Using the Internet

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ABSTRACT

As wide-area computer networks grow in size, so too are they developing simple tools which can be used to send and receive vast amounts of information easily and efficiently. And even though primary and secondary schools are not as yet using these networks extensively, there is every indication that they will do so in the near future. This paper outlines some of the basic access, database, and search tools available on the world's largest computer network, the Internet. A list of reference books, manuals, and on-line electronic papers about the Internet is included.

Introduction

Over the past five years or so, global computer networking has left the chrysalis of experimentation and has developed into a powerful tool for anyone who has the ability to access it. This new and rapidly growing form of communication has the potential to expand access to knowledge well past the point of any individual discipline, library, or other information repository.

This, clearly, is a Mecca for hard-pressed professionals. It is also one of the most powerful research and educational tools yet developed, even though debates on this latter point rage mightily.

The largest of the international computer networks is The Internet, which is expanding at a rate of about 80% per year (Matrix, 1993), with the consequent multiplier effect of more inter-connections between users. This means that there is more contact by more people across greater distances, with more emerging collaboration, which is changing the general pattern of how users carry out study, research, and teaching.

The largest user group of the Internet currently is made up of academics, tertiary students and computer specialists. Teachers in the technical, secondary and primary levels have not, as yet, generally had access to the Internet. It is only within the past two years or so that the interest of education departments and teachers themselves have developed to an extent that serious investigation is being undertaken. [-1-]

Notwithstanding the difficulties presently faced by schools and teachers, the network is being used by more and more schools and teachers in one way or another, and with this interest is the growing need for training of teachers in the use of the burgeoning number of applications that are of use. Historically speaking, the Internet (and related networks) are in a similar position to telephone exchanges in the early 20th century, where the common belief held was that telephones were all right for business, but who would want one in their home? (Toffler 1990).

It is my contention that the use of computer networks as a primary communications tool has now reached the critical mass point, and from all indications, the network providers are geared to begin massive campaign to gain new customers (Various Edupage bulletins)

This paper will discuss some of the tools currently available on the Internet which can be of use to researchers and teachers. Fortunately, there has been significant progress in the development of manuals and books about how to use the Internet, and a short reference list of these is included at the bottom of the paper.

Internet Tools Overview

Internet tools can be broken roughly into four types: access, communications, databases, and search
facilities. Access tools are those which enable users to get into the network one way or another. Two of the most common are telnet and ftp. Communications tools include electronic mail (e-mail), bulletin boards or Listservs, and newsgroups. The databases are repositories of information or applications available throughout the networks, often in archives, such as the Wide Area Information Service (WAIS). These can be searched using search tools like gopher, World-Wide Web (WWW), Veronica, and others.

The first step is getting into the Internet. While there are currently over 2 million computers connected (Matrix News, March 93) together using a common language or protocol, there is still not universal access to it. In Australia, for example, the Australian Academic and Research Network (AARNet) is the principal Internet network, and controls all access to it. There are some commercial providers, but these themselves negotiate with AARNet for a connection. Some school systems are in the process of obtaining a link into AARNet, and thereby gaining the potential to link to other schools, nationally and internationally.

Generally speaking, users can access the Internet by gaining access to one of these two million host computers. They can do this by the means of a modem or a direct line. Then, depending on the facilities the host computer maintains, the user can use the commands telnet and ftp and gopher to gain access to other [-2-] computers around the world. Gopher can also be seen as a search tool, and further explanation is provided below.

**Access Tools**

Telnet allows a user to gain operational access to another computer. In most cases, a user will require a personal User Identification (UID) and a password on the machine being telnetted to. Once these are properly invoked, the user then has access to all the facilities available to remote users on that machine. For example, the machine I use, Lingua, provides full Internet services to all its users, but they must have been issued a UID and password by our systems manager.

In some cases, institutions allow some facilities of their computers to be accessed via anonymous telnet, which means that users have a limited access to facilities on the computer, but can freely log in, sometimes using a readily available UID and password, or are connected directly to a specific service. University library catalogues often use this latter approach.

The command ftp or file transfer protocol, enables a user to access another computer for the purposes of either obtaining, or sending data. This command is most often used by those institutions who maintain public archives. A user simply uses the ftp (address) command, to gain access to archived documents on remote machines. In some cases the user can also send documents to a remote host, as well as receive them. This is a particularly useful access command, because valuable materials are stored in these archives. One of the more prolific archive sites in the languages area, for example, is the University of Michigan, which maintains linguistics and language archives.

**Communications Tools**

The most commonly used communication tool on the network is electronic mail (e-mail). This is also the oldest form of computerised communication, and is used not only by the Internet, but by many other wide-area networks as well. It is possible for Internet users to send e-mail to AppleLink, Bitnet, Compuserv, Fidonet, UUCP, Pegasus, and other networks which have gateways between each other. In August of 1993, the Matrix estimated that there were over 22 million users on these networks, and since then the number has assuredly grown. (Matrix News, August 1993)

E-mail is simple to use. It is simply a matter of finding the right address for the recipient of the message, and then using whatever mail program is provided on the computer. There are a number of them, such as the straight Unix Mail program. VMS has a similar mail program. Newer mail programs provide enhanced facilities. The newer ones, Elm and Pine assist the user in [-3-] providing good help cues, automatic filing and storage, and an easy to use line editor.

A variation on the theme of e-mail is the use of bulletin boards. On the Internet, bulletin boards often take the form of Listservs, which are essentially automatic mailing and routing programs. The growth of listservs on the Internet, like everything else, has been explosive. It is probably a safe bet to say that for any group of users with a shared interest, there is a corresponding listserv.

Listservs also provide archiving facilities, and allow the owners of a listserv to either moderate (edit) incoming messages, or to simply monitor the traffic flow. There is a general protocol for subscribing to one of these groups. Simply send an e-mail message to the appropriate address in the form listserv@machine.domain.country. The message must contain only the words subscribe (listserv name)
(users name). The subscriber will then receive all messages sent to that particular group. And, of course, the subscriber may also send material to the listserv for routing to all other subscribers. This is a particularly good facility for people within a discipline or profession who may want to share information with colleagues who are remote. An excellent example is the Linguist List at Texas A&M University, which has been going for about 5 years now, and has an international subscription rate of over 4,500 users.

A more general way of receiving and disseminating information is through the use of the Usenet, a collection of over 2,000 newsgroups (public bulletin boards) which all share the same protocol, but which cater for tastes from the ridiculous to the sublime. Users can access Usenet (if it is available on the users computer) using several different news reading programs. It is also possible to select only pertinent newsgroups from the full panoply and read only them. For example, my Usenet program contains about 1,300 newsgroups, but I read only about five of them regularly, and another ten or so less frequently. There are groups relating to education, distance education, language education, linguistics, languages and cultures, etc.

Much valuable information can be obtained from these groups. One specific example is an Australian group, aus.culture.china which provides international information on Chinese issues. It is prepared and edited by the International Chinese Federation of Students, and provides excellent information on current events within the Peoples Republic, Taiwan, and Hong Kong.

**Databases**

As mentioned earlier, there is a growing number of archive sites which contain databases of all sorts of different materials which can be obtained by using ftp, or gopher to reach them. For education, and particularly language education, one of the better sites currently available is gopher.merit.edu., located at the University of Michigan.

In some instances, organisations set up computerised databases which are specifically designed for remote access. One such has been developed by my own organisation, the Language and Technology Centre of the National Language and Literacy Institute of Australia (NLLIA), which has over 27,000 records in 8 related databases relevant to language education, linguistics, applied linguistics, and related fields.

The NLLIA Database System is a set of computerised databases, all of which hold information on language and literacy related areas. This system is part of a larger computer system which is based on a menu of many computer applications which includes electronic mail, file transfer, and communications. The databases currently available for access are:

- Language Courses: includes information on tertiary subjects in languages/linguistics, etc. areas, with over 8,000 on line at present.
- Institutions: a list of over 800 Tertiary, TAFE, secondary and primary schools, other institutions and various government departments in Australia.
- Resources: About 7,000 language-related resource items are referenced.
- Language Professionals: information on over 2,500 language professionals in Australia.
- Bibliography: Over 6,500 bibliographic references on languages, linguistics, applied linguistics, language teaching, and literacy research.
- Scholarships: A listing of over 280 available scholarships, grants, travel schemes, etc. which are available for students, teachers and researchers in the language and literacy arena comprise this database.
- Adult language/literacy Courses: information on about 1,000 different LOTE courses available for adults around Australia.
- Literacy Research: contains citations and abstracts on research and publications emanating from that research on literacy matters.

In this database category, I also include library on-line catalogues, ERIC, and other key information repositories which can be accessed through the network. The telnet command will easily get [-5-] users into many university library catalogues around the world. Elements of ERIC can be accessed remotely either through using gopher (see below), or in some instances obtaining ERIC Mini-Bibs which are held in various archives.

**Search Tools**

Finding ones way through cyberspace is becoming easier thanks to new search tools, but for the new user, it can still be tricky. I will here provide some basic descriptions of some of the key search tools now in use, and how to use them.
A primary search tool is gopher. This facility was invented by the University of Minnesota, and it has become one of the principal ways of finding information on the network. Gopher is a command which allows a user to enter a gopher area of a host computer, and from there access archives from that machine, log into other machines, read on-line information, mail information to someone else, or generally wander around the world in gopher-space. There are currently about 1,100 gopher sites around the world, and all of them are linked to each other. Gopher is a search tool because it can automatically send a user from one machine to another machine with the pressing of one key. It is also an access tool, because it allows a user to get into gopher space in the first place, rather like ftp.

Key archive sites can be accessed by using the gopher command, as well as the ftp command. In many instances, gopher is easier to use than ftp. To get to a gopher site, a user will type gopher gopher@computer-name.domain.country. At that point a menu will appear providing a listing of all available services on that particular gopher. Many of these will have a listing like: search all gopher servers in the world, or something similar.

The gopher menu system is very simple. A user simply goes down the menu, or up, presses the enter key when the arrow is next to the desired application, and the computer then provides further instructions. On-line help can be obtained by pressing a question mark.

Allied with gopher is a search tool called Veronica. It was originally developed to search archives, commonly called Archie. Veronica is a very powerful tool which allows users to search for words or word strings across a variety of archive sites. The searches can become quite complex, because of the string search capacity, as well as the ability to use Boolean operators. So, for example, a user might want to find every CALL program available on a particular archive, OR every linguistic parsing program. The text in the Veronica box would be something like computer aided language learning or linguistics, parsers. If the search comes up with any [-6-] hits, the user can then use the gopher tools to send the results back to the appropriate home directory.

The Wide Area Information Server (WAIS) is another search and retrieval system, and helps users search databases over the network. WAIS search tools are often included in gopher menus, and allows users another way of gaining access to over 400 databases ranging from agriculture to social sciences.

The main WAIS search facility works similarly to Veronica. To start a search, the user selects which set of databases are to be searched. Then the user sets up a query by typing in keywords which will be used by WAIS for the search. If the search is successful, headlines of documents meeting the querys criteria are displayed. To retrieve a document, the user selects it from the list.

An interesting feature in WAIS allows a user to run a follow-up query. If a response is incomplete (e.g., few hits), the user can re-state the query differently, or feed back to the system any one or more of the selected documents which are relevant. The ensuing results from the search will include documents which are similar to the ones initially selected, and which share a large number of common words.

**Putting It All Together**

How does this all fit together? Here’s a hypothetical case to show how it all works. A user logs into her account on the local host computer by typing in her UID and password. Once she gets into the machine, the first thing she wants to look at is her mail. So, she types out the appropriate command to get to her incoming mailbox.

In the mailbox is a message from a colleague in Europe who has discovered that there is a new listserv relating to a subject of mutual interest (let’s say its applied linguistics), and some interesting topics are being discussed on it. The user saves the message, responds with thanks to her colleague, and reads the rest of her mail, which includes several messages from another listserv, one of which lets her know that a particular curriculum package for the teaching of LOTE (Languages Other Than English) to grade one children is available in an archive accessible via ftp or gopher.

Once she’s done with the mail, she then decides to join the new listserv, so she subscribes to it following the instructions offered by her colleague.

Shes now interested in looking at that curriculum package, so she uses the gopher command to reach that particular archive. She calls it up using the gopher menu, and decides that she wants it, so she selects the send command, which automatically sends the [-7-] package to her own machine. This exercise has stimulated further interest, and so she then wonders if there might be something in another key archive that relates to applied linguistics. So she gophers to that site, and selects the veronica search tool. She types in the relevant key words, and discovers that there are a couple of items available. She then selects these, and gets them sent to her home computer for later perusal.
She then decides to let other colleagues know about the information she got from her European colleague, so she then types out a news article about this new listserv, and posts it to a newsgroup she reads regularly.

All of this took fifteen minutes.

She's still interested in trying to find something about teaching LOTE to grade ones, so she telnets to Lingua, the NLLIAs computer at The University of Queensland where she has obtained an account, and works through the resources and bibliographic databases to see what might be available. She found two pertinent resources and a bibliographic citation which provided her with another contact. She saved the database reports, and then down-loaded them to her own machine for future reference.

This exercise took ten minutes.

In her perusal of Gopher-Space, our user discovered that there is an ERIC site which she can access, and so she gophers back to the relevant site, and finds that there is a selection of Mini-Bibs which can be down-loaded. This took five minutes.

So, in half an hour, our user has managed to find some key references, learned about a new discussion group, discovered some new archive materials in different places around the world, and communicated with a colleague on the other side of the globe. She received some important information, and also contributed by sending information back through the news group.

This hypothetical operation is one which reflects operations that network users can do on a daily basis. It also points out that people with similar interests can use the network to collapse time and space and work collaboratively at a distance, even though they may have never met in the flesh.

**Implications**

So what relevance does this have to researchers and teachers? Bearing in mind that using high technology in schools is not necessarily a common event, it is still very much a cutting edge which will ultimately alter the way education is carried out. The speculation on this point is the subject of much thinking, papers, [-8-] even novels, and not directly germane to this article. But here are some interesting points.

Most primary and secondary schools, even in developed countries, are seriously under-resourced in the area of telecommunication, as well as in other areas, which means that the use of computers, either in a stand-alone mode, or in a local or a wide-area network, is very much only a hope for most.

To amplify this point, the new Chairman of the United States Federal Communications Commission, Mr Reed E. Hunt, said recently: There are thousands of buildings in this country, with millions of people in them who have no telephones, no cable TV and no reasonable prospect of broadband services. They're called schools (NY Times, 12/6/93 C6).

Teachers of languages often complain that they are isolated and remote from the action in the discipline. The use of a computer network to contact colleagues and peers around the world is a cheap and efficient way to at least partially deal with this problem. In the longer term, whole multi-media teaching packages will be able to be pulled from the network, and used directly within a classroom.

The use of the network as a hypertext carrier has immense implications for education and for teachers. They will be able to design their own packages from self-generated materials, coupled with materials taken from the network. This will include multi-media materials such as sound, graphics, animation, photographs, and other media (The Matrix News October 93).

Even though the computer environment in schools appears to be grim at the moment, there are some fascinating initiatives that are in place, and working. One such, the Texas Education Network links over thirty thousand teachers in 18 cities. And there are others, such as Californias Education network, which links schools directly into the Internet (Theise, 93).

We are truly at the jumping-off point. Narrow band, wide band networks, multi-media teaching packages on-line, who knows where it will all go. Stay tuned for virtual reality.

**List Of Internet References**

Information available from sources on the Internet:
Big Dummies Guide to the Internet, Electronic Frontier Foundation 1993. Available via ftp or gopher from numerous sites. [-9-]


Internet Access Points to ERIC ERIC Clearinghouse on Information Resources, Syracuse University, and ERIC Clearinghouse for Junior Colleges, University of California at Los Angeles. ERIC Networker 4.0, November 1992. For further information on access, email acceric@gwuvm.gwu.edu

Books About The Internet


For a more copious listing of Internet and general computer networking references, see the March 1993 RFC (Request for Comments) by John Quarterman, Matrix Information and Directory Services (MIDS). This RFC can be obtained via ftp from: ftp.crim.ca and the file is /Internet/rfc/rfc1432.txt

References


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