide information on selling yourself with your resume and how to settle yourself into a new job. To see this kind of information, check out the Royal Bank site at "www.royalbank.com/english/hr/hr/index.html".

GOVERNMENT SERVERS. The government of Canada provides descriptions of occupations along with salary ranges and employment projections at "hrdc-drhc.gc.ca/hrdc/corp/stratpol/jobs/english/index.html". The specific page for electrical and electronics engineers is "hrdc-drhc.gc.ca/hrdc/corp/stratpol/jobs/english/volume1/2133/2133.html".

NEWSPAPER SERVERS. Some newspapers provide Web pages that display jobs advertised in the printed version of the paper and thus extend their readership beyond traditional bounds. Check out USA Today at "www.usatoday.com", click on their search engine and enter the word "jobs" — I found 265 documents of job-related stories. Or try the U.K. newspaper The Guardian at "www.guardian.co.uk", click on Recruit Net and search what they claim is the U.K.'s largest database of jobs. You can even use an "expert program" to help you compose the "perfect resume." Or try the Canadian newspaper The Globe and Mail at "www.theglobeandmail.com", click on Career Connect, and submit a request to search career adds on-line, and much more.

Three newspapers in three countries — but available to anyone with Internet access. Similarly, the other corporate servers I have noted — manufacturers, financial institutions, government, etc. provide information over the Internet. For some it is their primary reason for existence, for others it is either an important aspect of their business or a public service designed to bring viewers to their site.

IEEE SPECTRUM. You can also view the job-related advertisements in the on-line version of *Spectrum* (or the printed copy). Log on to "www.spectrum.ieee.org/spectrum/member.html". Then click on Current Issue, Advertisements/Classifieds, Career Opportunities, and view any of the job-related items.

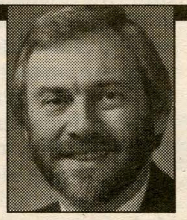
THE POTENTIAL. What does this mean to our members? To those with access to the Web, an opportunity to search individually for available jobs and to take advantage of the new services that are available over the Internet. To those without Web access, this information could be made available through the networking possibilities of our sections and chapters, augmented in the United States by our PACE (Professional Activities Committees for Engineers) network. Outside the United States, the linkages between local sections and their national society can provide a forum for this activity if the members so desire.

Those with Web access could serve as the local node to collect and distribute information to other members and also to upload information collected locally to IEEE-wide servers. By working together as volunteers, we can expand the benefits of IEEE membership and take advantage of the IEEE Internet connectivity. As a society of engineering professionals, working together to help each other enjoy appropriate work opportunities can be a mutual success story.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/alden".

traveling the information highway

with Bob Alden



Adding graphics to your Web page

In previous columns I have discussed some of the simpler techniques that we use in producing Web pages. In this one, I look at a few of the basic techniques for adding graphics in the form of in-line images. One of the caveats in using images is that these files have to be transported across the Internet and downloaded into your computer before they can be seen. I tend to use images sparingly and, if I need a large image, I try to place it on a page that does not have to be viewed in the early sequence of a set of pages. The size of image files can be minimized by choosing a minimal color depth — four bits per pixel for 16 colors.

PREVIOUS COLUMNS. For those of you who want to look back at previous columns, here is a short index of my Web-writing-related articles (the Web address follows in double quotes in case you want to view them on the IEEE web server): Producing Web pages — August 1995 "www.institute.ieee.org/INST/aug95/inf_hwy.html", Producing Web pages, part II — October 1995 "www.institute.ieee.org/INST/oct95/inf_hwy.html", Web page writing with Corel's WordPerfect 7 — November 1996 "www.institute.ieee.org/INST/nov96/inf_hwy.html". For those of you who wish to browse on-line, I have put together a linked index of all of the columns I have written (Nov./Dec. 1992 on) at "power.eng.mcmaster.ca/alden/ti.html".

THE IMAGE TAG. In the August 1995 column, I described the concept of a tag, which is really a command in the hypertext markup language (HTML). The tag for displaying an image is of the form **<img align=left src="ieeelogo.gif">** where **<img** and **>** are the beginning and ending delimiters of the image tag, **align=left** is the positioning attribute, and **src="file_name"** is the image source identifier. Other positioning attributes such as center or right can be used. If the file is not stored in the same directory as the HTML file, then the appropriate path specification or complete URL (uniform resource locator) must be included. The image to be displayed is contained in a file with the extension ".gif". This implies a certain file format. Two image formats are recognized by Web browsers — gif and jpeg.

IMAGE FILE FORMATS. There are different types of file formats that are designated by specific file extensions. Since some programs recognize some and not others, the file format is important, may be confusing, and may lead to incompatibility. Here is my list of graphic file formats, listed alphabetically by the file name extension and followed by some brief comments to help you distinguish them:

- BMP — Bitmap is a Microsoft Windows or OS/2 pixel by pixel palette dump format without any data compression;
- EPS — Encapsulated PostScript is part of the Adobe postscript language
- GIF —Graphics Interchange Format from Compuserve is another uncompressed pixel by pixel format in two versions, GIF87a and GIF89a — the latter has the capability for transparent backgrounds.
- JPEG — Joint Photographers Expert Group (JPEG) is a pixel by pixel format but with data compression so that the files are smaller than BMP and GIF but some information is lost. Jpeg is used for larger graphics — especially photographs.
- PCX — Zsoft created this pixel by pixel format which has some compression but no loss of information (in between BMP and JPEG)
- TGA — Truevision Targa is an uncompressed pixel by pixel format.
- TIFF — TIFF is the Aldus Tagged Image File Format and can be either compressed or not.
- WMF — Windows Meta File, the format used in the Windows clipboard and the Word word processor, contains both vector (line-art-based) and bitmap (pixel-based) images
- WPG — WordPerfect Graphic, the format used in the WordPerfect word processor and WP Draw applet, contains both vector and bitmap images.

SOURCES OF IMAGES. There are several main sources of files: you may create your own file using a graphics program or by scanning an existing print or photograph; you may receive files that are sent to you on a disk or via FTP (file transfer protocol); or you might download a file from the Web. The format of the file you have will likely depend on how it was created. You may wish to change the size or appearance of the image and thus you will need to import your file into some program to make those changes. So we need to know what kind of software (programs) to use, what formats these programs can use, and how to change from one format to another.

SOFTWARE. Here are some examples of software I use to create Web images.

Paint (part of the usual Microsoft Accessories package) is an image creation/editing program that I use to create some image files, add color to others, and add a border to an existing file. Paint recognizes PCX and BMP formats. I saved my files in BMP format and used Lview to convert them to GIF.

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Lview is an image file editor/viewer available in freeware or licensed versions based (in part) on the work of the JPEG (I am using Lview for Windows version 3.1). The freeware version I use recognizes JPEG, BMP, GIF and Targa file formats. The commercial version (LviewPro) also recognizes TIFF format. I use Lview to view files, convert between BMP and GIF formats, and change the size or color balance of images. The software can be downloaded from "www.shareware.com".

Tif2pcx is a file format converter distributed with PaintShow Plus that converts TIFF formatted files to PCX format, and is one example of small utility programs that exist to enable format conversions. I had a number of TIFF files that I wanted to use so I used tif2pcx to convert them to PCX and then I used Lview to convert to GIF.

GIFAnimator is a Microsoft tool for creating animated GIFs available from "www.shareware.com". (I have not yet used this product but it looks interesting.)

IEEE LOGOS. These are available at "www.ieee.org/copyright/logos.html" in TIFF, GIF, JPEG, and EPS formats for use by IEEE volunteers for recognized IEEE entity activities.

FILES FROM THE WEB. Any time you view a Web page, the files are copied from the computer where the page is stored into a cache directory. In my case, the path is C:\Program Files\Netscape\Navigator\Cache\. This location is determined at the time that you install your browser. The files that are copied include not only the HTML files but also the image files, so you can copy any of these files from your cache directory to another directory to use that file for your own purposes. For example, you might want to use someone else's home page as a template to help you create your own. Or you might want to copy and use a graphic file.

There are some legal and moral implications involved. Some files contain content which is copyrighted and may not legally be used without express written consent of the owner. Some files are in the public domain and may be copied and used legally. Some may be legally used by another person as long as certain restrictions are respected — giving credit to the owner, not changing the content, and so on. Let's look at how one copies and uses a image file that can be legally copied and edited.

Unfortunately, these files are stored with people-unfriendly file names so you usually need to do some detective work to figure out which file is which. One useful trick is to empty the cache just before you view the page. In reality you view the page, empty the cache and reload the page. To empty the cache — using Netscape Navigator Version 3 as an example — click on Options, then Network Preferences, and Clear Disk Cache Now.

If you look in the cache directory before and after this operation, you will see that the directory is emptied (except perhaps for a file allocation table dummy entry which you can ignore). I did exactly this while viewing my home page, which contains two small images — a McMaster University logo and an IEEE logo.

When I looked in the cache directory after clearing and reloading I saw three files with the file names "M0PAR40Q", "M0PAR41C.GIF", and "M0PAR41D.GIF". By viewing the first one — with no extension — using a text editor/viewer, I realized it was my home page HTML file, so I could copy and rename it as "my_home_page.html", for example. To identify the GIF files, I used Lview by clicking on File, then Open, then I selected GIF format, and the cache directory. I then saw the two GIF file names in the file display window and selected one of them — with the 41C.gif ending. Lview displayed the IEEE logo. I then could copy that file and rename it as, for example, "ieeelogo.gif".

So there we are — several ideas for sources of images, a few tools to make the necessary changes and format conversions, and a simple HTML tag to insert these images into our Web page. For more information you can look over any of the excellent books on creating Web pages, or use search engines like Lycos, Yahoo, and so on and search on strings like GIF, TIFF, etc. Happy imaging!

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traveling the information highway

with Bob Alden

E-mail courtesies

Every so often I receive suggestions for topics to discuss in this column. This month I am responding to several members who have written to me after they have received e-mail messages they did not like. There are a variety of reasons. The concerns range over questions of manners, style, content, volume, frequency and so on.

I also receive reminders that not all of our members know how to use the Internet. For those who have never used a computer for e-mail, the next section is for you. The remainder of this column is about the do's and don'ts of e-mail.

IF YOU HAVE NEVER USED E-MAIL. Using the Internet has become much less complicated. Manufacturers of hardware and writers of software, together with the business acumen of service providers, have combined to provide us with systems that are fairly simple to use. The cost of a personal computer (PC) is about the same as the cost of a high-quality television set, and the cost of Internet access is often comparable to the cost of telephone service.

In many areas, one can purchase a computer from a retailer with the Internet access software fully installed. Since PC sales are so competitive, you can often persuade the store manager to set up your access software if you have arranged for your Internet access ahead of time. Getting started using e-mail (electronic mail) becomes a matter of taking your PC home, connecting the parts as the person in the store showed you, connecting to the power outlet and the phone line, turning on the power, watching the various program icons (little pictures you click on to activate the program) appear on the screen, and using the mouse to click on the e-mail program icon. Modern e-mail programs are very straightforward to use. If you have never used one, your friendly sales person at the store where you buy your computer will show you how (if not — buy where they will!).

In some ways, using a browser to access the Web is even easier than accessing e-mail. E-mail is (mostly) the sending and receiving of messages between people, whereas Web browsing is looking up information that someone has published. Putting it another way, e-mail is an alternative to (in some ways a blend of) the telephone or postal service, whereas Web browsing is an alternative to browsing in a library.

FOR EVERYONE. For all e-mail users — novice, expert, or in between — there are a number of ways we can make the use of e-mail more friendly, and more effective in building a professional image for ourselves.

SPELLING. Just because it's e-mail, it is not an excuse to ignore the common courtesy of correcting obvious mistakes in spelling. Your e-mail message is a written document and may be printed or forwarded to someone else.

CAPITALS. Do not leave the "Caps Lock" setting on your keyboard on. The use of CAPITALS in e-mail is called SHOUTING and is considered impolite. Why? Because single-spaced, capitalized text on a screen looks awful — end of story.

HELLO AND GOODBYE. It is good manners to introduce yourself when you send someone a letter or use the telephone. You usually begin by mentioning your recipient's name. Depending on how well or in what way you know the person, you use the appropriate degree of formality or informality. You also conclude a letter with your own name, again using the appropriate formality. It is surprising how many e-mail senders ignore these two parts of the message.

There is a reason why some claim this is unnecessary. Your e- mail message is embedded in a file that contains a header before the message. This header contains the "To," "From," "CC," and "Date" information along with a whole lot of other information that, most of the time, you do not need nor want to see. Some e-mail software packages strip off these headers or parts of them prior to displaying your message. In any event, the header is for the computer network that processes your message, not for the reader.

Many people use a so-called signature file that is automatically appended to the end of the message. This is the equivalent of letterhead or a business card. It is not a friendly way to end your message. (Most e-mail packages have a feature that helps you create this so-called signature file when you begin using that package. You normally only change it when something like your phone number changes.)

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JUNK MAIL. The Internet is not a medium for junk mail. Do not send unsolicited advertising. Most Internet access providers will deny access to the Internet if there are significant abuses to the stated Internet policy of not permitting unsolicited commercial messages. Web pages may and do contain advertising but you — the user — choose to view those pages. You can elect to join various electronic services — for example, join mailing lists or log on to commercial servers — but the Internet philosophy is that the receiver chooses, not the sender! The Internet Society governs the use of the Internet. Its various task forces, committees, etc., set the rules of conduct, control the assigning of Internet addresses, and so on. If you are interested, you can view their home page at "www.isoc.org". If you receive junk mail, complain strongly to your service provider.

THE DREADED CC. Who to CC to? It is so easy to include multiple CCs on original messages you send or to reply to all the CCs on the original message you received. But who really needs a copy? And if you received a CC for information, do you need to respond? Make sure there is a good reason to reply. By the way, most e-mail packages have a way for you to reply to the sender or to the sender and all of the CCs. Make sure you understand which is which.

GROUP ALIASES. If you want to send messages to several people you can create group aliases in most e-mail packages. These are your personal group aliases, and when you send to the group alias, your message is sent to all of the addresses that you included in the group alias when you created it. All of these addresses are listed in the header file. If you included a large number of addresses, then the header file may be much longer than your message. It is very annoying to receive a message that follows several screens full of addresses. There are two alternatives. Ask your service provider to create a system group alias for you — that way each person gets their own message without all of the recipients being listed. The second alternative is to ask your service provider to enable you to use a mailing list managing program such as Majordomo. The advantage of the second alternative is that you can edit the mailing list yourself without waiting for the service provider to respond to your request (once it has been set up). Please see the July '96 issue of THE INSTITUTE for more information on e-mail aliases.

REPLYING TO MAILING LISTS. If you subscribe to a mailing list and receive messages, you need to be aware that you may have a choice as to whether you reply to the sender of the message or all of the recipients. Within IEEE, we have developed a convention to differentiate between so-called mailing lists and so-called discussion groups. Please see the April '96 and May '96 issues of THE INSTITUTE for more information on each of these. The key distinction is that all replies in a discussion group always go to everyone in the group, whereas replies only go to the owner of a mailing list. Both of these can be managed using Majordomo. Some folks set up mailing lists without using this distinction. In my view, discussion groups (those lists where replies go to everyone) should only be used when people become part of the group by subscribing and have the option to unsubscribe. However, if you are on one of these lists — find out how to reply responsibly.

KEEP IT SHORT. E-mail messages are best kept short — half a screen of text is ideal. Post large quantities of information such as conference announcements on Web sites or FTP sites, or as auto-retrievable text files, and send a short message describing what is available and where it can be obtained. For conferences, include the name, sponsor, location and date, and put everything else in a set of files.

That's all for now — a few explanations and some thoughts on how we should be using e-mail as members of a professional community. Your thoughts and suggestions will be most welcome.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president.

In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/alden".

traveling the information highway

with Bob Alden

IEEE's Internet Project

Are the IEEE's Internet services adequate in today's world? The delegates to Sections Congress '96 (SC '96) held last November in Denver, Colo., USA, have said "no." They have asked the IEEE to provide a wide range of Internet services and they have placed a very high priority on these kinds of services.

The complete set of 38 prioritized recommendations were reported in the January issue of THE INSTITUTE. Elsewhere (above) in the current issue, our editor reports on the meeting of the IEEE Board of Directors in 1997 February and the initial report presented by the Electronic Communications Steering Committee (ECSC is an ad hoc committee of the Board of Directors). That ECSC report proposes a plan, the Internet Project, to respond to the six SC '96 recommendations that relate to Internet services.

This month I want to share some of the background behind that report and outline the process we are beginning — to put improved Internet services in place.

THE RECOMMENDATIONS. First let's review what the delegates are asking for — with these six recommendations:

R1 — IEEE should provide electronic facilities on suitable servers that are interactively accessible by all IEEE members and entities. Services provided should include Web pages, e-mail, member services (including renewal), reporting technical information, IEEE information, training and help lines.

R2 — Recommend that IEEE provide the electronic infrastructure for disseminating information down to section and chapter level to include directories, Web page links, ROOT/CAM, technological insights and practices.

R3 — Enhance and facilitate electronic and personal communication with all IEEE entities by hosting interactive entity Web pages, improving SAMIeee, and better targeted advertising of member benefits services and conferences.

R4 — Provide resources and mechanisms to improve, enhance and maintain a network of electronic communications, for the benefit of, and in cooperation with, regions, sections, branches, societies and chapters, and the members, by 1997 December.

R5a — Recommend that to assist Sections with newsletter and publicity costs, IEEE provide financial and technical support to sections for the maintenance of a Web site for section home pages and provide e-mail aliases for all members.

R10 (with EAB) — Provide and deliver quality application-oriented continuing education and effective electronic communications to meet the needs of members and customers.

The number preceding each recommendation is the priority ranking assigned by the voting delegates — out of a total of 38, the ones relating to electronic communications constituted the top five and the tenth — which was jointly assigned to the ECSC and the Educational Activities Board.

Once the recommendations are developed at the Sections Congress, the IEEE Executive Committee assigns each recommendation to a major board or committee of the IEEE for action. These six constitute the assignment given to the ECSC.

THE OVERVIEW. The members of the ECSC discussed these recommendations in the context of the ongoing activities behind the scenes at the IEEE Operations Center — where most of the IEEE electronic communications services are managed in concert with the many volunteers who provide the leadership within our societies and sections around the world. In many ways SC '96 requests are an endorsement of IEEE's past actions in providing Internet services within and from our operations center using IEEE staff. But now our section volunteers are asking to have the same advantages at the local section level as we have at the corporate level. They say they need to be able to create and manage e-mail lists and Web pages on IEEE servers and to conduct IEEE business electronically. They are suggesting a much more extensive and intensive use of the Internet with much more information being made available to both volunteers and members on Web pages and via electronic mail.

For this to happen, we need to install and operate IEEE servers that IEEE section, chapter, student branch and society volunteers can access to create and use e-mail and Web-based (and related) services. We need to provide secure mechanisms to enable IEEE members and volunteers to conduct business transactions with IEEE — joining IEEE, renewing membership, changing ongoing membership services, ordering products, registering for conferences, etc. We also need to provide the capability for members to read or search on-line publications — that may not be available in the same way for non-members. For the thousands of volunteer leaders — filing reports, reading conference guides, requesting information, making contacts and arrangements — the list is as long as the IEEE is complex.

We also need to be able to differentiate between non-members and members, and between members of different societies (for example). We need to speed up the conversion of the huge amount of existing IEEE information to hypertext markup language (HTML) format so that it can be made available via the Web (and where appropriate — via CD-ROM, fax, FTP, e-mail, etc., for those living where Web access is not realistic).

Some of these tasks are fairly straight forward and relatively simple to implement.

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Others require major changes in the business and technology processes we use at our operations center. Currently, member records, financial information, product catalogs and related computer data are all protected behind a firewall, which is an electronic barrier to prevent people outside of the operations center complex from accessing that computerized data. Ensuring that access by members to this data, in order to conduct a business transaction, must be implemented very carefully. The concept of information conversion to HTML format is straightforward, but the sheer volume and the complexity of the IEEE's multifaceted technical/educational/professional activities adds its own unique set of challenges.

THE INTERNET PROJECT. To achieve the goals set by the SC '96 delegates, the ECSC strategy is to propose a set of five action plans. The intent of the ECSC report to the Board of Directors in February was to notify the Board of the direction being proposed. Before the next meeting of the Board (in 1997 June), these action plans will be developed. This will involve looking at our use of technology and our business processes, building on the experience we have gained in both our current operations and several key pilot projects (more on these in future issues), setting target dates, producing cost estimates, and assembling teams of people (IEEE staff and volunteers). We also need to involve as many people as possible in providing input from two complementary points of view — our members (including volunteers) as the customers of these future services, and staff and volunteers as the providers of these services. The five action items are:

A1 — provide volunteer servers outside firewall;

A2 — provide commerce servers inside firewall;

A3 — provide IEEE information over the Web;

A4 — improve section access to member information (SAMIeee);

A5 — develop the ability to manage increased use of the Internet.

The report to the Board contains more details. It includes cross references to link specifics in the action items with each element of the six recommendations. More on these individual action items in future.

PES CHAPTERS CONGRESS. Exactly four months previously, and in the same city (different hotel), the IEEE Power Engineering Society held its first Chapters Congress, modeled along the lines of the Sections Congress series (there have been five so far, held every three years). The PES Congress produced 80 recommendations for the PES leadership to consider — 13 of those were related to the use of electronic communications. Many of these recommendations will be addressed by the response to the sections congress recommendations.

YOUR INPUT. We have set up an electronic discussion group for anyone to use to discuss and provide input. You can join this group by sending an e-mail message to "majordomo@majordomo.ieee.org" and placing the command "subscribe internetproject-d" on the first line of the message. You can send a message to everyone who has joined (subscribed to) this group by addressing your message to "internetproject-d@majordomo.ieee.org".

WEB SITE. We have a Web site for this project. To access it from the IEEE home page, select "Electronic Communications" services (or go directly to "www.ieee.org/eleccomm"), then select "IEEE Internet Project." At present, this site contains the full initial report to the Board as well as links to the SC '96 recommendations, the electronic communications related recommendations from the PES Chapters Congress, and a number of links to pages about the Internet and Internet services. The discussion group "internetproject-d" is described. I hope that this site will serve as the primary source of information about this project. The discussion group is intended to be a significant venue for you to provide input to this project. I welcome your comments and suggestions on an ongoing basis.

DOWNLOADING IMAGES

In my February column ("Adding graphics to your Web page"), I discussed the basic process whereby, every time you view a Web page, the HTML file and the associated graphics files are first stored in the memory of your PC and thus you have the capability to use those files (bearing in mind the relevant copyright laws and other such factors) for your own purposes. Several members pointed out to me that if you really want to copy a graphic in the simplest way possible, you position your cursor over the graphic, click on the right mouse button and specify where you want to save the file.

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traveling the information highway

with Bob Alden

IEEE - 'The Source' for Web sites, info

The IEEE has been, and continues to be, the dominant source for new technical information in "electrotechnology." Our complex collection of technical societies and standards development task forces, combined with the traditional delivery system of conferences and publications, enables the world's leaders in technological development to congregate and learn from each other.

Times are changing, and the IEEE is transforming its wealth of technical information into electronic form for dissemination in a variety of ways that are faster and more convenient.

The recent Sections Congress addressed the provision of electronic (Internet) services, and last month I discussed the steps IEEE is taking to respond to delegates' recommendations. This month I focus on an extension to the concept of being the world leader in technical information. Let me explain.

THE SOURCE. As the IEEE, we have the capability to have the one Web site that is "The Source" for electrical and computer engineers, a convenient source for our members when they need to find any information related to the kinds of business they engage in.

This goes far beyond the technical information we produce and publish. It includes the statistics on demographics, customer preferences, business opportunities, funding and many other categories that government agencies and business associations collect and publish on the Web; it includes on-line catalogs of products and services that companies develop and maintain; it includes educational and training programs offered by both private and public sector institutions. It should include everything you, the IEEE member, need.

YOUR INPUT. And we, the IEEE members, are the ideal collectors of the links to this information. As we go about our work or as we read magazines, newspapers and so on, we see references to Web sites that contain useful information. If we can use our IEEE connections to share this information, think how many sources of information we can collect. How do we do this? Let's try an experiment:

I ask each of you to send three-line e-mail messages to the IEEE that contain the URL (e.g., the Web site address) of the source of information, a short descriptor for the link, and an appropriate additional descriptive phrase.

For example, suppose you thought that it would be useful to be able to read the on-line magazine *Technology Review* published by the Massachusetts Institute of Technology. You would put the URL — "http://web.mit.edu/techreview/www/tr.html" — on the first line , followed on the second line by the link descriptor *"Technology Review,"* followed by the description "published by the Massachusetts Institute of Technology, Cambridge, Mass., USA."

Using this format, please e-mail your contributions to "thesource@ieee.org".

WEB SITE. Last month I described a Web site for the IEEE Internet Project. I see "The Source" as being part of the overall IEEE Internet Project, so I have added a place for "The Source" on this Web site. This can be our temporary home for access to this information while we see how it develops. To access from the IEEE home page, go under "member services" and select "electronic communications" services (or go directly to "www.ieee.org/eleccomm"), then select "IEEE Internet Project."

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CATEGORIES. How will these links be organized? What categories will we have? These questions will be answered by your input. You will help shape this development by the kinds of information sources you submit. To get started, let me suggest a few categories based on the premise that different areas of information are relevant for each of our members at different stages of their careers:

◆ Technical — First, there are the sources of technical details, consumer patterns, and resource capabilities that relate to the practicing professional engineer in the "primarily technical" part of his or her career cycle.

◆ Management — For those who are in the "management" career phase, very different information issues emerge — human and financial resources.

◆ Life Members — For our life members there may be a third set of issues of interest - retirement issues, personal investment portfolios, and so on.

◆ Recent Graduates — For the recent graduate — our Graduates of the Last Decade (GOLD) members — there may be issues relating to starting careers and developing a professional practice.

A FEW HELPERS. We also need a few volunteers to help organize these URLs and create/maintain the Web pages that house them. If you have experience editing Web pages and are willing to assist, please join the e-mail discussion group we have set up for this purpose, "thesourcemanagers-d@majordomo.ieee.org". You can join this group by sending an e-mail message to "majordomo@majordomo.ieee.org" and placing the command "subscribethesourcemanagers-d" on the first line of the message. If you have questions, send me an e-mail.

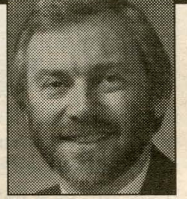
One caveat — this idea may flop, for two very different reasons — too little response, or too much input and not enough volunteers. However — bear with us if we take time to catch up with a wonderful deluge of great links! I will keep you posted on the "IEEE Internet Project" Web site.

Let me close with an appeal. If you are on a technical committee, or in the Engineering Management Society, the Life Members Committee, the GOLD program committee or any of the IEEE societies, boards or committees, and you see a possible role for your entity to play, please discuss this within your group and participate.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/alden".

traveling the information highway

with Bob Alden



Web pages and frames

As we browse various Web sites, we see a wide variety in the presentation of text, graphics, and the overall layout. Hypertext markup language (HTML) defines the codes for displaying the content of Web pages. Every so often a new version of HTML is announced as new formatting codes are introduced and a new "standard" is adopted.

One of the inherent problems in preparing Web pages is that the Web browser interprets the HTML codes, and different browsers interpret differently. Also, the user can change many of the default settings in the browser and thus change the appearance on the screen from what the author had intended. Some browsers do not recognize some codes that other browsers do.

Generally newer versions of browsers recognize more codes than older versions. My first column about the Web, August 1994, was entitled "Mosaic and the Web: the more sophisticated Internet."

At that time, Mosaic was the most popular browser. Today, Netscape Navigator and Microsoft Internet Explorer are the most commonly used browsers. I use both, and when I create a new page, I view it with both browsers to check that I am satisfied with the appearance. If not, I change my codes to eliminate unwanted differences.

One source about HTML codes that I find useful is Maran Wilson's "HTML Quick Reference V 1.2" which can be found at "http://sdcc8.ucsd.edu/~m1wilson/htmlref.html". This includes codes up to HTML version 3.2 and some extensions specific to Internet Explorer and Netscape.

FRAMES. This is a technique to subdivide your Web page into several pages by splitting the Web page window vertically and/or horizontally into discrete sub-windows or frames. I will use an example with three frames. The Web page is first split horizontally into a top portion and a lower portion with a 15 percent, 85 percent fixed split. The lower portion is split vertically with a flexible ratio whose default value is 25 percent, 75 percent.

To create a set of three frames requires four HTML files — one for each frame, and one to define the set of frames. Lets look at a three-frame example in detail.

EXAMPLE. One of my own pages in my personal Web site is called "Bob Alden's World In General Web Page Links" and includes a set of links to many different sites organized into categories. Originally I placed a menu (table of contents) at the top of the page with links to move down the page to the various category headings. The name of this file is "wig.html".

This is an ideal application for using frames. My top frame file, named "wigb.html", is the banner with information that I want to display all the time. The left frame file, "wigm.html", contains the menu. The right frame file, "wigc.html", contains the complete set of contents. Both left and right frames scroll automatically since there is more information than can be displayed at one time.

Each of these three files is just like any other HTML file. If you enter the URL "http://power.eng.mcmaster.ca/alden/wigc.html", you see that HTML file displayed by your browser using the entire window. The file, "wigf.html", contains the frames definition code. If you use the URL "http://power.eng.mcmaster.ca/alden/wigf. html", you will not see that HTML file but the set of three files it defines — each in their sub-window.

Lets look at this frame definition file displayed in the large box. I have added the numbers 0 to 9 at the left to aid in this explanation.

Line 0 contains the traditional starting tags for an HTML document including the title that is contained inside the head tags. **Line 9** contains the necessary closing tags.

Line 1 contains the first of two nested frameset tags that define the first frame pair with a 15 percent, 85 percent split using the rows attribute to define a top-bottom partition.

Line 2 defines the top frame source as the file "wigb.html", fixes the size of the frame, and enables scrolling if needed.

Line 3 is another frameset tag and splits the bottom partition 25 percent, 75 percent using the "cols" attribute to define a left-right partition.

Lines 4 and **5** define the sources for the bottom two frames.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

Lines 6 and **8** define the body of the non-frames HTML document and enclose the content that can be read by a browser that does not support frames. In such a situation, all of the tags that begin with <frame and </frame are ignored and the content on **Line 7** is displayed. In this example, the content is a link to the original non-frames document with a suitable accompanying note.

OTHER CODES. There are two other key codes to know about before you start: How to link from one frame to the other, and how to ensure the visited site fills the full browser window as opposed to filling the frame only.

Line 5 includes the "src" tag to identify the URL of the HTML file. It also defines a name for that file — in the example, it is "wc", my short name for the file "wigc.html". In the left frame, the first link is to a heading in the right frame.

The link tag contains both the URL (wigc.html) and the name (wc): "Hotels ". We also see that the URL has been expanded by the addendum "#hotels" which is a way of identifying a specific item within this long list (so one can skip down the page to the right point). That point is identified in the right frame HTML file by the following name tag: "Hotels". The link from the left to the right frame is internal, within the same directory, so it uses the simplest URL possible — the file name.

The links from the right frame are normally external and the full URL is needed — for example: Hilton Hotels. The only additional attribute within this link tag is target="_top". This is used to force the use of the entire browser window instead of only the right frame to display the linked page.

Well, that's a start. For more information about creating frames, you can check out Netscape's site at "http://home.netscape.com/assist/net_sites/frames.html".

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```
0 <html> <head> <title> Bob Alden's World In General </title> </head>
1 <frameset noborder framespacing="5" rows="15%,85%" >
2 <frame src="wigb.html" noresize scrolling=auto >
3 <frameset noborder cols="25%,75%" >
4 <frame name="wm" src="wigm.html" scrolling=auto >
5 <frame name="wc" src="wigc.html" scrolling=auto >
6 <noframes> <body bgcolor="gold" text="brown">
7 <H3><a name="top">Bob Alden's</a> <i>World In General</i> Web Page Links </H3>
<font size="+1" color="#ff0000"> <b> The non-frames version of this page will not be
updated after March 27, 1997 but is available using the original URL <a href="http://pow-
er.eng.mcmaster.ca/alden/wig.html"> http://power.eng.mcmaster.ca/alden/wig.html</a>
</font> </b>
8 </body> </noframes>
9 </frameset> </frameset> </html>
```

traveling the information highway

with Bob Alden

IEEE Web templates and image maps

Our IEEE staff — Webmaster Reginald Hands and his crew — have recently developed some Web page templates for IEEE volunteers and staff to use in creating or upgrading Web pages for IEEE sections, societies and so on.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

TEMPLATES. You can view these templates at "www.ieee.org/template/". Browse the seven or so samples, pick the one you like, then copy and edit the HTML file. You copy the file by clicking on "File", then "Save As" in your browser. You have to copy any images you want separately — place your cursor over the image and right click, then click on "Save Image As".

NAV MAP. One of the new-look features is a navigation bar or map. This is a graphic that the viewer clicks on to move to another page. The graphic is divided into several areas — each area corresponds to a different Web page. Please see the top right display on this column where I have added a solid border to better define the outer area of the graphic. Let me explain how to use the HTML tags (commands) to implement this feature, known as an image map. Then I will show you how to do almost the same thing without using graphics.

IMAGE MAP. To code an image map, you use three tags: MAP, AREA and IMG. There are as many AREA tags as the number of distinct areas within the image map. The MAP tag is a pair of tags that enclose the AREA tags and also includes the name of the map so it can be referenced by the IMG tag later.

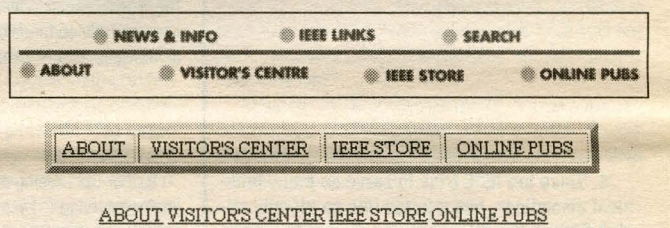
The AREA tag defines two things; one of the distinct areas within the image map and the URL of the Web page that is the link associated with this area. The default shape for an area is SHAPE="RECT". This is the simplest and is used here, and other shapes such as circles and polygons can also be defined. The rectangular area is defined by a sequence of four numbers (of pixels) — the top left X and Y coordinates, followed by the bottom right X and Y coordinates, where the zero for X is the left side and the zero for Y is the top of the image.

The IMG tag defines the URL of the image map graphic file, the width and height in pixels (which should be consistent with the area definitions), the width of the border (or lack thereof), and the name of the image map (in the MAP tag). The image map coding for this example is shown as part (a) in the box of coding.

For more information about creating image maps, you can check out Netscape's site at "http://home.netscape.com/assist/net_sites/html_extensions_3.html" or Maran Wilson's HTML Quick Reference V 1.2 at "http://sdcc8.ucsd.edu/~m1wilson/htmlref.html".

TABLE MAP. If you want an alternative to using images, you can use the TABLE tags to create a similar capability (see box to the right). In part (b) of the coding box, I show the code to create a single-row, four-column table that is functionally equivalent to the bottom half of the image map. You can find the table tags described in Maran Wilson's page noted earlier. Most table tags require a closing tag. For example, the tag pair to delineate a row is <TR> </TR>, and the corresponding pair for each column (within a row) is <TD> </TD>. The opening <TABLE> tag can contain attributes, which in this example set the background color within the table, the relative width of the table, and various spacing descriptors. Be aware that, right now, Netscape's Navigator and Microsoft's Explorer browsers recognize a somewhat different set of tags.

HYPERTEXT. A third alternative is to use a line of simple hypertext tags — this is often done under an image map for users whose browsers do not support graphics or who have turned off the automatic loading of images in their browser — perhaps to gain speed if their network or system is slow. You can see by comparing the coding in (b) and (c) that the only difference is the presence of the table tags in (b).



Displays: top - image map, center - table map, bottom - hypertext

TRADEOFFS. With the image map, you gain more control of the visual appearance because the viewer can change text font size, etc., by changing the browser settings. You can, using a graphics editor, produce a more compact, easier-to-read screen display image for presenting linking choices. The downside is the need for you to produce the graphic (depends on your level of skills and software) and for your intended viewers to be able to view images (depends on their level of Internet service). One basic choice in designing your Web site is whether you will use images at all, what size of images if you do, and whether you will develop and maintain "graphics" and "text only" versions.

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(a) Image Map Coding

```
<MAP NAME="navmap">
<AREA COORDS="0,24,71,50" HREF="/about.html">
<AREA COORDS="50,0,164,21" HREF="/newsinfo/">
<AREA COORDS="98,24,220,51" HREF="/visit/">
<AREA COORDS="176,0,274,21" HREF="/links.html">
<AREA COORDS="241,24,337,51" HREF="/ieeestore/">
<AREA COORDS="293,0,376,22" HREF="/dosearch.html">
<AREA COORDS="359,25,450,52" HREF="/pubs/online_pubs.html">
</MAP>
<IMG src="/graphics/nav_bar.gif" width="429" height="48" border="0" usemap="#navmap">
```

(b) Table Coding

```
<TABLE BGCOLOR="WHITE" WIDTH="60%" BORDER="5" CELLPADDING="2"
CELLSPACING="2" ><TR>
<TD VALIGN="MIDDLE" ALIGN="CENTER"><A HREF="/about.html">ABOUT</A></TD>
<TD VALIGN="MIDDLE" ALIGN="CENTER"><A HREF="/visit">VISITOR'S CENTER</A></TD>
<TD VALIGN="MIDDLE" ALIGN="CENTER"><A HREF="/ieeestore/">IEEE STORE</A></TD>
<TD VALIGN="MIDDLE" ALIGN="CENTER"><A HREF="/pubs/online_pubs.html">ONLINE
PUBS</A></TD> </TR></TABLE>
```

(c) Simple Hypertext Coding

```
<A HREF="/about.html">ABOUT</A> <A HREF="/visit">VISITOR'S CENTER</A> <A
HREF="/ieeestore/">IEEE STORE</A> <A HREF="/pubs/online_pubs.html">ONLINE PUBS</A>
```

traveling the information highway

with Bob Alden

Web page links

The usefulness of the web depends, not only on the quality of the information and services provided, but on the way in which the HTML files that create the Web pages are linked. Many IEEE members are creating pages and sites of their own and for IEEE entities. As Web page creators, we need to know how to structure our pages to help our viewers navigate the Web easily. This column is the third in a series about creating links.

FRAMES. In the June issue of THE INSTITUTE, I discussed how to create Web frames — this technique enables us to split the Web page into parts which can be scrolled individually. In my view, the prime use of this technique is to display a list of categories (table of contents) in one frame and the contents (the set of links) in the other frame — this makes sense if we have a long list of links that we need to organize into browse-able chunks. If we use frames, we have to look after several separate Web pages instead of one.

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IMAGE MAPS. In the July issue, I looked at image maps and their use in IEEE Web templates that are now available from IEEE. Image maps are useful to provide identity and consistency of format for major links to other Web pages within a Web site. These are generically graphic images but we can use table tags or hypertext links for similar purposes.

JUMP TAGS. In this issue, I will describe how to use tags to jump down a Web page. A very effective way to organize a single Web page with a large number of distinct content segments is to create a table of contents at the top of the page and be able to click on each entry in the table and jump down the page to that specific content segment. The content may or may not include a lot of links.

The objective in using this strategy is similar to using the frames technique. You may prefer this look to that of the split-page look of Web frames. Or you may prefer to manage one HTML file rather than several.

THE EXAMPLE that I am using is my set of Web links that I call my "World In General Web Page Links." This page can be viewed at http://power.eng.mcmaster.ca/alden/wig.html". This is the file that I copied and split into several files to create the frames example described in the June issue. In this issue I am looking at the single page version.

Bob Alden's *World In General* Web Page Links

Categories

- Hotels
- Airlines
- Car Rentals
- Worldwide Travel
- Travel in Canada
- Travel in U.S.A.
- Weather
- Financial Services
- News and Newspapers

The top portion of this page is shown at the upper right. I am using table tags to create a three-column by 11-row table so that the entire table of contents fits on most screens. Only the top three rows are shown. Below the table, and not shown here, are the actual contents. For example, the "Hotels" category has about a dozen or more entries, as do most of the categories. With this much information, there would be too much scrolling without the ability to jump about this page.

The coding box at the lower right illustrates two portions of the corresponding HTML code. Lines 1-7 form part of the table of contents at the top of the Web page. Lines 8-12 are from further down in the file. We will look at the coding in two steps — the essential "jump tag" implementation, and the overall presentation within a table structure.

JUMP TAG CODING. Lines 4 and 8 illustrate the two key portions of the jump tag coding. These are confined to the link tag which is of the form: ---, where ... is the jump instruction and --- is the text to be highlighted on the page.

Line 4 contains the "departures" information (using airport terminology). Here the format is href="#hotels" where the pound sign (#) indicates that hotels is the name of a so-called anchor that exists somewhere else on the same page.

Line 8 contains the "arrivals" information with the format name="hotels". Thus clicking on the highlighted text, "Hotels," in the table of contents, causes a jump to the highlighted text, "Hotels," elsewhere on the same page — which is displayed at the top of the browser window.

TABLE TAGS. Let's now look at the segments of coding represented by lines 1-12 to put the specific jump action into perspective. Lines 1 and 2 are headings – I will come back to line 1 in a moment.

Lines 3-7 contain the tags to define a table with three columns and a menu list with square bullets. Lines 4, 5, and 6 contain the entries in the top row of this table — all entries being "departures"-type jump tags. The two sets of three dots indicate where similar lines of code are not shown for this example.

Line 8 is the first "arrivals" type jump tag which is paired up with line 4. Line 9 contains one entry in the definition list: <dl> and </dl> are the list delimiters, and <dt> indicates the start of each entry. The set of three dots indicates where additional entries are not shown.

Line 10, together with line 1, shows how to jump back up to the table of contents. Lines 11 and 12 illustrate another set of entries similar to those of lines 8 and 9.

LINK & JUMP. You can also combine linking from one document to another and jumping down the page. For example, on my home page, I have a link to a set of IEEE Web page links which are listed on a page of professional association links. The "departures" tag is: IEEE and the "arrival" tag is: IEEE Home Pages . Here I have used a full path spec including the machine, the file name, and the "jump down" tag.

DESIGN CHOICES. Jump tags are useful to guide the viewer up or down relatively large pages. The alternative is to break up the page into several pages. Image map tags and table tags are useful tools to help us implement a sound Web page design strategy. Good design — good engineering — good business — good luck!

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```
1. <a name="top">Bob Alden's</a> World In General Web Page Links
2. <p><b><i>Categories</i></b>
3. <menu> <table cellpadding="3"> <tr>
4. <td> <li type="square"> <a href="#hotels">Hotels</a> </td>
5. <td> <li type="square"><a href="#airlines">Airlines</a> </td>
6. <td> <li type="square"><a href="#cars">Car Rentals</a> </td>
7. </tr><tr><td> ... </td> </tr> <tr> ... </table> </menu>
8. <P> <li> <a name="hotels">Hotels</a>
9. <dl> <dt> <a href="http://www.hyatt.com">Hyatt</a> Hotels ... </dl>
10. <P> <i>Back to List of</i> <a href="#top">Categories</a>
11. <P> <li> <a name="airlines">Airlines</a>
12. <dl> <dt> <a href="http://www.usair.com">USAir</a> ... </dl>
```

HTML Code

traveling the information highway

with Bob Alden

Web page hosting, other Internet services

The IEEE is introducing a new service — Entity Web Hosting (EWH) — for sections, chapters and so on. Let me put this into the context of IEEE's evolving electronic services.

DOING BUSINESS. Should the IEEE do business on the Internet? There are differences of opinion among IEEE members on this topic. I hear many answers: "yes," "no," "unsure," "not yet" and "perhaps not for me." I also hear the impatience and frustration of many members who use the Internet every day and are disappointed that we at the IEEE have done so little to date — relative to the many companies and societies who currently offer on-line services of every kind.

We have offered e-mail services for many years and are offering some Web-based services. But are we prepared to take the plunge and make the necessary investment to compete with the best?

IEEE DECISION. The IEEE Board of Directors is being asked to make that decision this year. The concept was presented at the February Board meeting (reported in this column in the April issue as IEEE's Internet Project), followed by an interim report last July, and a decision is expected to be made at the next Board meeting, to be held in November.

The costs are non-trivial and the investment in new hardware, software and business practices is significant. Our staff and volunteer leadership are preparing detailed plans so that the Board can make an informed and prudent decision.

INTERNET SERVICES. The objective is to do our business over the Internet — phasing in during 1998 and 1999.

These IEEE business operations include membership application, renewal and service changes; information delivery related to technical, educational, professional and local interests; and product catalog searching and ordering.

Assuming support from the Board, Internet-based services will be phased in to serve those who can make use of them. Traditional services will be maintained for our members who cannot or choose not to use Internet services. The preceding services are basic business processes and represent a major change in the way we do our business. During the current year or so, both volunteers and staff have piloted a wide variety of electronic services (quite apart from the massive effort to convert all publications to electronic form). One of the challenges is to effectively integrate where possible and select where necessary from the varied tools which have been developed.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

In the future, additional specific electronic services will be added once the basic infrastructure is in place.

INTERNET USE. Survey results suggest the Internet is becoming more widely used in ways that relate to the IEEE.

NON-IEEE SURVEYS. These results are from my newspaper "http://www.TheGlobeAndMail.com/docs/webextra/middle_kingdom/cyb/MKcybdex.html":

- **Business use** has surpassed home use — a market research study reports that business users are on-line 5.75 hours per person per month compared 3.5 hours for home users (http://www.npd.com/pcpr30.htm).
- **Book sales** — Amazon reported book sales over the Internet of US$27.9 million in the second quarter of 1997.
- **Buyers search** for product information on the Internet before making purchases — Commercenet and Nielsen Media Research report that 39 percent of all Web users searched the Net before ordering (http://www.commerce.net/work/pilot/nielsen_96/press_97.html).
- **The average user** of the Internet is male, in his 20s, very well educated, currently a graduate student or a young professional earning well over US$40,000 a year (http://www.survey.net/inet2r.html). Lots of interesting data at this site.
- **The gender gap** is closing — during the past year the percentage of women using the Internet increased from 34 percent to 42 percent.

IEEE SURVEY. The IEEE is conducting a survey to assess the market within IEEE for additional specific Internet-related services. If you get a survey form, I urge you to respond.

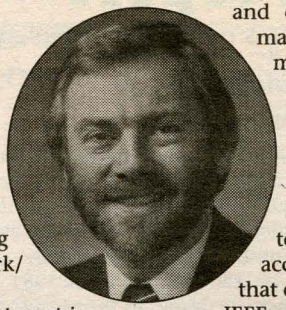
ENTITY WEB HOSTING. This new service is intended to meet the needs of IEEE entities — sections, chapters, societies, and so on — that want to have their own Web sites and have the know-how to develop and maintain Web pages but lack the facilities for storing these HTML and graphics files.

While this service is included in the overall plan being presented to the Board of Directors, it is being implemented first because it is relatively much lower in cost and much simpler to do.

For the past year or so, the IEEE has been experimenting with the hosting of Web pages for a few sections and regions on a server called "Sandbox" — which was set up to be a developmental server for student activities and pilot projects within the Regional Activities Board.

We now have a new server — EWH — for entity Web hosting being installed at our IEEE Operations Center on the outside of the firewall that protects our internal IEEE servers and business operations from external interference.

WHO DOES WHAT. IEEE staff will manage the server and provide the Web-hosting facilities — this includes installation of all hardware and operating systems, regular maintenance and backups and monitoring of usage.



IEEE volunteers will define operating rules, approve entity requests for hosting, monitor adherence to relevant IEEE policies, and make the decision to delete files and remove access permission to entities that do not cooperate.

IEEE entities that are assigned file space will upload and maintain their own files that constitute their Web site. Each entity will be individually responsible for its own content and keeping it current.

MORE INFORMATION. To find out more details about IEEE entity Web hosting, view the page at "http://www.ewh.ieee.org". Initially this page will contain preliminary information about when the service will begin and how the number and type of users will be phased in. This information will be updated and expanded as we learn how to manage and evaluate this new service.

The plan is to provide a basic Web-hosting service first and expand from there. A key objective is to provide reliable performance.

The phase-in process is as follows: alpha testing by staff, beta testing with a few selected sections, then limited production service with sections who have applied through the EWH site. Service for other entities should begin as early as possible in 1998, assuming the phase-in process yields favorable results.

IEEE POLICY. IEEE Web-related policies and guidelines are published on the main IEEE Web site at "http://www.ieee.org". The use of IEEE templates and style guides helps us develop some degree of consistency in appearance and functionality in an organization with many volunteers worldwide contributing to the IEEE effort.

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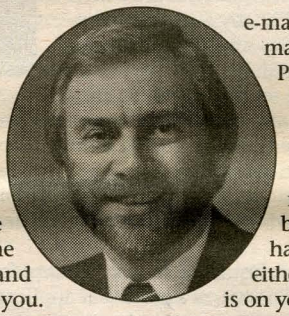
traveling the information highway

with Bob Alden



E-mail attachments

Every so often I receive questions about using the attachment feature of some e-mail programs. Here is a brief overview, and I begin by looking at why attachments are needed. E-mail is a commonly used abbreviation for "electronic mail," which is the transmission of ASCII text messages from one computer to another over a network which interconnects the two computers.

ASCII FILES. The basic American Standard Code for Information Interchange (ASCII) character set is supported by e-mail handling programs. It is a partial set of 128 characters that includes the 26 letters of the alphabet (times two for upper and lower case) plus the numerals and the other characters you normally find on a keyboard designed for English language use.

TEXT EDITORS allow one to edit ASCII files without embedding non-ASCII codes. One is generally limited to adding, copying and deleting characters, or groups of characters, but not enhancing the appearance by bolding, italicizing, or changing the basic size or position of selected characters. Most e-mail programs include one of these editors. If you prefer to use a word processor to create some of your e-mail messages, you need to use the save-as-text option to produce an ASCII file.

OTHER FILES. Files produced by word processors include a lot of other codes, to control the appearance of the text and to represent images and so on. These codes are generally "non-printable" and are not recognized by the programs that handle e-mail messages. Other files — spreadsheet, database, program, graphics and so on — also contain many of these non-printable codes.

SENDING FILES. If one wishes to send a non-ASCII file, such as a word processor file, over the Internet, there are two basic alternatives; "FTPing" or encoding FTP. File Transfer Protocol is the main method of sending any kind of file from one computer to another over the Internet. Modern FTP programs make this task relatively simple, especially in a Windows-type environment where the FTP program opens two windows — one for each of the sending and the receiving computer — and allows you to click and drag the file from one window to the other.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

You can almost always open the window for your own computer, but you may not be able to open a window on your intended recipient's computer, because you need permission to write into that computer. That means you can change the content on that computer — and generally that is not permitted. Some computers have what is called an "anonymous" FTP directory which anyone can use to connect to and transfer files.

Many times, when we want to send somebody a non-ASCII file, we find it is either impossible or inconvenient to use FTP. This is the situation where e-mail attachments are the solution.

E-MAIL ATTACHMENTS use the technique of encoding the non-ASCII file into an ASCII format, sending the file as an e-mail message, and decoding back into the original file format at the recipient's computer. There are several different encoding schemes or formats.

"Uuencode" and "uudecode" are two Unix commands. The first one is used to encode and send the file. The command is: "uuencode Myfname Yourfname | mail xxx@yyy". "Myfname" is the name of the file I want to send. "Yourfname" is the name of the received file after it is decoded, and "xxx@yyy" is the e-mail address to receive the message containing the encoded file. Use the above command with file names and an address that are appropriate for you.

The recipient has to follow three steps. Step 1 is to realize that this specific message is really an encoded file and not garbage — it is helpful to send a prior message of explanation. Step 2 is to save the message as a file — let's use the file name "newfile". Step 3 is to use the command "uudecode newfile" which results in a second file, called "Yourfname" (see previous paragraph) being created, which is the non-ASCII file I sent. The above sequence is basic to all encoding schemes but the actual encoding formats are different.

Binary Hexadecimal **(Binhex)** is another encoding scheme used with Macintosh systems.

MIME (Multipurpose Internet Mailing Extension) has become a standard way of automatically performing the sequence of encoding and decoding as well as building this sequence into the e-mail software package. Many of these packages support MIME and provide a relatively user-friendly interface. However, some do not, so it may be useful to check with your intended recipient ahead of time.

LOCATION. Where is your mail? This is another potential problem that, once understood, can be solved. If you are using a computer that is permanently connected to the Internet and has its own mail handling programs, you have your mail and all your other files on the same computer. If you are connecting your PC to a server on an intermittent basis, then you are likely using a mail program on the server that receives and holds your e-mail until you log on. There are two kinds of ways you can access e-mail in this case.

POP. If you use a Post Office Protocol (POP) e-mail server, your mail is automatically downloaded to your PC.

IMAP. If you use an Internet Mail Access Protocol (IMAP) e-mail server, you have a choice as to which messages are downloaded, but to access them you do have to download them. In either case, your e-mail program is on your PC with the rest of your files so the process of using attachments (encoding, etc.) is straightforward.

PINE. However, if you use an e-mail program on your server, for example PINE, then your e-mail messages are on the server and your other files are likely on your PC, so you will need to add the extra step of downloading (moving files from server to PC) or uploading (from PC to server). You will likely be able to use FTP for this because you have permission to write on both server and PC. If you are connecting over a local area network (LAN) there may be other convenient file transfer mechanisms available — such as network file system (NFS) links to make some directories on your server seem to be directories on your PC.

BETTER COMMUNICATION. Attachments, encoding, and FTP are all part of the tool set that exists to help us extend the usefulness of e-mail. Please remember, if your e-mail message contains more than simple ASCII text, make sure your intended recipient understands what you are doing and has the complementary software to receive gracefully.

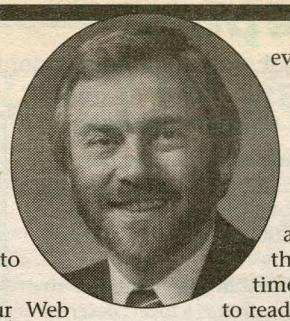
Contact the person you want to send the encoded file to. Say which encoding scheme you are using, and ask if the message can be received and decoded. Finally, do not send such mailing lists (where you may not know all the recipients.).

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/ alden".

traveling the information highway

PDF: The companion to HTML

with Bob Alden



PDF (Portable Document Format) files are a useful alternative to Hypertext Markup Language (HTML) files for the presentation of technical information and other situations where a mix of text and graphics is required. PDF is not a substitute for HTML because PDF files do not have the key hypertext feature: the ability to link to another document.

PDF files contain the same kind of information as do files which are sent to a printer. When a PDF file has been stored on a Web site and linked to a HTML file, it can be viewed, printed and copied. Normally it cannot be modified. If you want to view a PDF file, you need to install a program such as Adobe Acrobat Reader, available from Adobe Systems Incorporated at "www.adobe.com". Use of this reader is free, but use of software to create PDF files is not.

The use of PDF files is becoming widespread because of the limitations inherent with HTML. HTML was created to display text documents using a Web browser and provide links to other documents over the Web. One feature of Web browsers is the ability of the user to control the size and appearance of the text displayed in the browser window by selecting both the font size and the font itself. Graphics are displayed in a format defined by the creator of the HTML file. In many cases, there is no problem with this different treatment of text and graphics.

If you wish to create technical documents that contain equations, the equations are normally created using an equation editor which defines a graphic's frame or box and provides commands to enable you to select and position the various elements of the equation according to certain conventions. Many technical authors use their favorite word processor with an equation editor to produce technical papers. Traditionally, these have been printed on paper. Some of these papers are now being published on the Web. If you convert the word processor file to HTML, the equations are converted to GIF files.

If you want to use special characters — Greek symbols, for example — you have to create one-character equation graphics files. You can do this and create a pleasing printed document by appropriately sizing and placing each of these graphics within the text. However, the Web version of this changes the relative size and location of the embedded equations and special characters. This is compounded by the ability of the viewer to use different fonts and font sizes.

The clean solution is to create a PDF file and be sure you, as the author, are satisfied with the appearance before you "publish on the Web." You'll know that the appearance you intended will remain for all viewers.

To create a PDF file, you need to follow six basic steps:

- create your word processor document;
- save your document as a postscript file;
- convert the postscript file to a PDF file;
- upload the PDF file to your Web site;
- link this file to your Web page; and
- test by viewing with Acrobat Reader.

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CREATE your document using your usual word processor. If you normally use a postscript printer, follow your usual pattern. Otherwise take extra care, in the form of the steps that follow, because when you select a different printer you sometimes find that character and line spacings are slightly different and your page may be reformatted.

If your document has several pages, leave a spare line at the bottom of each page. Generally, do not try to cram any line where the line termination is critical.

SAVE your document to a file in a postscript printer format (using a ".ps" extension) using the print-to-file command in your word processor. Before you do this the first time, if you do not use a postscript printer you will need to load a postscript printer driver. Follow the normal procedure for your computer/operating system or obtain the help of an expert if you cannot do this kind of task yourself. One word of caution: You may need to experiment with several different printer drivers before you find one that translates everything correctly.

CONVERT the postscript file to a PDF file. The way that I convert is to use a package called Acrobat Distiller that is included with the Adobe PageMaker CD-ROM. This program reads in postscript files and converts and saves them with the extension ".pdf". The first few times you do this you will likely want to read your just-created PDF file in Acrobat Adobe Reader and see how it looks.

You may want to use Adobe Acrobat or other Adobe products that are described on the Adobe Web site at "www.adobe.com".

UPLOAD your PDF file to the directory where you keep your Web pages. Use whatever method you normally use for uploading HTML files — for example, File Transfer Protocol (FTP).

LINK your PDF file in exactly the same way you would link an HTML file, realizing your file has a ".pdf" extension instead of ".htm" or ".html".

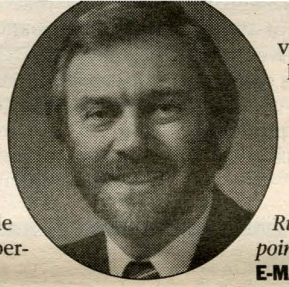
TEST by clicking on the link to your PDF document. If you have already installed Adobe Acrobat Reader, the reader program will be automatically invoked and you will see your document displayed on the screen in an Acrobat Reader window. You will see a menu which allows you to move from one page to the next (if it is a multipage document), magnify a portion of the page and print all or one of the pages.

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee and a former IEEE vice president. In his other life, he is the director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "power.eng.mcmaster.ca/ alden".

traveling the information highway

Members' input on Web and e-mail

with Bob Alden



In this issue, I am sharing some of the e-mail messages I received from you — our members. Following are contributions that address:

- IEEE Internet services, with a thoughtful plea for keeping traditional services;
- image maps: (a) noting a current disadvantage of using image links; and (b) making the case for including ALT tags;
- Web page links: describing correct coding when mixing tables and menus; and finally
- e-mail attachments, noting incompatible variations of UU-encoding.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

IEEE INTERNET SERVICES. Frank Preston writes ... "Your recent column (September '97) discussed IEEE Internet use, services, etc. You stated that the objective is to do business over the Internet. This is a given, of course. You also state that 'Traditional services will be maintained ... ' This should be an absolute requirement, but I seriously doubt if it will last very long. Someone will see that they can save money by the elimination of the 'duplication' and the traditional will go down the tubes.

"Here at NASA Langley, we used to have a weekly newsletter for employees. Then, with great fanfare, an on-line duplicate service was added and both were available. After about six months, the paper copy disappeared. Finally, after about a year, the on-line version has degenerated to a listing of events, etc. It is now practically worthless.

"If I can only have one, I want the traditional services and the hard copy. With more and more on the Internet, the old stuff is being deleted as it ages and the reference data is lost forever to libraries and members.

"One nitpick: You said that more women are using the Internet. This statement is ambiguous. Are 42 percent of the users now women, or did you mean that 42 percent of the women are using the Internet?"

[*To you and several other members who e-mailed me: the 42 percent is of users, not of all women.*]

IMAGE MAPS. Andy of Intel Corporation writes, "Image maps have another disadvantage, from the user's point of view, that you did not mention (July '97 column): ordinary links, whether in straight text or tables, change colors when the user has visited them. This makes it easier for a user to browse a complicated web of pages. Image map links do not change color in this manner. (They could — it is just a 'simple matter of programming' — but they do not on any browser I know.)

"I find this lack of history extremely annoying. I hate waiting a minute to download a page, only to learn that I have already seen it, via another link (or even the same link). I applauded when *The Wall Street Journal* on-line edition (I am a paid subscriber) started removing image links on some of its pages."

Andrew Plumb of the Canadian Microelectronics Centre writes, "I enjoy reading your articles, however ... :-) in this latest 'Traveling the Information Highway' (July '97) your code bits and the 'www.ieee.org/template/' examples seem to be missing some rather important 'ALT' tags. "The following example is snipped from 'templ_1.htm': **<A HREF="/index.html"> <IMGSRC="http://www.ieee.org/graphics/home.gif" WIDTH="36" HEIGHT="46" rdony@uoguelph.caBORDER="0"> </A>** (end snippet).

"The index.html link and even the nav_bar could use the ALT tags, otherwise when I browse the page with images off or a text-to-speech browser (as some of my blind friends would) I wouldn't necessarily know that the index.html image was a link.

"Other text browsers (like Lynx) replace and read all non-ALT'ed images with [IMAGE] or [IMG], which doesn't tell me much.

"Just one of my little peeves. :-) Use ALT tags liberally!"

[*I agree. I did not think of the reasons you quoted — I have changed my coding where I use graphic links. In the example snipped from the IEEE template, one would add the attribute ALT="Link to IEEE Home Page" inside the IMG tag.*

Please note I am using the descriptors tag and attribute to differentiate between a tag and what can appear inside the tag. (Andrew refers to ALT as a tag.)]

WEB PAGE LINKS. Layne Watson of the departments of computer science and mathematics at Virginia Polytechnic Institute and State University writes, "Bob, if someone has already pointed out that the HTML in your August '97 column in THE INSTITUTE is illegal, then ignore the rest of this message. If not, I wish to point out that the nesting of menu and table is technically illegal. A good browser will refuse to process it at all, and its behavior otherwise is unpredictable. The definition of "menu" says that it may only contain list items (hence the <table> right after <menu> is technically illegal), and that those list items may be displayed several per line.

"So some browser could logically take your s and arrange them in lines any way it wants, regardless of the table directives. You lucked out because your browser chose to arrange the s according to the <table> directives rather than as <menu> directives.

"Also the construct <td> is technically incorrect — the <li> is an orphan list item, having no surrounding list. Again, you lucked out because your browser chose to "propagate" the <menu> in front of each <li>. Technically, you should have <td> <menu> ... </menu> </td> for each table cell.

"Yes, I know, a lot of programs (Microsoft, especially) generate such HTML, but that doesn't make it right. I'm sensitive to this sort of thing because my class notes are read by students with many different browser versions, and 'illegal' HTML generally doesn't work right for somebody.

"This is no big deal, but since your column is read by lots of people, we ought to at least give technically correct examples."

[*My thanks also to Klaus Johannes Rusch, who wrote me on the same points.*]

E-MAIL ATTACHMENTS. Michael French writes, "Bob, I enjoyed reading your October '97 article in THE INSTITUTE on e-mail attachments.

"One item I believe worth adding is the advice to stay away from UU-encoding if at all possible.

"Over the years, several incompatible variations of UU-encoding have been put into use which has resulted in chaos. Whereas, to my knowledge only one variation of each MIME (Base64) and BinHex4 exist which makes their use reliable. Moreover, BinHex4 works fine on all platforms, not just Macs. For instance, I've experimentally found that both Eudora (1.5 and 3) and Pegasus (2.5) on a Windows-based computer decode BinHex4 flawlessly regardless of the SMTP header setup.

"Such is not the case for MIME (Base64)-encoded enclosures. The SMTP headers must be set up exactly right for Eudora or Pegasus (and I suspect all mail readers) to decode them.

"Since BinHex4 contains a CRC, and is so readily, automatically decoded by the most popular mail readers, I have come to the conclusion that BinHex4, not MIME (Base64), should be the default standard used by e-mail senders."

[*My thanks to all of you who send me e-mail. I do try to respond to every one of you —sometimes I get behind in my acknowledgments but please keep those messages coming. I appreciate your compliments, corrections, advice and suggestions for future articles.*]

Robert T.H. (Bob) Alden is the chair of the IEEE Electronic Communications Steering Committee, and a former IEEE vice president. In his other life, he is the founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org"; his home page is "power.eng.mcmaster.ca/ alden".

traveling the information highway

Doing IEEE business electronically *with Bob Alden*

1997 may well have been a pivotal year for the IEEE. At its November 1997 meeting, the IEEE Board of Directors made the decision to change the way we do business.

After a full year of careful planning, several key pilot projects, and consensus building among our staff, the Board approved a three-year, multimillion dollar plan to modernize our business infrastructure and enable our members and volunteers to use the Internet for most IEEE activities. This will ultimately encompass a full range of services, from joining and renewing our membership to changing our own membership record, on-line ordering of products and services, and finding the information we need as IEEE members and volunteers.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

TRACK RECORD. The year started with wide-ranging input from Sections Congress '96, the Power Engineering Society Chapters Congress, the IEEE Strategic Planning Committee, IEEE society initiatives and direct input from many members and staff.

The Electronic Communications Steering Committee was asked to recommend a response to the top five action items from Sections Congress — all of which related to the Internet and its use to provide improved IEEE services. The concept for "The IEEE Internet Project" was presented to the Board in February 1997 and reported in this column in the April 1997 issue.

IEEE staff, led by IEEE Executive Director Dan Senese, picked up the challenge and added two related projects that address bidirectional electronic access to our member/customer database and business practice changes to ensure efficient service provision.

The result of these three projects will be a real capability to do business electronically — whether or not the final product or service is in traditional or electronic form.

Several pilot projects have been successfully developed. Several hundred students have joined the IEEE as student members by filling in a Web application and paying their dues electronically using credit cards. A smaller number of new IEEE members have joined over the Internet using a similar process.

The alpha test phase of the Web page hosting project has been successfully completed and the beta test phase is underway, with close to 20 sections operating their Web sites from a server located at the IEEE Operations Center in Piscataway, N.J., USA. Before long, assuming all goes well, we will have a production grade facility for all IEEE entities. (For more details, view the site at "www.ewh.ieee.org" or see my September 1997 column.)

There are two other pilot projects that our staff are working on: an IEEE product catalog with searching capabilities, and a membership renewal Web form.

These pilot projects are enabling the IEEE to realistically plan for new services to be made available over the next three years. With the approval granted this past November, detailed implementation plans are now being developed.

1997 has seen three other areas of progress. The IEEE network that links the IEEE servers at Piscataway and elsewhere, and the connection to the Internet, have been strengthened and reconfigured to enhance reliability and security and to enable future increases in capacity as needed.

The second area is that of converting IEEE information to a form whereby it is accessible over the Internet. This is a huge job that's being planned and coordinated by the IEEE staff.

The third area is that of improving the member/customer database at the IEEE, where the current renewal cycle is proceeding with improved performance each year. Errors are down, response rate is up. In fact, we would not be moving to "doing business electronically" if we had not been able to solve our past database problems. John Witsken and his IT crew — and indeed, the entire IEEE staff — deserve a round of applause for a job well done.

1998 AND AHEAD. The coming years should be exciting ones for IEEE members. We can look forward to seeing results from these 1997 planning and prototyping activities. I see the short term (three year) expenses on infrastructure as an investment in the kind of quality services that IEEE members need. This investment should pay for itself, not only in improved member satisfaction but on the bottom line, with increased (primarily) nonmember revenue and reduced costs.

Members should be able to find information at the IEEE first and fastest, register on-line for virtually all conferences and other technical and professional events, read the latest technical material on-line or down-load conveniently, and interact with each other as never before. The era of just-in-time information is about to become a reality.

But we need to be careful. There are differing views as to how we use Internet technology. In my view, IEEE membership must have its advantages for the IEEE to survive. IEEE membership could mean faster access to information and better searching capabilities than are available for nonmembers.

We now have restricted on-line access to *IEEE Spectrum* and some other publications. Some of our publications — THE INSTITUTE, for example — are available to anyone.

What about technical papers? The interest of the author to have wide access to his or her publication needs to be weighed against the collective interest of the IEEE membership to have "an edge on access." Should papers be available to anyone? Should abstracts be available to anyone?

Should abstract or full paper searching tools be available to anyone? I heard recently that a market survey indicates that a critically important service is answering the question "does a particular abstract exist?" Not the content but the existence! In my mind this raises the question: should abstract searching be a member benefit?

I urge everyone to get involved in the decisions that are being made now and will be made shortly. These decisions will significantly affect how our IEEE evolves.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor and a former IEEE vice president.

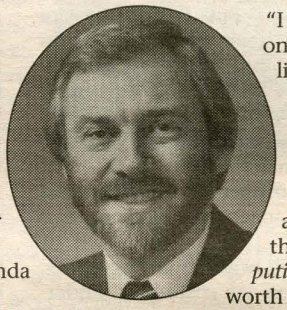
In his other life, he is the past director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada.

He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "power.eng.mcmaster.ca/alden".

traveling the information highway

Members' thoughts about PDF files

with Bob Alden



In my November 1997 column, I discussed the use of public document format (PDF) files. I erred in stating that PDF files do not have the hypertext linking feature of hypertext markup language (HTML) files. Quite a few of our readers let me know I was wrong!

They also included a lot of interesting and useful comments that I share with you now. Here is an edited selection — in the order that I received them.

> ***Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.***

FOR PDF. "I enjoyed reading your recent article in THE INSTITUTE. I must mention, however, a comment that appears inaccurate to me. Specifically, 'PDF is not a substitute for HTML because PDF files do not have the key hypertext feature: the ability to link to another document.' This is not true. PDF documents can contain any of several types of links including links to the Web via URLs. I have been benefitting from hypertext links within the document such as when one sentence references another in a different part of the document.

"These documents can be built using Adobe Exchange. A good example of such a document can be found on 'www.rv.tibco.com/filetran'. Download the PDF documents and see the extensive use of hyperlinks. Of course with the availability of PDF add-ins to browsers, this capability is available directly within a browser as is with HTML. In addition, PDF viewers support table of contents viewing and thumbnails.

"As such I see no reason why PDF does not supplant HTML except when considering the possibility of small devices that cannot support PDF because of perhaps a larger memory footprint. Also, I am not clear on how Java embedded in a browser integrates with PDF."

David Wroblewski
(DavidW@ncmi.com)

FOR JPEG. "I just read your article in the November issue of THE INSTITUTE, and I'm confused. What advantage is there to PDF format, except to Adobe? That's why I call it the 'Proprietary Dilettante Format.' Its big disadvantage is that, because it is so proprietary, no other software than Adobe's can read it unless users pay a huge licensing fee.

"I'm only a user, a retired Raytheon radar guy, with no ax to grind except the inconvenience of PDF files.

"A far more universal standard format for graphics such as photos is the JPEG format. Everyone's software can all read JPEG files just fine, including Netscape, AOL, and Adobe Photoshop; the only exception I've found, of course, is Adobe Acrobat! The best of such software allows the user to specify the JPEG quality level when saving a file. I am unaware of any disadvantages to that format."

Best regards, Tom Weil
(TAWEIL@aol.com)

PDF OR HTML? "Hi Bob: We are part of a committee to look at the 'nuts and bolts' programs and software infrastructure needed to support on-line master's thesis and Ph.D. dissertations. I have had some experience with PDF and am bothered by the following: 1) the file size is huge compared with the equivalent Postscript file, five times the size from my single experience on converting an NSF Fastlane proposal, where they dictated PDF submissions. Postscript was not permitted. I don't own Adobe PageMaker and don't want to buy it or anything else from Adobe; and 2) writing PDF means I need to buy something from Adobe. I don't think we want to dictate PDF to our students when there is a monopoly governing the output. I want to use any capability that is as platform — independent as possible, such as Postscript. Sure, Adobe pushed Postscript, but there are freeware programs that create Postscript and free readers (Ghost view for Unix and the PC).

"Your concept of 'living with both' is a good middle ground, I think. I don't mind this at all. But I am not sure that dictating PDF is a good decision based on the non-availability of free creators of PDF files. My personal preference has always been HTML and Postscript, mixed together, but PDF and HTML would be OK as long as Postscript is not disallowed.

"It is a complicated decision! Any further thoughts are appreciated! Thanks."

Paul Fishwick
(fishwick@cise.ufl.edu)

MORE CHOICES. " ... For quite some time, PDF files have had the ability to contain links to each other as well as to Web URLs. The links can be created in the source document with programs like FrameMaker, or can be added later with Acrobat Exchange.

"Otherwise a great article. I wish everyone would use PDFs for Web documents instead of slow and bloated Word or Postscript files."

Sincerely, Paul Miranda
(paul.miranda@amd.com).

A LIMITATION. "As content Web master for the UFFC-S Web site (www.ieee.org/uffc), I had posted several documents in the PDF format. Then, one day, a friend asked 'Do you realize that the search engines don't catalog PDF files?' Since then, I've posted everything as HTML, and have even gone back and converted the PDF files to HTML.

"I didn't investigate the matter because my friend usually knows what he's talking about. If, in fact, PDF files don't get cataloged by the AltaVista, etc., then that's a major drawback that you might want to tell your readers."

Regards, John Vig
(vig@doim6.monmouth.army.mil)

ADVANTAGES. "Dear Prof. Alden: I enjoyed your narrative on PDF files and thought I would add my comments.

"As an electric power engineer my work requires the preparation of studies and reports. These documents usually involve word processing files, spreadsheets, graphics such as AutoCAD and other programs that generate graphics. Our clients receive paper copies of these documents and often request 'electronic' copies. I am often reluctant to furnish 'raw' spreadsheets since the client may not have paid for the development (formulae, etc) and some of the graphics generating programs require a copy of the executable program to view the data files. In the case of drawings I am reluctant to furnish electronic copies because of the liability for changes.

"Adobe came to my rescue. I now prepare the documents using the original software and prepare printed copies for internal and external review. After the final review I make one PDF file using the various programs.

"This serves as my record copy and if the client asks for an 'electronic' copy this is what he gets.

"The PDF file is a little different in that I can link to various portions of the file. If a drawing is mentioned in the text, it is linked to the drawing. In the case of protective device studies the manufacturers' curves are scanned and provided as an appendix. I am experimenting with linking devices on single line diagrams to the corresponding device curves.

"Overall I think it is a powerful tool but I have not considered the Web aspects.

"I enjoy your column (it's about the only thing of value to me in this publication)."

Regards, John Hudelson
(k5dl@worldnet.att.net)

INCOMPATIBLE. " ... Also, your article jogged my memory about another similar one that I read awhile back. It was by Amy Wohl in the May 1997 issue of *Beyond Computing* magazine. Not too detailed, but worth review by your readers.

MMQ (mmquinn1@mmm.com)

HTML FIRST. "Actually, some versions of PDF do have the ability to hyperlink, although use of that feature (as well as encryption and some other 'advanced' features) makes the PDF file incompatible with some widely used PDF readers.

"PDF has other limitations when used on the Internet. PDF is a very nice format for presenting printable documents on the screen, but I find that it requires a very high resolution display for adequate on-line presentation. Users with text-only displays or speech readers and users at the end of slow Internet links have trouble using it. The data contained in PDF files can also be much harder for search engines to index.

"I hope people wanting to present technical information on the Web will first and foremost continue to publish in HTML, and offer PDF as a secondary 'high-end' format for those who can take advantage of it."

Thomas Breuel (tmb@aimnet.com)

FOR MAC USERS ONLY. "Bob, I have found what in some cases is a better solution than creating PDF files. I do not like PDF files because the fonts produced by the Acrobat driver are often difficult to read. I recently purchased a program, Myrmidon, from Terry Morse that works like Acrobat, but creates an HTML file rather than a PDF file.

"When you 'print' to the Myrmidon driver it preserves fonts and builds an output html file that has a page format rather than one that varies with the size of the window you have open in your browser. The driver is not perfect, but I prefer what it creates to a PDF file. Unfortunately, for you poor Wintel users, it is only available on Macs."

Larry Wear (lwear@cwo.com)

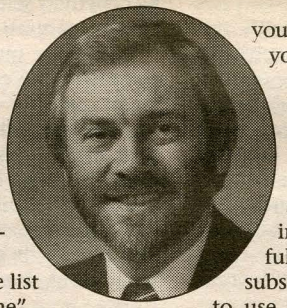
My thanks to all of you who took the time to write. I do like to include your contributions. If you have some experience or suggestions to share, please send me an e-mail.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada.

He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "power.eng.mcmaster.ca/alden".

traveling the information highway

Ways to use the majordomo program *with Bob Alden*



For the last few years, IEEE has asked members to provide their e-mail address as part of their contact information during the annual membership renewal process. At the same time, more and more IEEE members are using the Internet for communication.

These members could receive e-mail from IEEE staff and from the member-volunteers who provide leadership in our many societies and sections. Many sections and societies are looking into doing just this.

"Majordomo" is a computer program that is used to manage the various lists of e-mail addresses that are used to send e-mail to large and small groups of people.

In this column, I take a look at some of the different characteristics of these lists of e-mail addresses and how majordomo can be used to manage this type of activity.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm/" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

KINDS OF LISTS. There are mailing lists and discussion groups. Both are lists of e-mail addresses — I am using the two names to differentiate between fundamentally different characteristics. A mailing list is used to send messages to people who are on that list by the "owner" of that list. No one else should be able to send to that list — either directly or by replying. This kind of list could be used to send information to members of a society, section, chapter, student branch, or any other group of IEEE members — by staff or volunteer leaders, e.g,. a society president. Such lists can have "captive" audiences: for example, the entire IEEE entity membership. On the other hand, such a list can be composed of only those who wish to receive these messages.

DISCUSSION GROUPS. Discussion groups are for people to discuss — i.e., receive messages on the topic for which that group was established, reply to the group, see the other replies, etc. These groups are usually voluntary and may have other attributes — material may be screened by the group owner before being distributed. This is a called a moderated discussion group and might be suitable for a technical discussion group where an "editor" checks on the technical merit or suitability vis-a-vis the technical field of interest. These lists and groups can have different characteristics which can be determined when they are set up. All of these lists (groups) are processed by a computer program called a list manager — two such programs are "listproc" and majordomo. These programs are generally available to people who manage computer networks or servers. The IEEE uses the program called majordomo.

SUBSCRIPTION OR NOT? Do you have a choice as to whether or not you are on the list? Many lists and groups offer you the choice — you control your participation, by subscribing to join, and by unsubscribing to get off the list.

Suppose the name of the list you want to join is "listname".

To subscribe, send an e-mail message to "majordomo@majordomo.ieee.org" and put your request in the body of the message as follows "subscribe listname".

The address from which you sent the request is used by majordomo to send you the e-mail messages that are sent to the members of the list. You should begin to receive mailings starting with the next one sent out. You get off the list by sending the message "unsubscribe listname" to the same place you used to get on the list.

Messages are archived for some lists: that is, they are stored for a time so that you can find them using the majordomo commands. Each of the above words or phrases in double quotes (do not type these quotes) is a command to majordomo. You can use other commands as well. Put each command on a separate line.

To find out more about the majordomo commands, put the word "help" on a separate line of your message. Put the word "end" on the line after the last command, especially if your e-mail package adds a "signature" at the end of each e-mail message. A "signature" is the e-mail equivalent of letterhead in that it usually contains information on who you are and how to reach you — it is automatically added at the end of your message. You usually create a signature using your e-mail processing software when you initially set it up.

MORE INFORMATION. For more information about using majordomo, mailing lists, and discussion groups, visit the "Electronic Communications Services" page at"www.ieee.org/eleccomm/". The information contained there is useful both to members who want to subscribe and to volunteers who want to use majordomo to set up discussion groups or mailing lists.

WHY MAJORDOMO? A program like majordomo is useful because once the list is created with the desired features, the management of the list can be performed by anyone with e-mail access to the Internet (and the appropriate password). Majordomo provides a lot of choices so that the characteristics of the list (or group) can be tailored to the needs of the group.

YOUR INPUT. If you have needs that could be met by the use of targeted e-mail messages — for example, being reminded about upcoming conference, new products, technical or professional meetings, etc., in your area of interest — why not consider contacting your society or section and telling it what you need or don't need?

Correction: The first line of the February column should have read "portable document format (PDF)."

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "power.eng.mcmaster.ca/alden".

traveling the information highway

How to use the IEEE's e-mail services *with Bob Alden*

As part of the IEEE's move to do business electronically, our e-mail services are being strengthened and expanded. Over the past year, a number of structural support service improvements have been implemented. The IEEE internal network, our gateway to the Internet, and the methodology for managing IEEE servers have been upgraded. One of the service areas that benefits from these improvements is e-mail. Let's look at some of the ways that you — the IEEE member — are affected.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm/" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

RELIABILITY. Many members use e-mail to interact with IEEE staff and other members. At a time of rapidly expanding use, maintaining adequate server capacity and network bandwidth is a non-trivial task. IEEE now has a plan in place whereby our staff monitors network traffic and service outages so that we, as members, can expect reliable service. I believe that we will all see a continuation of improved reliability in our electronic communications with and through IEEE.

VIRUS SCANNING. One of the major concerns today is the spread of viruses — particularly in files sent as e-mail attachments. For the past several months, the IEEE has been scanning e-mail messages that contain attachments for viruses. Any mail with file attachments that is sent from IEEE or is forwarded through IEEE is scanned. If a virus is detected, a warning message is automatically sent to both the sender and the recipient. The infected file is discarded and it is the responsibility of the sender to clean and resend the file.

IEEE ALIASES. Personal aliases for IEEE members who are active volunteers have been made available for many years. There have been requests to expand this service to all IEEE members who want one. We are now at the stage where IEEE can respond to this request.

WHAT IS AN IEEE ALIAS? An IEEE e-mail alias is really an e-mail message forwarding service. Let me explain how it works using my own alias as an example. My IEEE alias is "r.alden@ieee.org". I tell people that this is my e-mail address even though my real address is "alden@power.eng.mcmaster.ca". When someone sends an e-mail message to my IEEE e-mail alias, it arrives at the IEEE (in Piscataway, N.J., USA) and is forwarded to me at my real address (that I told the IEEE about when I requested my alias). If I were to change the address where I receive my e-mail, I would tell IEEE my new address, so that my e-mail would be forwarded correctly. It is up to me to make sure that I update that piece of information — otherwise I do not get my e-mail.

WHY AN IEEE ALIAS? Is an IEEE e-mail alias for you? Maybe yes, maybe no. Here are six reasons to have an IEEE alias (perhaps you have others — if so, let me know):

(1) if you change your service provider and hence your e-mail address, you only have to send one correction — an update form to IEEE;

(2) if you leave an employer that provided you with e-mail services, or you change location/position within your company and it results in a different e-mail address, you only have to send in one update to IEEE;

(3) if you want to have a fairly simple and easy to remember e-mail address;

(4) if you want to have an e-mail address which is service provider or employer independent;

(5) if you want the added measure of protection against viruses;

(6) if you want to have an e-mail address which associates you with the IEEE.

HOW TO APPLY. There are two ways — using the Web and using e-mail.

Via the Web: View the Web page at "www.ieee.org/eleccomm" and click on "IEEE Alias Service Overview" to read the explanations. Click on "IEEE Alias Request" to view and fill in the Web form. That's it. You will likely get a response within a few minutes or occasionally longer that will tell you if your request can be granted.

Via e-mail: Send an e-mail message to "alias-info@ieee.org". You will get an automatic reply with instructions — send back an e-mail message in exactly the format requested and with all the requested information.

The advantage of using the Web form is the capability of on-line checking that speeds up the process.

EXPECTED RESPONSE. Whether you use the Web form or e-mail messaging, you are creating a text file that will be processed automatically. You have to do it right to be successful. You will likely get a response within a few seconds or minutes or occasionally longer that will tell you if your request can be granted.

Since this service is being introduced to a potentially much larger group of users, and if the initial response is significant, there may be a "phasing in" period.

Please check the Web site at "www.ieee.org/eleccomm" for any status updates.

Alias names are available on a first come, first serve basis.

HOW TO UPDATE. If your real e-mail address changes (because you changed your e-mail service provider — a commercial provider, your employer, etc.) you must tell IEEE by updating your alias file.

Again, there are two ways — using the Web and using e-mail. You use the same Web form for your initial alias request and for updating. Remember, if you do not update, you will not get your messages — they will go to the address you last specified. If you are updating via e-mail, send a message to "alias-info@ieee.org" and follow the instructions in the reply you get back.

UPDATE. Please — do not forget to update your address if it changes, so that your e-mail messages are forwarded correctly. Such messages are not saved by IEEE — they either get lost or sent to the previous server where your messages used to be stored.

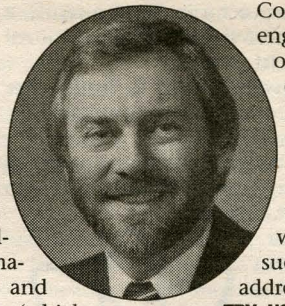
MORE INFORMATION. For more information about using IEEE e-mail aliases, visit the "Electronic Communications Services" page.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor, and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "power.eng.mcmaster.ca/alden".

traveling the information highway

The WWW can be for everyone

with Bob Alden



The IEEE is using the Web for its business of providing information and related services to its members. Companies, governments, teaching institutions, etc., are all using the Web to provide information and services to the world in general as well as to selected sets of people via Web sites that require a password.

Recent graduates who have used computers virtually all their lives use e-mail and the Web in the same way that older folks use the telephone and television.

Those who learned their engineering skills before the advent of the computer have either made the transition or have avoided doing so.

Those who have not made the transition may need some help to use what for them is new technology.

We, as IEEE members, can help each other to learn about the Internet, the tools available to use it, and the kinds of information and entertainment that is increasingly being made available.

I raise this topic because I am constantly seeing examples of IEEE life members, usually retired, who are taking and/or teaching computer and Internet-related courses. One of them, Walter Elden, an IEEE life senior member, has developed a course entitled "Internet, E-mail and Web Class."

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In addition to his many IEEE volunteer activities, Walt is Web master for the Suntree Country Club, whose Web site hosts the material. The URL for the course material is "www.suntree.com/netclass/cover.htm" in case you want to see what he has put together. You can also e-mail Walt at "w.elden@ieee. org". (His e-mail alias is an example of the IEEE e-mail aliases now available to any IEEE member who wants one. If interested, please see my April column for more details or view the Web page at "mail.ieee.org/eleccomm/".)

GIVING A COURSE. If you have the time and the inclination, and are comfortable using the Internet, why not consider giving a course on how to access the Internet?

You can use information like Walter has made available for your course materials, and use my "World In General" Web pages posted at "power.mcmaster.ca/alden/wigf.htm" for a source of links to a large number of Web sites.

I have links categorized under headings of travel, culture, health and sports, information, money, Internet tools, and links to power engineering sites (which is my technical interest).

What else do you need? Your own (or a borrowed or rented) PC with access to the Internet and a room large enough to hold your class. One or two extra monitors can be used for up to 10 people.

Using a projector connected to the external monitor output of your PC — desktop or laptop — and a fairly large screen allows you to accommodate a much bigger class.

If you choose this route, remember that you need a larger screen than you would use for photographically produced slides, because the definition is relatively poorer.

TAKING A COURSE. If you would like to take such a course, why not contact your local IEEE section or chapter and see if they have a program already in place?

If they don't, think about volunteering to organize one with the administrative help of your local IEEE entity.

Find out who might be able to be the presenter — given the resources available, you don't need a "guru."

Consider checking with local engineering schools for students or retired teachers, or retired engineers who have computer experience.

Another resource is the IEEE Life Member Committee. Contact the chair of that committee, Richard (Dick) Jaeger, who is interested in developing such programs. His e-mail address is "r.jaeger@ieee.org".

TRY USING THE WEB. Apart from my work-related activities, I use the Web to print advance schedules of my favorite baseball team's TV broadcasts.

I also use it to find accommodations before I travel, and to order fresh coffee beans from Costa Rica.

Whatever your interest, there is most likely a lot of useful information available. If you haven't tried it, why not find out a bit more before you write it off — it can be a lot of fun!

I invite you to join us on the Web.

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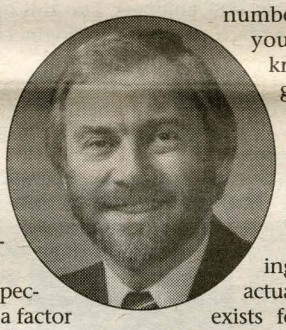
He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "power.eng. mcmaster.ca/alden".

traveling the information highway

Using your IEEE e-mail alias

with Bob Alden



In my April column, I announced the availability of a new service for IEEE members: personal IEEE e-mail aliases.

Any IEEE member who wishes to have one can apply by filling in a Web form or sending an e-mail message.

The URL is "www.ieee.org/eleccomm" and the corresponding e-mail address is "alias-info@ieee.org". Either address provides you with the information you need to apply.

The response has been very positive. I have received a few questions that I thought would be useful to discuss in this issue.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm/" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

WHO QUALIFIES? The answer: Any member of IEEE from student member to life fellow and every possible grade in between. For nonmembers — including IEEE society affiliates — this may be another reason to become an IEEE member.

VIRUS PROTECTION. Several members have told me that they see the automatic screening of e-mail attachments for viruses to be a very valuable service.

RETURN ADDRESS. Masahiro Tsuchiya writes: "I find your column 'Traveling the Information Highway' in THE INSTITUTE very informative and useful. After reading your column this month, I took advantage of the new IEEE alias service and obtained an alias for my e-mail.

"I have one simple question, however. Is there a clever way to change my e-mail return address so that my e-mail will show (to the recipient) my alias as the return address?

"If my true e-mail address is shown to the recipient, he will keep sending his e-mail to it, thereby minimizing the value of having an alias. That is, when I change e-mail service, I lose some e-mail until everyone learns my new address. Does it depend on the e-mail service? I use Microsoft Net."

The short answer is yes, you may be able to do this. Let me explain — this question raises some interesting thoughts about Internet protocols and characteristics of e-mail programs.

First of all, netiquette (Internet guidelines for use) requires us not to hide the source of any e-mail message, notwithstanding all those hucksters who send junk mail with phony addresses.

However, there is the option in some e-mail programs to specify a "Reply To" address, in addition to the originating address, which shows up as the "From" address.

Both addresses are included in the header file that accompanies the message content (along with the destination address, date, subject, etc.). Some e-mail programs, when they receive a message with both a "From" address and a "Reply To" address, give you the choice of which one to use for your reply.

For example, my "From" address is "alden@power.eng.mcmaster.ca" when I send e-mail from the machine "power." If my e-mail package allowed this option, I could add "r.alden@ieee.org" as my "Reply To" address, since this is my IEEE alias.

PINE. I am currently using version 3.9 of PINE as my e-mail program. It gives me the option of replying to the "From" or "Reply To" address if they both exist in a message that I want to reply to, but it does not give me the option of specifying a "Repy To" address when I originate an e-mail message.

The option of being able to specify a "Reply To" address may be a factor in deciding which service provider to use or which e-mail program to use (if you have the choice — some service providers do not allow this option).

Normally, I only see the "To," "From," "Subject" and "Date" headers. There is a "header mode" that I can activate (H) to see the full set of headers.

EUDORA. Eudora Light is a freeware software package available on the Web at "www.shareware.com". It features a "Return Address" option which can be set by selecting "Options" from the "Tools" menu. The header file (which some e-mail programs do not display) indicates the true originator as well as the return path, but the "From" address provided is the "Return Address," not the originating address. This means that if Masahiro Tsuchiya were to use Eudora Light and set the "Return Address" in Eudora to be his IEEE e-mail alias, then replies to his messages would be sent to his IEEE e-mail alias.

By the way, if you want to see all the e-mail message headers, click on the "Blah, blah, blah" button in Eudora Light. (Note: The shareware site mentioned above has a variety of software packages available — some are free, others have a cost.)

SIGNATURE FILE. Many e-mail users create a so-called "signature file" that is automatically appended to outgoing e-mail messages. This is the e-mail equivalent of letterhead — usually a few lines of text that can include your name, phone and/or fax number, and the e-mail address that you want your recipients to know about. A signature file is a great place to put your IEEE e-mail alias.

IEEE OPTIONS. It is not feasible for the IEEE to insert your IEEE alias as the sole reply address for the following reasons:

- Looking up a table containing all IEEE e-mail aliases and actual addresses to see if a match exists for every e-mail message that passes through "ieee.org" would likely clog up the system and add significant delays to all IEEE electronic communications (e-mail, Web, FTP, etc.).
- Inserting an IEEE e-mail alias (by IEEE as part of the e-mail forwarding service) as the return address may be desirable for some members but may well be contrary to other members' wishes.

There is no doubt that for some members, having an IEEE e-mail alias has several advantages (association with IEEE, continuing to receive messages after you change your real address, added protection against viruses). However, these advantages depend upon other people using your IEEE e-mail alias when they send you messages.

We can each promote the use of our IEEE alias, on our signature file, on business cards, and by telling everyone else that we prefer they send e-mail to our aliases. When we send messages, depending on the features of the e-mail program we use, we may be able to use our IEEE e-mail aliases as our normal return address.

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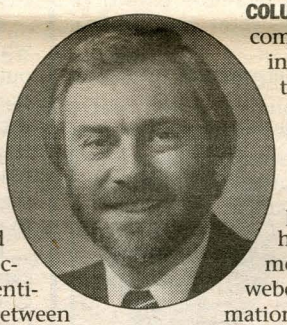
traveling the information highway

The help page for IEEE's electronic services *with Bob Alden*



What's in the box? Each month this column contains a box referencing the Web page that the IEEE staff maintains to provide information about IEEE electronic communication services. That page has recently been improved, so I thought you might like to know what's there. (The address is in the box below.)

> ***Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.***

The eleccomm page can be accessed from the IEEE home page "www.ieee.org" by clicking on the link "Electronic communications" under the heading "Member Services." On the left side is a menu of links:

- **Services**
  - E-mail Services
  - Personal Aliases
  - Mailing-Lists
- **Aliases**
  - Register
  - Update
  - Delete
- **Policies**
  - Alias Service Agreement
  - Electronic Mail Policy
  - Acceptable Use Practices
  - Netiquette Guidelines
- **Mailing Lists**
  - Overview of Mailing-Lists
  - What's NEW
  - FAQs
  - Tutorial for ListOwners
  - MajorCool
  - Maintenance Menu
- **Contacts**
  - Abuse Issues
  - Virus Issues
  - Policy Issues
  - Alias Problems
  - Mailing-List Problems
  - General E-mail Questions

There is also a convenient pop-up menu at the top of each page which is page-context sensitive, so users can select related links quickly. In my opinion, our staff has come up with a very effective design. Thanks guys!

WHAT'S NEW. Currently the most obvious item on the "eleccomm" page is the IEEE Personal E-mail Alias Service (with Free Virus Scanning) with a link underneath the box for more details, including the application form.

SERVICES. These links briefly describe the difference between personal and service (or functional) aliases as well as an overview of mailing lists.

ALIASES. Click on any of the three links here and view or use the convenient Web forms to register for your personal IEEE alias, update your existing alias, or delete your alias if you no longer wish to use it. It is important to keep your alias information current — primarily the address where you want your messages forwarded to. If you are not sure where your alias points to, you can view the update page and make sure it is correct (or make that important change).

POLICIES. Here's a convenient place to view the policies governing the use of e-mail on the Internet and within the IEEE community.

MAILING LISTS. These links explain mailing lists, how to join one (subscribe and unsubscribe), how to set one up, and how to manage one.

Mailing lists are being increasingly used by IEEE societies and sections (and other IEEE entities) to communicate between selected sets of IEEE members. We also have discussion groups. At IEEE we try to differentiate between mailing lists and discussion groups — although they both use the same software (majordomo) to automate the handling of e-mail messages.

Briefly— mailing lists are lists controlled by the owner who sends to a captive audience such as a committee, working group, an entire society or section membership, and so on. Discussion groups are lists set up and managed by an owner with an idea for a discussion topic and anyone can subscribe or unsubscribe.

Only the owner can send messages to a mailing list. Different types of discussion groups can be set up so that anyone, or only subscribers, can send messages to the group subscribers. Replies to a mailing list go to the owner, while replies to a discussion group go to the subscribers (unless it is a moderated group). For more information please see my March 1998 column.

There is also a link to MajorCool — a user-friendly, Web-based tool for managing majordomo lists.

CONTACTS. Here you will find a convenient way to ask IEEE for help or raise a concern about issues involving the use of e-mail services in an IEEE context. Click on any of the links (abuse, viruses, policies, mailing lists, general e-mail) and use the form to send your message directly to IEEE.

COLUMN LINKS. At the bottom of the "eleccomm" page is a link to a chronological index of my columns that you can use to view current and back issues (since the first one in 1992).

THE OTHER PAGE. If you are looking for Web-related information, check out the IEEE Web Documentation page that is linked from the IEEE home page under the "And much more ... " section or at "www.ieee.org/webdoc.html". It contains lots of information about creating Web pages for IEEE related activity as well as a link to the IEEE Entity Web Hosting program. EWH is a service whereby IEEE volunteers can create, store and maintain Web pages for regions, sections, councils and societies. The URL is "www.ewh.ieee.org".

YOUR THOUGHTS? Is there a way IEEE can improve electronic communications services? Are there items of information that you would like us to include on the "eleccomm" page? You can e-mail me or the specific contact addresses listed on the eleccomm page. If there is a major policy or resource issue, you can contact your region or division director or other members of the executive committee. The entire IEEE Board of Directors is now listed on the Web — look under "And much more" on the IEEE home page or "www.ieee.org/corporate/bodroster/". There are links to Web pages for the three presidents: elect, current and past. President-elect Ken Laker's has a direct "MailTo" link you can use.

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He welcomes your input via e-mail at "r.alden@ieee.org". The URL for his home page is "power.eng.mcmaster.ca/alden".

traveling the information highway

Life members and the Web

with Bob Alden

Recently I had lunch with an old friend and colleague, Ray Findlay. He was commenting on the rapid growth of life members — their number has approximately doubled over the last decade, said Ray, who has a fantastic knowledge of IEEE facts. I began to think about this and relate it to a story in my local newspaper titled "Seniors retire to cyberspace."

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LIFE MEMBERS. The IEEE has 28,600 life members, according to the 1997 Report of the IEEE Secretary. There are only two of IEEE's 36 technical societies that have as many members as the IEEE has life members! Look at the volume of services, publications, chapters, meetings — and yes, even Web pages — devoted to members of IEEE societies. I want to explore the idea of developing Web-based services for life members and retired members. The first step is to note some existing services.

AARP & CARP. To quote the newspaper article I noted above, "The 50-plus bracket is growing faster than all other on-line groups, and these veterans of life are putting the Internet to remarkably practical use." This is reinforced by viewing the Web pages of North American associations for retired persons. The American Association of Retired Persons at "www.aarp.org" and the Canadian Association of Retired Persons at "www.fifty-plus.net" are providing Internet-related services, Web pages on topics such as travel, and special discounts for members using the Web.

TOPICS. Let's consider some topics of possible interest for life members and retired members — retirement planning, investing, banking, health, travel and hobbies.

RETIREMENT PLANNING. The personal investments page of Prudential posted at "www.prudential.com" has information on retirement planning; the same type of link and information exists on the Fidelity Investments site at "www.fidelity.com". There is a Canadian Web site called RetireWeb at "www.retireweb.com" which, not surprisingly, is sponsored by a couple of investment companies. These are only a random sampling of the many Web sites available.

INVESTMENTS. I suspect that the investment industry is one of the most active sectors of electronic commerce. Today one can find not only information but on-line transaction services. Strong On-line's Web site at "www.strong-funds.com/" is one good example.

COUNTERING SCAMS. One of the concerns of potential investors is the possibility of being scammed by unscrupulous individuals. The U.S. Postal Service has an information site at "www.usps.gov/websites/depart/inspect/" covering consumer fraud. Another site is the one for National Fraud Information Center at "www.fraud.org"; the U.S.-based group cooperates with a number of other organizations in the U.S. and Canada. For those members who live outside North America, the sites are accessible to you, and you may find similar information services in other countries. A somewhat related topic is that of Risk Management. RISKWeb offers an electronic discussion group at "www.riskweb.com".

ON-LINE BANKING. For those who prefer not to visit their local bank to transfer funds, pay bills and so on, there are now many on-line banking services. We'll use as an example three large banks with international services that are based, respectively, in the U.S., UK, and Canada. The Bank of America site at "www.bofa.com", Barclays Bank's site at "www.barclays.com", and the Bank of Montreal's site "www.bom.ca" all feature on-line public information as well as password protected services.

HEALTH. The Web has many sites that are health, fitness, and disease related.

The World Health Organization at "www.who.ch"; the U.S. National Library of Medicine at "www.nlm.nih.gov/"; the Center for Disease Control at "www.cdc.gov/"; the pharmaceutical information network at "pharminfo.com/pin_hp.html"; and the U.S. Department of Agriculture's food and nutrition information center at "www.nal.usda.gov/ fnic/" all provide information to anyone who logs on.

TRAVEL. Airlines, car rental companies, hotels, and a whole lot of travel companies have Web sites that make it easy to browse, compare availabilities and costs, and provide either telephone numbers, e-mail addresses, or Web forms for on-line reservations. Some ask only for the type of credit card you will use when you arrive, some use a telephone link to finalize the arrangements including payment details, and some have so-called secure links for on-line payment. I use the phrase "so-called secure links" because I know some Internet users are not yet believers in this type of security. I have developed my own level of comfort and so far I have not been disappointed.

Airports are increasingly providing information to both travelers and those meeting arriving travelers. Some of these provide on-line arrival and departure times so that you can check for delays or cancellations.

HOBBIES. Most of us have hobbies and many of us wish for the time when we have more time to devote to those interests. Such a list is not easily developed because it is so diversified and unique to each person.

For example, the use of libraries for recreation as well a business is now enhanced by on-line catalogs, searching by title or author, and checking availability. Many other hobbies can be researched on the Web. For example, the main Yahoo search engine "www.yahoo.com" page lists photography, movies, music, sports, travel, autos, outdoors, and many other categories. For some, Web surfing using a commercial search engine is a joy; for others it is frustrating because of the sheer amount of choice and the wide variations in quality.

IEEE SERVICES? What services should IEEE provide? We could provide links to existing organizations like the ones I noted earlier in this column. We could provide links to Web sites that focus on such topics as retirement planning, investments, health care, leisure activities, and so on. I have samples of these in my world-in-general Web page set at "power.mcmaster.ca/alden/wigf.html", including all the sites I have listed here as well as many in my travel section.

Sites like these could be part of a Web page set for life members. There is also the aspect of continuing professional activities such as consulting — these issues could be addressed and services developed. If any of you are interested in helping to develop IEEE services for current or future life members and retired members, why not let me know (I will pass on your message) or contact IEEE Life Member Committee Chair Dick Jaeger at "life-members@ieee.org".

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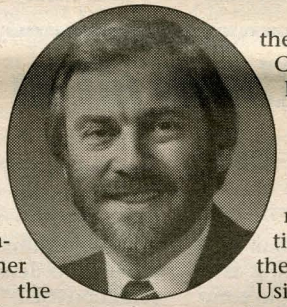
traveling the information highway

Two kinds of graphics

with Bob Alden



There are many kinds of graphic file formats and even more software programs that people use to create them or convert one kind to another. But there are really two basic kinds of graphics — bitmap and vector. Let's look at each of these to understand their differences and their use in creating images on the Web.

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Images are either displayed on computer screens or printed or both.

A typical 11-inch diagonal dimension VGA computer screen contains a matrix of pixels, 640 wide by 480 high, with a typical density, or resolution, of 72 dots per inch (dpi), or pixels per inch.

A super VGA monitor has a higher density and thus more pixels for the same size of monitor. Larger monitors or higher density monitors enable a 640 by 480 pixel image to be displayed in a portion of the screen, whereas the standard VGA monitor uses the entire screen for this image.

Since the standard VGA monitor is currently considered the "minimum standard" for monitors, the 640 by 480 matrix and the 72 dpi resolution are the defaults for full-screen images to be displayed on the Web.

Printers tend to have higher resolutions, in the order of 200 to 600 dpi, so we need to realize that we can not get the same definition over the Web as we can using a printer.

BITMAP. A bitmap graphic is just that, a rectangular map (or matrix) of bits (pixels) that define the image. With a monochrome graphic, each pixel is either on or off. With a grayscale graphic, the intensity of "being on" is set within a range.

With a color graphic, each pixel has a range of intensity settings for the three color components — red, green, and blue. The more grayscale or color resolution required, the more bits of information needed to define the appearance of each pixel, and the larger the image file size.

Scanned images are bitmap in nature and tend to be large but you can select options to reduce the resolution of both the number of pixels and their color (or monochrome) intensity.

By selecting a file format or converting to a different file format, you are often choosing from a variety of compression algorithms which are often application-sensitive. You can reduce the size of the file but you may pay in terms of reduced quality.

For more information on file formats, please see "Adding graphics to your Web page" in the February 1997 issue of THE INSTITUTE. (Back issues are archived at "www.institute.ieee.org/INST/ti.html").

VECTOR. A vector graphic is made up of mathematically defined vectors with properties of position, size, color, thickness, and so on. These vectors can define straight or curved lines which can be open or closed.

Closed items can be filled. Lines can be terminated with a wide variety of arrow shapes — i.e. one vector can include another vector as a property. These vectors are really objects, and we can change these graphic object properties easily.

Generally speaking, vector-based files are much smaller than comparable bitmap files. Another useful characteristic is the inherent ability to scale the size of these objects up or down without any loss of quality.

Since vector graphics can not be viewed using most web browsers, they need to be converted to a suitable file format, which really means converting to a bitmap file in a Web browser acceptable format like GIF or JPEG.

SOFTWARE. There are a large number of choices of software packages to use, many are available over the Internet as either shareware or freeware. Some are offered for free for a trial period. Sometimes the free version has more limited features than the one offered for sale. I will comment briefly on my own limited experience in creating graphics for technical printed notes and for Web-based versions of those notes.

PAINT. Initially I created bitmapped graphics using Microsoft Paint (which is included in the Windows operating system under "Accessories"). It is simple to use and easy to learn because it has limited capabilities. Enhancing any part of a graphic file is tedious, time consuming, manual work. What time you save in learning to use this package, you may well waste using it. It is quick-and-dirty, if you will. For some simple graphics, it is very effective. Drawing arrows, for example, is a pain because there are no tools to assist you.

CORELDRAW. Currently I am learning to use CorelDRAW, version 8, a very sophisticated graphics package that has a difficult learning curve. I looked at various books and bought the "official" guide, endorsed by Corel. After finding it impossible to learn from, I purchased "Teach Yourself CorelDRAW 8 in 24 Hours," published by SAMS. (I have had success with previous SAMS books). This one works for me. It also provides an introduction to Corel Photo-Paint, which the official guide does not.

Using this software I can create graphics to use in Corel WordPerfect files. I then have the option to create public document format (PDF) files using Adobe Acrobat to make the conversion. Alternatively, I can create Web-compatible graphics in either GIF or JPEG formats directly using CorelDRAW.

PHOTO-PAINT. Corel Photo-Paint is a version of CorelDRAW (to my way of thinking) that is designed to work with bitmap graphics (it is included on the CorelDRAW CD-ROM). Using Photo-Paint, I am learning to create and modify graphics files and save them in a variety of formats, including BMP and GIF.

CONCLUSION. I have found the use of vector graphics advantageous, both for direct use in a word processor, and as an intermediate step in developing bitmap graphics for the Web.

If you have some thoughts or suggestions about graphics packages, especially those that are easy to use or worthwhile learning, please let me know. I hope to pass along some of your ideas in future columns.

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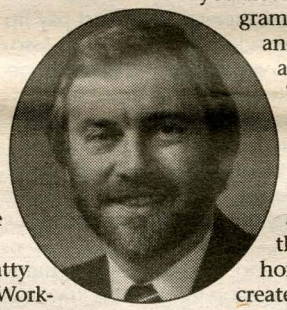
traveling the information highway

Ideas for graphics and IEEE services

with Bob Alden



I am back from vacation and have survived the start of term at my university. While on vacation and away from my Internet access I realized how I missed that access to information.

As a case in point, I wanted to arrange travel by train between two points in France. While making arrangements (with my limited French vocabulary) I noted a Web site (www.sncf.fr). When I returned home, I visited that Web site, discovered a full set of timetables with a convenient query capability, and an option to view pages in English — it would have been so much easier!

If you are about to set off on vacation (holidays are coming up soon — winter one's in the Northern Hemisphere, summer one's in the Southern Hemisphere), I recommend you think ahead (more than I did) and use the Web to help you plan.

Now that I am back, I want to share several e-mail letters from IEEE members.

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My September column focused on the difference between bitmap and vector graphics. I asked for your thoughts and suggestions on graphics packages. Here are a couple responses, along with two suggestions for Web-based services for IEEE members or volunteers.

PAINT SHOP PRO. Manny Schnall, consultant (eschnall@ieee.org) writes, "Dear Bob: I have found Paint Shop Pro to be very capable for Web graphics, and worthwhile learning. It was recommended to me by a local community college instructor, who calls it the most popular Web graphics editor in the world. A 30-day trial version can be downloaded for free from "www.jasc.com." This can create and modify graphics files and save them in a variety of formats, including JPEG and GIF. Have been enjoying your articles."

Thanks for the tip. There are many programs out there — what is the best one? In some ways, it is the one you have and know how to use — as long as it meets your needs. Some of the more sophisticated programs are huge and difficult to learn. I am not promoting any one package, only the idea of using ones that works for you.

repliGATOR. Owen Ransen (ransen@nemo. it) writes, "Dear Mr. Alden, I saw your article on graphics programs in THE INSTITUTE and thought you might be interested in repliGATOR, an easy to use effects program. It needs no plug-ins, no mouse skill, and only costs US$29. Cheap and quirky would be a good description. (I wrote it so I am allowed to say that!). Anyway, you can find out more, and download a demo, from 'www.ransen.com'. All the best, Owen."

I took a look, and tried the demo — it produces some interesting special effects if you have some images you want to experiment with.

WWW ALIASES. Wojciech Krajewski (w.krajewski@ieee.org) writes, "Is it possible to offer 'WWW aliases' service for IEEE members in form of 'www.ieee.org/~username'? It could be done by a simple HTML page with HTML redirection statement to a real WWW address and with a link for browsers that do not support automatic redirection. I think it would be a very nice supplement to great IEEE e-mail aliases. What do you think?"

I think it is a great idea. I hope that sufficient interest is expressed so that the IEEE Board of Directors will decide that this is a service to be funded. If you agree, why not e-mail your director (technical or regional) and ask for this service to be implemented?

PHOTOS. John R. Beatty "j.r.beatty@ieee.org" is chair of Working Group H5, for the IEEE Power Engineering Society (PES) Power System Relay Committee (PSRC).

He writes, "Yes, I know I have met that guy from earlier IEEE PSRC meetings. Now he's coming over to say hi to me. Uh-oh! What IS his name??? Oh, that sinking feeling as my brain goes through its long list of IEEE PES PSRC people I have not seen for the past four months — trying desperately to put face to name!

"The above is a real, recurring problem for all but a mental genius with photographic memory. I visualize that it can be helped by the implementation of a new Web site listing of NAMES, FACES, PLACES organized by participating societies like IEEE PES PSRC. This enhancement could be used on a regular basis at or before meetings for look up of unremembered 'names equal faces' or 'faces equal names.' Does the digital photography, data compression-storage, and local and/or IEEE Web site technology exist to make such an initially small and eventually large listing possible? For only IEEE PES PSRC leadership or all working members? Would this be best done from the grassroots IEEE working group and then move up or start from the top and go down? I would appreciate your 'reality check' comments, suggestions, and/or directions. If feasible, I can then approach my PSRC committee leadership."

Thanks for your message, John. Here is my answer: you have a very useful idea for the IEEE — exactly what I do at my university. Yes, it can be done and is likely best done by volunteers who can collect the images — all you need is a camcorder — and a program like Adobe Photoshop to create and touch up the photographs, by adjusting contrast and so on. Take the camcorder to your committee meeting — you do not need special lighting, just a plain contrasting background. Take the "photos" in less than a minute per person, process the image on your PC back home to create a JPEG file format, create an HTML file with an image command of the form "**<img width ="100" src="name.jpg">
 Name, Initial**".

This provides a convenient size of image so you can print 25 photos on a page in a 5-by-5 arrangement (I used the width scaling command to reduce the size from the 300 by 400 pixel JPEG image I had created.) I also created the above command line to put a name under the picture with an e-mail link. The image file sizes are about 10 kilobits, which is quite reasonable.

One word of caution: Your committee members may not want their photos and e-mail addresses live on the Internet for anyone to access, so you can place the files in a password protected directory on the server you are using and give all your committee members the password.

You should be able to arrange this with your server manager or, in time, with the IEEE. If it works for your committee, the idea will spread to others ... but I repeat my belief that it will work best if done by volunteers and accessed from a link on the PES Web site.

My thanks to the above four contributors, and others who sent me e-mail.

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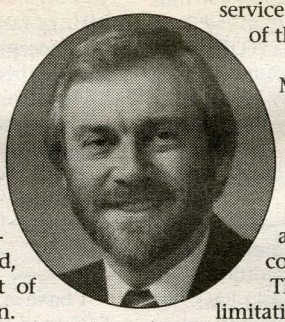
traveling the information highway

A plan for IEEE electronic services

with Bob Alden



Welcome to the January 1999 issue of THE INSTITUTE. This is the issue where I traditionally review some of the past and look ahead to see our direction on the information highway. One year ago, I noted that the IEEE Board of Directors had made the decision for IEEE to do business electronically. In particular, the top five of the 1997 Sections Congress recommendations — all relating to electronic services — were to be implemented in a plan called the Internet project.

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This project included a number of infrastructure developments that were needed to create a reliable foundation of data and processes within the IEEE staff support structure. We are about half way through the planned time frame for implementation. Quite a number of the recommended services have already been implemented. Over the past few months our incoming president, Ken Laker, has started a follow-up activity by a new electronic services committee.

ESSC. The IEEE Electronic Services Steering Committee, chaired by past president Troy Nagle, is developing a plan for new Web-based and other electronic services for the IEEE. Troy is requesting your input. The ESSC Web site at "www.ieee.org/committee/essc/" has both information about the mandate of this committee and an interactive discussion section where you can participate. The opening paragraph on that Web site is: "The role of ESSC is to take a fresh look at IEEE's future offerings in electronic services, particularly those offered over the Web from an Institute wide perspective. The intent is to develop an Institute plan that maps what customers (members, companies, libraries, etc.) want from IEEE, two to five years in the future, into a coherent strategy that addresses policies, processes, and computing/communications/information infrastructure requirements needed to implement the services."

YOUR INPUT. Please! It is important that this committee receives a wide range of input from as many IEEE members as possible. The IEEE Board has established this committee and will act on its recommendations. If we do not participate — that is, see what is being proposed, comment on the proposals, or make new suggestions — we are leaving these decisions to a small set of people.

MY INPUT. I have my own idea — the concept that each IEEE member would have a customized view of the IEEE Web site, reflecting her or his own interests. Let me explain how this would work from a user viewpoint. When each of us log on to the IEEE Web site, we would enter our name and individual password. The next page we see contains links to the technical societies that we have joined, our local section, an e-mail list of those we often contact, and so on.

Any of the restricted IEEE sites, containing information that we have contracted to obtain by (for example) membership in a technical society would automatically be shown without any additional passwords. There would be a link that allows us to customize our "log on page" for the current session or for the next time we revisit the IEEE site.

It seems to me that the IEEE spends a lot of time on "Web page design" for members in general. Why not invest in a process whereby we, as individuals, can create our own design that suits us — however peculiar our individual quirks are?

Does this make sense to you — or do you think it is a waste of time and effort? Do you have an idea for a new service? Please look at the ESSC site (today — while you remember) and add your ideas, observations, or critique of what is being proposed.

RAPID CHANGES. The importance of timely reviews of IEEE's plans for electronic services can not be overstated. It was only four years ago that the IEEE Web came into existence with simple static graphics and mostly text passages to read. Since that time the Web has continually expanded its range of service offerings. Following are two of the more recent developments.

WIRELESS WEB. Bell Atlantic Mobile is now advertising a new service using cellular digital packet data (CDPD) technology for connecting your laptop to the Internet while you are traveling — for US$55 a month (where the cellular coverage exists).

This can bypass the frustrating limitations imposed by hotel and airport telephone systems for those who need to work on the Web while they travel. To check this one out, view "www.bam.com".

WEB CDs. MP3 (MPEG-1, Layer 3) compression technology is being used to compress entire CDs so that they can be distributed via the Web instead of physically shipping the disk. This may change the business practice of many music distributors and the way we collect recordings. To read more about the possible impact of this technology, check out the 15 Nov. issue of the *New York Sunday Times*. The Web site is at "www.nytimes.com". By the way, anyone can log on to this site and view the current issue at no cost. You have to register first (no charge). However, if you want to go into their archives (the past 365 days), there is a charge of US$2.50 per item.

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traveling the information highway

Using form tags for building Web pages

with Bob Alden

A Web page is a document written in HTML (hypertext markup language). You can use a wide variety of Web page editors such as FrontPage to create these documents or word processors such as WordPerfect or Word, or any one of the available text editors. Depending on the package you use, the HTML codes (or tags) may be hidden from you while you are in that package. However, we can all use the View Page Source menu features in our Web browser to view the source code of any Web page we have on our screen. In this issue, I will begin a discussion of the features we can utilize with FORMS — one of the major categories of HTML tags.

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FORM tags can create pull-down menus, text-input boxes, clickable radio buttons, and multiple-choice checkboxes. The pull-down menu is a box that expands when we click within the area of the box. Fig. 1a shows the box as it appears on our screen. Fig. 1b shows the expanded box after we click within the Fig. 1a box. As we move the cursor over the four different segments of the expanded box, the segment under the cursor becomes highlighted. When we click on a highlighted area, the associated command is executed.

Fig 1a

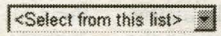
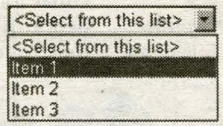


Fig 1b



We will now look at the codes that we can use to create these pull-down menus and execute commands. In this column, I am going to look at commands to manipulate the display of different HTML files in the browser window and in a portion of the window (called a frame). In a future column, I will look at commands we can use in an interactive form that generate an e-mail message that transmits the input from the form to someone's mailbox. For the latter case, we need access to the server and the assistance of the system manager. For today's case we can implement the commands without the help of a system manager.

The codes displayed in Fig. 2 allow us to replace the HTML file containing our Form by any one of three other HTML files (the first one is named file_1.htm). This code segment is placed within the body of the HTML file. (For an introduction to creating HTML files, please see my August 1995 column or any one of the excellent books available.) One I particularly like is "WebMaster in a Nutshell" by Spainhour and Quercia, published by O'Reilly in October 1996 — their Web site is "www.ora.com".

Fig 2 Form coding to load files into current (left) frame

```
<form> <select onChange="if (this.options[this.selectedIndex].value != 'nil')
window.location.href=this.options[this.selectedIndex].value;"
onBlur="this.selectedIndex=0;" size="1">
<option selected value="nil">&lt;Select from this list&gt;</option>
<option value="file_1.htm" >Item 1</option>
<option value="file_2.htm" >Item 2</option>
<option value="file_3.htm" >Item 3</option>
</select> </form>
```

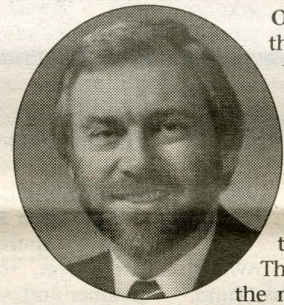
PULL-DOWN MENUS are created using three basic tags; form, select and option. Each of these tags are tag pairs with an opening and a closing tag. The opening tag may contain attributes but the closing tag does not. The closing tag is like the opening tag but contains a forward slash.

Form Tag. This defines the beginning and the end of the form code segment using <form> and </form>.

Select Tag. The select tag pair encloses the option tags, and the opening select tag contains JavaScript code consisting of two event handlers, onChange and onBlur, as well as a size attribute which specifies that only one line of the form is displayed initially. The event handlers control the appearance and action of the form.

The onChange event handler is called when the user makes a new selection from the pull-down menu, picks up the value from the selected option (which is an HTML file name in the three non-null options), and displays the file in the default location (the current frame).

The onBlur event handler is called when the user clicks anywhere outside the pull-down menu and resets the index to zero.



Option Tags. There are four of these, with indices ranging from 0 to 3. Between each option tag pair is the text that is to be displayed. For the first one (index = 0), the < and > are the codes (also called character entities) for the symbols < and > which traditionally enclose the default display for the unexpanded pull-down menu. The value, which in this example is the name of an HTML file, is passed into the JavaScript string in the select tag when the option is selected.

APPLICATION. The coding for a form to create this pull-down menu is relatively complicated compared to using a set of three links such as:

Item 1

but it provides a mechanism to fit an arbitrary number of such links in one line. I have used forms coding in the design of my department's home page. You can view this page at "http://ece.eng.mcmaster.ca". In this case, I chose to use two frames to provide content in the right-hand three-quarters of the window (the right frame) and quick links in the remaining portion (the left frame). To implement the placement of an HTML file in the right frame using a select tag in forms coding in the left frame, the select tag in Fig. 2 needs to be replaced by the code given in Fig. 3.

Fig 3 Replacement coding for select tag to load files into right frame

```
<select onChange="if (this.options[this.selectedIndex].value != 'nil')
window.parent.right.location.href=this.options[this.selectedIndex].value ;"
onBlur="this.selectedIndex=0;" size="1">
```

EXAMPLE. If you wish to investigate this further and try experimenting with this type of coding, you can view and/or copy the example I created. The URL is "http://power.eng.mcmaster.ca/alden/test/f1.htm".

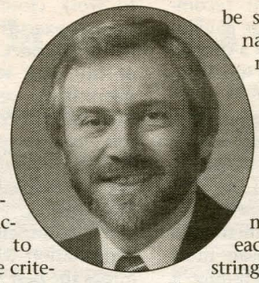
I close with a special thanks to Steve Spencer and Gorav Arora at McMaster University who helped me understand the JavaScript code.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor, and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "http://power.eng.mcmaster.ca/alden".

traveling the information highway

Using forms for creating on-line questionaires

with Bob Alden



Last month I discussed the use of some of the FORMS commands to create pop-up boxes and their use in selecting Web pages to view within one or more frames — I used the Web site for the department of Electrical and Computer Engineering at McMaster University, that I created, as the basis for the example I developed for this column.

This month I look at the more obvious use of FORMS commands — to create an on-line form. Two applications of such a form are: a membership application or order forms like the ones IEEE and others are using, and a questionnaire to solicit input. I use the latter in my teaching, where I use the Web for all course content and administrative information, as well as on-line presentation materials for all lectures. Earlier this year my students were asked to complete an on-line questionnaire to provide feedback on their success in accessing various portions of our course Web site. I have adapted that questionnaire to provide today's example.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm/" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

EXAMPLE. You can view and complete the questionaire, illustrated on this page, using the URL "http://power.eng.mcmaster.ca/alden/test/ieeeq1.htm". If you click on the "submit" button, the responses you have entered, will be e-mailed to the address you have entered for item 8. Each entry line is numbered for reference in this discussion. You can use the "View", "Page Source" command in your browser to see all of the code or use "File", "Save As" to save this file on your own PC and edit it to create your own HTML FORM.

THE BASICS. To create an on-line questionnaire, we need to write three segments of code using two files. The first file is the HTML document that defines the Web page that is the questionnaire. The obvious piece of code is written in HTML (hypertext markup language). There is also a second distinct segment of code, written in JavaScript and placed between the HEAD and the BODY sections of the HTML file, that checks that the input (provided by the person filling in the form) obeys certain constraints before sending the form to the server. If we have permission to create Web pages in our own Web space on our server, we also have permission to create both parts of this code (HTML and JavaScript).

The third segment of code is written in Perl and usually resides in the cgi-bin directory of the server being used to receive the information from the submitted form and send it to the desired recipient in the form of an e-mail message. This is known as the server application. We do not normally have access to the cgi-bin directory, at least in the sense that we can not write in that directory — if we can find it. You may be able to arrange with your system manager to get "write permission" for a specific file so you can edit it. Your system manager may be willing to provide a generic file for your use (with write permission) so you can adapt it to your needs. There may be other options that relate to the location and attributes of these files — I have described a typical situation.

HTML CODE. The forms coding is placed within the body of the HTML code. The form is enclosed by a tag pair <FORM> and </FORM> and includes two other tags <INPUT> and <TEXTAREA>. The input tag can be of several types; hidden, radio button, check box, text, reset, or button.

FORM TAG PAIR. The opening tag contains several attributes — the name of the form, the method whereby the parameters are passed (POST or GET), and the action which specifies the URL of the application (the Perl code noted earlier).

```
<FORM NAME="ieeeq" METHOD=POST
ACTION="/cgi-bin/ieeeq-cgi"
onSubmit="return false;">
```

INPUT TAG. This tag generally defines (i.e., names) a parameter whose value is based on user input. Different types of input tags allow a variety of input formats.

hidden This type of input tag provides the author of the form the capability to pass a mailing address to the server application. While one can also specify the mailing address directly in the application coding, passing the address avoids the need to access the cgi-bin directory. I use the following code in my questionnaires for my students when I want the form responses returned to me, but am not using it in this our questionnaire because I want you (not me) to receive the response.

```
<INPUT TYPE="hidden"
NAME="submit_to_address"
VALUE="alden@mcmaster.ca">
```

radio button This type of input tag forces a choice of only one of two or more options. The code for item 3 below, illustrates two options. In item 7, the choice is for one of six. There are as many INPUT tags as there are choices. One option can be preselected by the insertion of the word CHECKED

```
3 Do you regularly access the IEEE Web
site ? <INPUT TYPE="radio"
NAME="ieeesite" VALUE="Yes" > Yes
<INPUT TYPE="radio" NAME="ieeesite"
VALUE="No" CHECKED> No
```

check box This type allows a choice of any combination from none to all, as illustrated in item 2. There are as many INPUT tags as there are choices.

```
2 Is your Web access via
<INPUT TYPE="checkbox"
NAME="access1" VALUE="modem" >
Modem and/or
<INPUT TYPE="checkbox"
NAME="access2" VALUE="network" >
Network (leave blank if you do not have
access)
```

text This type allows a single line of text to be entered as illustrated by items 1, 5, 6, and 8. The code for item 5 is given below. SIZE specifies the width of the window while MAXLENGTH allows more characters to be entered. If the type is PASSWORD instead of TEXT, the entry is masked on the screen.

```
5 Enter your full name
<INPUT TYPE="TEXT"
NAME="member_name" SIZE="31"
MAXLENGTH="50">
```

reset This type of input enables the user to reset the form display to its initial appearance. The value attribute allows the author to define the words which are displayed in the box.

```
9 <INPUT TYPE="reset" VALUE="Click
here to clear all entries">
```

button This type of input enables the user to submit the form. The value attribute has the same use as for reset. The last item within the INPUT tag is the instruction to run the JavaScript code which performs error checking, interactively prompts the user to change the input to meet the criterion used in the error checking process, and submits the form when the criteria are satisfied.

```
<INPUT TYPE="button" VALUE="Click
here to send the response back to you"
onClick="runSubmit(this.form, this)">
```

TEXTAREA TAG. This tag pair is like the text type of input tag except that one can specify the number of rows of text and the width. A default initial message can be displayed using the value attribute which is unused in the coding for item 4 shown below.

```
4 Do you have any comments (etc) you
would like to share with IEEE about
using the Web for IEEE activities ? <br>
<TEXTAREA NAME="comments"
VALUE="" ROWS="3" COLS="75">
</TEXTAREA>
```

ERROR CHECKING. In the example file, ieeeq1.htm, the error checking is fairly simple. Only three fields are checked, corresponding to the member name, member number and e-mail address. The name entry must contain at least one character. The number entry must contain exactly eight numerals. The e-mail address must contain the "@" symbol. The user is prompted if any of these checks fail. These checks are performed using a series of JavaScript functions which are placed immediately after the HEAD segment of the HTML file.

SUBMISSION. After the error checking is satisfied, the contents of the form, a sequence of VALUES for each of the fields defined by the NAME parameter in the form tags, the INPUT and TEXTAREA tags, are sent to the default server where they are processed by the application "ieeeq-cgi" defined in the opening FORM tag. This application is stored in the cgi-bin directory which is identified in the action attribute ACTION="/cgi-bin/ieeeq-cgi". This could be expanded to read ACTION= "http://power.eng.mcmaster.ca cgi-bin/ieeeq-cgi". If the information was to be sent to a server at IEEE, the full name of that IEEE server would replace the power server at McMaster.

PROCESSING. On the server, in the cgi-bin directory, the application ieeeq-cgi processes any files sent to it. A sequence of Perl commands composes the e-mail message by appending the value of each of the named variables to a string which describes the information. For example, the response to item 2 about Web access might be "Modem" by checking the first box. The INPUT tag (under **check box** above) assigns the value of "modem" to the variable "access1" when the box is checked on the form. The line of Perl code is:

```
print MAIL "Access Web via:
$input{'access'}\n";
```

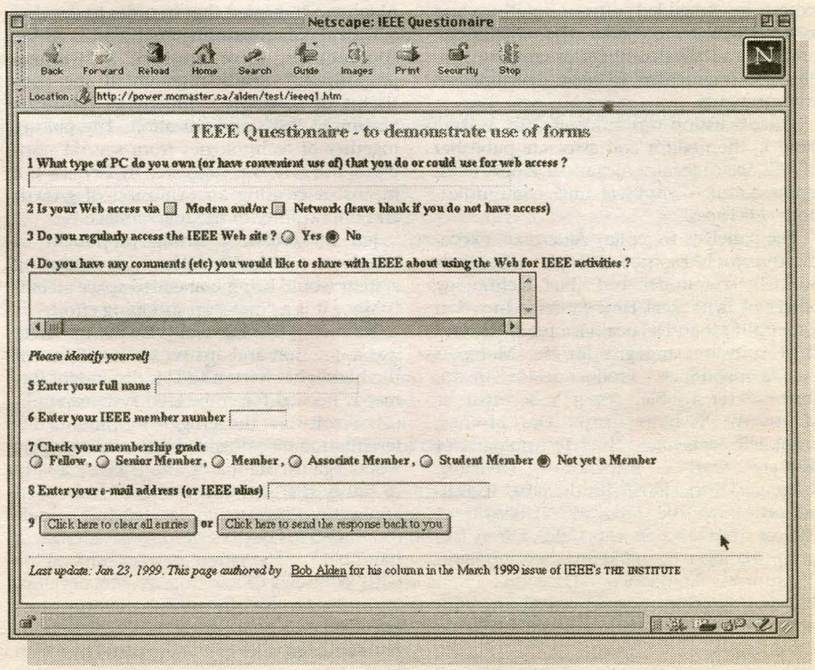
and this results in one line of the message "Access Web via: modem".

The final step is to write on a new Web page that the response has been sent.

As I noted in last month's column, this use of Web forms requires us to write code in our own Web directory (normal access) and in the cgi-bin directory. By the way, cgi is the mnemonic for Common Gateway Interface, one of the set of Unix system management tools normally used by our system managers. If we want to set up questionnaires — a valid activity for IEEE Society and Section volunteers, teachers, anyone looking after a Web site offering services, and so on — we need to obtain that access one way or another. If you want to create your own on-line questionnaires, this will help you get started.

If you want to explore or copy and adapt my sample questionnaire, you have the address and the info to try it. You can use the application on power.eng.mcmaster.ca as it is designed to send the resulting message to the address you enter. As with other e-mail activities, please do not abuse these facilities by sending spurious message to other folks.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor, and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/alden".*



traveling the information highway

A Perl script for processing form outputs

with Bob Alden

In my March column, I discussed the use of forms to create on-line questionnaires, and I included a sample that I placed on-line so anyone can try it for fun or adapt it to create their own. The URL is "http://power. eng.mcmaster.ca/alden/test/ieeeq1.htm". I introduced and referred to the cgi script written in Perl that one needs to create the e-mail message containing the response to the questionnaire. The questionnaire appears as a graphic in that column (both printed and on-line versions).

One of our readers, Dr. Richard Enbody, <enbody@cse.msu.edu>, sent me the following message. "Great article on using forms.... How about adding a link to the Perl source? That will give readers a copy of everything needed to duplicate your form submission. I appreciate the fact that you haven't explained the Perl (you cannot do everything in one column), but it is useful for completeness. It is also handy for Perl novices who know a little. Rich"

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

For Richard and others, here is some more information on the script file I used. Please see the accompanying box for the full script. I have added line numbers to help us in the following discussion.

PERL SCRIPT. The first three lines are system related, 01 a directive specifying the location of the Perl interpreter on our server. The second ensures that the cgi-bin directory is added to the path searched by Perl scripts. The third specifies the use of the Perl language library cgi-lib.pl which is needed to perform certain functions, such as the parsing routine ReadParse (line 04) which takes the raw input and parses it into an associative array of name/value pairs.

The e-mail message

```
Date: Mon, 22 Mar 1999 10:55:33 -0500
From: nobody <nobody@power.eng.McMaster.CA>
To: r.alden@ieee.org
Subject: Robert T.H. Alden
PC: Pentium II IBM Compatible
Access Web via: modem
Access Web via:
Access IEEE Web site regularly: Yes
Comments to Share re IEEE Web: Great service
Member's Name: Robert T.H. Alden
Membership Number: 12345678
Membership Grade: senior
Member's E-mail: r.alden@ieee.org
```

Lines 05 to 17 generate the e-mail message. Line 05 writes the header, line 06 inserts the address where the message is to be sent, and also inserts an identifying phrase (the member's name in this case) into the subject line - the message always comes from the same system user ("nobody" on our system) so a distinctive identifier is useful when receiving many responses. Lines 07 through 15 write one line of text for each response (input) after inserting a descriptive phrase to identify the question. The \n following the input variable name is an escape sequence signifying a new line.

Lines 16 and 17 end the message generation sequence and the remaining lines write a conformation Web page informing the user that the submission has been processed.

Where your cgi-bin directory is located and how you can create/edit your cgi file is between you and your system manager. With the right amount of cooperation you should be able to create one or more such files and edit them to suit your needs. I gave the file I have described here the name "ieeeq-cgi"as it is a cgi file for my IEEE questionnaire.

The Perl script

```
01 #! /usr/bin/perl
02 push(@INC, "/cgi-bin");
03 require("cgi_lib.pl");
04 &ReadParse(*input);
05 print &PrintHeader;
06 open(MAIL,"| mail $input{'email_address'} -s \"$input{'member_name'}\"");
07 print MAIL "PC: $input{'pc'}\n";
08 print MAIL "Access Web via: $input{'access1'}\n";
09 print MAIL "Access Web via: $input{'access2'}\n";
10 print MAIL "Access IEEE Web site regularly: $input{'ieeesite'}\n";
11 print MAIL "Comments to Share re IEEE Web: $input{'comments'}\n";
12 print MAIL "Member's Name: $input{'member_name'}\n";
13 print MAIL "Membership Number: $input{'ieee_id'}\n";
14 print MAIL "Membership Grade: $input{'grade'}\n";
15 print MAIL "Member's E-mail: $input{'email_address'}\n\n";
16 close(MAIL);
17 print <<'ending_print_tag'
18 <html><head><title> Entry Accepted </title></head><body>
19 Your questionaire response has been sent to the e-mail address you
20 entered in item 8. Thank you for participating.
21 <p></body></html>
21 ending_print_tag
```

MORE INFO. Here are a couple of useful Web sites you may wish to check out.

"http://hoohoo.ncsa.uiuc.edu/cgi/" is the basic on-line resource for the Common Gateway Interface. It contains introductory material, examples of cgi behavior and programs, and a discussion of the different languages that can be used to write cgi programs. Perl is just one choice, but being a script, it does not have to be compiled (compared to C or Fortran — for example).

"http://cgi-lib.stanford. edu/cgi-lib/" is the home page for the cgi-lib.pl library which is said to be the de facto standard library for creating cgi scripts in the Perl language. It also contains good descriptive information, examples, and text book references.

In my February column, I referenced the O'Reilly book "Webmaster in a Nutshell" - again — one of my favorite series.

My thanks to Richard for his suggestion, and Steve Spencer who provided the original script file and advice. I hope this will complete the picture for those of you who want to develop questionnaires of your own, or possibly for your Section or Society, or any other IEEE entity you are involved with.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor, and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "http://power.eng.mcmaster.ca/alden".

Traveling the information highway

Installing password protection

with Bob Alden

Most of us use the web as a source of information. Much of this information is available to anyone who has access to the web. Some information is restricted to those individuals who have been given permission to access it. One of the common methods to restrict access is to require the entry of a username and password into a box (see figure 1) which is displayed when the user attempts to view a file in a directory that has been protected.

How do we make this happen? Let's consider the common server operating system - UNIX - which is used on many of the servers where we place our files on the web. I will use my own web site as an example. On our server, power, which is a PC, we use LINUX, which is the UNIX adaptation for PCs. It is important to identify and distinguish between two locations on this server, the directory where my web files are stored (that I want to protect), and the directory where I place the passwords (to allow the intended permissions).

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm/" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

WEB DIRECTORY. My main personal web directory has the path "/var/lib/httpd/htdocs/alden/" which shows up in the location window of my browser as "power.eng.mcmaster.ca/power/alden/". If I am going to protect a directory, called "ieeedir" which is one level below my main web directory, it has the path "/var/lib/httpd/htdocs/alden/ieeedir/".

If I place a file called ".htaccess" in this directory, the directory becomes protected. The content of this file is shown in figure 2. The first line of this file specifies the location and name of the file that contains the usernames and the passwords which are encrypted. The third line allows me to customize the login box - see figure 1.

PASSWORD DIRECTORY. My logon directory, where my e-mail is stored, has the path "/usr/people/alden/". I create a subdirectory called "htpass", which has the path "/usr/people/alden/htpass/". In this directory, I produce a file which I will call "ieeepass". This is a simple text file which has content as depicted in figure 3. "ieeepass" contains as many lines as the number of different name/password combinations I want to use. The first line is different from the rest in that it contains the code "-c" after the first word. This is the attribute to create a new encrypted password file. Apart from the "-c", each line contains four words and constitutes a UNIX command string with four elements; the command to create a password, the file name where the password is to be stored, the username associated with the password, and the password itself.

THE PROCESS. There are always several ways to implement a process, depending on the tools you have or which ones are convenient for you. This process takes place in a UNIX environment, and the rules for defining and using files and directories are different from those in DOS or Windows. If you are not familiar with UNIX, I suggest you obtain a book and read up on the commands and features I mention here. One book that I have found useful is "The Waite Group's UNIX Primer Plus" by Mitchell Waite, Donald Martin, and Stephen Prata, and published by SAMS.

The intent of the following steps is to create one file "ieeepass"containing all the password information, and then convert this file to a command which we execute to create a second file ".ieeehtpasswd" containing the encrypted passwords.

To access my login directory on power, I use the command "telnet power.eng.mcmaster.ca". To create my subdirectory "htpass", I use the command "mkdir htpass". To change to this directory I use the command "cd htpass". To produce or edit the file "ieeepass", I use the UNIX editor "vi". To make this file executable, I use the command "chmod 700 ieeepass". To create the file ".ieeehtpasswd, I execute the command "./ieeepass". Then I remove the file "ieeepass using the command "rm ieeepass" (I may choose to save it somewhere else), and log off. I also have to tell those people, to whom I have given permission, what their names and passwords are!

If, later, I wish to add more names and passwords, I edit a new file "ieeepass", without the "-c" in the first line and containing the new usernames and passwords. If I wish to delete a permission, I can use the same username and a new, undisclosed, password - this changes the password for that user from the known to an unknown value. I can also edit the file ".ieeehtpasswd" by deleting the line for this user.

The first file discussed ".htaccess", can also be produced using the UNIX editor "vi". Alternatively, if you prefer, you can produce the two text files, ".htaccess" and "ieeepass" on your own PC (using your favorite text editor) and use the Windows-based FTP application to upload them to your server. You can also use FTP to create the subdirectories.

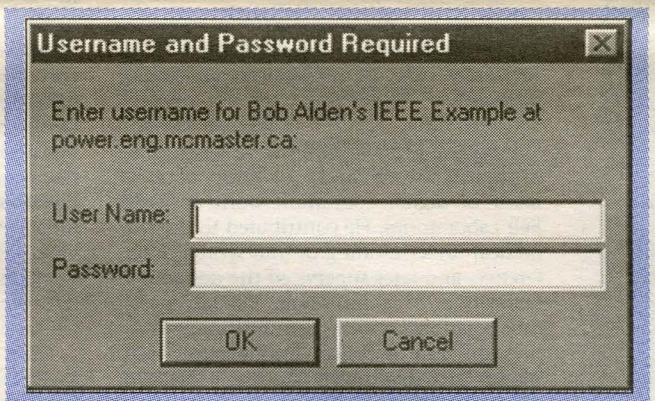


Figure 1: Login Box

```
AuthUserFile /usr/people/alden/htpass/ .ieeehtpasswd
AuthGroupFile /dev/null
AuthName Bob Alden's IEEE Example
AuthType Basic

<Limit GET>
require valid-user
</Limit>
```

Figure 2: Contents of UNIX file .htaccess

```
htpw -c .ieeehtpasswd name1 passwd1
htpw .ieeehtpasswd name2 passwd2
```

Figure 3: Contents of file ieeepass

However, you do need to log on to your server and use UNIX commands to change attributes and create the encrypted file.

Since UNIX is case sensitive, we must be careful to be consistent when we create file names, usernames, and passwords, and when we use editors to modify files and commands to move files around. Also, all UNIX files have ownership and permission attributes which specify who can read, write, and execute them. Depending on the attribute of the file name (e.g. does the name include a period at the beginning) the file may be hidden or visible to different viewing commands.

The two directory locations and the files I have discussed follow relatively standard UNIX operating system conventions. Your system manager can change these details for reasons of personal preference and system security. You will need to contact your system manager and find out the locations and conventions that apply to you. The "htpw" program (see figure 3) has been modified (from the original "htpasswd" program) by our system manager to enable batch processing using scripts.

To summarize, we need to use create three files in two directories in order to implement password protection. We also need to check/coordinate with our system manager and be prepared to use a few UNIX commands. My own system manager, Steve Spencer, has been invaluable in guiding me initially and helping me learn to do these kinds of things on my own.

You too, can protect parts of your own web site so that certain pages are only accessible by those with whom you share the password. You can do this to provide privacy for any group from your family, to an IEEE committee, to your company. As with any system of privacy, it is not absolute, but this is one system that seems acceptable to many web users.

By the way, you can view the protected directory I mentioned above by typing the following URL into your browser location window: "power.eng.mcmaster.ca/ power/alden/ieeedir/".When you see the box shown in figure 1, enter one of the two username/password combinations shown in figure 3. If you wish, you can try to duplicate the process on your own Web site - the default page in this directory contains additional information for you. Good luck.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor, and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http:// power.eng.mcmaster.ca/alden".

Traveling the information highway

Using UNIX commands — an introduction

with Bob Alden

Is there any reason for me to learn UNIX? Those of us who use non-MAC PCs probably have one of the versions of Windows as our operating system. Especially with the later versions, one can perform most tasks by pointing and clicking. MAC users had these capabilities even earlier. Those of us who started to use PCs before Windows had to learn DOS commands in order to create directories, copy or delete files, and so on.

UNIX is the operating system of choice for servers. Folks who want to create and maintain Web pages will likely find themselves in a UNIX environment at some point. Some folks who have become fed up with Windows tendency to "crash and trash" have opted to install freely available PC versions of UNIX (for example LINUX). For on- line information about this type of operating system, which comes in both free and commercial versions,see "www.linux.org", "www.linux.com", "www.UNIXsystems.org" or use a search engine, such as "www.yahoo.com" and enter UNIX or LINUX as the search parameter. By the way, Bob Lucky's "Reflections" on free vs commercial activity in the May 1999 issue of Spectrum is worth reading if you haven't already done so.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/elec-comm/" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

Can I avoid using UNIX? In many cases, the answer is YES. But there are a few occasions, such as installing password protection (as noted in my June 1999 column), where one needs to log in to the server. If you connect to the Internet via a telephone line and modem and your connection is slow, it may be faster for you to log in and use UNIX commands, including the editor vi, rather than up- and down-loading files so that you can work on them using the Windows or DOS environment of your PC.

However, some of you may want to try the following, just to gain the experience and learn a little more about your server and how it works. The following examples assume a Windows environment on my PC and either a LAN or modem connection to the Internet.

Suppose I have some files on my server "power" and I want to copy or edit a file, or create a directory, or look at file permissions or change them, I can do this by logging in to that server using a Telnet session. I can invoke a Telnet session in several ways, double-click on a pre-configured Telnet icon, double-click on a MS-DOS icon and type "telnet machine_name" where machine_name is "power.eng.mcmaster.ca"(in my case - you substitute your server's name), or click on START, PROGRAMS, MS-DOS Prompt and type "telnet machine_name". You should next see the login prompt which requires you to enter your name and password. You can only log in to a server where you have previously arranged to have login permission from the system administrator of that server. Now we are in a UNIX environment and need to know some basic commands.

UNIX COMMANDS. These commands are used at the UNIX prompt, which may be a symbol such as % or $, or an abbreviated path that shows you which directory you are in.

UNIX is considered to be cryptic in style - error messages and explanations (when they exist) are very compact - when all is well, no system comments are provided - e.g. when you delete a file, there is no reassuring notification. UNIX is case sensitive - the filenames "Fname" and "fname" are different! Files and directories are treated and often displayed in the same manner. In the following explanations, xx, yy, zz are used to denote names of commands, directories, or files.

man xx display manual (information) about command xx - example: man pwd will show information about the command "pwd"

pwd print (display) the full pathname of the working (current) directory

cd yy change to directory yy - if yy is a single name, go down one level to that directory - if yy is a full path spec (e.g. /xx/yy/zz, go to that directory

cd .. change to directory one up

mkdir yy make directory yy

rmdir yy remove (delete) directory yy (yy must be empty)

ls list in short format (names only) contents of current directory but not files starting with "."

ls -a list all contents of current directory (including the normally hidden "." files)

ls -l list contents of current directory in long format - includes permissions, ownership, date of last update

cat zz concatenate (display) contents of file zz

cat zz | more pages the display

rm zz remove (delete) file zz

mv xx yy rename file xx as yy, or if yy is a directory move xx into yy

cp xx yy copy file xx to yy (yy can be directory or file name or both) example: cp file1 subdir/file2 will copy file "file1" in the current directory to a subdirectory "subdir" and name the copy "file2"

chmod 700 xx change the access mode of file xx to 700. 700 is a compact code that permits only the owner of the file to read, write, or execute the file. 444 is another value that permits anyone to read the file. The default access mode values are determined by your system administrator (who you may need to contact), and may be different depending on how you create the file (e.g. using a UNIX editor, using FTP to copy a file created elsewhere, and so on).

ftp hostname, mail name@hostname these are also UNIX commands that you can invoke to transfer files and send mail if you want to do it the primitive way (but you do not have the convenience of the newer user-friendly applications)

FOR MORE INFO. UNIX commands are described in the various UNIX system manuals. You will probably find it easier to purchase a book and keep it handy as you learn and gain experience. Reference 2 is relatively old (in the time scale of computer advances) but still very useful. Reference 3 covers UNIX in general, while Reference 1 (my favorite) concentrates on communications features of UNIX.

1 The Waite Group's UNIX Communications, 2nd ed 1991, by Bart Anderson, Barry Costales, and Harry Henderson, published by SAMS.

2 The UNIX System, by S.R. Bourne (AT&T), 1983 ed, published by Addison-Wesley.

3 The Waite Group's UNIX Primer Plus, 2nd ed 1991, by Michell Waite, Donald Martin, and Stephen Prata, published by SAMS.

COMMENT. UNIX is very powerful and comes in different versions. There are many more commands and most commands have lots of options. Take care and enjoy the world of UNIX.

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Traveling the information highway

Using vi - an introduction

with Bob Alden

What is Avi@ and is there any reason for me to learn to use it? Avi@ is a text editor (the vi stands for visual) that is common to all UNIX operating systems. If you are maintaining web pages on a server that uses UNIX or a UNIX based operating system, you may find it a handy tool as I have. It is one of the family of ex editors, ex, edit, and vi. I discovered vi while looking over my system manager=s shoulder many years ago.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm/" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

To use this editor, you must be in a UNIX environment. Either you have decided to use an operating system like Linux on your pc or you have accessed a server that is running UNIX or Linux (or a proprietary version). You may be sitting at the server console or you may be sitting at your pc which is connected to the server via a dialup telephone connection using a modem or via a network (and so on).

Let=s take the case where you are at home using your pc and have logged on to the server where your web files are stored and you have file saving permission. You invoke a Telnet session. You should see a UNIX prompt. Please see my July 1999 column for more details if you are not familiar with UNIX commands or invoking a Telnet session.

GETTING STARTED.

At the UNIX prompt, you can usually view the on-line manual for the vi editor by typing Aman vi@ followed by hitting the Aenter@ key. Depending on the versions of UNIX and vi being used you will likely see the manual for vi (or VIM). VIM stands for Vi IMproved. I will focus on a few of the basic commands common to all vi editor versions. You will realize from scanning the on-line manual that there are many more features and options.

Or you can type Avi@ and begin to edit a brand new file you are about to create (if you save it properly) or you can type Avi xx@ and edit the file Axx@ (assuming that Axx@ is the name of an existing file in your current directory.

Before explaining the various text editing commands, I will cover some basics that are needed in order to perform your editing conveniently and safely. Here are the four sections:

1 How to get in and out of vi
2 Two modes of operation
3 Moving around
4 Editing text

1 HOW TO GET IN AND OUT OF VI — For each of these commands, type the command and hit the Aenter@ key.

TO INVOKE

vi xx to invoke the editor from the UNIX prompt where xx is the filename

To Read, Save and Exit — note these commands begin with a colon.

:r xx to read file xx into the edit buffer at the current cursor location
:w to write (save) the edit buffer to the file as currently named
:w yy to write the edit buffer to file yy
:wq to write then quit (exit) the editor
:q to quit the editor (if no modifications were made since the previous write command - you are expected to save your edit buffer contents first)
:q! to quit the editor (this forces the quit, even if your edit buffer has not been saved)

2 TWO MODES OF OPERATION — these are the command mode and the text input (or insert) mode. If you are in insert mode, you get into command mode by hitting the AEsc@ key. If you are in command mode, you get into insert mode by hitting one of several keys, for example; i, a, or R. Ai@ inserts text before the cursor, Aa@ inserts text after the cursor, R replaces characters.

These commands assume you have the cursor where you want it, so let=s next look at moving around on the visible screen and moving the screen up and down (backwards and forwards in the text).

3 MOVING AROUND — this allows you to find the relevant portion of text if there is more text than fits in the window or screen and to position the cursor within the visible text.

Screen Control — hit the following key combinations where ^F means Ctrl F (depress the Ctrl key while hitting the "F" key)

^F move a full screen forward
^D move a half screen forward
^B move a full screen backward
^U move a half screen backward

Cursor Control — hit the following keys

spacebar move one character to the right
backspace move one character to the left
enter move to start of the next line
- move to the start of the previous line
0 move to the start of the current line
$ move to the end of the current line
h move one character to the left
j move one line down (same column)
k move one line up (same column)
l move one character to the right
e move to the end of the word
w move one word to the right
b move one word to the left (back)

4 EDITING TEXT — consists of inserting or replacing characters (already discussed) or deleting characters, words, lines and sets of lines. When a delete command is used, the deleted text is placed in a buffer which can subsequently be reinserted.

Deleting Text — hit the following keys (after first moving the cursor to the text you wish to delete)

x delete the current character (hold down for several deletions)
dw delete the word
dd delete the line
3dd delete three lines (starting with current line)

Other Editing Commands

p place buffer contents after cursor (or below for lines)
P place buffer contents before cursor (or above for lines)
r* replace the current character with * (* is any character)
u undo the last command (undelete)
U undo all changes on the current line
J join the next line to the current line
/x...y searches for the pattern x...y

There are many other features that you may wish to use as you develop your experience with vi but this should help to get you started..

FOR MORE INFO.

UNIX commands are described in the various UNIX system manuals. You will probably find it easier to purchase a book and keep it handy as you learn and gain experience. Here are two of the many books. Neither is new (in the time scale of computer advances) but then vi has been around for a long while.

The UNIX System, by S.R. Bourne (AT&T), 1983 ed, published by Addison-Wesley.

The Waite Group's UNIX Primer Plus, 2nd ed 1991, by Michell Waite, Donald Martin, and Stephen Prata, published by SAMS.

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Traveling the information highway

Medical Web services

with Bob Alden

An interesting question for some IEEE members is "what kind of services could I offer over the Web?" I decided to start looking at what other professionals are doing, to see if there are parallels or some useful ideas. Physicians are using the Web to offer at least two kinds of Web-based services; free public service information, and fee-for-service consultations. They are also using the Web to access professional information and services for themselves.

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PUBLIC SERVICE. These sites provide information and often rely upon corporate financial support and advertising income. America's Doctor at "www.americasdoctor.com" provides information in a variety of ways, while explicitly stating that the information obtained via their Web site does not constitute "medical practice." It is possible to communicate with a doctor on-line, join a live chat session on a posted topic, view transcripts of previous sessions, join so-called communities (based on broad categories of diseases), and link to the Web sites of selected hospitals.

One can also order, using on-line credit card payment, a variety of medically related products.

I thought it was interesting that the disclaimer file seems to be the longest document in the entire Web site.

A recent newspaper article (The Toronto Star) notes the interest in this site by quoting the usage as 500,000 visitors each month which is met by a staff of about a hundred physicians. **Physician's Guide to the Internet** at "www.webcom.com/pgi/" provides information related to the practice of medicine for anyone.

Pharmaceutical Information Network at "pharminfo.com/pin_hp.html" provides information for both physicians and patients about drugs, medical books, and so on.

WebMD at "www.WebMD.com" has two sections. One is a Health and Wellness Center providing information for the general public. While it does not provide on-line communication with physicians it does provide answers to selected questions. The other section is a fee-for-service resource for healthcare professionals. Topics include business management, communications services, supplies ordering, and so on.

FEE-FOR-SERVICE. CyberDocs at "www.cyberdocs.com" is on the Web to sell products and services. You can buy medications on-line and consultations with physicians. The only information available is to impress you with the credentials of the staff and to speed those paid-for products to you. By the way, their version of a disclaimer file states that they expect all their customers to seek appropriate medical follow-up with another physician in an office- or hospital-based setting. They also indicate that certain classes of drugs such as narcotics are not appropriate for on-line prescription.

RELATED SITES. The Web contains a large number of sites for health-related issues and information. Here are a few that I have found and put on my own Web site under the heading "World in General." They are an indicator of what is available. You can find more by using a search engine like Yahoo at "www.yahoo.com" and clicking on "Health."

World Health Organization at "www.who.ch"

Food and Nutrition Information (U.S. Agriculture Department) at "www.nal.usda.gov/fnic"

U.S. National Library of Medicine at "www.nlm.nih.gov"

Canadian Medical Libraries at "www.mun.ca/lists/canmedlib"

Center for Disease Control at "www.cdc.gov/cdc.html"

American Diabetes Association at "www.diabetes.org"

Canadian Diabetes Association at "www.diabetes.ca"

Juvenile Diabetes Foundation at "www.jdfcure.org"

Healthfinder at "www.healthfinder.org"

APPLICATION TO ENGINEERING. Public Service. There is certainly scope for public service information. The general public has many concerns and questions that could be answered over the Web. These range from the economic and environmental impact of electric power generating stations and transmission systems, to signal access difficulties with cell phones, or compatibility within computer systems.

Fee-for-Service. Physicians tend to serve individuals on a one-to-one basis whereas engineers tend to provide infrastructure services to utilities, corporations, and government. However the trend is for engineers to increasingly offer services on a contractual basis, project by project, instead of being full-time employees. Does this suggest that these engineers could benefit by promoting themselves on the Web, as individuals or in consulting teams?

THE IEEE CONNECTION. Perhaps direct participation by IEEE members in offering Web-based services, at both the Section/Chapter and the Society level could benefit us as individuals and as a profession. Our IEEE connection could provide quality assurance for the service we offer as well as an opportunity to publicize and promote our Institute.

Why not think about your area of expertise and how you might participate — as an individual, within your company, or as part of an IEEE entity? These medical sites offer us some examples of the range of services, the mix of free information, fees for services, and product sales, as well as different ways to fund the activity, and the need for disclaimers.

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Bob Alden's August column was published with several errors, through no fault of his own. A correct version appears on THE INSTITUTE Web site at "http://www.spectrum.ieee.org/INST/aug99/inf_hwy.html". We apologize for any confusion this may have caused.

Traveling the information highway

Text editors for DOS and Windows

with Bob Alden

My August 1999 column on "Using vi — an introduction" generated two letters e-mailed to me that I want to share with you. The first one asks about text editors for DOS, Windows, etc. while the second provides one answer. I will add my own answer as well.

My previous description of the vi editor for UNIX was intended for use in an on-line mode for working remotely on Web page maintenance and for editing UNIX files on servers. This column broadens the scope to include text editing in general.

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1. The Question. From Lou Rose, Miami, Florida "Lou_Rose@fpl.com" who writes "Hi. I've just finished reading your article about vi, the UNIX text editor. My ears always perk up when I read about text editors. I wonder if you might consider writing another about a text editor for the Windows95/98/NT/DOS environment?

I wish I could recommend the text editor by name but what I'm really after is to learn if there is anything on the market that comes close to Brief, by Underware, that I used many years ago when I was a programmer. Unfortunately, it was DOS based and didn't migrate to Windows very well. It was a wonderful editor, it could open unlimited files into unlimited buffers (well — memory available was the only limit,) and it could mark text vertically.

I use Wordpad exclusively today but I would spend $100 for a text editor with these two features alone. I've tried many recommended editors over the years but nothing compares with Brief! I'm in no hurry, please find what I'm after, write the article and I'll wait to read it...:)

Oh, and thanks (even if you decide against taking up this challenge.) I enjoy your column every month."

2. One Answer. From Robert Montante "bobmon@bloomu.edu" who writes "I cannot resist pointing out that vi is alive and well in other environments than UNIX ones. I've encountered at least 3 versions for MS-DOS; one of these, VIM, is a real standout that has been ported to various other platforms as well.

I am an avid vi user, and in my opinion VIM is the best version around — worth bringing up on any system I use, even if it's a UNIX variant with its own vi already in place. Particular improvements include more-modern regular expressions, multiple editing windows, command-line history, selecting of regions of text for edits (including rectangular regions)...I haven't found all the additions. The current MS-DOS implementation includes a very nice Windows adaptation, for Win3.1/95/NT lovers. Many of these features have the further benefit of making vi easier for first-time users to grasp (Yayyy!!! — he said evangelically).

There are Web pages devoted to VIM, including both the source code and precompiled binaries for many architectures; all free. Premier would be "www.vim.org" no doubt :-| Sincerely, Robert Montante.

3. Another Answer. I use a text editor that has been written by a colleague of mine, Barna Szabados. He felt a need to have an efficient text editor for program development (code writing), looked around, found nothing that suited him, and decided to write his own. Initially written for DOS (in the days before Windows), it has been extended to run in a Win 32 (Windows 95/98 and NT) environment. It is freely available and you can read about it and download the program from "http://power.eng.mcmaster.ca/szabados/soft/ z95.htm". The file size for Z95 is about 113 kilobytes. The original DOS only version, called ZABED, is only 21 kilobytes. Here are a few comments about Z95 so you can better judge if it is suitable for you. It runs in a DOS window so it is fast with instantaneous refresh.

- you can run full screen or in a window
- it is designed for fast entry and editing, using single and combined keystrokes using Shift, Alt and Control modes
- there is a consistent hierarchy using one key, the shift+key, the alt+key, and ctrl+key (e.g. to delete a character, a word, a line, a selected buffer)
- buffer size is limited by your system resources
- you can have up to nine simultaneous edit files open with swapping of data
- you can display any two edit files with a (vertical or horizontal) split screen using a single keystroke
- you can define and use macros to invoke a sequence of commands with a single keystroke
- macros can be stored and reactivated on single keystroke action or auto-activated at load time or buffer swap time
- you can use colors to highlight portions of text (using imbedded code)
- you can set and jump to user defined tags in any of the edit sessions
- you can copy text to and from the Windows clipboard
- all sorts of programmer's goodies are included, such as checking for matched parentheses, programmable indents, autowrap, DOS and UNIX document formats, spilt-screen viewing and cursor synchronization for document comparisons; single key programmed words (handy for long variable names!), stacks for previous commands, find and replace buffers; two distinct search and replace buffers and two distinct active macros per file, etc...

Text Editors vs Word Processors. Word processors are great for producing text to be printed with attractive formats. Web page editors (including word processors with HTML document features) are used by many to produce Web pages. I find their default formats annoying. When I am editing Web pages, I find that the use of a text editor allows me to do exactly what I want.

I use Z95 all the time to edit e-mail messages, cutting pasting and formatting in conjunction with a word processor, and for maintaining Web pages. In fairness, I likely use Z95 more than vi because I started with it — at the time — for producing program code. In my view, both have their place and are valuable tools for those of us who use computers both on and off the Web.

To Lou, thank you for your request. To Robert and Barna, thanks for providing the answers. To our readers, why not e-mail me if you know of a text editor that you find useful (and preferably free) so I can pass on your suggestions.

On a related topic, many readers have asked me for advice on simple programs to produce the kind of graphics that electrical and computer engineers need. Other than MS Paint (which is bitmap graphics but simple), the other programs I have tried seem overly complex for the task. Any thoughts?

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Traveling the information highway

Limiting e-mail by using Web pages

with Bob Alden

E-mail can be a great way to communicate but one can get too much of a good thing. We are all aware of obvious "nuisance mail" such as unsolicited advertisements, but there is a more subtle kind that proliferates within companies. This is the use of multiple e-mails where one Web page would do. Having hundreds (or thousands) of poorly formatted copies of a document on servers is not smart business. It is also an indicator of a larger problem — poor information management.

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Most companies have discovered that sending e-mail (whether on Intranets or the public access Internet) is cheaper and quicker than photocopying and physically distributing memos, flyers, letters and so on.

As a result, e-mails of meeting agendas, minutes and everything else are sent out. Copies of messages, designed primarily for one recipient, are cc'd to too many others.

Many of us, especially those who receive a lot of e-mail, have learned to hit the delete key in order to survive. Unfortunately we are forced to choose between deleting something we may need in the future or trying to build an e-mail filing system (there are tools but that is another topic).

What is often missing is the distinction between knowing that content is available and the content itself.

Short e-mail messages are the ideal. E-mail is not designed for readability of large documents, Web pages (properly formatted and linked) are. The challenge is to make more and better use of the Web for information content.

There are two distinct components to success in this area: changing the culture, and managing the Web.

CHANGING CULTURE. Younger folks are used to the Web, they have grown up with it and have different expectations than most older folk. They are more comfortable browsing and reading on-line. Since managers tend to be older, they tend not to implement Web-based strategies.

Many managers still have their secretaries send all their messages for them, print received messages and place the printed copies on their desk. E-mail is a task that can be delegated, Web browsing cannot.

Secretaries who have learned to cope with e-mail may be reluctant to learn to use a software package to produce Web pages. If they do so, they need to be taught (a) how to use the new software (or commands they have not used in word processors they have used), and (b) that formatting for the Web is different from the printed page.

How to implement a change in culture?

1. It has to start at the top of the management chain and involve managers and administrators, engineers and secretaries, IT support staff, in fact every employee who interacts with company information.

2. It has to be planned. It will not happen just because computers and a network were installed.

3. Resources have to be made available. Employees need time to learn new ways and practice them and they need to be trained by competent people. They need the tools that are right for them.

4. Employees have to be rewarded when they adapt to the new culture and change their behavior.

Developing the appropriate appearance and consistency for documents that are viewed on and printed from the Web is an important and non-trivial task. Usually the format will change (from the print-based page) because the enhancement tools are different for the Web.

Insisting on a policy of only one source document (on the Web) is critical. Printed versions must be printed from the Web and not typed separately.

MANAGING THE WEB. It takes a lot of planning to design a directory system so that each employee who contributes content to the Web site has convenient access, security, and accountability.

The same is true with the design of the Web links so that all employees (and customers and the general public) can find the information they need and are authorized to access.

The choice of tools is important. Whether to train employees in the use of word processors with HTML or PDF output file formats, or in the use of other software like Pagemaker, Netscape Communicator, and so on, depends on employee experience and adaptability as well as corporate needs (including the ability to integrate and update software assets).

The need to develop user buy-in to both tools and process is just as important in this management application as in others.

Good design, and adequate time to train and implement, must be given priority — these are not costs but investments with positive returns. Putting them off will cost more.

REVIEW CURRENT PRACTICES. Most companies (industry, educational institutions, government agencies, etc.) are doing business on the Web. Investing in time and expertise to change expectations and behavior, as well as to design and implement a modern information system, is a wise decision. Failure to do so results in mismanagement of information, frustration and loss of productivity for employees, and a less efficient use of resources.

We all need to look at what we are doing and ask the question — have we trained our people in how to use modern technology? Or are we still driving that old horse and cart down the new freeway — clogging the information highway.

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Traveling the information highway

Marketing yourself on the Internet *with Bob Alden*

This column is based on the workshop I was asked to present at the recent IEEE Sections Congress held in Minneapolis, Minn., USA. The attendees seemed to like it so I thought I would share the main ideas with all of our readers.

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A successful traditional marketer is well-groomed, well-dressed, knowledgeable, eager to please, determines customer needs and follows up. These attributes can be summarized as appearance, content and service. It's the same on the Internet! As is the need for credibility and knowing your business.

GETTING STARTED. Where do we begin? By setting some objectives for ourselves — first by deciding who we are.

Who are you? An individual who wants to market your professional offering as a consultant or someone with an interest such as a hobby? A person who owns or works for a profit-oriented company? A volunteer in an IEEE entity — Section, Chapter, etc. — or even an IEEE candidate for office? Or anyone else for that matter. The following concepts are sufficiently general enough to be applied to all of us, no matter what we want to market in the broadest sense.

Web vs. e-mail. The Internet implies a range of electronic communications from simple e-mail to the World Wide Web (which includes Web pages, file transfers and e-mails). There are two reasons why simple e-mail is not appropriate for marketing activities: unsolicited e-mail messages are not liked, and effective e-mail messages are short. A well-designed Web site is a useful marketing tool. So we need to look at those attributes that form a well-designed site.

Your Web site or theirs? Are we going to market ourselves by visiting other Web sites or are we going to design our own? I am going to focus on the latter, but I will briefly describe the main characteristics of commercial career Web sites. (There are also many jobs posted on corporate sites and professional interest sites such as IEEE-USA's.)

Careers on the Web. Careers (or jobs) are listed on a variety of commercial sites. You can post your own resume and subsequently check how many companies have viewed it. You also can view the jobs that are posted and send an e-mail message to any company who posts a job you are interested in — they only respond if they choose to. There is no charge to you. It is the companies that pay to search these sites.

YOUR SITE OBJECTIVES. There are two key decisions you need to make in order to begin to set the objectives for your Web site.

What do you want your viewers to get from your Web site? There are two key choices here. 1. Information about you or about products and/or services you provide. 2. The products or services themselves. Choice No. 1 is much simpler to implement than No. 2.

What do you want to get from your Web site? Becoming known, making money, providing a public service or something else?

IMPLEMENTING. The answers to the above questions begin to clarify the objective for your Web site. Now let's look at some key implementation features of your Web site.

What kind of Web address (URL) do you want? "www.webaccessprovider.com/r123/homepages/rthalden/" or "www.aldenweb.com". The first is what you will likely get from a service provider unless you buy your address. Keep it simple and easy to remember.

What is the first impact of your home page? It should be attractive, fast loading and meaningful.

What are the desirable characteristics of your site? It should exude content, be easy to navigate, and provide a reason to return.

To achieve this, make "good" use of graphics, including image maps. Use Web tools such as frames, Web forms, password-protected directories, pdf files for technical information that includes equations, graphs, etc. Include the use of e-mail tools such as mailtos, mailing lists and discussion groups.

How do you sell over the Web? You need a Web form for information (correct and complete) on the products to be purchased; buyer details such as full name, postal and e-mail addresses, telephone and fax numbers; and payment details and authorization (credit card or other details). You need to:

1. enable on-line use of credit cards, or
2. arrange a telephone conversation to get card info, or
3. for repeat customers, use known card information.

How does your site become known? Try everything. Tell your friends, e-mail potential viewers, ask others to put links in their site to yours, keep track of your visitors (using Web forms), and use metacommands for search engines.

SAMPLE WEB SITES. Here are some examples of Web sites oriented for marketing. I have selected them to show the different approaches. They have (in my opinion) differing degrees of presentation success — especially in their use of graphics (some load too slowly over modems or busy connections), colors (some are hard to read on poor monitors) and text placement (some portions do not display initially on small-size monitors).

Cafe Britt "www.cafebritt.com" is a small company commercial site.

Tilley Endurables "www.tilley.com" is also a small company commercial site. Both companies have expanded an existing business by using the Internet.

Amazon.Com "www.amazon.com" is a large, aggressive Web-based company commercial site.

CyberDocs "www.cyberdocs.com" is a hard-sell Web-based company commercial site.

Guinness "www.guinness.ie" is a corporate soft-sell commercial site.

O'Reilly "www.ora.com" is a well-designed site and an excellent source of books (especially for software and Internet applications).

Draft Wildi Web Site "www.power.eng.mcmaster.ca/alden/test/tw/tw.htm" is one that I am building to assist an author (of a book I use) with developing a Web site. You can see the demonstration of a questionnaire to collect site visitor information.

ON-LINE HELP. Many of the e-mail and Web-based techniques noted briefly here have been discussed in earlier issues of THE INSTITUTE. You can access all of my columns by using the page of links at "www.power.eng.mcmaster.ca/alden/ti.htm".

REFERENCE BOOK. My choice of a reference book for building a Web site is "Webmaster in a Nutshell" by Stephen Spainhour and Valerie Quercia, published by O'Reilly 1996 or 2nd ed. 1999. (Check out the O'Reilly Web site noted above.)

I hope this brief introduction will alert you to the approach and the kind of Web-based tools you should consider in the planning stages of developing and implementing a marketing venture on the Internet, whether it be a personal one, or one for your company, IEEE Section, Chapter and so on. *Why not give it a try?* So many others are.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor, and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org". His home page is "http://power.eng.mcmaster.ca/alden".

Traveling the information highway

Greeting the new century

with Bob Alden

This January issue welcomes in the new year, a new decade, a new century and a new millennium. Assuming our systems — most of which are computer-based — survive the Y2K bug, you are reading this article in your usual way, online or in paper form.

Looking back over the previous annual sets of columns, I see a partial record of IEEE's progress in using the information highway in increasingly sophisticated ways.

My first column, published in November/December 1992, was entitled "E-mail is making its way to the IEEE." My January 1995 title was "The IEEE World-Wide Web comes to life." Two other headlines also catch my eye: January 1998, "Doing IEEE business electronically," and January 1999, "A plan for IEEE electronic services." The January issue is where I try to think about where we are heading. This one is in a similar vein. So here we go...

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm/" or send a message to "fileserver@ieee.org" and place the file name "info.email" by itself at the start of the first line in the message.

During the recent Sections Congress, 1999 IEEE President Ken Laker gave a remarkable plenary session entitled "IEEE of the 21st Century," which you can read online at "http://www.ieee.org/organizations/corporate/ken.html". He pointed to two major technical evolutions that created and changed the IEEE as we know it today — the founding of the AIEE in 1884 and of the IRE in 1912, and their merger in 1963. He suggested that the emergence of Web delivery of information is causing the IEEE to undergo its next fundamental change. I could not agree more!

If Ken's view is correct, we need to think about the implications of these changes — for the survival of the IEEE in an increasingly competitive environment — and for meeting our needs as members. These two concerns are not the same.

The IEEE could survive as a provider of services for its customers — a Web-based "ieee.com". However, I prefer to focus on meeting the needs of IEEE members — a Web-based "ieee.org" — and that's where you and I need to step up and demand services that we need because they are too slow in coming. I say this because, although I am proud of what we have done, I am sensitive to the concerns I continue to hear and of the opportunities we are missing.

At that Sections Congress, I was asked to be the facilitator of a caucus on electronic communications. We brainstormed, prioritized, selected sets of related issues and developed recommendations. There was a clear consensus that the single most important current issue was to clean up the IEEE membership database.

Is this an electronic communications issue? Yes, because the database is the foundation of all electronic services and the delivery of those services. That group of section chairs brought their experience of responding to member needs and concerns — they were clear — there are still too many mix-ups in member service delivery even though the first five of the previous Sections Congress recommendations (all on electronic communications) have been implemented.

FIRST MILLENNIUM CHALLENGE. Doing business electronically has several implications for our database:

- To be effective, the IEEE must have one (and only one) database. Right now, there are still many different databases being used by IEEE societies and other entities.
- A single database, staff maintained, must be accessible to all IEEE members and entities for use and updating, with the appropriate level of access control (who can do what).

This is my first challenge for the IEEE directors and society presidents in the new millennium: fix our database (IEEE-wide).

SECOND MILLENNIUM CHALLENGE. Doing business electronically in 2000 means providing new services beyond putting what was on paper onto a desktop.

- The Web provides a new way to deliver technical information. Web-based technical papers could be much shorter and more meaningful than the paper version, using links to existing papers for background and comparisons and the like (that was the topic in my September 1994 column!).
- The Web provides a conduit for members to access more than IEEE publications — engineering tables, procedures, examples and so on — of the technical activities that we do every day in our professional lives. It would be a real convenience for IEEE members to find virtually everything they need via the IEEE Web site.

This is my second challenge for the IEEE directors and society presidents in the new millennium: provide new Web-based services (be bold — this is our technology — ensure that our services are the best).

YOUR INPUT. Using the Web and that centralized database has a danger that IEEE activities can become more centralized and staff driven. While we need a competent professional staff, we also need to consider our history — somewhat more than the last century — and the strength and diversity that our members and volunteers have provided.

As we reposition the IEEE to meet Ken Laker's challenge of Web delivery, we need (I suggest) a resurgence of member input to provide the impetus for developing the kind of services that members need — and that the IEEE needs to prosper and continue to be the leading organization in electrotechnology into the next millennium.

Why not communicate your needs and concerns to your regional director, divisional director, society president, or volunteer to help develop those new services. Let's work together and really use the IEEE Web for our benefit in this new century.

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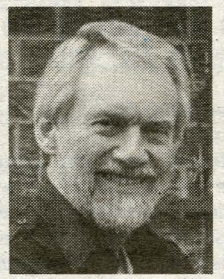
Traveling the information highway

Graphics software

with Bob Alden



This column is devoted to the topic of graphics and is based on responses I received to my October 1999 column in which I asked for your input on this subject. All these graphics software packages have Web sites listed where you can find out more. Sometimes you can download a free version or one with a free time-limited trial version so you can try it before you make the decision to buy or not. Some packages appear more than once because of the accompanying comments, which I want to share with you.

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First, a comment about platforms and their evolution, which is currently underway. We are seeing a merger of the personal computer and the server in two ways. In the past, both the hardware and the software were different. Increasingly, we see Intel Pentium-based PCs being used as servers at a fraction of the cost of traditional servers. We also see open-source operating systems like Linux being used as the operating system for both the server and PC.

I will begin with a message from a member in Belgium who suggests that this column begin to address open source products. I agree, so here goes.

Dear Bob: This message is a reaction to your October column in which you asked for graphics programs. Here are a few in open source:

XCIRCUIT at "bach.ece.jhu.edu/~tim/programs/xcircuit/"

SKETCH at "www.online.de/home/sketch/"

XFIG at "www-epb.lbl.gov/xfig/index.html"

KILLUSTRATOR at "wwwiti.cs.uni-magdeburg.de/~sattler/killustrator.html", and

AMAYA is a simple HTML editor, available for Windows and UNIX/Linux alike at "www.w3.org/Amaya/".

Speaking of Linux: I think it is high time to spend more time on discussing open source products (or at least emphasizing it) in your columns. Too many engineers are still held too tightly in the Microsoft web, and are not aware of the wealth of available software tools in the open source world. Best regards, Herman "Herman.Bruyninckx@mech.kuleuven.ac.be".

GNUPLOT. Your readers might want to try Gnuplot at "http://www.cs.dartmouth.edu/gnuplot_info.html" (and the more general listing of Gnu software at "www.gnu.org/software/software.html"). I don't know if it runs on Winblows. I use it frequently on UNIX. One of the attractions of Linux/UNIX is the huge amount of quality, open source, free software. The support for it is much better than support for commercial products. Regards, Vince Kelley. "Vince.Kelley@ReadRite.com".

XFIG. With regard to your final paragraph in October's edition of THE INSTITUTE requesting comments on simple graphics editors for engineering, my suggestion is xfig at "www.xfig.org". It comes as part of most, if not all, Linux distributions and would almost certainly be installed on any university/company UNIX xwindows system. I currently use this editor on a Linux machine (resurrected 486), though the majority of my work is done from a Windows 95 platform, only because I don't have Linux versions of all the software I wish to run. Xfig is a vector graphics editor, with powerful line editing features. It is very smooth and predictable in its use and the final output is very professional. A number of output formats are available, including PostScript, LaTeX picture format, bitmap and compressed image (jpeg, gif) formats. The question I ask is: Are there any Windows95+ versions of this software out there? Regards, Simon "simon_webb@elec.uow.edu.au".

GEDA. I cannot imagine one doing work with a paint program for doing schematic capture or other electrical diagrams. This is stone-age stuff when there is so much software around. I do almost all of my work for capturing designs in gEDA, at "www.geda.seul.org". My pcb guy does not yet deal with Linux so all that he gets out of it at the moment is netlist info, which is a pain but I just have to keep working on him ;-). The same package has a useful (to me) library of IEEE symbols, which I use to create posters and concept diagrams, as well as support material for patents. I find gEDA quite simple to use but then I find compiling the gEDA sources simple, which may not be everyone's definition... I'm told there's an NT port but also that it is not the central focus of the gEDA project.

There are other, less comprehensive, tools around for Linux and brethren, e.g. Xfig, dia and a whole lot more. Have a sniff around on one of the many Linux repositories, e.g. "www.linuxberg.com", or ask at "google.com". Since I've made a commitment to gEDA and am satisfied, I cannot really comment on too many more of them. It goes without saying, though, that the cost of packages for Linux, etc., is rather better than the shrinkwrap stuff in the Windows world, and one has better direct support from the author of the package or other heavy users of the package. FWIW, Arnim, "arnim@med-dev.com".

XFIG. Dear Bob: In the 10/1999 issue of THE INSTITUTE, you requested our choices for an engineering sketching tool. My "one and only" program is good old XFig (original by Supoj Sutanthavibul, now by many contributors). Some reasons are: It is free. It is open source. It runs on GNU/Linux :-) It is pretty stable (granted, that depends on the version). It has an easy and effective way to manage symbol libraries. It supports layers, grids, splines, import graphics, etc. It exports to (E) Postscript, PiCTeX, PNG and some other formats. The files are pretty compact and text only. They can be generated or post-processed with scripting tools very easily.

At my workplace, I create all kinds of documentation, mainly for articles and HTML documents, with XFig. It really fits good together with Ralph Engelschall's free Web site Meta Language "wml" into a Makefile driven production environment. Mit freundlichen Gruessen / Yours sincerely, Marian Eichholz "duspat@ibm.net".

OPTIONS FOR WINDOWS USERS

Now for our MS Windows users, here are some choices.

MAYURA DRAW. Bob: This is what I use, Mayura Draw, an excellent vector-graphics drawing program at "www.mayura.com/". Cheers, John <leis@usq.edu.au >. (This is freeware for Windows.)

Bob's note: I downloaded this package for a 15-day free trial — to be followed by a $15 registration fee if I decide to use it. My initial reaction is very positive.

FREEHAND. Dear Bob: I'll be very interested to see what readers say regarding programs to create graphics (i.e. drawings, diagrams or circuit schematics). I have tried several programs over the years, ranging from 'Lite' versions of Autocad to Texcad (Tex/Latex figures) to the latest version of Corel Draw. At the moment I'm using Macromedia's Freehand 8.0 at "www.macromedia.com/software/freehand/". It's not complex — in fact, the user interface is very easy and intuitive — it's inexpensive, and finally, it doesn't hog all the hard drive! I've persuaded a number of colleagues to convert to Freehand and so far we're all very impressed with it. Hope you find the comments useful. With best regards, Lionel "l.watkins@auckland.ac.nz". (This is a product that is sold — regular and educational- discount prices — but you can download a 30-day free trial version.)

Dear Bob: On the subject of graphics, I have discovered that there is no one program that does everything.

VISIO. For proper drawings, I use Visio at "www.visio.com" and am very happy with it. With Visio I can create a detailed drawing (or schematic, or block diagram...) and save it in Visio format for later editing. For distribution or embedding in documents or Web pages, I can save the drawing as a gif or wmf file and get great results.

PHOTO EDITOR. For images, I use Microsoft Photo Editor (which is part of Microsoft Office) at "www.microsoft.com". It is the best program I have found for manipulating and printing color graphic images. What I see is what I get on the page.

PAINT SHOP PRO. To add lines or text to graphic images, I use Paint Shop Pro, also shareware (download-and-pay-online ware) at "http://www.jasc.com/ psp.html".

LVIEW. For filtering and format conversion, I use LView Pro at "www.lview.com", although the version I have (old) has problems with larger images. LView gives me a great deal of control over file sizes and properties of jpg, gif and wmf formats. I avoid MS Paint like the plague. There you have it, my 2 cents worth! Thanks for your informative and enjoyable columns. Cheers, Jeff "jeff.mizener@ bln7.siemens.de".

Bob's note: Most of the packages that Jeff describes are commercial products for Windows — some have free trial periods, some have academic discounts, and some versions are available free of charge over the Internet.

MORE INPUT

Well, there we are, a fair choice of graphics programs for two very different operating systems. I'm starting to think seriously about trying Linux as my operating system. This sounds like another topic for reader input. Why not write to me about your experience with the Penguin (using Linux) on your PC so I can share this information with you.

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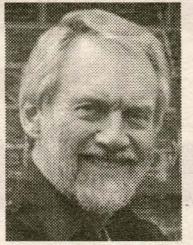
Traveling the information highway

Empowering Web development

with Bob Alden



Why does almost everyone use the Web to post documents that look and act like printed pages? Is it the mindset of Web site authors and publishers, the tools available, or the needs of the viewers? It takes time to change the way we do things and to change our expectations. I think it is time to look at alternatives to the current practice and use the IEEE to pioneer improved use of the Web.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/elecconm". To view any of my columns, use the index of links at "http://power.eng.mcmaster.ca/alden/ti.htm".

For example, technical papers published on IEEE Web sites could link directly to relevant background articles, standards, references and so on. With such a format/structure, the contribution of the author could be more focused and comparisons with other work could be made much easier for the viewer. The inclusion of motion and three-dimensional views could enhance explanations and improve understanding.

In a more general vein, we could be making much more effective use of the Web and its potential to create better communication environments

I invite all of our readers to share their ideas on this topic — send me your e-mails. The remainder of this column is devoted to one such contribution by Peter Wittenberg at "wittenberg@ieee.org".

Dear Bob, I'm an IEEE member writing in response to your request for suggestions, this time on Web development tools.

Over the last couple of years, I have been working on creating a new book in HTML. I'm not yet ready to release even the partial work I've completed, but I'll let you know that it does things that I haven't seen on the Web yet. Anyway, I've had to learn a lot about writing for the Web, just as you have over the past five years.

I started out using MS FrontPage for Web site development. I used it exclusively for about a year for my editing because I thought Microsoft would be the best company to produce Web tools. I was wrong. I still use only the Web publishing feature.

Microsoft has a paradigm for Web development that, unfortunately, guts the flexibility of HTML and the Web. They treat Web pages as if they were word processor documents and try to have a one-to-one mapping from Word to Web pages. Word processor documents are intended to be viewed on a page, precisely in the font and size that the author originated.

Web pages are layouts, designed to reconfigure themselves reasonably if the reader needs to use a different font or larger size to compensate for vision problems or a different display. It is not possible to do a one-to-one mapping from a word processor to a Web page, not if you want a well-designed Web page. The visual features of a development system are appealing, but limiting.

The insidious feature of a full development system is that people become dependent on the development system (such as FrontPage). Users become unable to operate without their particular development systems. No development system really encompasses all of the capability of HTML, Java script, and Java.

The code these systems write for the Web is generally much too complex. While they allow you to edit the HTML directly, doing so makes the visual interface of the development system fail, even though the code works well on a browser.

I currently use UltraEdit at "http://www.ultraedit.com", which is an excellent shareware text editor with programming features. Can it be improved? Of course it can be, but it provides me with much of the functionality I need. As you become more experienced on the Web, you begin to write in HTML and Java script directly so you can really get the full capability on the Web.

A Web site that gets contributions from more than one person will definitely have a configuration management issue. This can be handled by careful management and organization of the directory structure, or it can be handled by the file management features of a Web site management program. In this situation, a Web site management program could be very useful. Although I personally manage my Web site through careful organization (I have less than 500 pages in my Web site and probably won't exceed 2,000 Web pages), some outfits with large Web sites will probably need the Web site management features of a combined program.

The style issue of the editors for most of the visually-oriented editors is a tough issue. There are many people, probably 95 percent of the population, who will never learn HTML. These people can actually produce Web pages with a visually-oriented editor. Although the Web pages they produce will not quite fit the Web paradigm, they will be usable by most people. Despite my disdain for the all-in-one Web program paradigms, they are probably the right solution for most of the population.

I can only hope that the companies producing these programs set defaults that drive people toward correct use of HTML. Unfortunately, this is not the case today. The companies producing these systems really want you to be tied to their products. A movement toward general, easily-edited HTML transportable to any server would be a step away from consumer dependence on the programs. Previous software markets have proven to be worth many billions of dollars. Control of the Web site production software, still in its infancy, will be worth many billions as well.

The Web site that taught me to write proper HTML is that of the World Wide Web consortium, "http://www.w3c.org".

From Peter Wittenberg, Associate Technical Fellow, Boeing.

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Traveling the information highway

Creating pop-up windows

with Bob Alden

Small pop-up windows are used in a variety of ways; for example, to present a dialog box for entering a password, to display additional information to that on the main window and so on.

Usually these windows are relatively small so that the majority of the main window is still visible. I wanted to display circuit diagrams and equations on top of the main screen that I am using for online projection while teaching. I thought that some of you might like to know how to create a pop-up window for your own use.

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To generate a pop-up window, we need to use JavaScript and to write three distinct segments of code:

1. JavaScript to open our new window - this segment is placed in the header of the HTML file that is the content of our existing window. This is a script to access and modify the open property of the window object (Fig. 1).

```
<script language="JavaScript1.2">
function OpenWindow (URL, WinName, Features) { //v2.0
window.open(URL, WinName, Features);
}
</script>
```

Fig.1: JavaScript to open a new window

2. HTML code to invoke the JavaScript - this segment is placed in the body of the file that is the content of our existing window (Fig. 2).

```
Click to open a <a href="javascript:OpenWindow ('ltwin.htm','ltwin',
'outerwidth=500,outerheight=230,resizable,status,toolbar,scrollbars')">
Window in left top corner of the screen</a> outerWidth=500, outerHeight=230,
resizable, with scrollbars, toolbar and status line. Links to another page.
```

Fig. 2: HTML Syntax to invoke the JavaScript to open the new window

3. JavaScript to set the position of our new window - this segment is placed in the header of the HTML file that is to be the content of our new window (Fig. 4).

The window.open property has three arguments and is written as: window.open(URL, WinName, Features)

where URL is the address of the HTML file that is to be viewed in our new window, WinName is the name of our new window, and Features is a list of features that we want to implement.

If you have more than one window, it is a good idea to give each of them different names, otherwise the browser may not be able to distinguish between them.

Some of the features I have implemented are:

- **toolbar** - this inserts the toolbar at the top of our window and allows us to access standard Windows utilities such as Forward, Back, Reload, Print and others.
- **status** - this inserts the status line at the bottom of our window. Both of these take space and can be left out if we do not need the facilities they provide.
- **scrollbars** - this inserts scrollbars to allow viewing of more content than will fit in the window as sized.
- **resizable** - this enables the viewer to expand or contract the size of the window.
- **outerWidth** - this sets the initial outer width of our window in pixels such as outerWidth=500.
- **outerHeight** - this sets the initial height of our window in pixels such as outerHeight=200.
- **innerWidth** - similar to outerWidth but sets the dimension inside the window frame instead of outside the frame.
- **innerHeight** - similar to outerHeight.

As soon as you specify one feature, all others are assumed to be absent unless you include them.

THE EXAMPLE. Figures 1 and 2 show the code to create the window illustrated in figure 3. This is part of an online example you can view and examine at: "http://power.eng.mcmaster.ca/alden/test/win/test.htm". The complete example has five pop-up windows illustrating different properties, content and screen location.

Figure 4 shows the JavaScript code, placed in the header section of the new window's HTML file. The code is placed between the opening and closing script tag. The opening tag identifies the script language and version number.

The code's first two lines specify the location of the upper left outside corner of the new window relative to the upper left corner of the screen. If this code is not include, the new window is placed near the upper left corner.

The third line of code specifies the initial scroll position (0,0 is the top left) if the scroll bars are needed.

COMMENTS. Since the pop-up window is initially displayed on top of (in front of) the main window, we may want to keep it as small as possible. Toolbars and status bars take up space, scrollbars enable content to be viewed in a portion of the total space. In some situations, we may be more concerned with the inside dimensions of the window (displaying content), while for others the outside dimensions may be important (locating the window). These are design tradeoffs to weigh. The online example illustrates many of these. I will return to this topic in the future.

In the meantime, you have some tools to learn to work with. For more reading, try *Controlling the user environment with JavaScript 1.2* at "http://developer.netscape.com:80/viewsource/davis_javascript. html".

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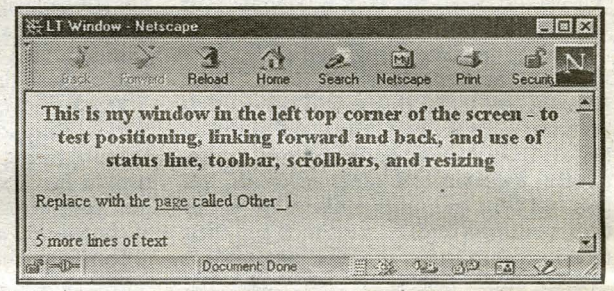


Fig. 3: The new window

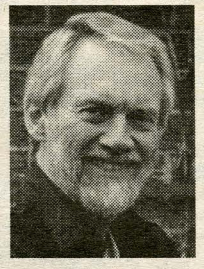
```
<script language="JavaScript1.2">
window.screenX=0;
window.screenY=0;
window.scroll(0,0);
</script>
```

Fig.4: JavaScript within the new window

Traveling the information highway

Creating interactive pop-up windows

with Bob Alden



Last month I looked at creating small pop-up windows using a combination of JavaScript and HTML code. This column is a continuation. I will look at how to create two more pop-up windows that illustrate some interactive techniques that you may find interesting. By interactive, I mean obtaining current data relating to the dimensions of the screen, and the location and size of the window. Some of these dimensions were discussed in last month's column.

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The window shown in Figure 1 displays the dimensions of the window itself, and updates the readout if the size of the window is changed by clicking and dragging one of the corners.

A second window, not shown here but available in the online example described below, displays the location of the window, updating the readout as the position of the window (or its size) is changed by clicking and dragging the window title bar.

EXAMPLE 1. Figure 1 is a screen capture of one of the windows that can be viewed and manipulated from "http://power.eng.mcmaster.ca/alden/test/win/test.htm". This is the same URL that I gave in last month's column. You will find that I am grouping the examples together so you can easily move between them, copy the source codes and so on.

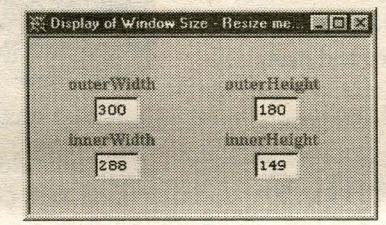

Fig. 1: The New Window

(If needed, I suggest you review last month's column for the explanations of the window.open properties. That column includes the Features property as well as the relationship between the JavaScript and the HTML code, which are part of the HTML file in the original or calling window. The JavaScript code to open the window is identical to the one given in last month's column and is not repeated here.)

The first of our new windows is opened by invoking the JavaScript OpenWindow function when the following link is clicked. Click to open Window.

In this statement, we have identified the HTML file (sizewin.htm) to be opened in our new window, named our new window (sizewin) and specified the features (width, height, resizable) that we wish to use — although we chose to set the values in the JavaScript code in our new window (see Fig. 2).

THE JAVASCRIPT code in Figure 2 is placed in the header portion of the HTML file of the new window. Let's look at this code.

Lines 1 and 2. First, we set the outside dimensions of our new window by using window.outerWidth = 300 and window.outerHeight = 180. These are the outside dimension properties of the object window. This determines the related window properties for the inside dimensions, window.innerWidth and window.innerHeight, since the relationship between inner and outer dimensions is fixed by the Windows operating system.

Lines 3 and 4. Just as window is an object, so is screen, and it has properties of width and height (screen.width and screen.height). These are set when we right click on our PC's desktop, and select properties and settings. My screen is set to 1024 x 768, other common settings are 800 x 600 and 640 x 480.

Using the values of these screen and window properties, we compute the location of the top-left corner of our new window (relative to the top-left corner of the screen) using window.screenX and window.screenY in the two simple equations.

Line 5. If there is an error in the JavaScript, an error dialog occurs by default. This action can be customized or turned off — as is the case here — by setting to null.

Lines 6 thru 11. The function loadForm places the values for our window dimensions into the variables outerW, outerH, innerW and innerH, which are the names of the four fields in the FORM that are used to display the values. The FORM is given the name, dmnsn, and the HTML code to create it is given in Figure 3.

This function is called in two places: in Line 14 of Figure 2, and in the BODY tag of the HTML file where it appears as onLoad="loadForm()," and also is used to load the form when our Web page is initially loaded into our browser.

Line 12. This instruction causes our window to be notified (by an event) whenever the user resizes the window.

Lines 13 thru 16. This instructs the event handler to both load the form and ensure the event is passed along to underlying system handlers.

Line 17. This causes the event handler to be invoked when notification is received that our window has been resized (a resize event).

The FORMS code in Figure 3 is used to display the values of our window dimensions.

Table tags (Lines 2 and 15) are placed inside the Form tags (Lines 1 and 16) to control the appearance of the four sets of output.

The first output (top left in Fig. 1) is the outer width and is displayed within the TD tag pair (Lines 4 and 5) using the INPUT tag. The field is named "outerW" and has the value passed to it in Line 7 of Figure 2. The other three outputs are displayed using similar coding.

EXAMPLE 2. I developed another window that displays the location of its four outer edges so that one can move it around the screen and note the distance, in pixels, from the edge of the screen. This can be helpful when one is working on the appearance of a Web page. This example uses similar coding to that illustrated in Figures 2 and 3.

SOME REFERENCES. The example shown here is described in *Controlling the User Environment with JavaScript 1.2* at "http://developer.netscape.com:80/viewsource/davis_javascript.html". A simple book on understanding and writing JavaScript that I find very useful is *JavaScript for the World Wide Web* by Tom Negrino and Dori Smith, 3rd. edition, 1999, published by Peachpit Press at "http://www.peachpit.com". It has many examples both in the book and on the Web.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor, and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his home page is "http://power.eng.mcmaster.ca/alden/ti.htm".

```
<SCRIPT language="JavaScript1.2">
01 window.outerWidth  = 300;
02 window.outerHeight = 180;
03 window.screenX = (screen.width/2)-(window.outerWidth/2);
04 window.screenY = (screen.height/2)-(window.outerHeight/2);
05 window.onerror=null;
06 function loadForm() {
07 document.dmnsn.outerW.value=window.outerWidth
08 document.dmnsn.outerH.value=window.outerHeight
09 document.dmnsn.innerW.value=window.innerWidth
10 document.dmnsn.innerH.value=window.innerHeight
11 }
12 window.captureEvents(Event.RESIZE);
13 function resizeHandler(e) {
14 loadForm();
15 return routeEvent(e);
16 }
17 window.onResize=resizeHandler;
</SCRIPT>
```

Fig. 2: JavaScript within the New Window

```
01 <FORM name="dmnsn" onSubmit="return(false)"> 
02 <TABLE cellpadding="0" cellspacing="0" WIDTH="100%" >
03 <TR ALIGN=CENTER>
04 <TD><B>outerWidth</B>  <BR>
05 <INPUT size=4 name="outerW"></TD>
06 <TD><B>outerHeight</B>  <BR>
07 <INPUT size=4 name="outerH"></TD>
08 </TR>
09 <TR ALIGN=CENTER>
10 <TD><B>innerWidth</B>  <BR>
11 <INPUT size=4 name="innerW"></TD>
12 <TD><B>innerHeight</B>  <BR>
13 <INPUT size=4 name="innerH"></TD>
14 </TR>
15 </TABLE>
16 </FORM>
```

Fig. 3: Forms Code to Display Size Variables

Traveling the information highway

Creating images that change

with Bob Alden

In my April and May columns, I looked at creating pop-up windows using a combination of JavaScript and HTML code. A few readers noticed that the examples I used did not work with Internet Explorer. I agree — I was using Netscape and forgot to check for compatibility. I will address this issue in a future column.

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This month I look at how to create a graphic whose appearance changes when the cursor is placed on top of it. This technique is normally used when several clickable images form a menu, each one being highlighted in turn as the cursor is moved from one to the next. (It works on both Netscape and Internet Explorer.)

We begin by creating two similar images with the same dimensions. One image is initially displayed. When the cursor is placed over this image, the other image is displayed in its place. One of these images is shown in Figure 1. The differences between the two images are usually in the choice of background color or something similar. Additionally, if details such as the key words "Click Here" in our example are shifted very slightly down and to the right in the second image, the image appears to shimmer when it is switched.

Figure 1. One of two similar images

The code to implement this technique is given in Figure 2. Some code segments that do not pertain to this technique have been deleted.

Lines 13 through 17 contain the clickable image coding with the <IMG> tag between the <A> tag pair.

Lines 14 and 15 contain the OnMouseOut and OnMouseOver event handlers that invoke the JavaScript function, navMouseOver, which appears in lines 9 through 11. These event handlers cause the images to be switched as the mouse is moved over or off (out of) the image location.

The JavaScript code in lines 5 through 8 defines variables that are manipulated to determine which image is displayed. The two similar images are "button1.jpg" and "button1a.jpg".

EXAMPLES. You can try this example and view the full code online at "http://power.eng.mcmaster.ca/alden/test/win/test.htm".

The idea for this topic came from the IEEE Student Branch at Simon Fraser University, Burnaby, B.C., Canada, whose Home page URL is "http://www.ensc.sfu.ca/undergrad/ euss/sg/ieee/". They have some nice visual features on their Web site.

REFERENCE. More information about event handlers is available at Netscape's JavaScript Reference at "http://developer.netscape.com/docs/manuals/communicator/jsref/index.htm". See Chapter 9.

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```
1 <html><head><TITLE>Demo of OnMouse</TITLE>
2 <SCRIPT TYPE="text/javascript" LANGUAGE="JavaScript">
3 <!-- Hide script from older browsers
4 if (navigator.appVersion.substring(0,1) >= 3)
5 { button1a = new Image (214,82);
6   button1a.src = "button1.jpg";
7   button1b = new Image (214,82);
8   button1b.src = "button1a.jpg"; }
9 function navMouseOver(imgid,imgnew,text)
10 { if (navigator.appVersion.substring(0,1) >= 3)
11 { document.images[imgid].src=eval(imgnew + ".src"); window.status=text; } }
12 // End hiding script from older browsers --> </SCRIPT> </head> <body>
13 <A href="newpage.htm"
14 OnMouseOut="navMouseOver('button1a','button1a','');"
15 OnMouseOver="navMouseOver('button1a','button1b','New Page');"
16 true return>
17 <IMG border=0 height=82 name=button1a src="button1.jpg" width=214> </a>
18 </body> </html>
```

Figure 2. The HTML File including the JavaScript code.

Traveling the information highway

Compatibility between browsers

with Bob Alden

In my April column, I described the way in which HTML and JavaScript codes are combined to create pop-up windows. The coding I used was taken from examples I had tested with Netscape Navigator (NN) — which I tend to prefer. Several readers sent me e-mail messages about compatibility-related issues. Thank you: your mail is appreciated. Martin Waxman and Peter Pho observed that my examples did not work with Internet Explorer (IE) and made a number of suggestions, so let me respond to this aspect first.

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Window.Open Features	
Netscape	**Internet Explorer**
height=	height=
width=	width=
outerwidth=	NA
outerheight=	NA
innerwidth	NA
innerheight	NA
screenX=	left=
screenY=	top=
toolbar	toolbar
status	status
scrollbars	scrollbars
resizable	resizable
menubar	menubar
location	location
titlebar	titlebar

Fig. 1: Comparison of Features Syntax

The two browsers are not compatible for all the features. Some features exist in one but not the other. Some features exist in the one version but not in previous versions. Under the heading, "More information," I list the URLs for both so you can take all these differences into account. For now, I will hit the key points.

You can see the list of similar features in Figure 1. The first set (followed by an equal sign) requires a value in pixels, while the remainder are either true or false. Figures 2 and 3 illustrate the NN and IE syntax respectively in an example with Figure 4 illustrating the syntax to be compatible (to be interpreted correctly by both browsers).

In these examples, I have written the features that can only have a binary value (a true or false attribute) using their names. We can write the name by itself, or write name=yes or name=1 to denote TRUE. We can leave the name out of the list, or write name=no or name=0 to denote FALSE. If only a few features are included in the list, all others are assumed to have their default values. The default binary value is FALSE.

The outer and inner window dimensions are only valid in NN 4 (not in earlier versions or in IE). The width and height dimensions correspond to the inner window dimensions. The screenX and screenY were also introduced with NN4. The NN screenX and screenY attributes can be placed and set in JavaScript in the called window but I could not get the corresponding IE left and top attributes to be recognized in the same way by IE. So I deleted these JavaScript segments and replaced them by augmenting the code in Figure 2. (They were not present in Figure 2 of the April column example.)

MORE INFORMATION. Both NN and IE have Web sites that describe the window open features they support. The URL for Netscape is "http://developer.netscape.com/docs/manuals/js/client/jsref/window.htm#1202731"; and the URL for IE is "http://msdn.microsoft.com/workshop/author/dhtml/reference/methods/open_0. asp#open_0".

FOR COMPATIBILITY. Place all the features you need in the OpenWindow JavaScript function located within the hyperlink tag pair, as in Figure 4. Include both the NN and IE versions of the attributes. Each browser will use the features it supports and ignore the others. If you want to take a look at the revised coding for my online examples, the URL is "http://power.eng.mcmaster.ca/alden/test/win/test.htm@".

That's it for this one. I will address more compatibility issues next time. By the way, any suggestions as to how some group (perhaps the IEEE) could inflict some sense of standards on browser developers to avoid this silly situation?

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```
Click to open a <a href="javascript:OpenWindow('ltwin.htm','ltwin',
'outerwidth=500,outerheight=230,screenX=0,screenY=0,resizable,status,
toolbar,scrollbars')"> Window in the left top corner of the screen</a>
```

Fig. 2: NN Syntax Example

```
Click to open a <a href="javascript:OpenWindow('ltwin.htm','ltwin',
'width=486,height=130,left=0,top=0,resizable,status,toolbar,
scrollbars')"> Window in the left top corner of the screen</a>
```

Fig: 3: IE Syntax

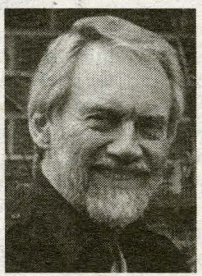
```
Click to open a <a href="javascript:OpenWindow('ltwin.htm','ltwin',
'outerwidth=500,outerheight=230,screenX=0,screenY=0,width=486,
height=130,left=0,top=0,resizable,status,toolbar,scrollbars')">
Window in the left top corner of the screen</a>
```

Fig. 4: NN and IE Compatible Syntax

Traveling the information highway

Handling JavaScript turnoff

with Bob Alden



Beginning with my April columns, I have addressed the use of JavaScript to create new windows. In the August issue I looked at the compatibility between Netscape Navigator and Internet Explorer because, unfortunately, the folks who produce these programs do not follow the HTML standards.

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The use of JavaScript can be very beneficial. One such use is to control the appearance of the screen by enabling small pop-up windows to present specific content while preserving the original screen layout and keeping most of the content visible. One can perform similar functions using frames but the two techniques are complimentary, but not interchangeable. There also is the issue of handling (older) browsers that do not understand the frame syntax.

Some Web designers create pages that use JavaScript and other fancy dynamic-screen presentation techniques and they overdo the use of these techniques with the disadvantage of slow downloading for viewers who do not have an ultra-fast connection to the source server.

Consequently, some users routinely disable or turn off JavaScript. One approach is to present a simple introductory screen that offers the choice of either a simple set of HTML pages with mostly text and no frames or JavaScript, or the full complement of Web technology.

This month I am passing along an e-mail message I received from Klaus Rusch who has some useful suggestions to make the new windows content viewable by users who turn JavaScript off.

Dear Bob,

Your column on creating Javascript pop-ups has provided a good overview on how to influence the appearance of the window. There are two drawbacks with the approach you recommended though:

Some browsers, albeit a small percentage, may not support JavaScript 1.2. So rather than getting the pop-up or at least the content, visitors using these browers will see an error message like "JavaScript Error: OpenWindow is not defined" because the function is only defined for JavaScript 1.2 or higher while the function call is used no matter which JavaScript version is available.

The other concern, which also affects visitors using current browsers, is the fact that some people disable JavaScript for security or other reasons so these visitors again will be unable to see all of your content.

A backwards compatible way of creating pop-ups might look like this:

```
<a href="somepage.html" onClick="return OpenWindow
('somepage. html', 'popup','status,scrollbar')">
```

with OpenWindow being a JavaScript function that checks for the JavaScript version supported, and returns false if the window creation succeeded (and the HTML link should not be followed), or true if the window creation failed.

Alternatively, the Javascript link could be generated by Javascript itself, with an alternate <noscript> section, like this:

```
<script language="JavaScript1.2">
document.write("<a href='javascript:OpenWindow...'");  // Javascript link
</script>
<noscript>
<a href="somepage.html">
</noscript>
```

Regards, Klaus Johannes Rusch (KlausRusch@atmedia.net)

Thank you Klaus, I appreciate your contribution.

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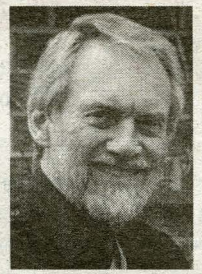
Traveling the information highway

The ease of using e-tickets to fly

with Bob Alden



Purchasing services over the Web is becoming more acceptable as companies reinvent their business practices and develop Web sites that work. This month, I look at the virtual airline ticket — "e-tickets" — that can be purchased and used without going near an airline office or using a travel agent. All my arrangements were done from home. Here's how it works.

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The example I use is purchasing an airline ticket to fly to Newark, N.J., USA, to attend the recent Editorial Advisory Board meeting for THE INSTITUTE. The airline in this example is Air Canada "www.aircanada.ca/". Many other airlines currently offer or soon will be adding similar services.

The first thing is to access the airline's Web site and create my personal "Web account" (to use IEEE terminology) providing information about me — essentially the same information I had previously given to my travel agent over the phone.

Step one is to log on to the site and enter my name and password. Stored on this site is my home address, phone and fax number, information about the credit card I will be using, and my frequent flier number.

Step two is to review the possible flight options and prices, including special deals. These days, airlines seem to be using the Web for selling last-minute bargains as an alternative to third-party sales. I also can check seat availability and then make my reservation.

One drawback I found is that not all flight options are available. For example, I could not select the option to fly into Newark and return from New York's LaGuardia (a nearby airport) on the Web whereas I could have if I phoned my travel agent or the airline.

Step three is to use my credit card to purchase the ticket. I was given the choice of entering my credit card information in the airline's system that links to the Web site or phoning in the same information.

Which is less risky? I thought about this for quite a while and decided I was sufficiently confident with this service provider's system. This is a personal decision. I concluded that I was no more at risk using their Web site than the telephone. In fact, I am more satisfied transmitting that information only once to set up my Web account instead of repeatedly providing it over an unsecured telephone line. The Web connection uses encryption and my credit card number does not appear on my browser. I also have the choice to use more than one credit card, perhaps to distinguish between business and personal use.

Step four is to select the method of ticket delivery: pick up a physical ticket at the airport or an airline office, or receive an e-ticket in which the details are faxed to me at home. I much prefer the e-ticket option.

Two cautions though. Print the Web pages that summarizes your ticket reservation and keep the faxed e-ticket — especially if you need to be reimbursed for this travel cost. This fax contains your ticket number and booking reference as well as flight and payment details. Secondly, check with the organization that will be reimbursing you to confirm if they will accept this form as proof of expense. Generally, organizations require the physical ticket stub but many are changing their rules to accomodate e-tickets.

Step five is obtaining the boarding pass at the airport where there are two possibilities (depending on the degree of automation implemented). The advanced method is to use either your frequent flier card or the credit card used to pay for the e-ticket to obtain a boarding pass from a machine. The alternative is to present the fax confirmation at the check-in counter.

One of the obstacles you might face is that some airlines do not consider the e-ticket to be a legal document. You may have a problem changing flights or air carriers but to date, I have not had any major problems. In one case, my airline even exchanged my current boarding pass for an a physical ticket to facilitate my switch to a different carrier. In my opinion and with my experience so far, I have found that the conveniences outweigh the inconveniences.

Purchasing an e-ticket using my home computer and a credit card to both pay for the ticket and obtain my boarding pass is simply a logical outgrowth of the Automated Teller Machine (ATM) technology. We can see this technology at work in both our banks and in most stores where we use our ATM debit cards to pay for groceries, clothes and almost everything else we need to purchase. We even use our home computer for on-line banking. The information highway is truly becoming the road of convenience in so many areas of our everyday life.

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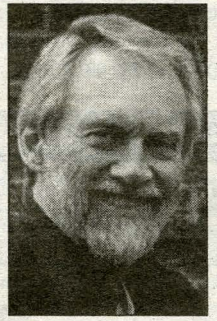
Traveling the information highway

Using IEEE Xplore

with Bob Alden



Last month I ended with the sentence, "The information highway is becoming the road of convenience in so many areas of my everyday life." The IEEE has added to my set of electronic conveniences with the advent of IEEE Xplore. I decided to take it for a test drive and had mixed results.

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The good stuff

I liked the current (late October) version of the IEEE Home page with a large graphic on the right to attract members to this new service, along with an IEEE Publications heading on the left with three links below: IEEE Xplore, *IEEE Spectrum*, THE INSTITUTE. This is really useful — I always felt that the *Spectrum* and THE INSTITUTE links should be on the front page.

The opening screen for Xplore is functional and makes sense, with one exception. The Welcome box includes a "Log-out" link instead of the "Log-in Now" link as shown in the help screen.

The use of only one name/password system for all publication searching where the user chooses (and can change) the password is much better than the prior use of two different systems (that should never have been implemented but thankfully has been fixed).

The online help in a pop-up box is effective and seemed to answer my questions.

I began my test of the search capabilities by using the Search by Author feature, entering my own name. That worked — although I discovered that one of my papers appeared to have an incorrect initial and thus was not able to be searched correctly. This kind of error tends to show up when effective searching tools are introduced so be on the lookout for this type of anomaly. You will need to contact the Xplore folks to get the error corrected (as I must).

The basic search is most effective. I used the phrase "customer perception" to see how many other articles used this phrase in addition to a few papers I had co-authored. Not only did the search return the papers I knew about, but also a number of others I did not. I like the way it works.

The bad stuff

Overall, my experience has been that the system is slow (far too slow) to respond. Not for searching, but for displaying screens prior to requesting a search. Also I encountered two specific problems. Here is one user's experience.

When I initially tried out this system, I was annoyed to discover that I could not view papers in non-society conference proceedings that I had both authored and paid to attend, and for which I received the proceedings. I complained to our IEEE staff who told me that, initially, commercial customers had access to everything but members did not. I realize that it is much simpler to give complete access than implement the extremely complex access rules that the mix of 36 IEEE technical societies and the Publications Board have evolved (made even more impossible by so many conferences with their list of differing sponsors).

When I tried several weeks later (near the end of October), I found I could view any paper I wished (without logging in), even in journals I do not subscribe to. I understand that this was a temporary consequence of major server crashes due to much heavier use of the system. These problems have now been fixed (I'm told), hopefully for good. Earlier today, I found I needed to log in and I faced the same restrictions I encountered initially.

Closing comments

These problems highlight two aspects of IEEE that concern me, both related to our ability to deliver electronic services. These are complexity and size.

Complexity. Who can access what? Member benefit seems to get lost in the politics of IEEE technical society management regarding access to publications. Each of our 36 technical societies set their own rules. Viewed in the light of Xplore's excellent searching capabilities, the current practice of selectively restricting electronic access by members, based on society memberships and other factors, seems counterproductive. If institutional customers can search everything, why not members? I believe that continuing to use business rules developed to pay for printing and mailing journals is just plain silly in the Internet age when we have the kind of online access and searching we have in Xplore.

Size. Can the IEEE handle success? The likely success of Xplore (its searching capability is really super) as it becomes better known may create even more overloading of IEEE servers and access lines — I hope the capacity will be there!

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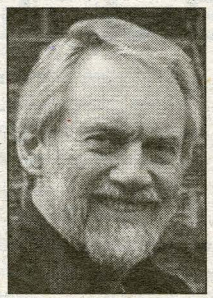
Traveling the information highway

Creating your own domain name *with Bob Alden*



During the last few months, I have been changing over from a courtesy Internet access account at my alma mater, the University of Toronto, Canada, to a commercial Internet Service Provider (ISP). I have just completed adapting from a low-speed dial-up to a high-speed telephone connection and my own directory on that ISPs server where I am developing my own Web site (as distinct from the Web site I have been using on my employer's server). I wanted my own domain name, but ISPs require the purchase of a Web-hosting service to support the use of an individual domain name.

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Since there may be some of you who would like to know how to create personal Web sites, this month I will discuss the aspect of getting a personal domain name. The Web sites quoted are ones I actually used in this process.

Why a personal domain name? When I signed up with my commercial ISP, I discovered that I would automatically get an e-mail address and Web space where I could create my own site. My ISP is Echo Online, "www.eol.ca", and my URL would have been "www.eol.ca/~bobalden". I decided that such a Web address was complicated and I wanted a simpler one so folks could easily find me. Other reasons might be to promote a service, product, interest or even one's self.

HOW TO GET STARTED

I asked some of my friends and also went looking on the Web. The concepts of Web hosting and domain names are so intertwined that a Web search for one tends to find both services. Companies that offer Web hosting services tend to offer domain name searches. Many also offer domain name registration and parking. Some offer domain name management. Let's look at each of these components separately.

I used "www.EasyHosting.com", one of many you can find using a search engine and such key words as "Web hosting", "domain names", or "domain parking". If you visit the InterNIC Web site, "rs.internic.net", you can search the complete list of accredited registrars, which are sorted in a variety of ways. Since the domain registration business has been deregulated, you will find a variety of prices and services.

NAME SEARCHING

These Web sites have a window where you enter your desired name and the suffix, which can be "com," "org," or "net". These are the most common. There are a whole flock of new ones that have just been approved such as "name" and "biz". In some countries, you can use a country suffix and may be required to use other geographic segments such as states or provinces. Since I did not want a geographic suffix but I did want to advertise what I plan to do in my post-retirement career, I opted for the "com" suffix as the most appropriate. I found that "bobalden.com" was available, which meant I did not need to invent an alternative.

DOMAIN NAME REGISTRATION AND PARKING

I applied online at EasyHosting to register my newly chosen domain name and, because I had not yet contracted for a Web-hosting service, to "park" it temporarily. I completed their form and identified myself as the registrant, the administrative contact, the billing contact, and EasyHosting as the technical contact because the domain name was being parked there. I paid the US$15 annual fee by credit card. I also selected a name and password to manage my domain name. They confirmed my registration application, name and password by e-mail. It took a few days before the name I had applied to register showed up as belonging to me. The alternative approach is to select your Web-hosting service provider and pay them to register and manage your domain name.

DOMAIN NAME MANAGEMENT

While arranging my Web hosting, I told them I wanted to manage my domain name myself and they gave me the information I needed to change the technical contact from my parking host at EasyHosting to my Web site host at Echo Online. They also provided me with the names of their primary and secondary name servers. Next I went to the Web site at "www.opensrs.org" where I entered my domain name, domain management name and password. Once logged in, I changed the names of the name servers and technical contact details. The change became effective about 12 hours later.

In the future if I wish to change the company supplying me with Web hosting, I simply repeat the process of changing the name servers and the technical contact.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor, and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org". His new Web site is "http://bobalden.com".

Traveling the information highway

with Bob Alden

Using a Web hosting service

In my February column, I discussed the process of obtaining and managing my own domain name, "bobalden.com", which I wanted to use for my new Web site. To use this name, I purchased a virtual Web hosting service — this is a service that offers management capabilities needed to operate a professional-level Web site. However, there are several choices if you want to have a Web site. I will call these choices basic Web hosting, redirection and virtual Web hosting, and will look at each of these in turn.

Information about the IEEE's Information Highway is available electronically. To find out what is available, visit the Web page at "www.ieee.org/eleccomm". To view any of my columns, use the index of links at "http://bobalden.com/ti/".

Internet access (viewing other folks' Web pages) and Internet presence (having your own Web pages) are two different services that can be purchased together from the same provider or separately from different providers.

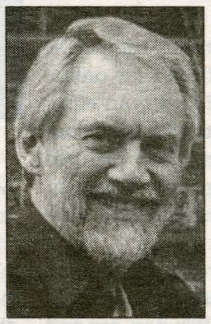
Often, when you purchase Internet access, you get a limited Internet presence at no extra charge. The Internet access service can vary from CN$5/month to more than CN$30/month for personal access — depending on the speed of connection (e.g., a 56k modem or digital subscriber line) and the connect hours/month. Prices are highly variable, and while my figures are in Canadian dollars, similar prices are appropriate in U.S. dollars.

BASIC WEB HOSTING: A basic Web space (typically 10 to 20 Mb) is often included with your Internet access service and the Web address is typically of the form "home.company.com/~yourloginname" where "company.com" is the domain name of your service provider, home or something similar denotes the Web space service, and "yourloginname" is just that. You can upload your files using File Transfer Protocol (FTP) software, but you likely do not have the other features described under virtual Web hosting. This level of service is fine for creating a basic Internet presence to show personal interests and hobbies or for communicating among family and friends in a non-business context — although many businesses use this type of service because it is inexpensive. The cost is usually free with your Internet access service.

REDIRECTION: One member, Don Rowe, brought a commercial redirection service to my attention. Its URL is "http://www.redirection.net", and they offer this service for US$5 a year to customers who have their own domain name and the basic Web space described in the preceding paragraph. You can find out more by viewing their site. Since I have the domain name "bobalden.com," and my Internet access provider gives me the address "home.eol.ca~bobalden," then "bobalden.com" would be redirected to "home.eol.ca~bobalden". My domain name is the only one that appears, and my address is always hidden. While this is cheaper than paying for virtual Web hosting, it enables my domain name, but no additional site management features.

The IEEE runs an excellent Web hosting service for IEEE entities at "http://ewh.ieee.org". I recently used it for the IEEE Canadian Foundation when I redesigned its existing site and relocated it on the IEEE "ewh" server. The address is known as "http://www.ieee.org/canadianfoundation". This is a pseudo-domain name (nonregistered) that is redirected to the actual address "http://ewh.ieee.org/r7/cafoundation". The pseudo-domain name is replaced by the actual address in the location bar of your browser once the page is loaded, whereas "Redirection.Net" cloaks the URL so that the domain name stays in the location bar.

VIRTUAL WEB HOSTING: This type of Web-hosting service expects that you have a domain name for your Web site. As in the basic hosting service, you use FTP to upload your files. Most importantly, you have additional site management services. My provider, Echo Online, at "http://www.eol.ca" provides 50 Mb of Web space, 10 customizable e-mail addresses, 500 Mb of free monthly Web transfers, a choice of NT or Unix host, free detailed traffic analysis, and the capability to use cgi or asp scripts as well as password protecting directories. I have access to daily logs that enable me to find defective links (that I created). For example, I can see which pages are most widely viewed, where my viewers came from (by domain), and what times are the busiest. The cost is CN$25/month with a discount for a 12-month contract, plus additional charges for excess Web transfers.



FREE WEB HOSTING: Yes, there are free chunks of Web space out there where you can place your Web site. But there are usually some conditions that result in someone making money off your site; for example, advertisements that appear when your site is viewed. Alternatively, if you wish to display certain kinds of visual delights (that are outside the IEEE's technical area), you can find free Web hosting using the popular search engines.

I opted for the virtual Web hosting because I wanted the tools to help me create and manage my Web site. I briefly looked at my local cable company as my joint access provider and Web host. I concluded their business plan was to provide fast access but very limited Web hosting. After asking around, I concluded that the fast access was a variable commodity and reliability was poor. I also investigated my local large telephone company and found them big, bulky, uncommunicative and poor on service and facilities (although I find them great for basic phone service).

I opted for a modestly sized local provider where I could go to the office, meet and talk with some of their staff, and get good answers as I was getting started. If you do not need that kind of reassurance, you can do everything over the Web. Search for providers, read their service descriptions and obtain prices. You can always change providers if you don't like the service or get a much better deal.

Robert T.H. (Bob) Alden is the IEEE Electronic Communications Advisor, and a former IEEE vice president. In his other life, he is the past and founding director of the Power Research Laboratory at McMaster University in Hamilton, Ont., Canada. He welcomes your input via e-mail at "r.alden@ieee.org", his new Web site is "http://bobalden.com".

Call for nominations for IEEE Simon Ramo Medal

The IEEE is seeking nominations for the 2002 IEEE Simon Ramo Medal. The medal is awarded for significant achievement in systems engineering and systems science. The prize consists of a gold medal, bronze replica, certificate and cash honoraria. The nomination deadline is 1 July 2001. TRW will continue to sponsor the medal for 2002.

For nomination information, visit "www.ieee.org/about/awards" or contact IEEE Awards Activities, 445 Hoes Lane, Piscataway, NJ, USA 08855-1331; telephone +1 732 562 3840; fax +1 732 981 9019; e-mail "awards@ieee.org".

IEEE Asks For Input on Services

IEEE President Ray Findlay has asked a team of IEEE volunteers and staff to look for ways the IEEE can improve services using information technology. IEEE Chief Information Officer John Witsken and I are co-chairing this Information Technology Opportunities Team, or ITO.

Information about IEEE's information highway is available electronically. To find out what is available, view the Web page at "www.ieee.org/eleccomm. To view any of my previous columns, use the index of links at "www. bobalden.com/ti/".

Information technology opportunities

New or improved services are likely to be delivered using the Internet and might make use of our newly improved information technology infrastructure. Over the past several years, the IEEE has invested heavily in new hardware, software, people and the physical space to house our network of servers that comprise "http://www.ieee.org" and the huge database that enables members and customers to access the electronic services. Now that this massive infrastructure upgrade at our Operations Center in New Jersey, USA, is complete, and the new services planned several years ago are being delivered, President Findlay thinks it is time to take a new look at what our members are getting and what services are still needed.

IEEE portals

One of the ongoing developments is introducing portal technology and content management. Both are important to the IEEE. Interaction is needed to enable convenient, individual, member-tailored service selection. Sophisticated content management is necessary to deliver the type of distributed and independent management capability that IEEE Societies and other entities need. The success of this developing Web interface will likely be central to the selection and delivery of services.

Diverse needs

The IEEE Operations Center supports all the varied facets of the IEEE community. While our total membership is large, there are additional electrotechnology professionals who purchase services as individual customers. There also are corporate and institutional customers, as well as IEEE staff. There are tens of thousands of members who are active volunteers who have additional needs to help them run our Societies, Sections, Chapters, Branches and conferences, among others. Our individual needs for services are different because of what we do or where we live and work, and even because of what technical or professional specialty occupies our interest.

For more information

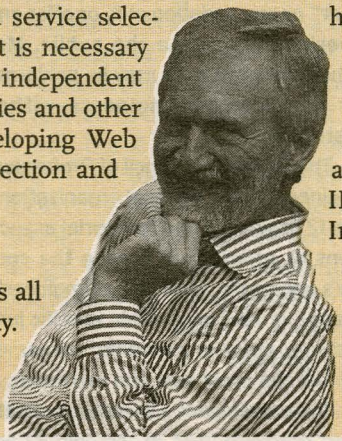
The ITO Team has a Web site at "http://www.bobalden.com/ieee/ito/index.htm" where I will place information about its members, scope, record of activities and progress, as well as links to relevant sites. If you know of some useful information or links I can add, please let me know.

To request new services

To contact all the team members, write to "ITOteam@ieee.org". Clearly our job will be much easier and the outcome will be much more relevant if you will write to us with your suggestions. Tell us about new or improved services that you feel you need, and why they are important to you. If your request or suggestion is beyond the team's scope, we will forward it for the appropriate follow-up.

Our IEEE

This is our IEEE. It is a member-driven organization with superb staff support. This partnership of dedicated staff and volunteers is the key aspect that has led to our past success, and the one that will ensure continued success. We need to understand your needs as members, volunteers, customers or staff. We need to hear from you. Please e-mail the ITO team and tell us what you need in the way of IEEE services that could be offered via the Internet.



Bob Alden is an IEEE volunteer, interested in electronic services among other aspects of the IEEE scene. You can find out more at "http://www.bobalden.com. He welcomes your input at "r.alden@ieee.org".