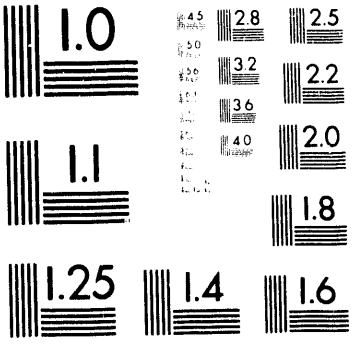
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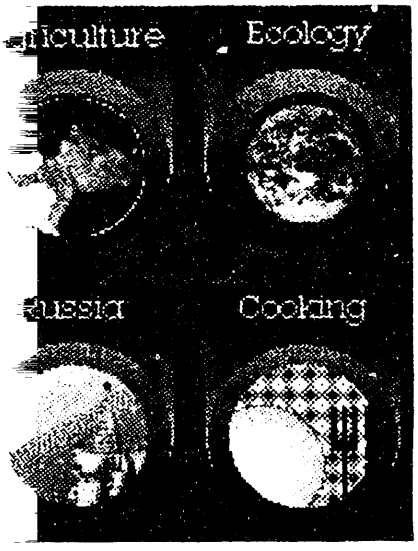
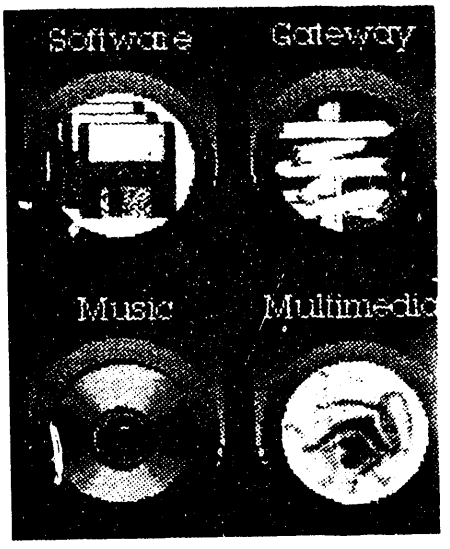
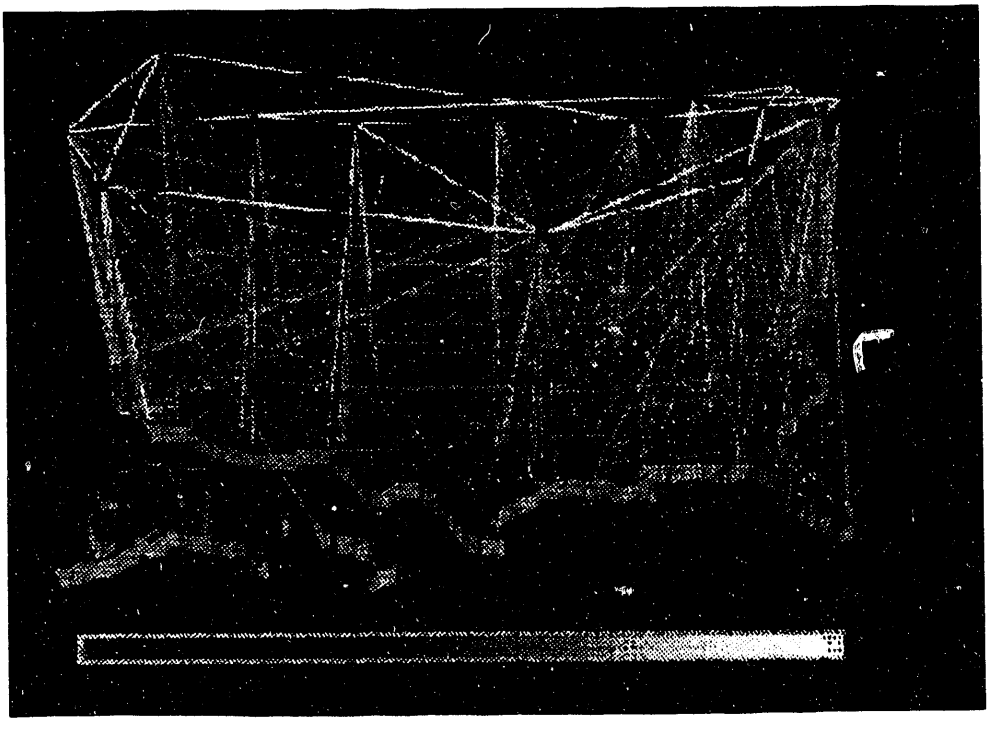


EVERYTHING YOU MIGHT WANT TO KNOW ABOUT

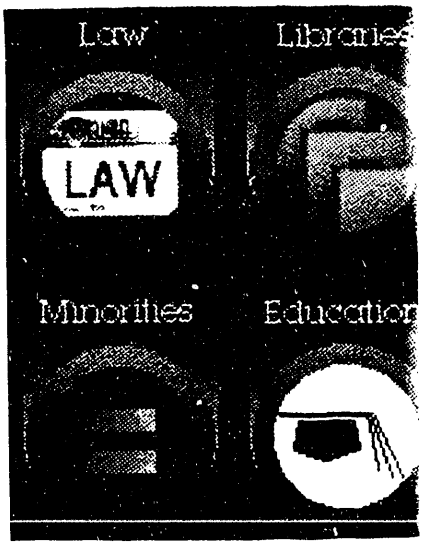


THE INTERNET



THE INTERNET

BUT ARE AFRAID TO ASK!



A NEW USERS RESOURCE

Created by: Eric Thiel
LLNL Summer program
for teachers
1993

UCRL-MA-115210

Work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.

EVERYTHING YOU MIGHT WANT TO KNOW ABOUT

THE INTERNET

BUT ARE AFRAID TO ASK!

A NEW USERS RESOURCE
CREATED BY: ERIC THIEL
LLNL SUMMER INTERN PROGRAM 1993
SUPERVISOR: BILL MAURER
WATSON PROJECT

IN THIS RESOURCE

READ.ME.FIRST - (7 pages) - origin of this resource, how to use this resource, Other Juicy TidBITS

What is The Internet - (11 pages) - Internet definition, history, administration, protocols, financing, and current issues

Internet Services - (7 pages) - quick reference list of many of the Internet services

Internet Tools - (4 pages) - quick reference list of the many Internet tools

Gopher - (14 pages) - In depth description of gopher document delivery service

World Wide Web - (11 pages) - In depth description of World Wide Web document search and retrieval system

WAIS - (33 pages) - In depth description of the WAIS document search and retrieval system and a list of all WAIS sources

ASTRA - (6 pages) - In depth description of the ASTRA document search and retrieval system

ARCHIE - (15 pages) - In depth description of the ARCHIE electronic directory service and document retrieval system

WHOIS - (7 pages) - In depth description of the WHOIS directory service

NETSERV - (6 pages) - In depth description of NETSERV data access service

TRICKLE - (6 pages) - In depth description of TRICKLE file request service

BITFTP - (5 pages) - In depth description of BITNET access to FTP sites

NETNEWS - (6 pages) - In depth description of NETNEWS communication

LISTSERV - (10 pages) - In depth description of LISTSERV communication

Gold in the Internet - (40 pages) - J. Martin's search for treasure in the Internet

FYI - Internet questions & answers - (33 pages) - Answers to frequently asked questions (FAQ's) by new Internet users

Internet & Education - (72 pages) - A survey of educational computer networks

READ.ME.FIRST

Eric Thiel
Biology Teacher
Amador Valley High
Pleasanton, Ca.

Why this Resource?

In the fall of 92 I applied for a position in the LLNL Summer Intern program for high school science and math teachers. Fortunately I was hired and assigned to Electrical Engineering Department's, Engineering Research Division's, Computer Systems Research Group's, Watson Project. This group of computer scientists is working on establishing a software program that will assist nuclear proliferation analysts in documenting and cataloging any questionable activity on the part of nations unfriendly to the United States. Needless to say the future of the USA and the world may depend upon the hard work of these analysts. The Watson project will provide the analysts with an invaluable tool. This tool will enable them to be much more efficient at what they already do quite well.

So what was a Biology teacher doing in this group? As it turns out the information I filled out on the questionnaire enabled them to match one of my interests with an opening in the summer intern program. I am very interested in computing but have never had the time or the proper equipment to do much other than word processing and grade recording. Bill Maurer, my immediate supervisor, gave me the assignment of exploring "THE" computer network known as the Internet. I was to look for any useful information or databases that may be of interest to analysts. This was a computing opportunity most teachers can only dream about. My perception of the Internet's amount of information, its availability, and its significance to an educator was equal to what the Commodore 64 is to the Cray C-90. In other words, I had no clue about the **tremendous** wealth of information that can be right at your fingertips. It staggers the mind to think that there are hundreds of thousands of educators, scientists, and politicians that are nearly totally unaware of it's value, and in some cases that it even exists. If having the proper equipment in place is not a roadblock, not accessing the Internet should be number 8 on the current list of seven deadly sins. Once having the ability to connect the user will run into two main concerns. First; scheduling time to connect to the Internet - Second; once connected how to disconnect before suffering from malnutrition. The Internet has the tendency to captivate it's users and transfer them into a state of infomania (in/fo/may/nee/uh - def: the overwhelming need to exploit as many information resources as possible).

As I began my Internet odyssey I quickly realized that a resource consisting of the documents that made my journey effortless and highly rewarding would be of interest to other future navigators. From the Internet I downloaded some of the files that were of greatest use to me and have used them to create this resource. That isn't to say they are the best or the only travel guides, but they will definitely get you headed in the right direction. To provide you with a guided tour, if one is needed, I have included J. Martin's "There's Gold in them thar Networks" copyright January 1993. In Martin's paper you will

find information about getting an Internet connection as well as information for mining some of the "gold" available. Realize that the Internet is a dynamic network. New servers, hosts, and files are continuously being added. It is quite possible some of the hosts mentioned in Martin's document will be changed and have new Internet addresses by the time you read it. Do not hesitate to acquire newer versions of his memo or one of the many other guides listed in the Internet Services portion of this resource. One of the beauties of the Internet is that it is always getting better. There is always something new to explore each time you connect. One can never know about everything that is available on the Internet, but it is sure fun to try.

Equipment Needed:

In order to access the Internet you need to have a direct hookup from your own computer or have the ability to connect to another computer or work station that does. Direct line connections to the Internet have a fairly hefty monthly charge as well as an initial hookup service fee. More than likely you will join the Internet community by connecting to another network of computers that has Internet access. This can be done in one of many ways. The most preferred method is by TELNETTING to a server that has Internet capabilities. Many users get on line by connecting to servers via modem. For more detailed information about getting on line read Gold in the Internet.

I began my exploration using a 486 IBM pc. This pc was equipped with DOS 6.0, WINDOWS 3.1, PC XVIEW (allows me to utilize numerous windows utilities), an ethernet adapter, and PCNFS (allows me to telnet and ftp directly from my own computer). I have spent time mining the Internet from my Macintosh LCIII and dialing in to one of the many local bulletin board systems that has Internet privileges. In both cases it became apparent that browsing the Internet is fun and can easily become an addiction.

How To Use This Resource

This resource is intended to be a quick reference guide that will allow new users to explore areas of specific interest. It is not intended to be a guide that requires you to read from cover to cover. If you are somewhat familiar with accessing the Internet you may want to browse the various selections that are found in this resource and try working with those topics of which you are least familiar. If you are a true newcomer I would strongly recommend that you to read "What is the Internet" first. After finishing this short document your best bet would be to go page by page through "Gold in them thar Networks" and try accessing the different servers that are described there. Having a copy of "Zen and the Art Of the Internet", a beginners guide, would also help to make your journey into the Internet a very enjoyable experience. Refer to the section titled "Other Juicy TidBITS" for information about Macintosh & DOS software, simple descriptions of useful utilities, and additional resource information. Good luck and welcome to CYBERSPACE.

J. Eric Thiel

OTHER JUICY TidBITS

Resource Books:

Excellent First Time Users Hand Book

"Zen and the Art Of the Internet"
Brendan P.Kehoe
Prentice Hall C-1993

Excellent Internet Resource Guide User's Guide and Catalog

"The Whole Internet"
Ed Krol
O'Reilly & Associates, Inc C-1992
(newest version May 1993)

An Internet textbook worthy of classroom work

"Internet System Hand Book"
Daniel C. Lynch-Marshall T. Rose
Addison - Wesley Publishing Co. C-1993

Understanding Internet Protocol

"Internetworking with TCP/IP Principles, Protocols, and Architecture"
Douglas Comer
Prentice Hall

ON LINE RESOURCE MATERIALS

See Internet Services section and;

Internet on-line Bookstore: allows user to order specific books by e-mail using charge cards - Bookstore accessible via GOPHER nstn.ns.ca - select menu item "other gophers or Nova Scotia" then select Roswell electronic bookstore.

Additional hard copy - New User Guide to the Internet
ftp nysernet.org
cd pub/guides

SOFTWARE

Software guided tours through the internet.

Merit Cruiz Through The Internet (DOS & Macintosh)
Access via anonymous FTP nic.merit.edu
Change directory to resources

Big Dummies Guide Through the Internet (Macintosh- Hypercard needed)
Access via anonymous FTP sumex-aim.stanford.edu
Change directory to info-mac

DOS SOFTWARE - anonymous FTP to wuarchive.wustl.edu
cd msdos

anonymous FTP to wuarchive.wustl.edu
cd pub

WINDOWS Software - anonymous FTP to cica.cica.indiana.edu
very busy- may need to try during non work hours

MACINTOSH SOFTWARE - anonymous FTP to sumex-aim.stanford.edu
cd info-mac

anonymous FTP to rascal.ics.utexas.edu
cd mac

UNIX SOFTWARE - GNU Project (Free Software Foundation)
anonymous FTP prep.ai.mit.edu
cd pub/gnu

anonymous FTP to archive.cis.ohio-state.edu
cd pub

IMPORTANT TERMS & DEFINITIONS

IP address = Name or number of a host computer on the Internet which allows users to connect. The IP name gives information about the host (ie. domain). The address number is always represented as four numbers separated by periods (ie. 147.31.254.130). If I wanted to retrieve Macintosh software from the host at Stanford University I would use either the name address or the number address shown below.

user to connect :	(ftp)	sumex-aim.stanford.edu
or :	(ftp)	36.44.0.6

Most Internet users connect to foreign hosts by using the IP name. The Ip name generally tells you the location of the host and it's domain. The last three letters make up the hosts domain. Below are some examples:

convex.com	convex computer company
sumex-aim.stanford.edu	stanford university education
nasa.gov	nasa government facility
af.mil	airforce military facility
nic.near.net	gateway to another network
eff.org	electronic frontier organization

TELNET - With Internet access this command enables the user to connect to other hosts on the network. This will allow the user to connect to bulletin boards, campus wide information systems, libraries, super computers, data bases, and a number of other resources which may be a few miles or thousands of miles away. You would view on-line information in real time. Data from hosts on other continents would get to your terminal in seconds. It is almost as if you were typing commands directly onto the host you are connected to.

For example if I wanted to connect to the education bulletin board system at Lawrence Livermore Lab I would type the following:

:telnet nebbs.nersc.gov

Telnet enabling software for all platforms is available on the Internet.

FTP - file transfer protocol - allows the user to move files from one host to another if the foreign host allows access. These files may be text, high tech graphics, maps, or even sound files. A large number of the hosts on the Internet allow **anonymous** FTP privileges. By using anonymous FTP the user need not have a special password. The anonymous command will allow you to search directories that contain public domain files. Many hosts on the Internet are dedicated to providing

this service. The host sumex-aim.stanford.edu is an example of one. If I wanted to find a file on this host I would perform the following:

command line -	:ftp sumex-aim.stanford.edu
at login prompt type -	*login:* anonymous
at password prompt type -	*password:* guest *or* (your e-mail address)
at ftp prompt	> ls *or* cd

If you know the location of the file(s) you wish to access you can change directories in a command line or you can do an ls (list directory) to determine which of the directories you would like to browse

*FTP commands	get - brings file from foreign host to you
	put - puts your file onto foreign host
	cd (directory name) - change to this directory
	cd .. - go back one directory
	pwd - show present working directory
	mget - retrieves multiple files
	mput - transfers multiple files
	prompt - with multiple file transfers this turns off the query mode so you do not have to respond yes to the transfer of each file
	binary - for the transfer of graphics files

COMPRESSED FILES - often many of the files you wish to download are compressed. You will need a utility to expand these files once you have acquired them. Fortunately there are many public domain compression and expanding software programs available on the Internet. My personal favorite for the Macintosh is "STUFFIT EXPANDER". The uncompress command works for UNIX systems and versions of this are available for DOS. Files with a (.z) or (hqx) are compressed files.

E-MAIL - Electronic mail - Technology is rapidly becoming a very common part of daily life. Many people communicate with one another electronically via e-mail. Sending someone an e-mail message hinges upon the idea that the recipient has an e-mail address. The address can be located on a personal computer, a work station, or large archive server. E-mail addresses associated with the Internet contain the '@' sign. This is generally preceded by your name and followed by the host and its location. For example if you wished to send me an e-mail message you would send it to thiel@nes.nersc.gov. The need to communicate is the basis of networking. Electronic mail sending and receiving is an essential part of Internet exploration.

OTHER USEFUL TOOLS

FINGER - Most systems accommodate the finger command which provides information about each user that is currently logged in. This command also has extensions for use over the Internet. In most cases the user would type the word **"finger"** for a summary of who is logged on to the local system.

TALK - Most systems accommodate the talk command. The Internet provides it's users with the option of having interactive conversations. Once on the Internet the user would need only to type the word "**talk**" followed by the users address. If that user is logged on he or she will receive a message on their screen asking for a chat session. If the person wishes to chat with you they would respond by typing the word "talk" followed by your address.

PING - Most systems accommodate the ping command. Suppose you are unable to connect to a host, the Internet user can use the ping command to see if that host is up and running. The user would just type the word "ping" followed by the IP address of the host.

WHAT IS THE

INTERNET?

Written by: E. Kroll **University of Illinois**
E. Hoffman **Merit Network, Inc**

Acquired via **anonymous FTP** nic.merit.edu
cd documents/fyi/fyi_20.txt

A concise report that defines what the Internet is, how it originated, necessary protocols, how it is maintained, and current concerns.

Network Working Group
Request for Comments: 1462
FYI: 20

E. Krol
University of Illinois
E. Hoffman
Merit Network, Inc.
May 1993

FYI on "What is the Internet?"

Status of this Memo

This memo provides information for the Internet community. It does not specify an Internet standard. Distribution of this memo is unlimited.

Abstract

This FYI RFC answers the question, "What is the Internet?" and is produced by the User Services Working Group of the Internet Engineering Task Force (IETF). Containing a modified chapter from Ed Krol's 1992 book, "The Whole Internet User's Guide and Catalog," the paper covers the Internet's definition, history, administration, protocols, financing, and current issues such as growth, commercialization, and privatization.

Introduction

A commonly asked question is "What is the Internet?" The reason such a question gets asked so often is because there's no agreed upon answer that neatly sums up the Internet. The Internet can be thought about in relation to its common protocols, as a physical collection of routers and circuits, as a set of shared resources, or even as an attitude about interconnecting and intercommunication. Some common definitions given in the past include:

* a network of networks based on the TCP/IP protocols,
* a community of people who use and develop those networks,
* a collection of resources that can be reached from those networks.

Today's Internet is a global resource connecting millions of users that began as an experiment over 20 years ago by the U.S. Department of Defense. While the networks that make up the Internet are based on a standard set of protocols (a mutually agreed upon method of communication between parties), the Internet also has gateways to networks and services that are based on other protocols.

To help answer the question more completely, the rest of this paper contains an updated second chapter from "The Whole Internet User's Guide and Catalog" by Ed Krol (1992) that gives a more thorough explanation. (The excerpt is published through the gracious permission of the publisher, O'Reilly & Associates, Inc.)

The Internet (excerpt from "The Whole Internet User's Guide and Catalog")

The Internet was born about 20 years ago, trying to connect together a U.S. Defense Department network called the ARPAnet and various other radio and satellite networks. The ARPAnet was an experimental network designed to support military research--in particular, research about how to build networks that could withstand partial outages (like bomb attacks) and still function. (Think about this when I describe how the network works; it may give you some insight into the design of the Internet.) In the ARPAnet model, communication always occurs between a source and a destination computer. The network itself is assumed to be unreliable; any portion of the network could disappear at any moment (pick your favorite catastrophe--these days backhoes cutting cables are more of a threat than bombs). It was designed to require the minimum of information from the computer clients. To send a message on the network, a computer only had to put its data in an envelope, called an Internet Protocol (IP) packet, and "address" the packets correctly. The communicating computers--not the network itself--were also given the responsibility to ensure that the communication was accomplished. The philosophy was that every computer on the network could talk, as a peer, with any other computer.

These decisions may sound odd, like the assumption of an "unreliable" network, but history has proven that most of them were reasonably correct. Although the Organization for International Standardization (ISO) was spending years designing the ultimate standard for computer networking, people could not wait. Internet developers in the US, UK and Scandinavia, responding to market pressures, began to put their IP software on every conceivable type of computer. It became the only practical method for computers from different manufacturers to communicate. This was attractive to the government and universities, which didn't have policies saying that all computers must be bought from the same vendor. Everyone bought whichever computer they liked, and expected the computers to work together over the network.

At about the same time as the Internet was coming into being, Ethernet local area networks ("LANs") were developed. This technology matured quietly, until desktop workstations became available around 1983. Most of these workstations came with Berkeley UNIX, which included IP networking software. This created a new demand: rather

than connecting to a single large timesharing computer per site, organizations wanted to connect the ARPAnet to their entire local network. This would allow all the computers on that LAN to access ARPAnet facilities. About the same time, other organizations started building their own networks using the same communications protocols as the ARPAnet: namely, IP and its relatives. It became obvious that if these networks could talk together, users on one network could communicate with those on another; everyone would benefit.

One of the most important of these newer networks was the NSFNET, commissioned by the National Science Foundation (NSF), an agency of the U.S. government. In the late 80's the NSF created five supercomputer centers. Up to this point, the world's fastest computers had only been available to weapons developers and a few researchers from very large corporations. By creating supercomputer centers, the NSF was making these resources available for any scholarly research. Only five centers were created because they were so expensive--so they had to be shared. This created a communications problem: they needed a way to connect their centers together and to allow the clients of these centers to access them. At first, the NSF tried to use the ARPAnet for communications, but this strategy failed because of bureaucracy and staffing problems.

In response, NSF decided to build its own network, based on the ARPAnet's IP technology. It connected the centers with 56,000 bit per second (56k bps) telephone lines. (This is roughly the ability to transfer two full typewritten pages per second. That's slow by modern standards, but was reasonably fast in the mid 80's.) It was obvious, however, that if they tried to connect every university directly to a supercomputing center, they would go broke. You pay for these telephone lines by the mile. One line per campus with a supercomputing center at the hub, like spokes on a bike wheel, adds up to lots of miles of phone lines. Therefore, they decided to create regional networks. In each area of the country, schools would be connected to their nearest neighbor. Each chain was connected to a supercomputer center at one point and the centers were connected together. With this configuration, any computer could eventually communicate with any other by forwarding the conversation through its neighbors.

This solution was successful--and, like any successful solution, a time came when it no longer worked. Sharing supercomputers also allowed the connected sites to share a lot of other things not related to the centers. Suddenly these schools had a world of data and collaborators at their fingertips. The network's traffic increased until, eventually, the computers controlling the network and the telephone lines connecting them were overloaded. In 1987, a contract to manage and upgrade the network was awarded to Merit

Network Inc., which ran Michigan's educational network, in partnership with IBM and MCI. The old network was replaced with faster telephone lines (by a factor of 20), with faster computers to control it.

The process of running out of horsepower and getting bigger engines and better roads continues to this day. Unlike changes to the highway system, however, most of these changes aren't noticed by the people trying to use the Internet to do real work. You won't go to your office, log in to your computer, and find a message saying that the Internet will be inaccessible for the next six months because of improvements. Perhaps even more important: the process of running out of capacity and improving the network has created a technology that's extremely mature and practical. The ideas have been tested; problems have appeared, and problems have been solved.

For our purposes, the most important aspect of the NSF's networking effort is that it allowed everyone to access the network. Up to that point, Internet access had been available only to researchers in computer science, government employees, and government contractors. The NSF promoted universal educational access by funding campus connections only if the campus had a plan to spread the access around. So everyone attending a four year college could become an Internet user.

The demand keeps growing. Now that most four-year colleges are connected, people are trying to get secondary and primary schools connected. People who have graduated from college know what the Internet is good for, and talk their employers into connecting corporations. All this activity points to continued growth, networking problems to solve, evolving technologies, and job security for networkers.

What Makes Up the Internet?

What comprises the Internet is a difficult question; the answer changes over time. Five years ago the answer would have been easy: "All the networks, using the IP protocol, which cooperate to form a seamless network for their collective users." This would include various federal networks, a set of regional networks, campus networks, and some foreign networks.

More recently, some non-IP-based networks saw that the Internet was good. They wanted to provide its services to their clientele. So they developed methods of connecting these "strange" networks (e.g., Bitnet, DECnets, etc.) to the Internet. At first these connections, called "gateways", merely served to transfer electronic mail between the two networks. Some, however, have grown to translate other

services between the networks as well. Are they part of the Internet? Maybe yes and maybe no. It depends on whether, in their hearts, they want to be. If this sounds strange, read on--it gets stranger.

Who Governs the Internet?

In many ways the Internet is like a church: it has its council of elders, every member has an opinion about how things should work, and you can either take part or not. It's your choice. The Internet has no president, chief operating officer, or Pope. The constituent networks may have presidents and CEO's, but that's a different issue; there's no single authority figure for the Internet as a whole.

The ultimate authority for where the Internet is going rests with the Internet Society, or ISOC. ISOC is a voluntary membership organization whose purpose is to promote global information exchange through Internet technology. (If you'd like more information, or if you would like to join, contact information is provided in the "For More Information" section, near the end of this document.) It appoints a council of elders, which has responsibility for the technical management and direction of the Internet.

The council of elders is a group of invited volunteers called the Internet Architecture Board, or the IAB. The IAB meets regularly to "bless" standards and allocate resources, like addresses. The Internet works because there are standard ways for computers and software applications to talk to each other. This allows computers from different vendors to communicate without problems. It's not an IBM-only or Sun-only or Macintosh-only network. The IAB is responsible for these standards; it decides when a standard is necessary, and what the standard should be. When a standard is required, it considers the problem, adopts a standard, and announces it via the network. (You were expecting stone tablets?) The IAB also keeps track of various numbers (and other things) that must remain unique. For example, each computer on the Internet has a unique 32-bit address; no other computer has the same address. How does this address get assigned? The IAB worries about these kinds of problems. It doesn't actually assign the addresses, but it makes the rules about how to assign addresses.

As in a church, everyone has opinions about how things ought to run. Internet users express their opinions through meetings of the Internet Engineering Task Force (IETF). The IETF is another volunteer organization; it meets regularly to discuss operational and near-term technical problems of the Internet. When it considers a problem important enough to merit concern, the IETF sets up a "working group" for further investigation. (In practice, "important enough" usually means that there are enough people to volunteer for the working

group.) Anyone can attend IETF meetings and be on working groups; the important thing is that they work. Working groups have many different functions, ranging from producing documentation, to deciding how networks should cooperate when problems occur, to changing the meaning of the bits in some kind of packet. A working group usually produces a report. Depending on the kind of recommendation, it could just be documentation and made available to anyone wanting it, it could be accepted voluntarily as a good idea which people follow, or it could be sent to the IAB to be declared a standard.

If you go to a church and accept its teachings and philosophy, you are accepted by it, and receive the benefits. If you don't like it, you can leave. The church is still there, and you get none of the benefits. Such is the Internet. If a network accepts the teachings of the Internet, is connected to it, and considers itself part of it, then it is part of the Internet. It will find things it doesn't like and can address those concerns through the IETF. Some concerns may be considered valid and the Internet may change accordingly. Some of the changes may run counter to the religion, and be rejected. If the network does something that causes damage to the Internet, it could be excommunicated until it mends its evil ways.

Who Pays for It?

The old rule for when things are confusing is "follow the money." Well, this won't help you to understand the Internet. No one pays for "it"; there is no Internet, Inc. that collects fees from all Internet networks or users. Instead, everyone pays for their part. The NSF pays for NSFNET. NASA pays for the NASA Science Internet. Networks get together and decide how to connect themselves together and fund these interconnections. A college or corporation pays for their connection to some regional network, which in turn pays a national provider for its access.

What Does This Mean for Me?

The concept that the Internet is not a network, but a collection of networks, means little to the end user. You want to do something useful: run a program, or access some unique data. You shouldn't have to worry about how it's all stuck together. Consider the telephone system--it's an internet, too. Pacific Bell, AT&T, MCI, British Telephony, Telefonos de Mexico, and so on, are all separate corporations that run pieces of the telephone system. They worry about how to make it all work together; all you have to do is dial.

If you ignore cost and commercials, you shouldn't care if you are dealing with MCI, AT&T, or Sprint. Dial the number and it works.

You only care who carries your calls when a problem occurs. If something goes out of service, only one of those companies can fix it. They talk to each other about problems, but each phone carrier is responsible for fixing problems on its own part of the system. The same is true on the Internet. Each network has its own network operations center (NOC). The operation centers talk to each other and know how to resolve problems. Your site has a contract with one of the Internet's constituent networks, and its job is to keep your site happy. So if something goes wrong, they are the ones to gripe at. If it's not their problem, they'll pass it along.

What Does the Future Hold?

Finally, a question I can answer. It's not that I have a crystal ball (if I did I'd spend my time on Wall Street instead of writing a book). Rather, these are the things that the IAB and the IETF discuss at their meetings. Most people don't care about the long discussions; they only want to know how they'll be affected. So, here are highlights of the networking future.

New Standard Protocols

When I was talking about how the Internet started, I mentioned the International Standards Organization (ISO) and their set of protocol standards. Well, they finally finished designing it. Now it is an international standard, typically referred to as the ISO/OSI (Open Systems Interconnect) protocol suite. Many of the Internet's component networks allow use of OSI today. There isn't much demand, yet. The U.S. government has taken a position that government computers should be able to speak these protocols. Many have the software, but few are using it now.

It's really unclear how much demand there will be for OSI, notwithstanding the government backing. Many people feel that the current approach isn't broke, so why fix it? They are just becoming comfortable with what they have, why should they have to learn a new set of commands and terminology just because it is the standard?

Currently there are no real advantages to moving to OSI. It is more complex and less mature than IP, and hence doesn't work as efficiently. OSI does offer hope of some additional features, but it also suffers from some of the same problems which will plague IP as the network gets much bigger and faster. It's clear that some sites will convert to the OSI protocols over the next few years. The question is: how many?

International Connections

The Internet has been an international network for a long time, but it only extended to the United States' allies and overseas military bases. Now, with the less paranoid world environment, the Internet is spreading everywhere. It's currently in over 50 countries, and the number is rapidly increasing. Eastern European countries longing for western scientific ties have wanted to participate for a long time, but were excluded by government regulation. This ban has been relaxed. Third world countries that formerly didn't have the means to participate now view the Internet as a way to raise their education and technology levels.

In Europe, the development of the Internet used to be hampered by national policies mandating OSI protocols, regarding IP as a cultural threat akin to EuroDisney. These policies prevented development of large scale Internet infrastructures except for the Scandinavian countries which embraced the Internet protocols long ago and are already well-connected. In 1989, RIPE (Reseaux IP Europeens) began coordinating the operation of the Internet in Europe and presently about 25% of all hosts connected to the Internet are located in Europe.

At present, the Internet's international expansion is hampered by the lack of a good supporting infrastructure, namely a decent telephone system. In both Eastern Europe and the third world, a state-of-the-art phone system is nonexistent. Even in major cities, connections are limited to the speeds available to the average home anywhere in the U.S., 9600 bits/second. Typically, even if one of these countries is "on the Internet," only a few sites are accessible. Usually, this is the major technical university for that country. However, as phone systems improve, you can expect this to change too; more and more, you'll see smaller sites (even individual home systems) connecting to the Internet.

Commercialization

Many big corporations have been on the Internet for years. For the most part, their participation has been limited to their research and engineering departments. The same corporations used some other network (usually a private network) for their business communications. After all, this IP stuff was only an academic toy. The IBM mainframes that handled their commercial data processing did the "real" networking using a protocol suite called System Network Architecture (SNA).

Businesses are now discovering that running multiple networks is expensive. Some are beginning to look to the Internet for "one-stop"

network shopping. They were scared away in the past by policies which excluded or restricted commercial use. Many of these policies are under review and will change. As these restrictions drop, commercial use of the Internet will become progressively more common.

This should be especially good for small businesses. Motorola or Standard Oil can afford to run nationwide networks connecting their sites, but Ace Custom Software couldn't. If Ace has a San Jose office and a Washington office, all it needs is an Internet connection on each end. For all practical purposes, they have a nationwide corporate network, just like the big boys.

Privatization

Right behind commercialization comes privatization. For years, the networking community has wanted the telephone companies and other for-profit ventures to provide "off the shelf" IP connections. That is, just like you can place an order for a telephone jack in your house for your telephone, you could do this for an Internet connection. You order, the telephone installer leaves, and you plug your computer into the Internet. Except for Bolt, Beranek and Newman, the company that ran the ARPAnet, there weren't any takers. The telephone companies have historically said, "We'll sell you phone lines, and you can do whatever you like with them." By default, the Federal government stayed in the networking business.

Now that large corporations have become interested in the Internet, the phone companies have started to change their attitude. Now they and other profit-oriented network purveyors complain that the government ought to get out of the network business. After all, who best can provide network services but the "phone companies"? They've got the ear of a lot of political people, to whom it appears to be a reasonable thing. If you talk to phone company personnel, many of them still don't really understand what the Internet is about. They ain't got religion, but they are studying the Bible furiously. (Apologies to those telephone company employees who saw the light years ago and have been trying to drag their employers into church.)

Although most people in the networking community think that privatization is a good idea, there are some obstacles in the way. Most revolve around the funding for the connections that are already in place. Many schools are connected because the government pays part of the bill. If they had to pay their own way, some schools would probably decide to spend their money elsewhere. Major research institutions would certainly stay on the net; but some smaller colleges might not, and the costs would probably be prohibitive for most secondary schools (let alone grade schools). What if the school could afford either an Internet connection or a science lab? It's

unclear which one would get funded. The Internet has not yet become a "necessity" in many people's minds. When it does, expect privatization to come quickly.

Well, enough questions about the history of the information highway system. It's time to walk to the edge of the road, try and hitch a ride, and be on your way.

Acknowledgments

We would like to thank O'Reilly & Associates for permission to reprint the chapter from their book by Ed Krol (1992), "The Whole Internet User's Guide and Catalog."

For More Information

Hoffman, E. and L. Jackson. (1993) "FYI on Introducing the Internet --A Short Bibliography of Introductory Internetworking Readings for the Network Novice," 4 p. (FYI 19, RFC 1463).

To find out how to obtain this document and other on-line introductory readings, send an e-mail message to: nis-info@nis.merit.edu, with the following text: send access.guide.

Krol, Ed. (1992) The Whole Internet User's Guide and Catalog, O'Reilly & Associates, Sebastopol, CA. ISBN 1-56592-025-2.

Quarterman, J. (1993) "Recent Internet Books," 15 p. (RFC 1432).

The Internet Society
Phone: (703) 620-8990
Fax: (703) 620-0913
E-mail: isoc@cnri.reston.va.us

Security Considerations

Security issues are not discussed in this memo.

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INTERNET

SERVICES

Written By: Scott Yanoff

Acquired via anonymous ftp csd4.csd.uwm.edu
cd pub

This is an easy reference list to many of the Internet services. A very enjoyable way of learning what is available on the Internet is to pick a service and begin browsing. When time allowed it I would connect to a service of interest and explore directories, files, bulletin boards, and whatever was accessible. There was always something of value to be found. Some of my most prized Internet possessions came from searches like these.

From: yanoff@csd4.csd.uwm.edu (Scott A. Yanoff)
Newsgroups: alt.internet.services, comp.misc, biz.comp.services, alt.bbs.internet, news.answers
Subject: Updated Internet Services List
Organization: University of Wisconsin - Milwaukee, WI
Archive-name: internet-services

* SPECIAL INTERNET CONNECTIONS: Last Update: 2/11/93 *
* Compiled By: Scott Yanoff - yanoff@csd4.csd.uwm.edu *
* A + by an entry designates new entries/changes to the list since last update *

* Finger yanoff@csd4.csd.uwm.edu to find ways to receive this list!

-Agricultural Info., Family Issues, Food & Nutrition, and Environment
telnet psupen.psu.edu or telnet 128.118.36.5
PENpages (Login: PNOTPA)
telnet caticsuf.csufresno.edu or telnet 129.8.100.15
CSU Freso ATI-NET (Login: super)
telnet eureka.clemson.edu or telnet 130.127.8.3
CUFAN (Clemson U Forestry & Ag. Net.) (Login: PUBLIC)
ftp ftp.sura.net (get file pub/nic/agricultural.list, it contains agricultural email lists & services.)
offers: Agricultural info (livestock reports, current market prices, etc.)

-Almanac mail servers
mail almanac@esusda.gov
mail almanac@ces.ncsu.edu
mail almanac@oes.orst.edu
mail almanac@ecn.purdue.edu
mail almanac@silo.ucdavis.edu
offers: USDA market news, articles about the use of computer in agricultural science, and Extension Computing Technology Newsletters.
In body of letter: send guide Other commands: send catalog

-Am. Philos. Assoc.
telnet atl.calstate.edu or telnet 130.150.102.33
offers: BBS for APA. (Login: apa)

-Amateur Radio
mail info@arrl.org
offers: Ascii files about Amateur Radio and electronics.
Body of letter: help, info, send <filename> or quit (ie send prospect)

-Archie
telnet archie.funet.fi or 128.214.6.100 (Finland/Eur.)
telnet archie.au or 139.130.4.6 (Aussie/NZ)
telnet archie.cs.huji.ac.il or 132.65.6.5 (Israel)
telnet archie.doc.ic.ac.uk or 146.169.11.3 (UK/Ireland)
telnet archie.sura.net or 128.167.254.179 (USA [MD])
telnet archie.unl.edu or 129.93.1.14 (USA [NE])
telnet archie.ans.net or 147.225.1.2 (USA [NY])
telnet archie.rutgers.edu or 128.6.18.15 (USA [NJ])
telnet archie.kuis.kyoto-u.ac.jp or 130.54.20.1 (JAPAN)
telnet archie.nz or 130.195.9.4 (New Zealand)
telnet archie.th-darmstadt.de or 130.83.128.111 (GER.)
telnet archie.ncu.edu.tw or telnet 140.115.19.24 (TWN)
offers: Searches all ftp sites for any program you want. (Login: archie)

-Archie Mail Servers
mail archie@<INSERT ONE OF ABOVE ADDRESSES HERE>
Subject: help Offers: alterative Archie access to those w/o ftp or telnet.

-Auroral Activity
finger aurora@xi.uleth.ca or finger aurora@142.66.3.29
offers: Auroral activity warnings/watches/sightings, updated hourly.

-Baseball Scores
finger jtchern@ocf.berkeley.edu for scores/standings OR
mail jtchern@ocf.berkeley.edu w/Subject: MLB
offers: The latter will subscribe you to receive Major League scores daily!

-Backgammon Servers
telnet ouzo.rog.rwth-aachen.de 4321 /134.130.130.46 4321
telnet solana.mps.ohio-state.edu 3200 or 128.146.37.78
offers: Play Backgammon! (Login: guest)

-Billboard Charts finger buckmr@aix.rpi.edu
offers: U.S. Top Pop singles for the week.

-CancerNet mail cancernet@icicb.nci.nih.gov
offers: Cancer info. statements thru email. Body-of-letter: help or spanish

-CARL telnet pac.carl.org or 192.54.81.128
offers: Online database, book reviews, magazine fax delivery service.

-CHAT telnet debra.dgbt.doc.ca or telnet 142.92.36.15
offers: Interactive AIDS & Epilepsy docs, simulated conversation(Login: chat)

-Chess Server telnet valkyries.andrew.cmu.edu 5000 or 128.2.232.4 5000
offers: Play/watch real-time chess with human opponents. Type 'help' for help

-Dante Project telnet library.dartmouth.edu or 129.170.16.11
offers: Divine Comedy and reviews. (Login: connect dante)

-Diplomacy mail judge@morrolan.eff.org or mail judge@gu.uwa.edu.au
mail judge@shrike.und.ac.za or judge@u.washington.edu
offers: Play the game Diplomacy by Email. Body-of-letter: help
Note: No new games are forming on the u.washington Judge, but substitute players are still needed.

offers: Play the SSI game Diplomacy via email. Body-of-letter: help

-DUATS telnet duat.gtefsd.com or telnet 131.131.7.105
telnet duats.gtefsd.com or telnet 131.131.7.106
offers: Aviation weather, flight planning. (Login: <last name>)
The first address is for certified pilots, the second for uncertified.

-Earthquake Info. finger quake@geophys.washington.edu or 128.95.16.50
offers: Recent quake info (location, time, magnitude, etc.)

-E-Math telnet e-math.ams.com or 130.44.1.100
offers: Am. Math. Soc. bbs w/ software and reviews. (Login/Password: e-math)

-Educational Tech. Net telnet etnet.nlm.nih.gov or telnet 130.14.10.123
offers: Forums and discussion groups on medical tech. and edu. (Login: etnet)

-FaxGate mail FaxGate@elvis.sovusa.com
offers: Send a Fax via computer. In body-of-message: help

-FDA BBS telnet fdabbs.fda.gov or telnet 150.148.8.48
offers: FDA bbs (News releases, Aids info, consumer info...) (Login: bbs)

-FEDIX telnet fedix.fie.com or telnet 192.111.228.33
offers: info. on scholarships, minority assistance, etc. (login: fedix)

+Fileserver via Email mail jal@uiuc.edu
offers: Humor, ASCII, etc. At begining of line in message: Filesend: help

+4M Chat Client ftp ftp.santafe.edu
FTP and then compile the chat prorgam from this site. (cd pub/misc)

-Freenet telnet freenet-in-[a,b,c].cwru.edu or 129.22.8.38
telnet yfn.ysu.edu or 192.55.234.27 (Login: visitor)
offers: USA Today Headline News, Sports, etc...

-FTP Mail mail ftpmail@decwrl.dec.com
Subject:(hit return) Body-of-letter: help (return) quit Offers:ftp via email

-FTP Mail mail bitftp@pucc.princeton.edu
Body-of-letter: help or ftplist for a list of anon. ftp sites.

-FTP Sites/Archives ftp ocf.berkeley.edu or ftp 128.32.184.254
offers: Docs, 5 puritytests, the Bible, Dec. of Ind, lyrics..cd /pub/Library
ftp wuarchive.wustl.edu or sunset.cse.nau.edu or
offers: Gif archive, pc software. plaza.aarnet.edu.au or erratic.bradley.edu
ftp ftp.uu.net
offers: You name it, it's here!
ftp archive.umich.edu or sumex-aim.stanford.edu
offers: Software for MS-Dos computers, Mac, Amiga, Apple2, Apollo...
ftp oak.oakland.edu
offers: A huge software archive for PCs and UNIX.
ftp ftp.sura.net
offers: How-to's about internet (how to email, ftp, telnet, etc.) in /pub/nic
ftp deja-vu.aiss.uiuc.edu
offers: All the humor files you could want (tv, sex..) cd misc/fun/humor

-Genetics Bank mail gene-server@bchs.uh.edu
mail retrieve@ncbi.nlm.nih.gov
mail blast@ncbi.nlm.nih.gov
Subject: help Offers: genetic database/nucleic acid/protein sequence.

-Geographic Server telnet martini.eecs.umich.edu 3000 or 141.212.99.9 3000
offers: Info by city or area code (Population, Lat./Long., Elevation, etc).

-Global Land Info Sys. telnet glis.cr.usgs.gov or telnet 152.61.192.54
offers: Land use maps of U.S., graphs/data of geological info.(Login: guest)

-GO Server icsib18.icsi.Berkeley.EDU 6969 or 128.32.201.46 6969
telnet cnam.cnam.fr 6969 or telnet 192.33.159.6 6969
offers: Join others and play a game of GO. (Login/Password: choose your own)

-Gopher telnet consultant.micro.umn.edu or telnet 134.84.132.4
telnet panda.uiowa.edu or telnet 128.255.40.201
telnet gdunix.gd.chalmers.se or 129.16.221.40 (SWEDISH)
telnet gopher.uiuc.edu or telnet 128.174.33.160
telnet tolten.puc.cl or telnet 146.155.1.16 (CHILE)
telnet wsuaix.csc.wsu.edu or 134.121.1.40(Logn: wsuinfo)
telnet gopher.ora.com or telnet 140.186.65.25
telnet gopher.th-darmstadt.de or telnet 130.83.55.75
telnet nstn.ns.ca or 137.186.128.11 (login: fred)
telnet siam.mi.cnr.it or telnet 155.253.1.40
telnet info.anu.edu.au or telnet 150.203.84.20
telnet fatty.law.cornell.edu or telnet 132.236.108.5
telnet ecnet.ec or telnet 157.100.45.2
telnet finfo.tu-graz.ac.at or 129.27.2.4 (Login: info)
telnet gopher.isnet.is or telnet 130.208.165.63
telnet sunic.sunet.se or telnet 192.36.125.2
telnet info.brad.ac.uk or 143.53.2.5 (login: info)
telnet gopher.virginia.edu or 128.143.22.36 (logn: gwis)
telnet grits.valdosta.peachnet.edu or 131.144.8.206
telnet gopher.ycc.yale.edu or telnet 130.132.21.250
Offers: access to other services, gophers, documents, etc. (Login: gopher)

-Guitar Chords/TAB ftp ftp.nevada.edu or ftp 131.216.1.11
offers: Tablature/Chords for guitar in /pub/guitar.

-Ham Radio Callbooks telnet callsign.cs.buffalo.edu 2000 or 128.205.32.2 2000
telnet ham.njit.edu 2000 or telnet 128.235.1.10 2000
offers: National ham radio call-sign callbook.

-Handicap/Medical Site ftp handicap.shel.isc-br.com or ftp 129.189.4.184
offers: anonymous ftp of software and medical info.

-HP Calculator BBS telnet hpcvbbs.cv.hp.com or telnet 15.255.72.16
offers: BBS for HP Calc. users, with chat mode. (Login: new)

-Hpcwire telnet hpcwire.ans.net or telnet 147.225.1.51

offers: Excellent menu-driven information searches. (Login: hpcwire)

-Hytelnet Server telnet access.usask.ca or telnet 128.233.3.1
telnet info.anu.edu.au or telnet 150.203.84.20
offers: univ. & library catalogues around the world. (Login: hytelnet)

-INFO - Rutgers CWIS telnet info.rutgers.edu or telnet 128.6.26.25
offers: (Dictionary, Thesurus, Quotations Database) Recommend select LIBRARY

-Info/Software Server telnet rusinfo.rus.uni-stuttgart.de or 129.69.1.12
offers: journals, unix stuff, recipes, online cookbook, etc. login: info

-Internet Resrce Guide ftp nnsc.nsf.net
offers: compressed/tar'd list of net resources in /resource-guide.txt.tar.Z

-Iowa Politcl. Stk Mkt telnet ipsm.biz.uiowa.edu or 128.255.44.2
offers: Buy & sell shares in political candidates. (Non profit research proj.)

-IP Address Resolver mail resolve@cs.widener.edu
mail dns@grasp.insa-lyon.fr (body of letter: help)
usage: in body-of-letter: site <address here> Mails you IP address of site.

-IRC Telnet Client telnet bradenville.andrew.cmu.edu or telnet 128.2.54.2
telnet ircclient.itc.univie.ac.at 6668 or 131.130.39.10
+telnet irc.ibmpcug.co.uk 9999 or 192.68.174.240 9999
offers: Internet Relay Chat access, like a CB on the computer.

-ISAAC telnet isaac.engr.washington.edu or 128.95.32.61
offers: Info. System for Advanced Academic Computing, for IBM users.

-Law Library telnet liberty.uc.wlu.edu or telnet 137.113.10.35
ftp sulaw.law.su.oz.au (cd /pub/law)
offers: Law libraries and legal research. (Login: lawlib)
Offers copies of laws for each state, computer laws, and more!

-LawNet telnet sparc-1.law.columbia.edu or telnet 128.59.176.78
offers: Law/Judicial info and catalogs access. (Login: lawnet)

-Library Catalogs ftp dla.ucop.edu (pub/internet/libcat-guide)
offers: "Library Catalogs on the Internet: Strategies for Selection
and Use" document (how, but not where; also get one of the following).
ftp ftp.unt.edu (library/libraries.txt)
offers: "Accessing Bibliographic Databases" document.
ftp ariel.unm.edu (library/internet.library)
offers: "Internet-Accessible Catalogs and Databases" document.

-Library of Congress telnet dra.com or 192.65.218.43
offers: COPY of Library of Congress (Assumes terminal is emulating a vt100).

-LIBS telnet nessie.cc.wwu.edu or telnet 140.160.240.11
telnet info.anu.edu.au or telnet 150.203.84.20
offers: Access to nearly all online services seen in this list.(Login: LIBS)

-List of Lists ftp ftp.nisc.sri.com or ftp 192.33.33.22
mail mlol-request@wariat.org (music list of lists)
offers: List of interest groups/email lists in /netinfo/interest-groups.

-Lunar/Planet. Instit. telnet lpi.jsc.nasa.gov or telnet 192.101.147.11
offers: Resources on Geology, Geophys, Astron., Astrophys. (Login: lpi)

-Lyric/Music Server ftp ftp.uwp.edu or ftp ftp.iastate.edu (in /pub/lyrics)
offers: Lyrics, chords/tablature, and music pictures. (/pub/music/...)

-Mail Srver/Usr Lookup mail mail-server@pit-manager.mit.edu
in body of mail message: send usenet-addresses/[name searching for]

-MicroMUSE telnet michael.ai.mit.edu or telnet 18.43.0.177
offers: Educational Multi-User Simulated Environment. (Login: guest).

-MOLIS telnet fedix.fie.com or telnet 192.111.228.33
offers: Minority Online Information Service. (Login: molis)

-Monochrome telnet 138.40.11.1 or telnet 138.40.21.1 or
telnet 138.40.31.1 or telnet 138.40.41.1
offers: Multi-user messaging system (w/ chat & MUDs) (Login/Password: mono)

-Music Newsletter mail listserv@vm.marist.edu (internet) or
mail listserv@marist (bitnet)
Body-of-letter: SUBSCRIBE UPNEWS <your full name> Offers: Reviews, intviews.

-NASA Headline News finger nasanews@space.mit.edu
offers: Daily press releases from NASA.

-NASA SpaceLink telnet spacelink.msfc.nasa.gov or 192.149.89.61
offers: Latest NASA news, including shuttle launches and satellite updates.

-Nat'l Education BBS telnet nebbs.nersc.gov or telnet 128.55.160.162
offers: A limited-access system for NESP educators. (Login: guest)

-NED telnet ned.ipac.caltech.edu or telnet 134.4.10.118
offers: NASA Extragalactic Database. (Login: ned)

-Netfind User Lookup telnet bruno.cs.colorado.edu or telnet 128.138.243.151
telnet archie.au or telnet 139.130.4.6
telnet malloco.ing.puc.cl or telnet 146.155.1.43
telnet monolith.cc.ic.ac.uk or telnet 155.198.5.3
telnet mudhoney.micro.umn.edu or telnet 134.84.132.7
telnet netfind.oc.com or telnet 192.82.215.92
telnet redmont.cis.uab.edu or telnet 138.26.64.4
telnet sun.uakom.cs or telnet 192.108.131.11
offers: Given a name and org./school, finds a user for you (login: netfind)

-NetLib mail netlib@ornl.gov
mail netlib@uunet.uu.net
Subject:(hit return) Body-of-letter: send index Offers: Software thru email

-News Mail Servers mail [newsgroup]@cs.utexas.edu
offers: Post to Usenet news via email. (eg. [newsgroup] = alt-bbs)

-Newton telnet newton.dep.anl.gov or telnet 130.202.92.50
offers: Gov't BBS for those teaching or studying science, CS, math.

-NICOL telnet nisc.jvnc.net or telnet 128.121.50.7
offers: Access to internet resources, Elec. Publishing Service (Login: nicol)

-NICOLAS telnet dftnic.gsfc.nasa.gov or telnet 128.183.10.3
offers: Network Info. Center On-Line Aid System (Login: dftnic)

-NNTP News Servers telnet sol.ctr.columbia.edu 119 or 128.59.64.40 119
telnet rusmv1.rus.uni-stuttgart.de 119 or 129.69.1.12
telnet news.fu-berlin.de 119 or 130.133.4.250 119
offers: Telnetable access to post to the Usenet news.

-NOAA telnet nodc.nodc.noaa.gov or telnet 140.90.235.10
offers: Nat'l Oceanic and Atmos. Admin. Lots of data! (Login: NOAADIR)

-NODIS telnet nssdc.gsfc.nasa.gov or telnet 128.183.36.25
telnet nssdca.gsfc.nasa.gov or telnet 128.183.36.23
offers: Menu-driven access to Nat'l Space Science Data Center (Login: nodis)

-NONA telnet nsinic.gsfc.nasa.gov or telnet 128.183.112.71
offers: Nasa Science Internet Online Network Aid. (Login: nsinic)

-Nuclear Data Center telnet bnlnd2.dne.bnl.gov or telnet 130.199.112.132
  offers: National nuclear data. (Login: nndc)

-Oceanic Info. Center telnet delocn.udel.edu or telnet 128.175.24.1
  (Login: info)

-Oracle mail oracle@cs.indiana.edu w/ subject: help
  offers: The Usenet Oracle answers all your questions!

-OSS-IS ftp soaf1.ssa.gov
  mail info@soaf1.ssa.gov with "send index" as your msg.
  offers: Many FAQ's, ftp lists, library and service lists, gov't documents.

-PaperGate mail PaperGate@elvis.sovusa.com
  offers: Send a letter via computer. In body-of-message: help

-Public-Access Unix telnet nyx.cs.du.edu or 130.253.192.68
  offers: Free account, with access to various UNIX features. (login: new)

-Public-Access Unix telnet hermes.merit.edu or telnet 35.1.48.150
  telnet m-net.ann-arbor.mi.us or telnet 35.208.17.4
  (Which host: um-m-net Enter 'g' for guest. login: newuser)

-Queer Resource Dir. ftp nifty.andrew.cmu.edu
  offers: AIDS info/gay rights info. Recommen get file: README (cd pub/QRD)

-QUERRI telnet isn.rdns.iastate.edu or telnet 129.186.99.13
  offers: Questions on Univ. Extension. Regional Research Info (Login: querri)

-Recipe Archives ftp gatekeeper.dec.com (cd pub/recipes)
  ftp mthvax.cs.miami.edu (cd pub/recipes)
  offers: Anonymous ftp site for MANY food recipes.

-SDDAS telnet espsun.space.swri.edu 540 or 129.162.150.99 540
  offers: SW Research Data Display & Analysis Center.

-SERVICES telnet wugate.wustl.edu or 128.252.120.1
  offers: Access to nearly every listed service! (Login: services)

-Sid's Music Server mail mwilkenf@silver.ucs.indiana.edu
  Subject: BOOTHELP Offers: Lists of rare live recordings, cd's for sale.

-Software Server (ASK) telnet askhp.ask.uni-karlsruhe.de or 192.67.194.33
  offers: On-line software search. (Login/password: ask)

-SpaceMet telnet spacemet.phast.umass.edu or 128.119.50.48
  offers: Science/space bbs about space exploration w/ info from NASA.

-Sports Schedules NBA: telnet culine.colorado.edu 859 / 128.138.129.83 859
  NHL: telnet culine.colorado.edu 860 / 128.138.129.83 860
  MLB: telnet culine.colorado.edu 862 / 128.138.129.83 862
  NFL: telnet culine.colorado.edu 863 / 128.138.129.83 863
  offers: Sports schedules on-line. help for help, return for today's games.

-StatLib Server mail statlib@lib.stat.cmu.edu
  Mail with line: send index. Offers: Prgms, Datasets, etc. for statisticians.

-STIS telnet stis.nsf.gov or 128.150.195.40
  offers: Science & Technology Information System. (Login: public)

-Stock Market Report telnet a2i.rahul.net or telnet 192.160.13.1
  offers: Public access unix for a fee, market report is free! (Login: guest)

-Supreme Court Rulings ftp ftp.cwru.edu
  offers: ASCII files of Supreme Court rulings in directory /hermes

+Trade Wars telnet nelsons.cern.ch 2002 or 128.141.8.248 2002
offers: Play the online multiplayer game on Trade Wars World BBS.

-Tropicl Strm Forecast finger forecast@typhoon.atmos.colostate.edu
offers: Seasonal forecast for Atl. Ocn. Also: finger forecast@129.82.107.24

-UMD Info Database telnet info.umd.edu or telnet 128.8.10.29
offers: Info. docs on many subjects, incl. Supr. Crt Decisions (Login: info)

-Used Music Server mail Used-Music-Server@cs.ucsb.edu w/ subject: help
offers: Users can buy/sell/trade CDs/LPs/Tapes or subscribe to the list.

-UNC BBS telnet launchpad.unc.edu or telnet 152.2.22.80
offers: Access to Library of Congress & nationwide libs (Login: launchpad)

-WAIStation telnet quake.think.com or telnet 192.31.181.1
telnet nnsc.nsf.net or telnet 128.89.1.178
telnet wais.funet.fi or telnet 128.214.6.100
telnet sunsite.unc.edu or telnet 152.2.22.81
telnet SWAIS.CWIS.UCI.EDU or 128.200.15.2
offers: Wide Area Info. Service. (Login: wais or swais)

-Weather Service telnet downwind.sprl.umich.edu 3000 or 141.212.196.177
offers: City/State forecasts, ski conditions, earthquake reports, etc.

-Weather Maps ftp vmd.cso.uiuc.edu
offers: Surface analysis & current infrared weather maps GIFs. (cd wx)

-Webster telnet cs.indiana.edu 2627 or 129.79.254.191 2627
offers: Dictionary/Spelling service. Type "HELP" for info. (ALL CAPS!)

-Whois Service List ftp sipb.mit.edu (pub/whois/whois-servers.list)
offers: List of "whois" servers.

-Whois Services telnet nic.ddn.mil or telnet 192.112.36.5
mail service@nic.ddn.mil (w/ subject: help)
telnet regulus.cs.bucknell.edu 185 (Knowbot Info Serv.)
offers: Way to find internet address given a keyword. To access type: whois

-World-Wide Web telnet info.cern.ch or telnet 128.141.201.74 (SWISS)
telnet eies2.njit.edu or telnet 128.235.1.43 (USA [NJ])
telnet vms.huji.ac.il or telnet 128.139.4.3 (ISRAEL)
telnet info.funet.fi or telnet 128.214.6.100 (FINLAND)
telnet FATTY.LAW.CORNELL.EDU or telnet 132.236.108.5
offers: Access to various documents, lists, and services. (Login: www)

-ZIB Electronic Libr. telnet elib.zib-berlin.de or telnet 130.73.108.11
offers: Library of software, links to other libraries. (Login: elib)

* NOTE: NO LOGIN NAMES OR PASSWORDS ARE REQUIRED UNLESS STATED OTHERWISE! *
NOTE: FOR FTP SITES, LOGIN AS anonymous, Password is your email address.

--

Milwaukee, WI - A Great Place by a Great Lake
Computing Services Division - MAINFRAME CONSULTING
yanoff@csd4.csd.uwm.edu

INTERNET

TOOLS

Written By: John December

Acquired via anonymous ftp ftp.rpi.edu
cd pub/communications

This is an excellent summary of the various Internet tools. I used this as a **reference** guide to the basic roles of each of the different Internet tools. For each tool there is a compact list of what the tool does, instructions for trying out the tool, a source for further documentation, and what is needed to utilize the tool.

Internet Tools Summary

==========

Created/copyright John December(decemj@rpi.edu) Release 1.19; 24 Jul 93
Comments welcome. This document's updates are available via
anonymous ftp host: ftp.rpi.edu, file: pub/communications/internet-tools

---

PURPOSE: to compactly summarize tools available on the Internet that are used for network information retrieval (NIR), Computer-Mediated Communication (CMC), or other services. This is not meant to be a strict categorization, rather more of a catalog. In other words, some of these tools accomplish similar functions.

AUDIENCE: those involved in using NIR or CMC tools and services and beginners who want a compact list of what is available.

ASSUMPTIONS: the reader knows the basics of anonymous ftp, telnet, how to navigate on on-line menu; the information is oriented to UNIX or similar O/S.

ENTRY FORMAT: Each tool entry in this list corresponds to the format:

*Tool Name
Sum: A one-line description of what this tool does
Act: A representation of the action of this tool using my notation
Demo: (UNIX) instructions for trying out tool
Doc: source of further documentation; (aftp = anonymous ftp)host:file
Runs: network protocol, platform, or operating system, required/supported

MY NOTATION: In order to summarize the action of these network tools, I've developed a notation to express the essential information/communication action of each of the tools.

NOUNS
F File(s)
H Host/computer
I Interface
G Graphical User Interface
L List
M Message(s)
R Receiver
S Server
U User/sender

VERBS
:= has read access only
== has read and write access
:: interacts with user interface (synchronous)
(()) sound in interface
* video interface
<- copys (over network) from
<-> copys (over network) to and from
<+ linked from
<= created by
[] contains
() consists of

CONJUNCTIONS
; and

NOUN PHRASES
S[F] Server containing file(s)
M(L) Message consisting of a List
S[U] Server containing users(s) = other users using this server
H[U] Host containing users(s) = other users logged into this host

NOTATION EXAMPLES:
File Transfer Protocol: U == F <- H[F]
Narration: The user gets read/write access to a copy of a file that was copied over the network from a

host containing that file.

Electronic mail: R == M <- H[M <= U]
Narration: The Receiver gets read/write access to a copy of the Message that was copied over the network from an (originating) Host on which resides the original Message created by the User (Sender).

WORKS CITED: indicated by [n] in text, listed in Sources Cited section at end of this document.

=-NIR Tools

==========

-- These are described extensively in [2], and in [1] and [3].

*Alex
Sum: provides transparent read of remote files at anonymous FTP sites
Act: U := F <- S[F]
Demo: See [2]
Doc: aftp alex.sp.cs.cmu.edu:doc/README
Runs: UNIX machine and FTP

*Archie
Sum: locates files at anonymous FTP sites by filename search
Act: U := M(L <= S[F])
Demo: telnet archie.ans.net; login as 'archie'
Doc: aftp archie.ans.net:pub/archie/doc/README
Runs: TCP/IP, Prospero implementation based on UDP

*Astra
Sum: retrieve documents from databases known by ASTRA.
Act: U == M2 <- S[F] <- M1 <= U
Demo: mail ASTRADB@ICNUCEVM.BITNET; Message body: "help"
Doc: mail ASTRADB@ICNUCEVM.BITNET; Message body: "GET META DOCUMENT"
Runs:

*Biomix
Sum: presents network resources as locations on screen maps
Act:
Demo:
Doc: aftp mailbase.ac.uk:pub/unite/biomix.txt
Runs:

*Cello
Sum: DOS-based Internet browser incorporating WWW, Gopher, FTP, Telnet, News.
Act:
Demo:
Doc: aftp fatty.law.cornell.edu:pub/LII/Cello/readme.1st
Runs: DOS

*Compass
Sum: system for Internet access to resources and tools for CERFnet subscribers
Act:
Demo:
Doc: aftp mailbase.ac.uk:pub/unite/compass.txt
Runs:

*Essence
Sum: resource discovery system using indexes
Act:
Demo:
Doc: aftp ftp.cs.colorado.edu:pub/cs/distribs/essence/README
Runs:

*Gopher

```
 Sum:  locates and retrieves resources using a graph of menus
 Act:  U :: I(L <= S[F]); U := M <- S[F]
 Demo: telnet consultant.micro.umn.edu; login as 'gopher'
 Doc:  aftp boombox.micro.umn.edu:pub/gopher/00README
 Runs: TCP/IP

*Hytelnet
 Sum:  gives Internet access info by hypertext terminate-stay-resident browser
 Act:  U :: I(L)
 Demo: telnet access.usask.ca; login as 'hytelnet'
 Doc:  aftp access.usask.ca:pub/hytelnet/README
 Runs: DOS

*Jughead
 Sum:  gets menu information from various gopher servers
 Act:  ?
 Demo: none ?
 Doc:  aftp ftp.cc.utah.edu:pub/gopher/GopherTools/jughead/jughead.ReadMe
 Runs:

*Mosaic for X
 Sum:  provides network distributed hypermedia system for information discovery
 Act:  U :*(()): G(L <= S[F]..S[F]); U := M <- S[F]; U :: I(L <= S[F]);
 Demo: get binaries aftp ftp.ncsa.uiuc.edu:/Mosaic/xmosaic-binaries/
 Doc:  aftp ftp.ncsa.uiuc.edu:/Mosaic/mosaic-papers/getting-started.ps.Z
 Runs: TCP/IP

*Netfind
 Sum:  searches for info about people on Internet by name and org/location
 Act:  U :: I(L <= S[F])
 Demo: telnet bruno.cs.colorado.edu; login as 'netfind'
 Doc:  aftp ftp.cs.colorado.edu:pub/cs/distribs/netfind/README
 Runs: TCP/IP

*Netserv
 Sum:  a server for access to data files and programs of general interest
 Act:  U == M2 <- S[F] <- M1 <= U
 Demo: mail netserv@frmop11.bitnet; Message body: "get netserv helpfile"
 Doc:  mail netserv@frmop11.bitnet; Message body: "get netserv helpfile"
 Runs:

*Prospero
 Sum:  provides user-centered view of remote files
 Act:  U := F <+ S[F]
 Demo: See [2]
 Doc:  aftp prospero.isi.edu:pub/prospero/doc/README-prospero-documents
 Runs: Prospero message delivery later based on UDP

*Veronica
 Sum:  locates titles of Gopher items by keyword search
 Act:  U :: I(L <= S[F]); U := M <- S[F]
 Demo: telnet consultant.micro.umn.edu; login 'gopher'; choose 'Other..'
 Doc:  aftp veronica.scs.unr.edu:veronica/veronica-faq
 Runs: TCP/IP

*WAIS
 Sum:  retrieves resources by searching indexes of databases
 Act:  U :: I(L <= S[F]); U := M <- S[F]
 Demo: telnet quake.think.com; login 'wais'
 Doc:  aftp think.com:wais/README
 Runs: TCP/IP, product versions on X.25

*WHOIS
 Sum:  provides info on registered network names
 Act:  U := M <= S[F]
 Demo: telnet rs.internic.net
```

```
 Doc:  aftp gopher.ucdavis.edu:pub/IETF/WNILS/Discussion.Paper
 Runs: TCP/IP

*WWW
 Sum:  retrieves resources by hyptertext browser of databases
 Act:  U :: I(L <= S[F]); U := M <- S[F]
 Demo: telnet info.cern.ch
 Doc:  aftp info.cern.ch:pub/www/doc/
 Runs: TCP/IP

*X.500
 Sum:  provides globally distributed directory service
 Act:  U :: I(L <= S[F])
 Demo: telnet  128.86.8.56; login as 'dua'
 Doc:  aftp nic.merit.edu:documents/rfc/rfc1308.txt
 Runs: ISO down to TCP/IP (transport), others see [2]

------------------------------------------------------------------------
=-CMC Forums
========================================================================
*IRC
 Sum:  real-time discussion divided into channels
 Act:  U :: I(M <-> S[R])
 Demo: telnet 140.117.11.1; login 'irc'
 Doc:  aftp cs.bu.edu:irc/support/tutorial.*
 Runs:

*LISTSERV
 Sum:  retrieve messages from server via electronic mail
 Act:  U == M2 <- S[F] <- M1 <= U
 Demo: mail listserv@bitnic.bitnet; Message body: "get listserv tips"
 Doc:  mail listserv@kentvm.kent.edu; Message body: "send listserv memo"
 Runs:

*Mail
 Sum:  send message from one user to another (or many (mailing list))
 Act:  R == M <- H[M <= U]
 Demo: mail your-user-id@your-host.your-domain
 Doc:  aftp ftp.sura.net:pub/nic/network.service.guides/how.to.email.guide
 Runs:

*Mbone
 Sum:  live audio and video multicast virtual network on top of Internet
 Act:  U :*(): M <-> H[R]
 Demo: ?
 Doc:  aftp venera.isi.edu:mbone/faq.txt
 Runs:

*MUD
 Sum:  real-time interaction usually for social role-playing
 Act:  U :: I(M <-> S[R])
 Demo: telnet susan.mit.edu 4000
 Doc:  aftp ftp.math.okstate.edu:pub/muds/misc/mud-faq/part*
 Runs:

*Talk
 Sum:  real-time interactive talk with another user
 Act:  U :: I(M <-> H[R])
 Demo: talk other-user@host.domain
 Doc:  man talk
 Runs:

*USENET
 Sum:  discussion on many topics separated into newsgroups
 Act:  U := I(M <- S[F])
 Demo: rn
```

```
 Doc:  aftp pit-manager.mit.edu:pub/usenet/news.answers/what-is-usenet/part1.Z
 Runs:

------------------------------------------------------------------------
=-Services
========================================================================
*Finger
 Sum:  retrieve info about user registered on a host computer
 Act:  U := M <= H[R]
 Demo: finger decemj@rpi.edu
 Doc:  man finger
 Runs:

*Ftp
 Sum:  retrieve copies of files at remote FTP sites
 Act:  U == F <- H[F]
 Demo: ftp nic.merit.edu; login 'anonymous'; get READ.ME; quit
 Doc:  aftp ftp.sura.net:pub/nic/network.service.guides/how.to.ftp.guide
 Runs:

*Ping
 Sum:  requests echo from network host; see if remote host is up
 Act:  U := M <= H
 Demo: ping uiuc.edu
 Doc:  aftp uxc.cso.uiuc.edu:utils/ping/README; man ping
 Runs:

*Telnet
 Sum:  login to a remote computer to use applications
 Act:  U :: I(L <= H)
 Demo: telnet downwind.sprl.umich.edu 3000
 Doc:  aftp ftp.sura.net:pub/nic/network.service.guides/how.to.telnet.guide
 Runs:

------------------------------------------------------------------------
--Sources Cited
========================================================================
[1] Krol, Ed.  The Whole Internet User's Guide & Catalog.  Sebastapol,
    CA:  O'Reilly & Associates, 1992.
[2] Foster, Jill, George Brett and Peter Deutsch, Eds. "A Status Report
    on Networked Information Retrieval: Tools and Groups."  Draft version
    4.1, 20th July 1993. Aftp: mailbase.ac.uk:pub/nir/nir.status.report.
[3] Hahn, Harley.  A Student's Guide to Unix.  New York:  McGraw-Hill,
    1993.
[4] EARN Association. Guide to Network Resource Tools. Aftp: ds.internic.net:
    pub/internet-doc/EARN.nettools.txt.
[5] UNITE Systems List.  Aftp: mailbase.ac.uk:pub/unite/systems-list.txt.

------------------------------------------------------------------------
--UNIX Scripts Useful for filtering this document
========================================================================
--To get tool name and one of (Summary, Action, Demo, or Doc) lines:
   egrep "^\*|^ Act:" internet-tools
   egrep "^\*|^ Sum:" internet-tools
   egrep "^\*|^ Demo:" internet-tools
   egrep "^\*|^ Doc:" internet-tools
   egrep "^\*|^ Runs:" internet-tools
--Tool categories and names:
   egrep "^\*|^=-" internet-tools

------------------------------------------------------------------------
```

```
```

GOPHER

Brief Intro & Sample Windows
By: Eric Thiel

Detailed description of gopher
By: The EARN Association

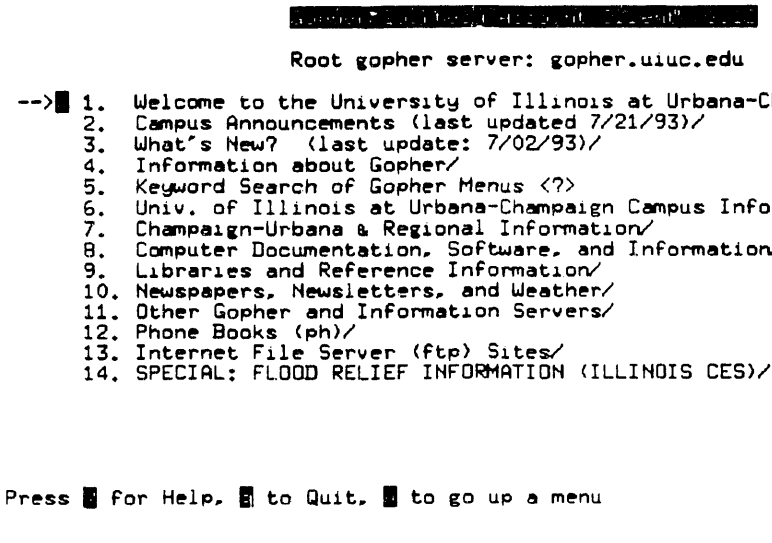
Acquired from LISTSERV@EARNCC.BITNET

In this section is a brief summary of what gopher is and sample windows produced while accessing gopher by command line and by using Turbo Gopher on the Macintosh. These sample windows were included to show the ease of use as well as acting as comparison of command line connection vs. client software interface. Software similar to Turbo gopher is available for other platforms. In addition I have also included the EARN Association's more detailed description of what gopher is and how to use it.

GOPHER

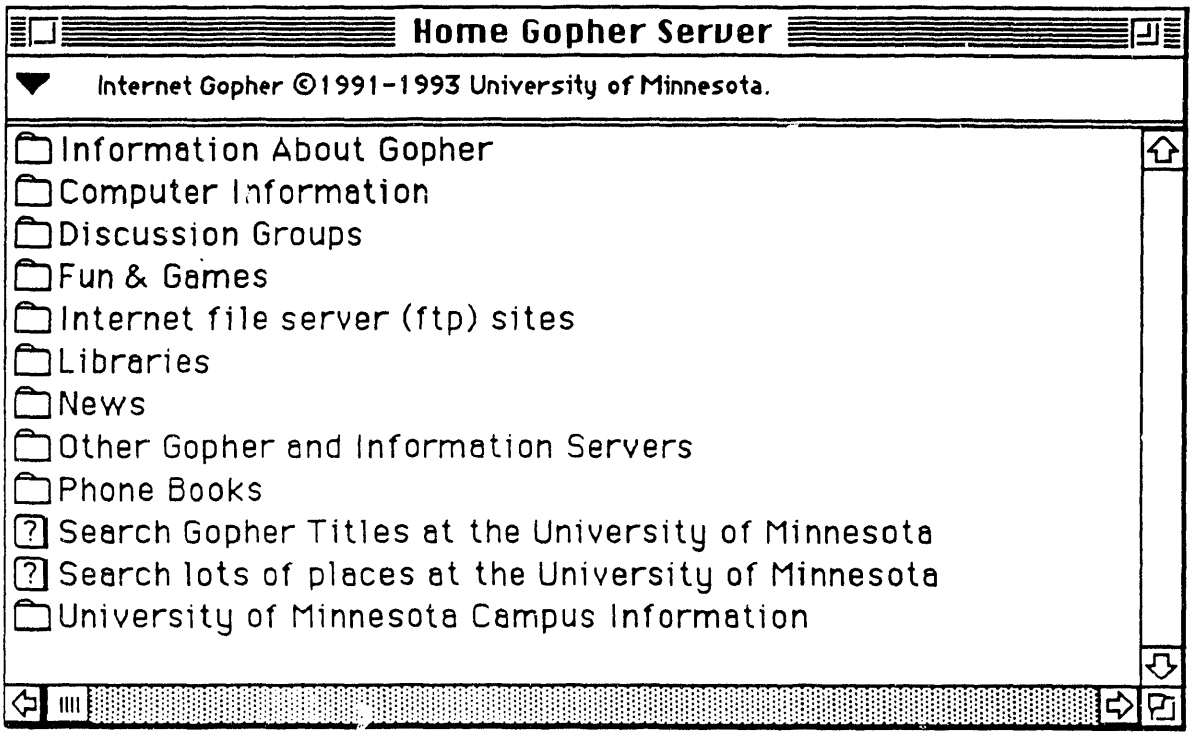
The internet GOPHER is a distributed document delivery service. It allows users to explore, search, and retrieve information residing in different locations. The information is acquired by searching through a series of nested menus resembling the organization of a directory with many subdirectories and files. The subdirectories and files may be located on a local server site or on remote sites served by other gopher servers.

The information may be text or binary file, directory information, image or sound. Gopher also offers GATEWAYS to other information systems such as World Wide Web, WAIS, Archie, WHOIS, and network services like telnet and FTP.

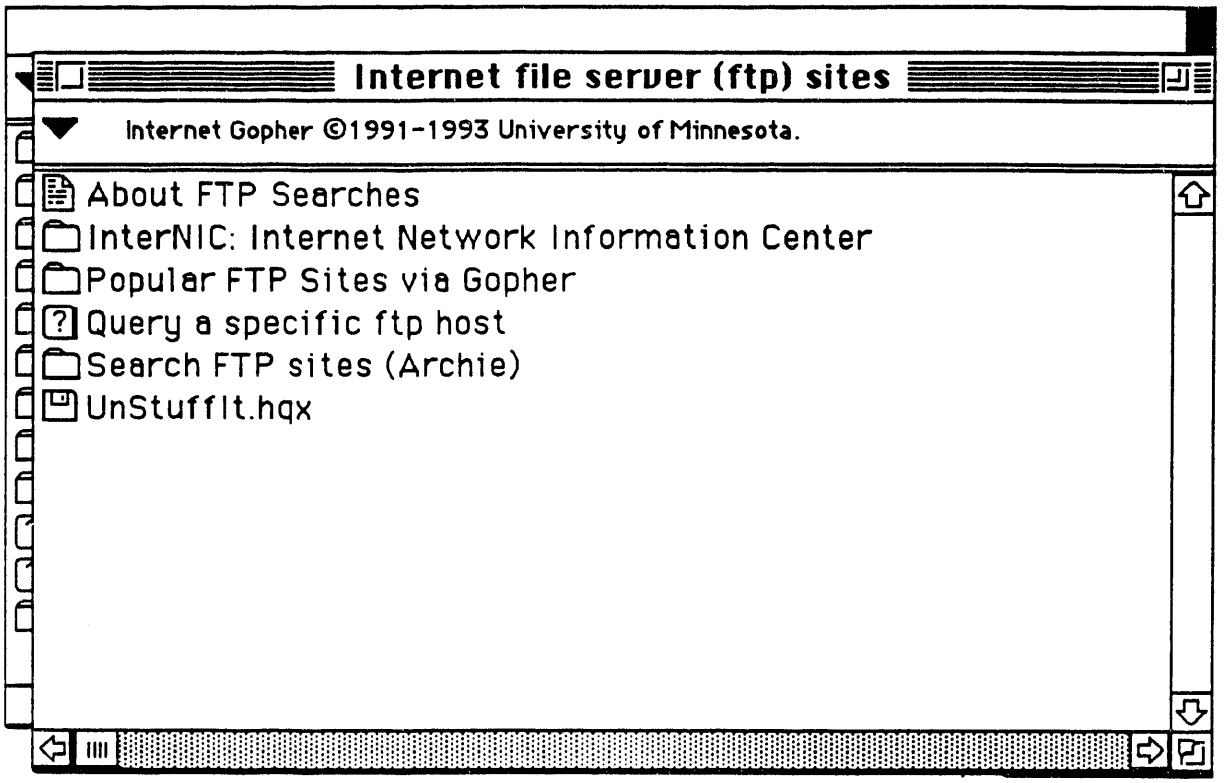


Gopher servers can be accessed by "telnetting" to one of the many gopher hosts. This menu was acquired by telnetting to the gopher host (ux1.cso.uiuc.edu). At the login prompt type the word **gopher**. This is the University of Illinois contribution to the gopher web. Accessing gopher via command lines on telnet will generate a series of menus that will ultimately lead you to files having information related to the topic of interest.

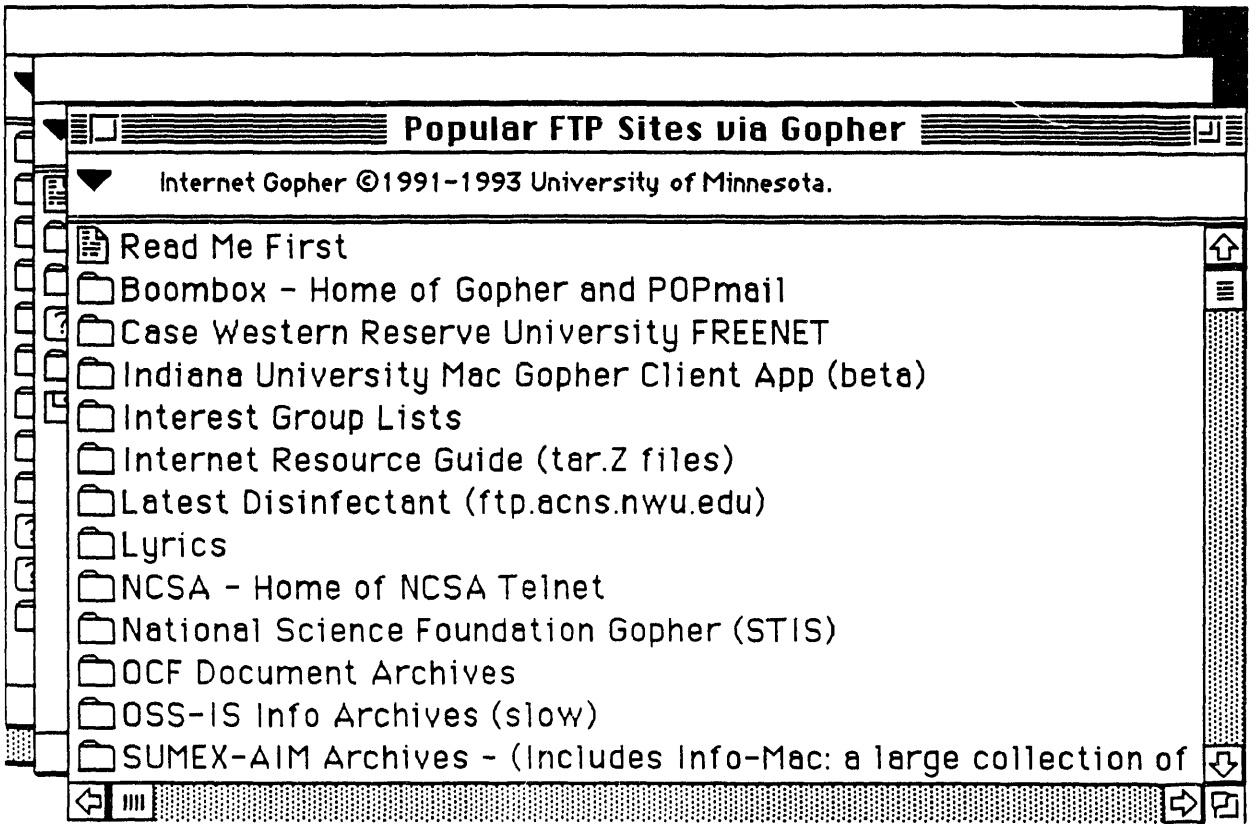
Accessing gopher servers can be simplified by using a user friendly interface. Most of these interfaces are free and available to anyone having access to the internet. XGOPHER is available for PC's with windows. Turbo GOPHER is available for the Macintosh. Below is an example of how Turbo Gopher works.



Available for the Macintosh is "Turbo Gopher". Opening turbo gopher leads to a series of windows resembling the organization of a directory with many sub directories and files.



Turbo gopher enables the user to explore Gopher servers as well as Archie FTP sites. The UnStuffit file allows the user to expand the compressed files that they have retrieved.



"Clicking" on the directory of interest will continue to lead the user to another window showing available files or additional directories.

GOPHER

What is Gopher

The Internet Gopher, or simply Gopher, is a distributed document delivery service. It allows users to explore, search and retrieve information residing on different locations in a seamless fashion.

When browsing it, the information appears to the user as a series of nested menus. This kind of menu structure resembles the organization of a directory with many subdirectories and files. The subdirectories and the files may be located either on the local server site or on remote sites served by other Gopher servers. From the user point of view, all information items presented on the menus appear to come from the same place.

The information can be a text or binary file, directory information (loosely called phone book), image or sound. In addition, Gopher offers gateways to other information systems (World-Wide Web, WAIS, archie, WHOIS) and network services (Telnet, FTP). Gopher is often a more convenient way to navigate in a FTP directory and to download files.

A Gopher server holds the information and handles the users' queries. In addition, links to other Gopher servers create a network wide cooperation to form the global Gopher web (Gopherspace).

Who can use Gopher

Gopher uses the client-server model to provide access to the Gopher web. You must be on the international TCP/IP network (the Internet) in order to use a client on your computer to access Gopher.

How to get to Gopher

Users explore the Gopher menus using various local clients or accessing a remote client via an interactive Telnet session.

Local clients

Public domain clients for accessing a Gopher server are available for: Macintosh, MS-DOS, OS/2, VM/CMS, VMS, NeXT, Unix, X-Window.

The clients are available for anonymous FTP from many FTP sites (eg, boombox.micro.umn.edu in the directory /pub/gopher).

Remote clients

Some sites allow public access via Telnet to a client. To access such a remote client, telnet to one of these sites:

info.anu.edu.au	Australia (login: info)
tolten.puc.cl	Columbia
ecnet.ec	Ecuador
gopher.chalmers.se	Sweden
consultant.micro.umn.edu	USA
gopher.uiuc.edu	USA
panda.uiowa.edu	USA (login: panda)

At the login: prompt type gopher (unless specified otherwise) and the top-level Gopher menu for that site will be displayed.

Users are requested to use the site closest to them.

Using Gopher

The implementations of the Gopher clients on various platforms are slightly different to take advantage of the platforms' capabilities (mouse, graphic functions, X-Window server) and to offer the popular look and feel. Even with different implementations, the same set of functions and commands is available.

When issuing the gopher command, you will be connected automatically to the default Gopher server specified at the installation. The format of the command is:

```
+-----------------------------------------------------------------+
|                                                                 |
|  gopher    <hostname>                                           |
|                                                                 |
+-----------------------------------------------------------------+
```

where hostname is an optional alternative Gopher server you want to talk to.

When connected to a Gopher server, it is still possible to access another server by exploring the Other Gopher servers in the rest of the world branch. To locate them more easily, the Gopher servers are distributed in geographical regions:

* Africa
* Europe
* Middle East
* North America
* Pacific
* South America

and then by countries.

Access to a Gopher server is identical whether using a local or a remote client: a simple menu-driven interface which doesn't require any special training or knowledge from the user.

Here is a sample menu:

```
-----------------------------------------------------------------

                  Internet Gopher Information Client v1.1

                            Information About Gopher

     1.  About Gopher.
     2.  Search Gopher News <?>
     3.  Gopher News Archive/
     4.  comp.infosystems.gopher (Usenet newsgroup)/
     5.  Gopher Software Distribution/
     6.  Gopher Protocol Information/
     7.  University of Minnesota Gopher software licensing policy.
     8.  Frequently Asked Questions about Gopher.
     9.  gopher93/
     10. Gopher| example server/
     11. How to get your information into Gopher.
-->  12. New Stuff in Gopher.
     13. Reporting Problems or Feedback.
     14. big Ann Arbor gopher conference picture.gif <Picture>


Press ? for Help, q to Quit, u to go up a menu          Page: 1/1

-----------------------------------------------------------------
```

In the example above, any item can be selected by typing its line number or by moving the cursor (-->) next to it.

An item could be:

* a subdirectory
* a text file
* a binary file
* a sound file
* an image file
* a phone book (directory information)
* an index-search
* a Telnet session

Items are displayed with an identifying symbol next to them. In the example above, "<?>" means a full text index-search, "/" means a subdirectory, "<Picture>" means an image file and no symbol means a text file.

Some Gopher clients are not able to handle certain file types (eg, sound files). Some clients display only files of types they can handle or files they suppose you are interested in. Others display all types of files.

Most Gopher clients allow you to create, view and select bookmarks. A bookmark keeps track of the exact location of a Gopher item, regardless of where it resides. It is useful when you often need to reach a file or a service located far from the top-level directory. A collection of bookmarks is like a customized Gopher menu.

Some capabilities of a local Gopher client are bound to the capabilities of your own computer. In fact, for sound files, image files and Telnet sessions, the Gopher client looks for the appropriate software on your computer and passes control to it to perform the requested task. When the task is completed, control is returned to the Gopher client.

At any time, it is possible to terminate the session (quit command), to cancel the current processing or to get the on-line help (help command).

An item is processed according to its type:

a subdirectory
: its contents are displayed. To go up one level, use the up command.

a text file
: the file is displayed. Then you can browse it, search for a particular string, print it on a local printer or copy (save) it onto your local disk space in a user-specified file (the last 2 functions may not be available to you).

a binary file
: the remote file is simply copied onto your local disk space in a user-specified file. Binary files are binhexed Macintosh files, archives (.zip, .tar,...), compressed files, programs, etc.

a sound file
: the remote file is played through your local audio device if it exists, as well as the appropriate utility. Only one sound file can be active at a time; you will be warned if you try to play a sound before a previous one is done.

an image file

the remote file is displayed on your computer screen if an image viewer exists on your computer.

a phone book you are prompted for a search string to look up people information through the selected phone book. Since different institutions have different directory services, the queries are not performed in the same fashion.

an index-search

you are prompted for a search string which may be one or more words, plus the special operators and, or, and not. The search is case-insensitive. Usually, an index is created to help users locate the information in a set of documents quickly. Eg:

terminal and setting or tset

will find all documents which contain both the words terminal and setting, or the word tset. or is non-exclusive so the documents may contain all of the words.

The result of the index-search looks like any Gopher menu, but each menu item is a file that contains the specified search string.

a Telnet session

Telnet sessions are normally text-based information services, for example, access to library catalogs.

VERONICA

Veronica was designed as a solution to the problem of resource discovery in the rapidly-expanding Gopher web, providing a key-word search of more than 500 Gopher menus. Veronica helps you find Gopher-based information without doing a menu-by-menu, site-by-site search. It is to the Gopher information space, what archie is to the FTP archives

Veronica is accessible from most top-level Gopher menus or from the Other Gopher servers... branch. There is no need for opening another connection or another application.

There are two search methods: the simple Boolean search method and the partial Boolean search method. When you choose either search method, you will be prompted for a search string.

The searches are carried out on an index of Gopher menu titles. They are NOT full-text searches of data at Gopher sites. Veronica queries are case-insensitive.

Simple Boolean search method:

The search string may contain keywords optionally separated by and and or. and is assumed between 2 words. or takes precedence over and. Eg:

eudora

will give you a list of menu titles that contain eudora, includ-

ing:

> Electronic Mail: Eudora on Macintosh, Micro-08
> Modem Setting Eudora Slip.
> A UNIX-based Eudora reader for those that ...
> Eudora: Popmail for the Macintosh.
> Eudora.
> etc.

while

> eudora and macintosh

will give you a list of menu titles that contain both eudora and macintosh, including:

> Eudora: Popmail for the Macintosh.
> v4.1 EUDORA: E-MAIL FOR THE MACINTOSH.
> Micro News: Eudora - A Mailer for the Macintosh.
> Eudora: Electronic Mail on Your Macintosh.
> ACS News - Eudora Mail Reader for Macintosh.
> etc.

Partial Boolean search method:

BOOLEANS
The search string contain keywords optionally separated and, or and not. The evaluation is done from left to right. not clauses are evaluated after all the other clauses are evaluated. Eg:

> red and blue or yellow but not green and orange
> or black but not white

will be interpreted as:

> (((((red and blue) or yellow) and orange) or black) not
> green) not white

PARTIALWORD
'*' is the wildcard character, which can replace any other character. It causes a partial search on the substring it follows. Eg:

> desk*

will give you a list of menu titles, including:

> The Help Desk.
> Keene State College Press Release COMPUTER ON EVERY DESK.
> DESKQview/X... An alternative to Windows???.
> Ethernet at Your Desktop/

LITERAL
A string surrounded with a pair of quotes (') or double-quotes (") causes an exact match search (case-insensitive). and, not, and '*' may occur in the literal string, they have no special meaning. The first part of a literal string must be a word, rather than a delimiter symbol, to get a successful search. Eg:

> "desk"

will give you a list of menu titles, including:

> Mac on Your Desk.

Information Desk.
Available at the Help Desk ....

The result of both search methods is a Gopher menu composed of items (with an identifying symbol) whose titles match the search string. Like any Gopher items, you can process them: open subdirectories, display text files, etc.

Learning more about Gopher

The Internet Gopher is developed by the Computer and Information Services Department of the University of Minnesota. Bug reports, comments, suggestions, etc. should be mailed to the Gopher development team at: gopher@boombox.micro.umn.edu.

Mailing list: gopher-news@boombox.micro.umn.edu
To subscribe send a mail to:
gopher-news-request@boombox.micro.umn.edu

Usenet newsgroup: comp.infosystems.gopher

A comprehensive description of veronica search methods is available from the veronica menus.

Veronica is being developed by Steve Foster and Fred Barrie at the University of Nevada. Bug reports, comments, suggestions, etc. should be addressed to: gophadm@futique.scs.unr.edu

WORLD WIDE WEB

Brief Intro & Sample Windows
By: Eric Thiel

Detailed description of WWW
By: The EARN Association

Acquired from LISTSERV@EARNCC.BITNET

In this section is a brief summary of what World Wide Web is and sample windows produced while accessing WWW by command line and by using XMosaic on the IBM. These sample windows were included to show the ease of use as well as acting as comparison of command line connection vs. client software interface. Xmosaic is available from the Internet. In addition I have also included the EARN Association's more detailed description of what WWW is and how to use it.

WORLD WIDE WEB

The World Wide Web is a large-scale networked hypertext information system started by CERN, the European Laboratory for Particle Physics in Geneva, Switzerland. It utilizes a uniform resource locator which gives it great versatility. Special documents can be keyword searched like in WAIS.

Hypertext is text that is not necessarily linear. The text contains links to other texts or to graphics, videos, or sound. Links are words/phrases designated in a color and/or by underlining depending on your browser. You select a link by clicking on the highlighted word or pressing the return key, again depending on your browser. The word that indicates the link then either changes color or the underlining becomes broken. The same link may be included in multiple documents. Once the user has clicked on a highlighted word or phrase a new window will appear with information about that word/phrase.

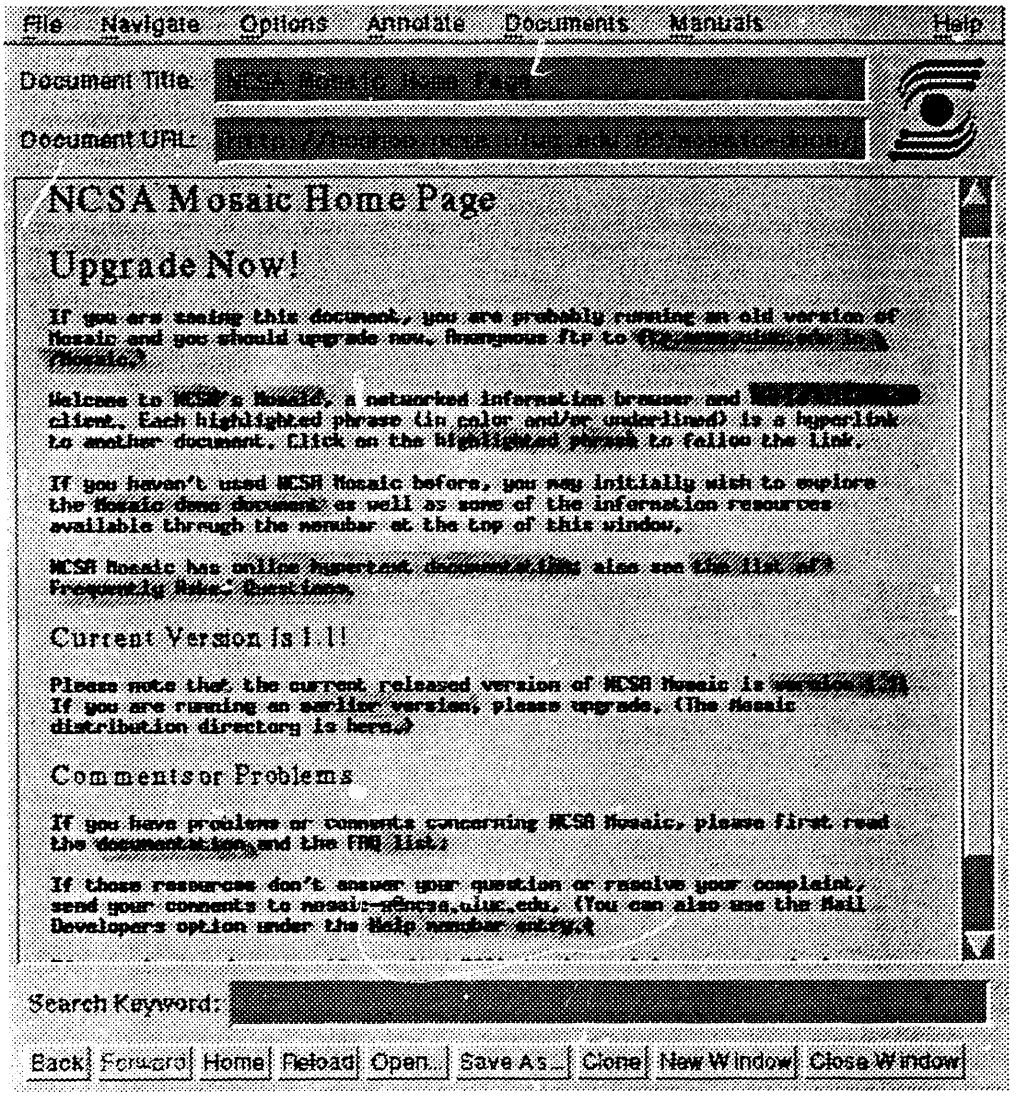
World Wide Web can be accessed by telnetting to one of the WWW servers found on the internet. At the login prompt type the letters "www" , no password is needed. Four of the most commonly used servers are listed below:

info.funet.fi	Finland
vms.huji.ac.il	Israel
info.cern.ch	Switzerland
eies2.njit.edu	USA

The example below shows the on screen menu acquired when telnetting to info.cern.ch

```
gargleblaster:/us/thiel: telnet info.cern.ch
Trying 128.141.201.74 ...
Connected to nxoc01.cern.ch.
Escape character is '^]'.


CERN Information Service
(ttypa on nxoc01)

                                    Overview of the Web
                          GENERAL OVERVIEW

  There is no "top" to the World-Wide Web. You can look at it from many points
  of view. If you have no other bias, here are some places to start:

 by Subject[1]       A classification by subject of interest. Incomplete
                     but easiest to use.

 by Type[2]          Looking by type of service (access protocol, etc) may
                     allow to find things if you know what you are looking
                     for.

 About WWW[3]        About the World-Wide Web global information sharing
                     project

Starting somewhere else

  To use a different default page, perhaps one representing your field of
  interest, see  "customizing your home page"[4].

What happened to CERN?

1-6, Up, <RETURN> for more, Quit, or Help:
```

User friendly interfaces for WWW are available for most platforms. Xmosaic is readily available for systems running windows. The next few pages demonstrates how xmosaic works.



The terms I have highlighted would appear colored or underlined on your screen when using xmosaic. These terms are "hypertext" that act as gateways to new information. Clicking on any of these terms will open a new window with information about that subject. The xmosaic window is composed of three main regions: Main Menu, Viewing Area, and Control Panel. General information about these three areas is shown on the next page.

The **MAIN MENU** consists of 7 menu bars and small windows showing the document title and the WWW server to which the user is connected. Documentation on each of the menu bars is given below:

File: Opening new windows; retrieving documents; saving, mailing, and printing documents; searching the current document; etc.

Navigate: Moving forward and backward in the window history; posting the window history and hotlist dialogs; adding the current document to the hotlist; etc.

Options: Toggling various options; selecting font sets; selecting anchor styles.

Annotate: Making a new annotation; editing or deleting an existing annotation.

Documents: A variety of interesting documents hard coded for easy access. Included in this menu are the interfaces for WAIS, GOPHER, FTP, USENET, HYTELNET, TECHINFO, TEXINFO and many others. The user can access information by subject, by a specific WWW server, by a specific internet service, or by user constructed project.

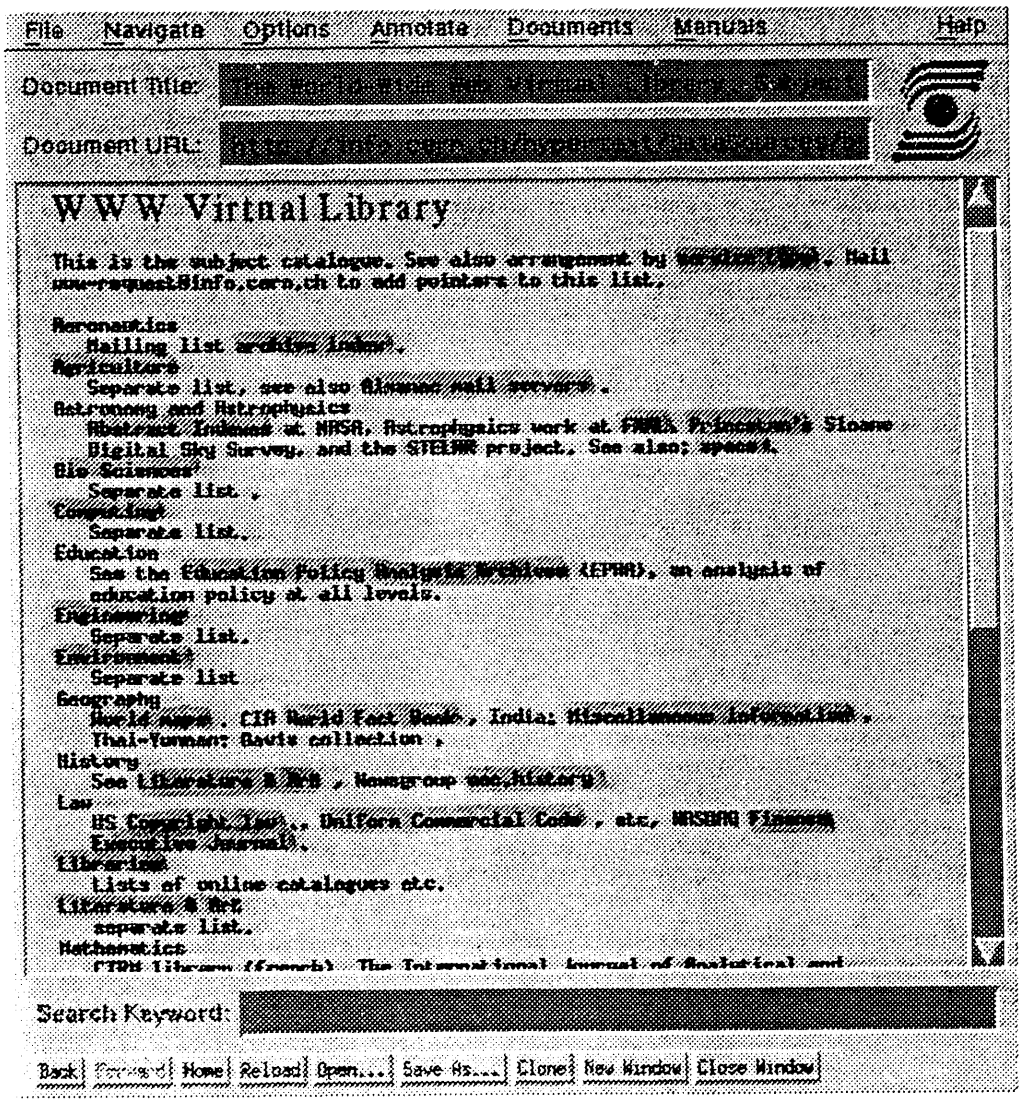
Manuals: A variety of interesting manual databases hard coded for easy access.

Help: Information on Mosaic and various related topics; an easy way to send mail to the developers.

VIEW WINDOW - Most of the Document View window is occupied by the Viewing Area (or "view", for short) -- this is the area of the window that displays the document and includes scroll bars to allow documents larger than the window to be easily displayed.

BOTTOM CONTROL PANEL - Below the Viewing Area is a small control panel with a text entry area and a row of buttons. This control panel gives quick access to NCSA Mosaic's searching capabilities and the more common commands that you may wish to access while browsing a set of documents.

If I opened Information by Subject under the document menu the window shown below would appear. The terms that are highlighted are hypertext and allow the user to immediately access the information by clicking on the particular subject of interest. Note that since the browsing capability is built right into Mosaic, HDF/netCDF files can come from any network source/service, be it FTP, HTTP, WAIS, Gopher, or wherever.



WORLD-WIDE WEB

What is World-Wide Web

World-Wide Web (also called WWW or W3) is an information system based on hypertext, which offers a means of moving from document to document (usually called to navigate) within a network of information.

Hypertext documents are linked to each other through a selected set of words. For example, when a new word, or a new concept, is introduced in a text, hypertext makes it possible to point to another document which gives more details about it. The reader can open the second document by selecting the unknown word or concept and the relevant section is displayed. The second document may also contain links to further details. The reader need not know where the referenced document is, and there is no need to type a command to display it, or to browse it to find the right paragraph. Cross-references may be defined in the same document. A collection of documents is a database.

If you were reading this document on a hypertext system, instead of this all too short explanation about hypertext, you would have a selectable pointer to a complete hypertext information web with examples and more pointers to other definitions.

For instance, in the first document you might read:

The WorldWideWeb (W3) is a wide-area "hypermedia" information retrieval initiative aiming to give universal access to a large universe of documents.

Selecting hypermedia will display the following explanation for you:

WHAT IS HYPERTEXT

Hypertext is text without the constraint of linearity.

Hypertext is text which contains "links" to other texts. The term was coined by Ted "Nelson" around 1965.

Hypermedia is a term used for hypertext which is not constrained to be text.

Then you can learn more about links and Nelson.

Also, special documents (indexes) in the WWW information space can be search for given keyword(s). The result is a document which contains links to the documents found.

World-Wide Web uses hypertext over the network: the linked documents may be located at various sites. WWW can handle different text formats and various information organizations. WWW also provides access to many of the other tools described in this guide.

Who can use World-Wide Web

WWW uses the client-server model to provide access to the information universe. You must be on the international TCP/IP network (the Internet) in order to use a client on your computer to access WWW.

How to get to World-Wide Web

Users access the World-Wide Web facilities via a client called a browser. This interface provides transparent access to the WWW servers. If a local WWW client is not available on your computer, you may use a client at a remote site. Thus, an easy way to start with WWW is to access a remote client.

Local clients

Usage of a local client is encouraged since it provides better performance and better response time than a remote client.

Public domain clients for accessing WWW servers are available for: Macintosh, MS-DOS, VMS, VM/CMS, MVS, NeXT, Unix, X-Window.

The clients are available for anonymous FTP from info.cern.ch in the directory /pub/www. All these platforms support a simple line mode browser. In addition, graphical clients are available for: Macintosh, Windows, X-Window, NeXT and Unix.

Remote clients

To access a remote WWW client, telnet to one of the server sites. At the login:prompt enter www, no password is needed. There are many WWW servers already available throughout the network, and the number is growing, so it is not possible to include a comprehensive list here. A server may provide databases on specific topics. The following servers act as demonstration sites:

info.funet.fi	Finland
vms.huji.ac.il	Israel
info.cern.ch	Switzerland (CERN)
eies2.njit.edu	USA

CERN is the entry point to find information about WWW itself and to have an overview of the Web with a catalogue of the databases sorted by subject.

Using World-Wide Web

When using a graphical interface, you access the WWW functions by pressing mouse buttons. In particular, references are highlighted or underlined words. To follow a link, click on the associated reference.

The line mode browser is a more simple user interface: references are numbers in square brackets next to words. Type the number and hit the RETURN key to follow a reference. For example, here is the beginning of the Subject Catalogue you get on the CERN server:

The World-Wide Web Virtual Library: Subject Catalogue
INFORMATION BY SUBJECT

See also arrangements by organization[1] or by service type[2]. Mail www-request@info.cern.ch if you know of online information not in these lists....

Aeronautics Mailing list archive index"3" .

Astronomy and Astrophysics
Abstract Indexes"4" (unavailable). Astrophysics work at FNAL"5" .

Bio Sciences[6] separate list .

Computing[7] Seperate list.

Geography CIA World Fact Book"8" , India: Miscellaneous information"9", Thai-Yunnan: Davis collection"10",

Law US Copyright law"11" .

Libraries[12] Lists of online catalogues etc.

Literature & Art[13] separate list.

Mathematics CIRM library"14" (french). The International Journal of Analytical and Experimental Modal

1-30, Back, <RETURN> for more, Quit, or Help:

The following commands are available within WWW. Some are disabled when not applicable (eg, Find is enabled only when the current document is an index). Angle brackets (<>) indicate an optional parameter.

Help gives a list of available commands depending on the context, and the hypertext address of the current document.

Manual displays the on-line manual.

Quit exits WWW.

Up, Down scrolls up or down one page in the current document.

Top, BOttom
goes to the top or the bottom of the current document.

Back goes back to the document you were reading before.

HOme goes back to the first document you were reading.

Next, Previous
goes to the next or previous document in the list of pointers from the document that led to the current one.

List gives a numbered list of the links from the current document. To follow a link, type in the number.

Recall <number>
if number is omitted, gives a numbered list of the documents you have visited.

To display one specific document, re-issue the command with number.

<Find> keyword
queries the current index with the supplied keyword(s). A list of matching entries is displayed with possibly links to further details. Find can be omitted if the Find
first keyword does not conflict with another WWW command. Multiple keywords are separated by blanks.

Go docaddress
goes to the document represented by the given hypertext address, which is interpreted relatively to the current document.

Extra command available on Unix versions only:

Print prints the current document, without the numbered document references. The default print command is lpr, but it may be defined in your local working environment by the variable WWW_PRINT_COMMAND.

To access WWW with the line mode browser, type: www. The default first document will appear on your screen. From this point, you should be able to navigate through the WWW universe by reading the text and following the instructions at the bottom of the screen. If you want to start with a first document other than the default, or if you want to change some other aspect of the usual interaction, there are a number of command line parameters and

options available. The full format of the www command to invoke the line mode browser is:

```
+-------------------------------------------------------------------+
|                                                                   |
|   www      <options>  <docaddress <keyword>>                      |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

docaddress
: is the hypertext address of the document at which you want to start browsing.

keyword
: queries the index specified by docaddress with the supplied keyword(s). A list of matching entries is displayed. Multiple keywords are separated by blanks.

Options are:

-n
: non-interactive mode. The document is formatted and displayed to the screen. Pages are delimited with form feed (FF) characters.

-listrefs
: adds a list of the addresses of all documents references to the end. Non-interactive mode only.

-pn
: sets the page length to n lines. Without a number, makes the page length infinite. Default is 24.

-wn
: sets the page width to n columns. The default is 78, 79 or 80 depending on the system.

-na
: hides references in the text. Useful, when printing out the document.

-version
: displays the version number of the software.

The commands listed above should be available in all clients. They may be abbreviated (CAPITAL letters indicate acceptable abbreviation). Case is not significant. Special characteristics of the line mode browser interface are:

number
: type in a number given in [] and hit the RETURN key to follow the link associated to the reference.

RETURN
: hit the RETURN key to display the next page of the current document (without a reference number).

Learning more about World-Wide Web

World-Wide Web is being developed at CERN (European Particle Physics Laboratory) by the World-Wide Web team leaded by Tim Berners-Lee. Bug reports, comments, suggestions, etc. should be mailed to: www-bug@info.cern.ch

On-line documentation is available from info.cern.ch, for anonymous FTP or using the remote WWW client.

Mailing lists: www-talk@info.cern.ch
To subscribe send a mail to www-talk-request@info.cern.ch

Usenet newsgroup: comp.infosystems.www

WAIS

(WIDE AREA INFORMATION SERVER)

Brief Intro & Sample Windows
By: Eric Thiel

Detailed description of WAIS
By: The EARN Association

Acquired from LISTSERV@EARNCC.BITNET

Brief description of WAIS sources
By: Chris Christoff

Acquired via anonymous ftp kirk.bu.oz.au
cd pub/Bond_Uni/doc/wais

In this section is a brief summary of what WAIS is and sample windows produced while accessing WAIS by command line and by using Xwais on the IBM. These sample windows were included to show the ease of use as well as acting as comparison of command line connection vs. client software interface. Xwais is available from the Internet. In addition I have also included the EARN Association's more detailed description of what WAIS is and how to use it. Immediately following the EARN Associations description of WAIS I have added an article which gives a brief description of each of the sources searched by WAIS.

WAIS

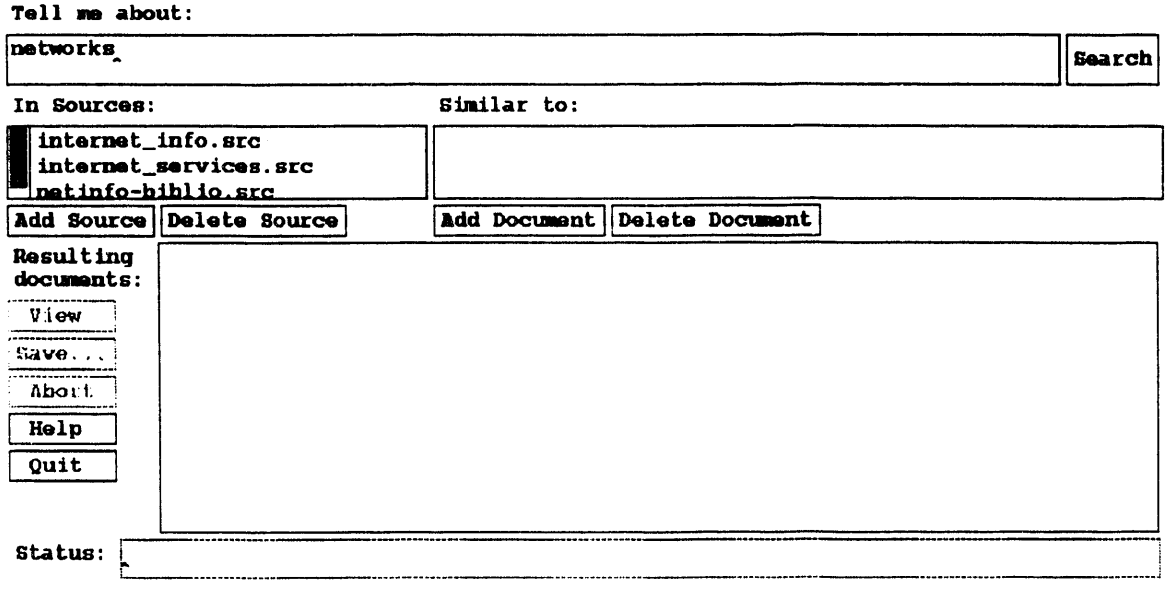
WAIS stands for Wide Area Information Server. It is a distributed information retrieval system. Wais enables the user to search databases over networks using an easy to use interface. The databases are collections of text based documents, sound files, pictures, and even video. More than 400 databases can be searched with WAIS.

WAIS allows the user to search/query a space-delimited set of seed words. Boolean, stemming, quoted strings, adjacency capabilities are becoming available.

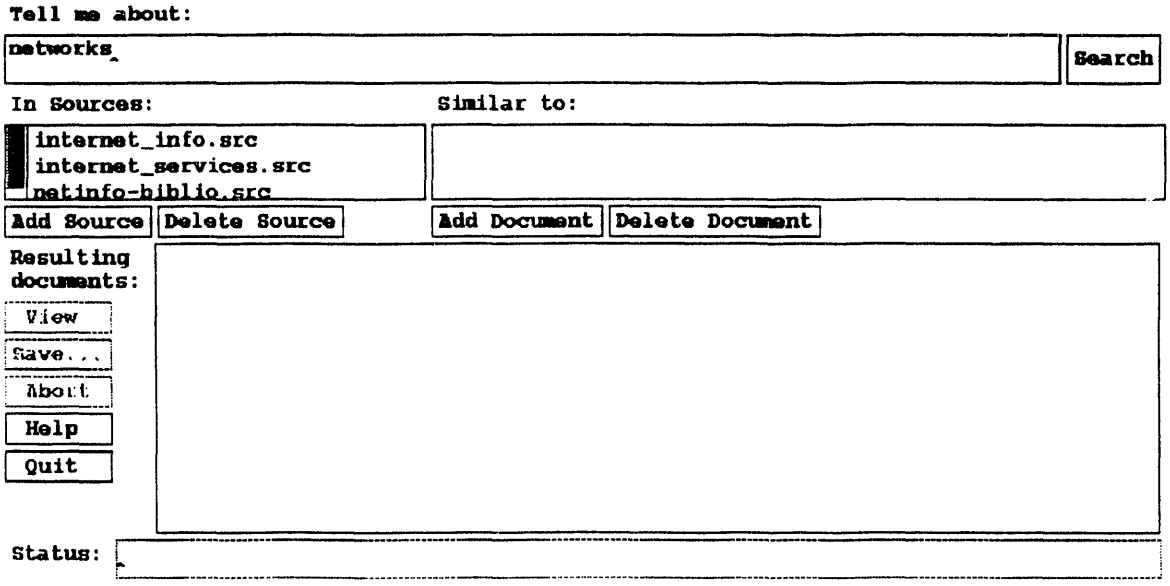
```
SWAIS                             Source Selection                        Sources: 465
 #              Server                          Source                            Cost
[illegible]
002:    [       munin.ub2.lu.se]  academic_email_conf                             Free
003:    [wraith.cs.uow.edu.au]    acronyms                                        Free
004:    [     archive.orst.edu]   aeronautics                                     Free
005:    [ ftp.cs.colorado.edu]    aftp-cs-colorado-edu                            Free
006:    [nostromo.oes.orst.ed]    agricultural-market-news                        Free
007:    [     archive.orst.edu]   alt.drugs                                       Free
008:    [     wais.oit.unc.edu]   alt.gopher                                      Free
009:    [sun-wais.oit.unc.edu]    alt.sys.sun                                     Free
010:    [     wais.oit.unc.edu]   alt.wais                                        Free
011:    [alfred.ccs.carleton.]    amiga-slip                                      Free
012:    [       munin.ub2.lu.se]  amiga_fish_contents                             Free
013:    [    coombs.anu.edu.au]   ANU-Aboriginal-Studies                 $0.00/minute
014:    [    coombs.anu.edu.au]   ANU-Asian-Computing                    $0.00/minute
015:    [    coombs.anu.edu.au]   ANU-Asian-Religions                    $0.00/minute
016:    [         150.203.76.2]   ANU-Australian-Economics               $0.00/minute
017:    [         150.203.76.2]   ANU-CAUT-Academics                     $0.00/minute
018:    [    coombs.anu.edu.au]   ANU-CAUT-Projects                      $0.00/minute

Keywords:

<space> selects, w for keywords, arrows move, <return> searches, q quits, or ?
```

Wais searches for data can be accomplished by telnetting to a **wais server**. This wais menu was produced by the wais server (quake.think.com). At the login propmpt just type the word **wais** and hit return. Accessing wais via command lines on telnet produces a menu that enables you to select a host to which you can direct your query.

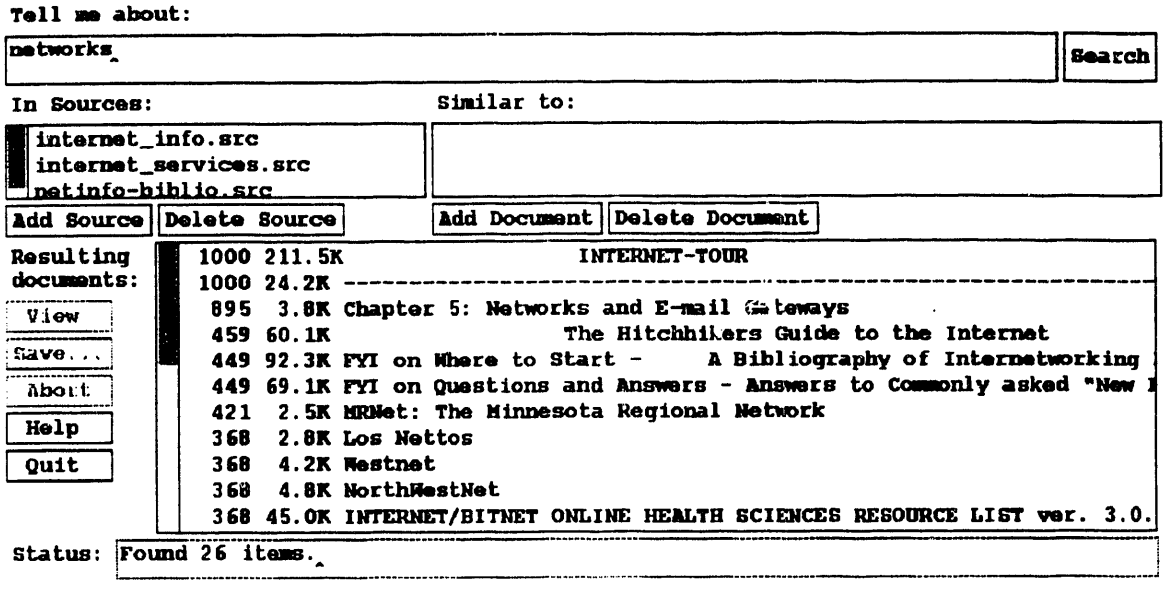
Accessing wais servers can be simplified by using a user friendly interface. Many of these interfaces are free and available to anyone having access to the internet. XWAIS is available for PC's with windows. A similar interface is also available for the Macintosh. Below is an example of how the Xwais interface works.



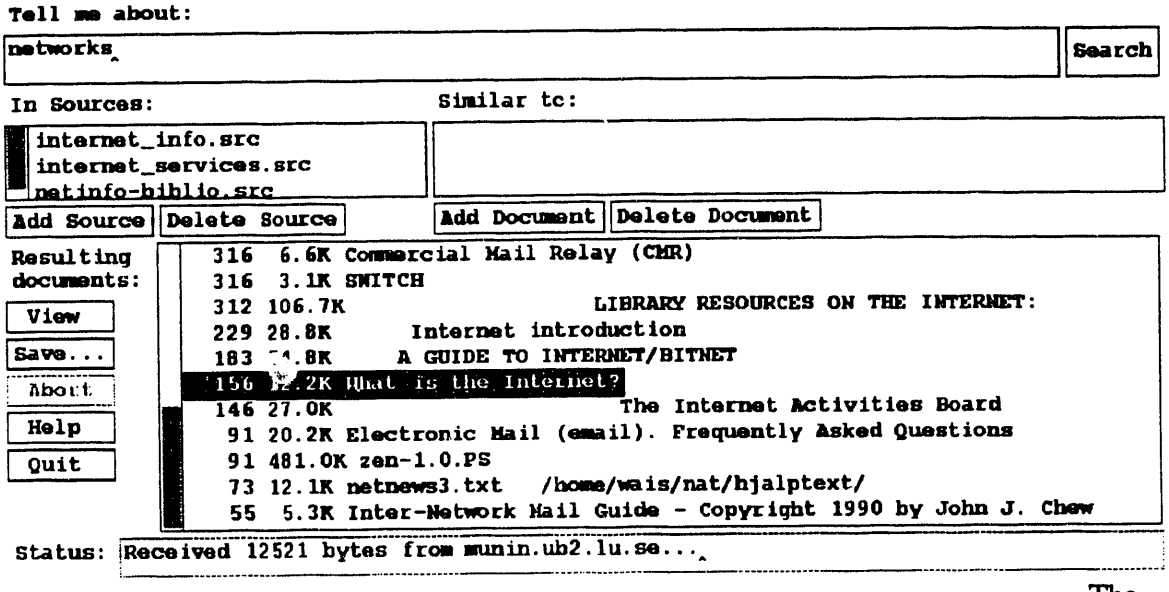
Available for the PC's is **XWAIS**. The Xwais window allows the user to search specific databases that have been entered into a users list of sources. The add source button enables the user to select only those sources to which they would like to direct their query.



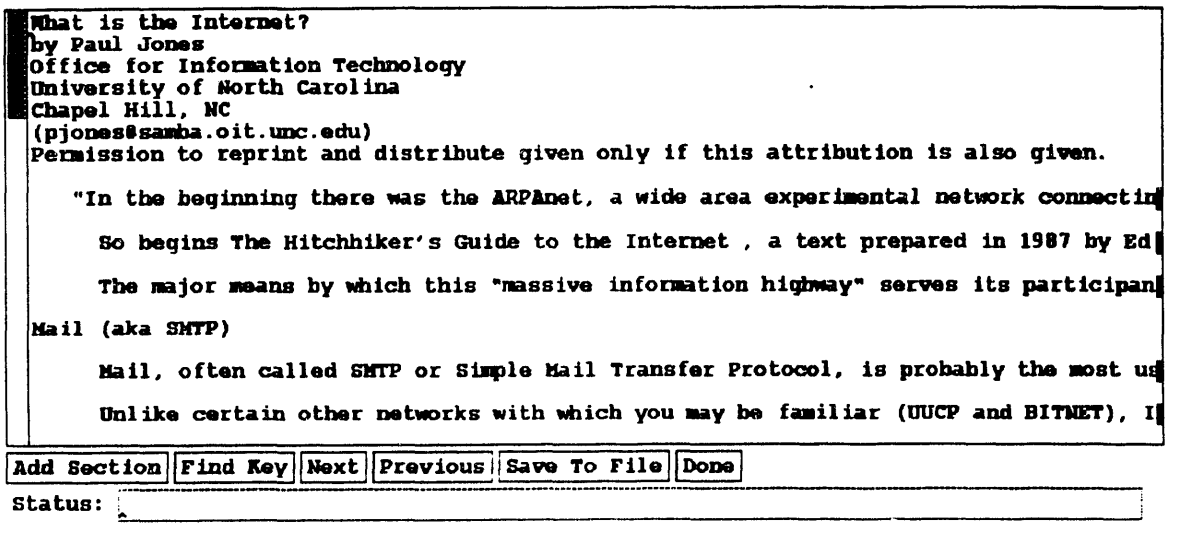
Available for the PC's is **XWAIS**. The Xwais window allows the user to search specific databases that have been entered into a users list of sources. The add source button enables the user to select only those sources to which they would like to direct their query.



Once the search has been completed, the status line will indicate the number of sources or "hits" found.The documents containing the "hits" will be shown within the large window. Reviewing the sources that were found is accomplished by moving the scroll bar on the left of the window. The user is now able to select any or all of the sources by highlighting them with the mouse to view, save to files, or delete.



The Xwais window allows the user to search specific databases that have been entered into a users list of sources. The add source button enables the user to select only those sources to which they would like to direct their query. Once the sources have been entered "clicking" the mouse on the search button begins the search.



WAIS documents can be viewed on line. Keywords can be found within the document by clicking on the "find key" button at the bottom of the window.

Chris Christoff
Bond University
chris@bu.oz.au

A BRIEF DESCRIPTION OF SOURCES SEARCHED BY WAIS

This document and a more comprehensive one showing host IP name and address, database name, cost for use, maintainer, and a more complete description of the database contents is available via anonymous FTP at kirk.bu.oz.au. Change directories pub/Bond_Uni/doc/wais.

Note: sources marked (*) have limited hours of availability.
sources marked (#) support boolean, partial word and literal searches
This document is an extension and reorganisation of a great document from the University of Melbourne, Australia.

Aeronautics

aeronautics.src ..... Contents of the aeronautics mailing list ftp area from University of Texas, coversing many topics of aeronautics, flying and aircraft

Archaeology

archaeological_computing.src .... Bibliography of papers on computing as applied to archaeology (BibTeX format)

Astronomy

astro-images-fits.src ..... Astronomical images in FITS format

astro-images-gif.src ..... Astronomical images in GIF format

Biology

alt.drugs.src ..... Oregon State University alt.drugs newsgroup archive

Arabidopsis_BioSci.src ..... Index of arabidopsis conference, and bionet newsgroup and mailing list messages

Arabidopsis_thaliana_Genome.src AAtDB database including genetic maps, strains, clones, colleague contacts and more

biology-compounds.src ..... Database of metabolic intermediate compounds

biology-journal-contents.src ..... Periodical references to journals in the field of molecular biology

bionic-ai-researchers.src ..... Database of molecular biologists working in the field of AI

bionic-algorithms.src ..... Literature references to molecular biology algorithms

bionic-arabidopsis.src ..... Database of arabidopsis research workers

bionic-biosci-docs.src ..... Files from the BioSci network

bionic-databases-limb.src ..... List of databases available to molecular biologists

bionic-directory-of-servers ..... Indexes 'bionic' sources in Finland

bionic-embl-software.src ..... A list of software available from EMBL

bionic-enzclass.src ....use in conjunction with the enzyme source

bionic-enzyme.src ..... Amos BairochÕs enzyme database

bionic-genbank-software.src ..... A list of software forGenbank database

bionic-info-gcg-archive.src ..... Log files from the INFO-GCG listserver

bionic-journal-contents.src ..... Literature references from molecular biology journals

bionic-networking.src ..... Texts to explain networking to biologists

bionic-sequence-bibliography .... Sequence analysis literature reference database

biosci.src ..... Archive of articles posted to BIOSCl mailing lists and newsgroups since 1989

Caenorhabditis_elegans_Genome.src A database of C. elegans information (e.g. DNA sequence, genetic map etc)

cldb.src ..... Animal cell lines available in European research labs

EC-enzyme.src ..... EC enzyme database

IUBio-arcdocs.src ..... Index of abstracts, help files and information on Indiana University Archive of Biology Software and Data

IUBio-fly-address.src ..... Index of addresses of Drosphila researchers (#)

IUBio-fly-amero.src ..... Database of polytene chromosone sites that bind antibodies to Drosphila proteins (#)

IUBio-fly-clones.src ..... Index to

sources of information on Drosphila melanogaster genetics (#)

IUBio-fly-din.src ..... Index of electronic Drosphila newsletter (#)

IUBio-flybase.src ..... Index of Drosphila database 'Flybase' (#)

IUBio-flystock-bg.src ..... Index of Drosphila fruit fly stocks at stockcentre at Bowling Green, USA (#)

IUBio-flystock-bl.src ..... Index of Drosphila fruit fly stocks at stockcentre at Bloomington, USA (#)

IUBio-flystock-um.src ..... Index of Drosphila fruit fly stocks at stockcentre at Umea, Sweden (#)

IUBio-gbnew.src ..... Index of updates of gene sequences since the last Genbank update (#)

IUBio-genbank.src ..... Index of Genbank databank gene sequences (#)

IUBio-netnews.src ..... Index of articles from Bio newsgroups and mailing lists (#)

Molecular-biology.src ..... Annotation of the GenBank DNA sequence database

online-mendelian-inheritance-in-man.src Catalogues of Autosomal Dominant, Autosomal Recessive and X-Linked Phenotypes

NIH-Guide.src ..... US National Institutes of Health Guide to Grants and Programs for biomedical researchers

prosite.src ..... A dictionary of protein sites and patterns

rebase-enzymes.src ..... The REBASE restriction database of Richard Roberts Cold Spring Harbor Laboratory

RPMS-pathology.src ..... Royal Postgraduate Medical School histo-pathological images (gif) and documents on mammalian endocrine tissues

Chemical Engineering

chem-eng-current-contents.src ... Chemical engineering bibliography

Computer Platforms

comp.admin.src ..... Previous 10 days news in newsgroup comp.admin

comp.sys.src ..... Previous 10 days news in comp.sys*

scsi-2.src ..... Small Computer System Interface-2 draft ANSI standard

Amiga

amiga_fish_contents.src ..... Index of Fred Fish's disk #1 of Amiga software

amiga-slip.src ..... Archive of mailing list on Amiga wide area networking

archie.au-amiga-readmes.src ..... Index of readme, index and contents files for Amiga software on archie.au

Macintosh

archie.au-mac-readmes.src ..... Index of the Readme, Index and Contents files for the Mac archive on 'archie.au'

info-mac.src ..... Archive of the info.mac discussion forum

mac.FAQ.src ..... Archive of mac.alt.FAQ news group

macintosh-tidbits.src ..... Tidbits electronic magazine for the Mac (*)

Next

NeXT.FAQ.src ..... Information about NeXT computer systems

NeXT-Managers.src ..... Archive of postings from mailing list for administrators of NeXT systems

PC

archie.au-pc-readmes.src ..... Index of Readme, Index and Contents files for amiga archives on Ðarchie.auÐ

cica-win3.src ..... Index to CICA (Centre for Innovative Computing Applications) Windows 3 archive

ibm.pc.FAQ.src ..... Information about IBM PC systems

Sun Microsystems

alt.sys.sun.src ..... Archived news articles from alt.sys.sun newsgroup

sun-admin.src ..... Archive of comp.sys.sun newsgroup

sun-announce.src ..... Archive of comp.sys.sun announce newsgroup

sun-apps.src ..... Archive of comp.sys.sun.apps newsgroup

sun-fixes.src ..... Sun MicrosystemÕs bug patches README files

sun-hardware.src ..... Archive of comp.sys.sun.hardware newsgroup

sun-manager-summary.src ..... Index of sun-managers mailing list summaries (#)

sun-misc.src ..... Archive of comp.sys.sun.misc newsgroup

sun-openlook.src ..... Archive of comp.windows.open-look newsgroup

SunSITE-ftp.src ..... Index of all of the index and README files in SunSITE ftp archive (which contains s/w, pictures, sounds and documents for Sun computers

sun-spots.src ..... Archive of the Sun-Spots digest and Sun Managers mailing list that discuss computers from Sun Microsystems

sun-wanted.src ..... Archive of comp.sys.sun.wanted newsgroup

sunflash-1990.src ..... 1990 issues of The Florida Sunflash journal

sunflash-1991.src ..... 1991 issues of The Florida Sunflash journal

sunflash-1992.src ..... 1992 issues of The Florida Sunflash journal

Supercomputers

San_Diego_Super_Computer_Center_Docs.src .. Some of the copyrighted documents available from SDSC's online system (userguides, Cray languages, math libraries etc)

Unix

comp.windows.x.motif.src ..... Archive of newsgroup on X-windows and motif

posix.1003.2.src ..... Portable Operating System for Unix draft standards

UC-motif-FAQ.src ..... Frequently Asked Questions on motif from the comp.windows..x.motif newsgroup

unix.FAQ.src ..... Information about UNIX

unix-manual.src ..... Manual pages for UNIX

Computer Science

bib-dmi-ens-fr.src ..... Bibliography of books and conference proceedings on maths and comp sci (French keywords)

bibs-zenon-inria-fr.src ..... Bibliograpy of books, conference proceedings, theses, periodicals, research reports on sotware engineering and mathematics (french keywords)

cacm.src .....
Communications of the ACM April Õ89 - April Õ92

comp.archives.src ..... Archive of comp.archives newsgroup, giving an index of ftp accessible files

Comp-Sci-Tech-Reports.src ..... Computer science technical reports, abstracts and papers from various FTP sites

cscwbib.src ..... Bibliography of computer supported cooperative work (refer format)

cs-journal-titles.src ..... Article title and authors from over 600 computing journals, conference proceedings, books and seminars

cs-techreport-abstracts.src ..... Titles and authors of some 5100 comp sci techreports, pre/reprints, notes and papers

cs-techreport-archives.src ..... List of sites that archive compsci reports

cs-techreports.src ..... Index of 2000 comp sci technical reports from ftp sites

Func-Prog_Abstracts.src ..... Small collection of computer science tech reports, abstracts and papers on functional programming

lolita-dator.src .....
Bibliography of a selection of computer related literature from Lund University, Sweden

lp-bibtex-zenon-inria-fr.src ..... Proceedings from conferences on Logic Programming (bibtex format)

machos-bibtex-zenon-inria-fr ..... Bibliography on MACH operating system (bibtex format)

merit-archive-mac.src ..... Index of some 2000 Mac programs available via ftp from mac.archive.umich.edu

meval-bibtex-zenon-inria-fr ..... Bibliography of MEVAL project - network queueing theory and modelling (french and english, bibtex format)

MIT-algorithms-bug.src ..... Bug lists for the book 'Introduction to Algorithms'

MIT-algorithms-exercise.src ..... Exercises to be used with 'Introduction to AlgorithmsÕ

MIT-algorithms-suggest.src ..... Suggestions submitted by readers of 'Introduction to Algorithms'

monashuni-papers.src ..... List of articles from many computing journals

monashuni-techreports.src ..... A list of archive sites that maintain Computer Science technical reports

neuroprose.src ..... Index to papers on neural networks on archive.cis.ohio-state.edu

nren-bill.src ..... U.S. High Performance Computing Act 1991

open_systems_calendar.src ..... Calendar of upcoming events related to Open Systems computing

ra-mime-zenon-inria-fr.src ..... Comp Sci and engineering reports from National Institute of Research in Computer Science and Control (mime format)

ra-zenon-inria-fr.src ..... 1990 activity reports from National Institute of Research in Computer Science and Control (french keywords, DVI format)

risks-digest.src ..... Collection of the RISKS digest which discusses the risks involved with using computers

SDSC_Docs.src ..... San Diego (State Uni) Supercomputer Centre information and documentation

software-eng.src ..... Archive of newsgroup comp.software-eng

tmc-technical-reports.src ..... Sampling of reports from Thinking Machines Corp

UNTComputerDoc.src ..... Technical documents written by Academic Computing Services at the University of North Texas

Languages

comp.lang.perl.src ..... Index of news group comp.lang.perl (perl computer language)

comp.lang.tcl.src ..... Archive of comp.lang.tcl newsgroup (tcl computer language)

tcl-talk.src ..... Think Class Library discussion list (Think C/Pascal for Mac)

Computer Software

ASK-SISY-Software-Information.src Information on software for different fields of interest to universities

comp.binaries.src ..... Archive for comp.binaries newsgroup (executable code for a variety of operating systems)

comp.db.src ..... Previous 10 days news in newsgroup comp.databases

comp.emacs.src ..... Previous 10 days news in newsgroup comp.emacs

comp.sources.src ..... Previous 10 days news in comp.sources*

comp.windows.ms.src ..... Archive of comp.windows.ms newsgroup (MS windows, programming, applications etc)

cosmic-abstracts.src ..... Abstracts of programs in the COSMIC inventory

cosmic-programs.src ..... Sample database of programs developed for the US Government

fj.sources.src ..... Index to Japanese software archive on utsun.s.u-tokyo.ac.jp

hyperbole-ml.src ..... Archive of Hyperbole mailing list (information manager built on Emacs)

info-afs.src ..... Index of archives of mailing list on the Andrew Fiel System

jargon.src ..... Collection of slang terms used by various subcultures of computer hackers and network phreakers

MacPsych.src ..... Archive of discussion on software for psychologists

sorrel-ada-archives.src ..... Software Reuse Repository Labs Ada Sources

wuarchive.src ..... The directory listing of the software archive wuarchive.wustl.edu

Connection Machine (CM) information

Applications-Navigator.src ..... A description of some 300 CM applications from many fields (e.g. fluid flow to AI)

CM-applications.src ..... Applications that run on Thinking Machines' CM series of computers

CM-fortran-manual.src ..... Documentation for CM Fortran (*)

CM-images.src ..... Sample images from calculations done on CM computers

CM-paris-manual.src ..... PARIS manual for programming the CM (*)

CM-star-lisp-docs.src ..... TMC *Lisp Reference Manual (*)

CM-tech-summary.src ..... TMC Technical Summary of the CM System (*)

cm-zenon-inria-fr.src .....
Administrative information for Connection Machine at National Institute of Research in Computer Science and Control (DVI format)

CMFS-documentation.src ..... CM File Server Reference Manual (*)

CWIS

bit.listserv.cwis-l.src ..... Archive of Campus Wide Information Systems (CWIS) listserver

Gopher

alt.gopher.src ..... Archive of the alt.gopher newsgroup

WAIS

alt.wais.src ..... Articles from the alt.wais newsgroup

au-directory-of-servers.src ..... Backup copy of the directory-of-servers at Thinking Machines Corp.

cicnet-directory-of-servers.src .... Directory of servers at CICnet

cicnet-wais-servers.src ..... WAIS servers run at the CICnet networld information

Connection-Machine.src ..... Databases on Connection Machine WAIS sever e.g. factbook, biology, bible, NIH guide (*)

directory-of-servers.src ..... Directory of servers at quake.think.com

directory-zenon-inria-fr.src ..... WAIS sources at National Institute of Research in Computer Science and Control (France)

INFO.src ..... Same as directory-of-servers.src

IUBio-INFO.src ..... Several biology WAIS sources (#)

SDSU-directory-of-servers.src ... San Diego State University directory of WAIS servers

unc-directory-of-servers.src ..... University of North Carolina directory of WAIS servers

wais-discussion-archives.src ..... Electronic discussion forum about WAIS

wais-docs.src ..... WAIS software distribution documentation

wais-talk-archives.src ..... Informal discussions about WAIS

Education

canada-asia-info.src ..... Curriculum Resources Database, developed by the Asia Pacific Foundation of Canada

catalyst.src ..... Articles from publication Catalyst on community services and continuing education

educom.src ..... Documents, summaries, calendars etc from Educom (association for higher education IT managers)

ERIC-archive.src ..... ERIC (Educational Resources Information Centre) digests

eric-digest.src ..... Short reports on topics of prime current interest in education

jte.src ..... Articles from the Journal of Technology Education

kidsnet.src ..... Archive of mailing list for international computer network for children and their teachers

k-12-software-reviews.src ..... Software and Courseware Online Review, contains reviews of educational software

livestock.src ..... Educational material for livestock production and management

Engineering

ijaema_a.src ..... Abstracts of papers from the International Journal of Analytical and Experimental Modal Analysis

software-eng.src ..... Archive of newsgroup comp.software-eng

Environment

DOE_Climate_Data.src ..... Index to US Dept of Energy world study reports covering subjects from air pollution to environmental policies to geological structure

environment-newsgroups.src ..... Archive of number of environmental newsgroups

Global_Change_Data_Directory.src .. Index of global climatic change study reports

great-lakes-factsheets.src ..... Factsheets

on environmental issues and subjects relevant to the US Great Lakes/St Lawrence river

lolita-miljo.src ..... Abstracts of environment related literature from Lund University, Sweden

midwest-weather.src ..... Weather forecasts for US midwestern states, updated hourly

miljodatabas.src ..... Index of environmental research projects from Lund University, Sweden

NOAA_National_Environmental_Referral_Service.src .. US National Oceanic & Atmospheric Admin environmental tests and available data (sun, atmosphere, earth and oceans)

USGS_Earth_Science_Data_Directory.src .. US Geological Survey directory of earth sciencs and natural resource database

Finance

agricultural-market-news.src ..... Agricultural commodity market reports compiled by the US Department of Agriculture

EIA-Petroleum-Supply-Monthly.src Tables and figures from US Dept of Energy, Energy Information Agency on disposition of petroleum products (postscript format)

nafta.src ..... Full text of the North American Free Trade Agreement

usda-rrdb.src ..... US Dept Agriculture agriculture and economic research

wall-street-journal-sample.src .... A couple of months worth of the Wall Street Journal (*)

Graphics

AVS_TXT_FILES.src .....

comp.graphics.src ..... Previous 10 days news in newsgroup comp.graphics

sample-pictures.src ..... Sample images in PICT format

Humanities

acronyms.src ..... Large list of acronyms and abbreviations

Aesop-Fables.src ..... A collection of over 300 fables (RTF format)

ANU-Pacific-Manuscripts.src .... Catalogue of microfilm collection of Pacific studies at the Australian National University

ANU-SocSci-Netlore.src ..... Network resources

useful to humanities and social science researchers

ANU-Thai-Yunnan.src ..... Bibliography and notes of Thai-Yunnan Project at the Australian National University

bryn-mawr-clasical-review.src ... Review of books in Latin and Greek classics

bush-speeches.src ..... Speeches and information from the office of former US president George Bush

clinton-speeches.src ..... Speeches by Bill Clinton for 1992 US presidential campaign

comp-acad-freedom.src ..... Computers and Academic Freedom lists (policies, bibliographies etc)

computers-freedom-and-privacy.src .. Text of the proccedings of the conference "Computers, Freedom and Privacy II" 1992

humanist.src ..... Volumes of the Humanist discussion list maintained at Brown University

india-info.src .....
Miscellaneous information for the Indian community

indian-classical-music.src ..... Music titles by Indian musicians

israel-info.src .....
Information on the State of Israel (including New East Report reprints)

jiahr.src ..... Articles from the Journal of International Academy of Hospitality

MacPsych.src ..... Archive of discussion on software for psychologists

movie-lists.src ..... Archive of rec.arts.movies lists of references to TV and film credits

movie-reviews.src ..... Movie reviews submitted by network newsgroup subscribers

Omni-Cultural-Academic-Resource.src .. Collection of international/cultural material including food, music, language, politics, religion, travel etc

poetry.src ..... Complete poetic works, including the complete poems of Shakespeare, Yeats, and Elizabeth Sawyer

proj-gutenberg.src ..... Documents produced by Project Gutenberg, an effort dedicated to the creation and distribution of English language electronic texts

roget-thesaurus.src ..... Roget's

Thesaurus, provided by Project Gutenberg

sample-books.src ..... Sample books and documents indexed at Thinking Machines

Science-Fiction-Series-Guide.src . ÒReviewsÓ of the major works of selected science fiction writers, and list of works on alternate history themes

sf-reviews.src ..... Science Fiction review articles

simpsons.src ..... Capsules for each episode of The Simpsons

thesaurus.src ..... As roget-thesaurus.src

toxic-custard-workshop.src ..... sarcastic/black humour

unced-agenda.src ..... Agenda for United Nations RIO summit

world-factbook.src ..... The 1990 World Factbook produced by the CIA with information on countries and cities (*)

world91a.src ..... 1991 CIA World Factbook with information on countries and cities

Journalism

factsheet-five.src ..... Information on 'zines' (underground, low circulation magazines)

journalism.periodicals.src ..... The Journalism Periodicals Index

london-free-press-regional-index.src .. Index of stories in the London Free Press (London, Canada)

the-tech-v112.src ..... 112th volume of The Tech, MITs oldest and largest newspaper

vpiej-l.src ..... Mailing list for electronic publishing issues, especially related to scholarly electronic journals

Religion

ANU-Asian-Religions.src ..... Bibliographic references to (mainly Buddhist) Asian religions

bible.src ..... King James version of the Bible (*)

Book_of_Mormon.src ..... The Book ot Mormon - Gutenberg version 11

Quran.src ..... The Koran

Information Sources

aarnet-resource-guide.src ..... A copy of the

AARNet Resource Guide

academic_email_conf.src ..... Info on newsgroups and electronic conferences (including Kovacs' scholarly e.c. list)

archie.au-ls-lRt.src ..... An index of the files on the Australian archive site 'archie.au'

archie-orst.edu.src ..... Index to SURAnet archie database of computer software

cicnet-resource-guide.src ..... Guide to some internet resources

comp.doc.techreports.src ..... Availability of tech reports from comp.doc.techreports newsgroup and various FTP sites

elec_journ_newslett.src ..... Information on electronic journals and newsletters for many disciplines (based on Strangelove's directory)

fidonet-nodelist.src ..... A list of nodes in the Fidonet network

file-archive-uunet.src ..... Directory listing of the archive on uunet.uu.net

finding-sources.src ..... Finding information on the network

ftpable-readmes.src ..... Database of README files from anonymous FTP sites around the world

ftp-list.src ..... Jon GranroseÕs anonymous FTP list

jik-usenet.src ..... FAQ articles from various newsgroups

lists.src ..... Several master lists of newsgroups, mailing lists, electronic serials and journals

netinfo.src ..... Index of text files relating to administration of the Internet

network-bibliography.src ..... Network related bibliographies

news.answers-faqs.src ..... Frequently Asked Questions on all subjects from news.answers newsgroup

news-conf.src ..... Conference announcements posted to news.announce.conferences newsgroup

quake.think.com-ftp.src ..... Directory of README files at the Thinking Machines Corp. ftp server

UNC_BBS_Info.src ..... University of

North Carolina bulletin board services

unc-ch-info.src ..... Most of University of North Carolina's INFO database (maintained by Judy Hallman)

utsun.s.u-tokyo.ac.jp.src ..... Directory of major Japanese FTP site utsun.s.u-tokyo.ac.jp

uunet.src ..... UUNET directory listing of FAqs from all newsgroups

uxc.cso.uiuc.edu.src ..... Recursive directory listing of uxc.cso.uiuc.edu

Law

columbia-law-library.src ..... A subset of the Columbia Law School online card catalogue

columbia-spanish-law-catalog ..... Columbia Law School index to Hispanic legislation

computers-freedom-and-privacy.src .. Text of the proccedings of the conference "Computers, Freedom and Privacy II" 1992

eff-documents.src ..... Documents and newsletters from the Electronic Frontier Foundation (education, policy, awareness, law etc applied to computers and communications)

eff-talk.src ..... Archive of the newsgroup comp.org.eff.talk (Electronic Frontier Foundation)

law-employers.src ..... Summary of legal employees in the US

patent-sampler.src ..... About 2 weeks of patent applications at the US Patent Office (*)

rkba.src ..... Files relating to the US Right to Keep and Bear Arms

supreme-court.src ..... US Supreme Court decisions in full text

us-judges.src ..... Records of clerkship application requirements for US Federal and upper level State courts

Libraries and Catalogues

bit.listserv.pacs-l.src ..... Discussion about computer systems provided by libraries to their patrons

columbia-law-library.src ..... A subset of the Columbia Law School online card catalogue

comp.internet.librart.src ..... Index to newsgroup on electronic libraries

current.cites.src ..... Index of

more than 30 journals for articles on electronic publishing, optical disk technologies, computer networking, information transfer and related topics

dit-library.src ..... Dept of Computer Engineering, Lund University, Sweden, library catalogue

hytelnet.src .....
Information sources accessible by TELNET including library OPACs (catalogues), bulletin boards, and others

inet-libraries.src .....
Information on accessing Internet and Janet (UK) accessible libraries

online-libraries-st-george.src ..... Art St GeorgeÕs directory of libraries and CWISÕs available over the network, together with access details

tmc-library.src ..... A catalogue of the library at Thinking Machines Corp.

Mathematics

bib-cirm.src ..... Books and conferences proceedings in mathematics (French keywords)

bib-dmi-ens-fr.src ..... Bibliography of books and conference proceedings on maths and comp sci (French keywords)

netlib-index.src ..... Indexes of the netlib mathematical software archive

s-archive.src ..... Mailing list archive for discussions about the S statistical analysis software

sas-archive.src ..... Mailing list archive for discussions about SAS statistical analysis software

spss-archive.src ..... Mailing list archive for discussions about SPSS statistical analysis software

stats-archive.src ..... US statistics theory mailing list archive

Miscellaneous

edis.src .....
California's Emergency Digital Information System news release test messages

sustainable-agriculture.src ..... Information on appropriateness of technology, organic farming, gardening etc

weather.src ..... Weather information, including surface analysis weather system maps

zipcodes.src ..... USA zipcode database

Multimedia

comp.multi.src ..... Index of news group comp.multimedia

comp.text.sgml.src ..... Archive of Standard Generalized Markup Language newsgroup

disco-mm-zenon-inria-fr.src ..... Multimedia documents in Internet MIME multimedia mail format

mime-samples.src ..... Multimedia documents in Internet MIME multimedia mail format

SGML.src ..... Standard Generalized Markup Language information

SIGhyper.src ..... Documents from the SGML Users' Group SIG on Hypertext and Multimedia

Networks

bcs-calendar.src ..... BCS calendar for this month and next month

bit.listserv.cdromlan.src ..... Archive of mailing list on cdrom products and LANs

comp.dcom.fax.src ..... Archive of comp.dcom.fax newsgroup (fax hardware, software and protocols)

com-priv.src ..... Discussions about issues related to the commercialisation and privatisation of the Internet

disi-catalog.src ..... Availability and capability of X500 implementations

eff-documents.src ..... Documents and newsletters from the Electronic Frontier Foundation (education, policy, awareness, law etc applied to computers and communications)

eff-talk.src ..... Archive of the newsgroup comp.org.eff.talk (Electronic Frontier Foundation)

matrix_news.src ..... Articles etc. from Matrix News monthly newsletter (Matrix News and Directory Services, Inc.)

mailing-lists.src ..... Lists of newsgroups, mailing lists, electronic serials and journals, with access details

merit-nsfnet-linkletter.src ..... Articles about the NSFNet and the Internet

network-tools.src ..... Descriptions and documentation about software tools for network monitoring and management

netbib.src .....
Bibliography of research on broadband networking, video and sound

phrack.src ..... All issues of Phrack - an old hacking and phreaking newsletter

ripe-database.src ..... RIPE (Reseaux IP Europeens) network contacts database

usenet-cookbook.src ..... The USENET Cookbook

usenet-FAQ.src ..... Some of the FAQ articles from USENET

x.500.working-group.src ..... Information about the availability and capability of X.500 implementations

Documentation and Standards

ietf-docs.src ..... Internet Engineers Task Force working documents

ietf-drafts.src ..... Internet Engineers Task Force drafts and working documents

internet-documents.src ..... Database of Internet Engineering Task Force (IETF) documents, including working group charters and minutes

internet-drafts.src ..... Draft copies of future Internet RFC (Request for Comment) documents

internet-resource guide.src ..... Guide to using the Internet

internet-rfcs.src ..... lnternet Request for Comment documents

internet-standards.src ..... Subset of RFC's (Request For Comment documents of internet 'standards')

Internet-user-glossary.src ..... Glossary of internet technical terms from IETF working group

open_systems_calendar.src ..... Meetings of OS committee and working groups

rfc-index.src ..... An index of the list of lnternet RFCs

ripe-documents.src ..... All documents available from ftp.ripe.net (RFC, IETF, IESG, RIPE and more)

ripe-internet-drafts.src ..... All internet drafts available from ftp.ripe.net

ripe-rfc.src ..... All RFCs available from ftp.ripe.net

Security

cert-advisories.src ..... Computer Emergency Response Team advisories on OS patches to correct security problems

cert-clippings.src ..... CERT clippings on security, holes and patches from various newsgroups

comp.risks.src ..... Archive of comp.risks newsgroup (risks to public in computers)

Using the Internet

internet_services.src ..... Documents describing services available on the Internet

internet_info.src ..... Texts, guides and info on internet use and ettiquette

netinfo-biblio.src .....
Bibliography of documents on using information services on the Internet

netinfo-docs.src ..... Various files with information on accessing the Internet and its resources

zen-internet.src ..... Zen and the Art of the Internet document, a network introduction

Phonebooks, Mail and Computer Lists

bitearn.nodes.src ..... Database of computers on BITNET center

cissites.src ..... LIst of contacts for organisations in the former Soviet Union who have/plan email

college-email.src ..... Email formats for US Uni students (by institution)

congress.src ..... Names, addresses and Ôpnone numbers for each US state congressman

domain-contacts.src ..... Internet network domains and their contacts

domain-organizations.src ..... Network domain names and organisations

fidonet-nodelist.src ..... A list of nodes in the Fidonet network

info-nets.src ..... Archive of infonets mailing list

internet-domain-contacts.src ..... Internet domains and contact information for the responsible parties

internet-phonebook. src ..... Index of the NFS Network Service Center Network Managers

Phonebook

irtf-rd.src ..... IRTF Resource Discovery mailing list

monashuni-phonedir.src ..... Monash University Ôphone directory

online@uunet.ca.src ..... The Online mailing list for information brokers and other people who search on line databases

SDSU_PhoneBook.src ..... San Diego State University Ôphone directory

sfsu-phones.src ..... San Francisco State University Ôphone directory

UNC_Staff_Phone.src ..... University of North Carolina staff Ôphone directory

UNC_Student_phone.src ..... Directory of students, University of North Carolina, Chapell Hill ,USA

uk-name-registration-service.src . Database of UK hostnames and addresses

usace-spk-phonebook.src ..... US Army Corps of Engineers Ôphone directory

usenet-addresses.src ..... A database of e-mail addresses of people who post to USENET

uumap.src ..... Tracks computers that are UUCP and Usenet sites around the world

whois.src ..... Whois service for finding information on internet domains, networks, hosts, organisations and people

Recreation

falcon3.src ..... Articles on flight simulation computer games

homebrew.src ..... Discussion on the art of brewing your own (beer that is)

movie-lists.src ..... Archive of rec.arts.movies lists of references to TV and film credits

movie-reviews.src ..... Movie reviews submitted by network newsgroup subscribers

netrek-ftp.src ..... Archive of information on Netrek (game)

rec.gardens.src ..... Index of articles from the rec.gardens recreational gardening newsgroup

rec.pets.src ..... 10 days news from rec.pets newsgroup (dogs, cats, etc)

Music

BGRASS-L.src ..... Archive of mailing ist on discusion of Blue Grass music

cdbase.src ..... Database of compact disk titles, record company and item number

early-m.src ..... Archives of discussions on early (medieval, rennaisance, baroque) music from rec.music.early newsgroup and earlym-l listserver

lyrics.src ..... The lyrics for a selection of contemporary music

midi.src ..... Musical Instrument Digital Interface documents

music-surveys.src ..... Comments on performers and music from rec.music newsgroups

MuTeX.src ..... Archive on discussion on TeX typesetting music from the Mutex mailing list

rec.music.early.src ..... As early-m.src

Food

recipes.src ..... Recipes

Robotics

comp.robotics.src ..... Archive of comp.robotics newsgroup

Research (Miscellaneous)

cerro-l.src ..... Mailing list contributions on research in Central Europe from the Central European Regional Research Organisation

eos-ncsu.src ..... Online help for N.C. State University's Project Eos

ut-research-expertise.src ..... University of Texas Catalogue of Research Expertise

UiO_Publications.src ..... Research publications at the University of Oslo

US-Gov-Programs.src ..... US Government research programmes

NCGIA-technical-reports.src ..... NCGIA Technical Reports

nsf-awards.src ..... Abstracts for awards made by the US National Science Foundation

nsf-pubs.src ..... Publications

of the US National Science Foundation

unimelb-research.src 1990
University of Melbourne (Australia) research report

Science (general)

sci.src ..... News from
sci.* (science) newsgroups e.g. aeronuatics,
electronics, medicine, physics, space

water-quality.src ..... Education
material on water quality assessment

US Government Departments

ota.src ..... US Ofice
of Technology Assessment policy documents

US-State-Department-Travel-Advisories.src ..
Archive of mailing list of US State Dept world wide
consular information sheets and travel warnings

WAIS

What is WAIS

WAIS, Wide Area Information Server, is a distributed information retrieval system. It helps users search databases over networks using an easy-to-use interface. The databases (called sources) are mostly collections of text-based documents, but they may also contain sound, pictures or video as well. More than 400 databases on topics ranging from Agriculture to Social Science can be searched with WAIS.

The databases may be organized in different ways, using various database systems, but the user isn't required to learn the query languages of the different databases. WAIS uses natural language queries to find relevant documents. The result of the query is a set of documents which contain the words of the query: no semantic information is extracted from the query.

Who can use WAIS

WAIS uses the client-server model to provide access to databases. You must be on the international TCP/IP network (the Internet) in order to use WAIS.

How to get to WAIS

There are many WAIS servers throughout the network. A directory-of-servers database is available at several sites. You can address a query to it.

quake.think.com acts as a demonstration site, you can telnet to it. At the login: prompt enter wais, no password is needed.

A complete listing of the advertised databases is available via anonymous FTP from Think.com in the directory /pub/wais as file wais-sources.tar.Z.

Public domain clients for accessing WAIS are available for: Macintosh, MS-DOS, Windows 3.x, VMS, NeXT, Unix, X-Window.

These clients are available for anonymous FTP from the University of North Carolina (SunSITE.unc.edu) in the directory /pub/wais.

The client interface differs slightly on different platforms. However, the queries are performed in the same way, whatever the

interface.

* Step 1: The user selects a set of databases to be searched from among the available databases.

* Step 2: The user formulates a query by giving keywords to be searched for.

* Step 3: When the query is run, WAIS asks for information from each selected database.

* Step 4: Headlines of documents satisfying the query are displayed. The selected documents contain the requested words and phrases. Selected documents are ranked according to the number of matches.

* Step 5: To retrieve a document, the user simply selects it from the resulting list.

* Step 6: If the response is incomplete, the user can state the question differently or feed back to the system any one or more of the selected documents he finds relevant.

* Step 7: When the search is run again, the results will be updated to include documents which are similar to the ones selected, meaning documents which share a large number of common words.

Learning more about WAIS

Bug reports, comments, suggestions, etc., should be addressed to George Brett at George.Brett@cnidr.org

Mailing list: wais-discussion@wais.com
To subscribe send a mail to wais-discussion-request@wais.com

Usenet newsgroup: comp.infosystems.wais

WAIS was developed at Thinking Machines Corporation.

Other WAIS Resources I have found useful

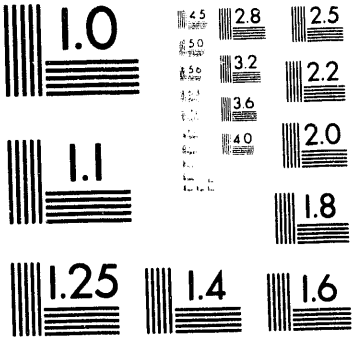
Journal of Computer Technology - journals are scanned for selected articles on electronic publishing, optical disk technology, computer networks & networking, information transfer, expert systems and artificial intelligence. Brief annotations accompany most of the citations.
wais.cic.net (wais search/anonymous FTP)

Congress - names, addresses, phone numbers, of members of congress - all 50 states
pit-manager.mit.edu (wais search/anonymous FTP)

National Science Foundation - recent publications
stis.nsf.gov (wais search/anonymous FTP)

Weather Reports Satellite Maps - up to date weather database
quake.think.com (wais search/anonymous FTP)

CIA World Fact Book - Demographics and politics of over 240 nations
cmns-sun.think.com (wais search/anonymous FTP)


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6

2 of 4

ASTRA

A detailed description of the ASTRA service
By: The EARN Association

Acquired from LISTSERV@EARNCC.BITNET

ASTRA

What is ASTRA

The ASTRA service allows users to retrieve documents from databases known by ASTRA throughout the network. Users can send their queries to the ASTRA server which in turn forwards the query to the related database servers. This provides an easy-to-use uniform access method to a large number of databases.

ASTRA provides the same user interface for all databases it can access, even if the database servers have different access languages, such as STAIRS, ISIS or SQL.

Each database defined in ASTRA has an abstract which holds information about the database: title, name of the maintainers, a brief description of the database, the main topics of the data-

base and its language. Users are advised to look at the abstracts before sending requests, to avoid sending requests to the wrong databases.

Some databases actually combine several different databases that deal with the same topics. When a user sends a request for such a database, the request is forwarded to all related databases.

Who can use ASTRA

Anyone who can send electronic mail to EARN/Bitnet can access ASTRA. Interactive user interfaces (clients) to ASTRA are available for VM and VMS systems on the EARN/Bitnet network. For all other users, there is a batch language that permits batch queries using e-mail.

How to get to ASTRA

Currently there are five ASTRA servers installed at the following addresses:

```
+-----------------------------------------------------------------+
|                                                                 |
|   ASTRADB@ICNUCEVM.BITNET                                       |
|   ASTRASQL@ICNUCEVM.BITNET                                      |
|   ASTRADB@IFIBDP.BITNET                                         |
|   ASTRADB@IFIIDG.BITNET                                         |
|   ASTRADB@IRMKANT.BITNET                                        |
|                                                                 |
+-----------------------------------------------------------------+
```

There are clients available for IBM VM and DEC VMS systems running on the NJE network. To order either client, send the following command to ASTRADB@ICNUCEVM.BITNET:

```
SUBSCRIBE SYS=sysname Firstname Lastname
```

where sysname is either VM or VAX, depending on your system, and Firstname Lastname is your real name (*not* your e-mail address). The ASTRADB server will send you a copy of the executable files and documentation files necessary to run the client.

Communication between the user interface and the server can be performed either by interactive messages, or via sendfile. In sendfile mode, the query entered by the user is placed in a file and delivered to the server.

Using ASTRA

The commands accepted by the ASTRADB server can be divided into two sections: general commands, such as HELP, and the commands that are part of the ASTRA Batch Query Language. In the following, angle brackets (<>) indicate an optional parameter.

```
HELP
```

General Commands:

```
+-----------------------------------------------------------------+
```

```
+-------------------------------------------------------------------+
|                                                                   |
|  GET       fn ft  <fm> <password>                                 |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

fn is the CMS filename of the file

ft is the CMS filetype of the file

fm is the CMS filemode of the file

password a password is required to access certain files.

This command allows the user to order any file from an ASTRA database server. SENDME is a synonym for GET command.

```
+-------------------------------------------------------------------+
|                                                                   |
|  NEWS                                                             |
|                                                                   |
+-------------------------------------------------------------------+
```

The NEWS command delivers a news bulletin from the ASTRA service. A separate file called ASTRA LOGNEWS with a complete log of old news is also available by sending the command: GET ASTRA LOGNEWS to the server.

```
+-------------------------------------------------------------------+
|                                                                   |
|  HELP      <fn>                                                   |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

fn is the optional filename of the helpfile to fetch.

This command provides the requested helpfile. If fn is omitted, the ASTRA INFO file is delivered. If a parameter is given, the helpfile with that filename is sent. Helpfiles on several databases are available.

Batch Query Language Commands:

Although the full-screen user interfaces to ASTRA are easier to use, the server also accepts batch-mode commands, which can be sent to the server by e-mail. The following batch-mode commands may be specified. Note that only the first character of each command is required.

```
+-------------------------------------------------------------------+
|                                                                   |
|  StartRequest: Username: username Host: host                      |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

username is the userid to which the results should be sent.

host is the host (or node) name to which the results should be sent.

This command starts the transaction, and specifies the address username@host to which the command results should be sent. For example, if the command comes from toot@hubble.circe.fr, the command should be:

```
S: U: toot H: hubble.circe.fr
```

```
+-----------------------------------------------------------------+
|                                                                 |
|  Dbname:   dbname TypeResult: resulttype                        |
|                                                                 |
+-----------------------------------------------------------------+
```

where:

dbname is the name of the database

resulttype
is the type of result desired.

This command selects a database name to use, and the type of results desired. Here the dbname can be any database name valid to ASTRA service. For an up-to-date listing of the available databases, send the command

```
GET ASTRA HELPDBTB
```

to ASTRADB@ICNUCEVM.BITNET.

resulttype indicates how the server should report the results. The choices are NUMERIC, DOCUMENT or SOFTWARE. NUMERIC indicates that only the number of hits should be returned, DOCUMENT specifies that the user should receive all documents matching the criteria, and finally SOFTWARE indicates that all related reports, software and pictures should also be sent to the user. For example, to search the STAR database and get the hit count, enter:

```
D: STAR T: N
```

```
+-----------------------------------------------------------------+
|                                                                 |
|  = querytext                                                    |
|                                                                 |
+-----------------------------------------------------------------+
```

This command starts a keyword search on the selected database. The querytext format can be either in STAIRS/CMS query language, or in the query language of the host (SQL stored query, or ISIS query language). The format to be used is specified with the PrintFormat command Consult the ASTRA help file for a complete list of search keywords.

```
+-----------------------------------------------------------------+
|                                                                 |
|  PrintFormat:  format                                           |
|                                                                 |
+-----------------------------------------------------------------+
```

where:

format is the print format name defined for this database.

This command tells the server which report format to use to display the results of a query. A default PrintFormat called D is

defined for each database, and specifies that the whole document is to be displayed. For examples and details, refer to the meta-database GEOL. Some other keywords that can be specified for the PrintFormat are as follows:

H=Y/N: Heading Required Yes/No
F=T/C: Tabular or Comma-Delimited format.

```
+-----------------------------------------------------------------+
|                                                                 |
|  EndRequest:                                                    |
|                                                                 |
+-----------------------------------------------------------------+
```

Use the EndRequest command to signal the end of a job. The Dbname, TypeResult, =, and PrintFormat commands may be repeated as many times as necessary within a batch job.

Examples

If you work on a VAX/VMS system in EARN/Bitnet and your name is Hilary Clinton, to subscribe to the ASTRA service and get the files for the interactive interface, use the command:

```
$ SEND ASTRADB@ICNUCEVM "SUBSCRIBE SYS=VAX Hilary Clinton"
```

To get help on ASTRA's meta-database, send the command:

```
HELP META
```

to: ASTRADB@ICNUCEVM.BITNET

Here is a sample batch file:

```
+-----------------------------------------------------------------+
|                                                                 |
|  startrequest: username: TURGUT host: FRORS12.CIRCE.FR          |
|  dbname: star typeresult: numeric                               |
|  = campus and network                                           |
|  printformat:                                                   |
|  dbname: soft typeresult: document                              |
|  = campus and network                                           |
|  printformat: all                                               |
|  endrequest:                                                    |
|                                                                 |
+-----------------------------------------------------------------+
```

Learning more about ASTRA

An extensive help file is available by sending the command HELP to ASTRADB@ICNUCEVM.BITNET. The following three files are also available at the same address using the GET command:

META DOCUMENT	the list and description of the available databases
ASTRAIMM DOCUMENT	the installation and maintenance guide
ASTRAFS DOCUMENT	the system specification manual

There are also LISTSERV lists for ASTRA users:

ASTRA-UG Used for the distribution of a newsletter about new databases or new versions of the current databases.

ASTRA-OG Used to report problems about the server. Users are encouraged to submit their questions or problems to this list.

To subscribe, send the command:

SUB listname Your Name

where listname can be either ASTRA-UG or ASTRA-OG to:
LISTSERV@ICNUCEVM.BITNET

An ASTRA newsletter is also available by sending the command: NEWS to ASTRADB@ICNUCEVM.BITNET.

The developers of the ASTRA service may be contacted at:
ASTRA@ICNUCEVM.CNUCE.CNR.IT

ARCHIE

Brief Intro & Sample Windows
By: Eric Thiel

Detailed description of ARCHIE
By: The EARN Association

Acquired from LISTSERV@EARNCC.BITNET

In this section is a brief summary of what ARCHIE is and sample windows produced while accessing ARCHIE by command line and by using Xarchie on the IBM. These sample windows were included to show the ease of use as well as acting as comparison of command line connection vs. client software interface. Xarchie is available from the Internet. In addition I have also included the EARN Association's more detailed description of what ARCHIE is and how to use it.

ARCHIE

Archie is an information system. It is an electronic directory service giving the user the ability to locate specific information in the Internet Network. The user can enter a specific keyword query and archie will produce a list of hosts that possess information regarding the topic of interest. The contents residing in over 1000 hosts will be scanned. Any matches between the users keyword and titles of files in these hosts will be compiled into a list. The list will show host, directory path, and file name. Files can be retrieved by anonymous FTP.

The archie database is automatically updated every 30 days. This insures that information is accurate and readily accessible.

Archie can be accessed by telnetting to one of the many archie servers found on the internet. At the login prompt type the word "archie" or in some cases "qarchie". This will allow you to begin a keyword search. At the archie prompt (>) type the word prog followed by the keyword you wish to search. After a period of time a list of hosts having files with your keyword as a main point or topic will be scrolled down the screen. The user may now access files by anonymous FTP from any of the hosts listed. See the example below.

The following is a list of archie servers:

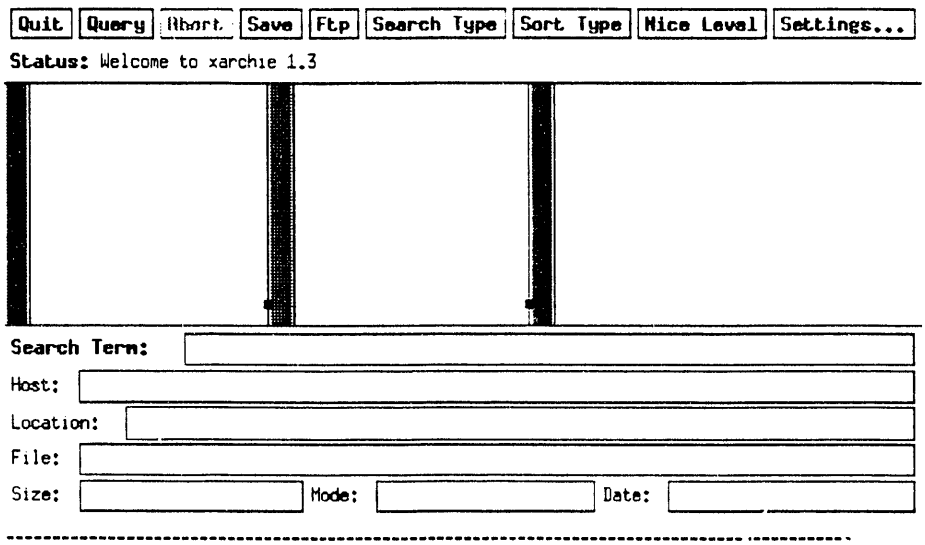
archie.sura.net	128.167.254.195	(Maryland University)
archie.rutgers.edu	128.6.18.15	(Rutgers University)
archie.unl.edu	129.93.1.14	(University of Nebraska in Lincoln)
archie.ans.net	147.225.1.2	(ANS archie server)
archie.au	139.130.4.6	(Australian server)
archie.funet.fi	128.214.6.100	(European server in Finland)
archie.doc.ic.ac.uk	146.169.11.3	(UK/Europe server)
archie.cs.huji.ac.il	132.65.6.15	(Israel server)
archie.wide.ad.jp	133.4.3.6	(Japanese server)
archie.ncu.edu.tw	140.115.19.24	(Taiwanese server)
archie.sogang.ac.kr	163.239.1.11	(Korean server)
archie.nz	130.195.9.4	(New Zealand server)
archie.kuis.kyoto-u.ac.jp	130.54.20.1	(Japan)
archie.th-darmstadt.de	130.83.128.111	(Germany)
archie.luth.se	130.240.18.4	(Sweden)

Client software should be supported at all of these sites.

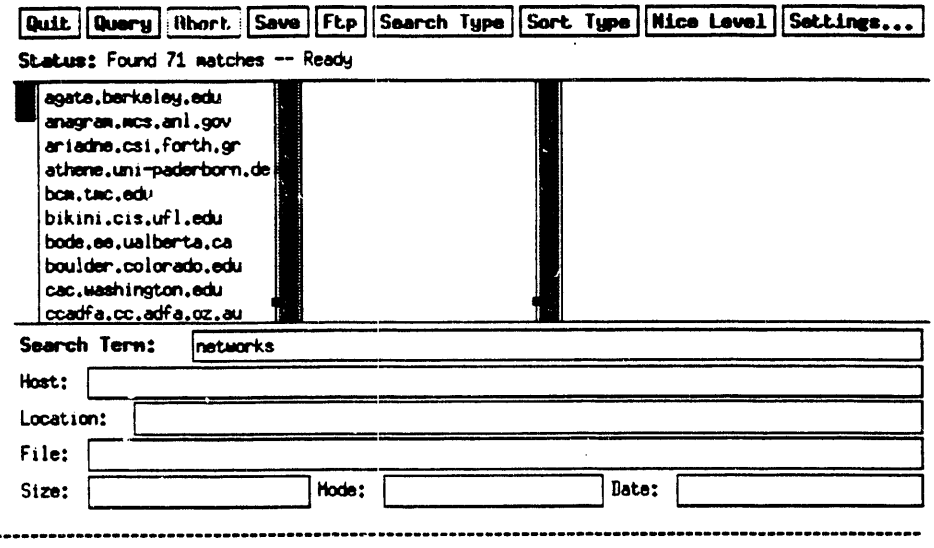
EXAMPLE:

```
gargleblaster:/us/thiel: telnet archie.sura.net
Trying 128.167.254.195 ...
Connected to yog-sothoth.sura.net.
Escape character is '^]'.
SunOS UNIX (yog-sothoth.sura.net)
login: qarchie
Last login: Tue Aug 17 11:41:32 from TECNET1.JCTE.JCS
>prog nuclear proliferation

Host terra.stack.urc.tue.nl
  Location: /pub/nfs/lyrics/n
    DIRECTORY drwxr-xr-x      512  Mar  3 09:34  nuclear.assault

Host kth.se
  Location: /kth/tex/stuttgart/help/documentation/tex-primer.vms-specific
      FILE -rw-r--r--    19939  Feb  6 1992  nuclear.tex

Host ftp.luth.se
  Location: /pub/misc/lyrics/n
    DIRECTORY drwxr-xr-x      512  Apr 10 20:25  nuclear.assault

Host unix.hensa.ac.uk
  Location: /pub/uunet/doc/papers/coombspapers/coombsarchives/international-relations
      FILE -rw-r--r--    26722  Apr 22 10:07  song-korean-nuclear-issue.t
```

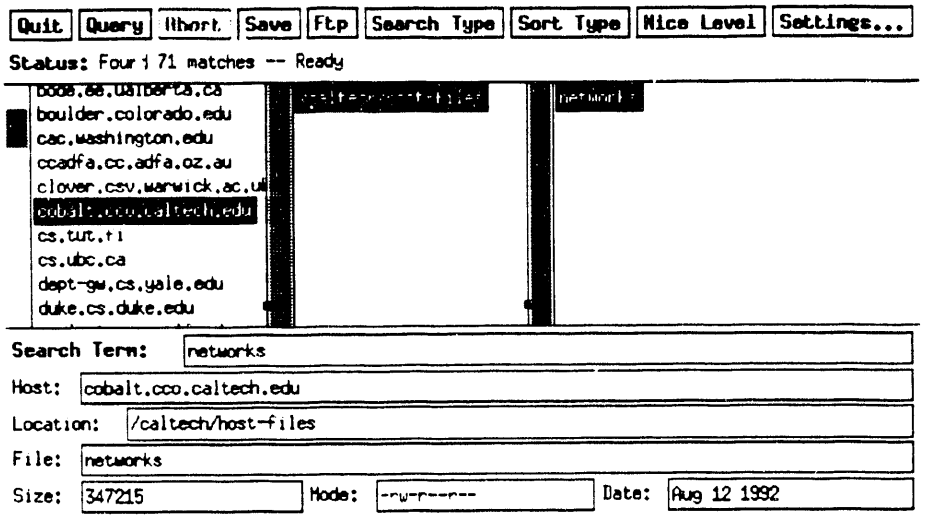
Accessing archie servers can be simplified by using a user friendly interface. Most of these interfaces are free and available to anyone having access to the internet. XARCHIE is available for PC's with windows. Archie interfaces for the Macintosh are available as well. Below is an example of how Xarchie works.



Available for Windows on PC's is **XARCHIE**. The xarchie window allows the user to enter a keyword to search. Once the keyword has been entered and the **query** button is activated, by a mouse click, the XARCHIE servers will be searched for documents that contain the subject of interest.



If the search term was "**NETWORKS**", after a few seconds the search will have located all sources in which the keyword was found. In this particular case there were **71** sources. By "clicking" on a specific host in the list of hosts on the left, the user can get detailed information about file location, size, and date it was entered.



Clicking on the **FTP** button or double "cliking" on the file name will allow the user to access (download) the document(s) from the host to the users file space.

```
Host mcsun.eu.net

    Location: /EUnet
      DIRECTORY drwxrwxr-x        512  Jul 21 03:00  networks

Host kragar.eff.org

    Location: /pub/cud
      DIRECTORY drwxr-xr-x        512  Jun  2 01:11  networks

Host uts.mcc.ac.uk

    Location: /pub/doc/UTS-Admin/roff-version
           FILE -rw-------        633  Feb 27 1991  networks

Host clover.csv.warwick.ac.uk

    Location: /pub/cud
      DIRECTORY drwxr-xr-x       1024  Jun 14 09:57  networks
>quitConnection closed by foreign host.
gargleblaster:/us/thiel:
```

When the search is finished a list of all the hosts in which there were "hits" will be scrolled across the screen. The host address, file names, file size, and file location will be displayed. (The window above shows the last four "hits" of the 96 that occurred during this particular search).Initiating an anonymous FTP session with a specific host will allow the user to retrieve any of the documents identified by archie. Typing quit at the archie prompt terminates the session.

ARCHIE

What is ARCHIE

Archie is an information system. It offers an electronic directory service for locating information in the international TCP/IP network (the Internet).

The best known use of archie is for scanning a database of the contents of more than 1000 anonymous FTP sites around the world. Currently, this database contains more than 2,100,000 file names from anonymous FTP sites. This database is known as the archie database.

The files made available at anonymous FTP sites are software packages for various systems (Windows, MS-DOS, Macintosh, Unix, etc.), utilities, information or documentation files, mailing list or Usenet group discussion archives. At most FTP sites, the resources are organized hierarchically in directories and subdirectories. The database tracks both the directory path and the file names.

The archie database is automatically updated, thereby ensuring that the information is accurate. Using this database, users can easily find the the location of files they need without logging onto several machines.

Who can use ARCHIE

Users on any network can access the archie database by electronic mail. Other means of access are available to users on the Inter-

net (see the section Using ARCHIE below for details).

You are requested to respect a few basic rules when you request information from an archie server:

* avoid connecting during working hours; most of the archie servers are not dedicated machines, they have local functions as well.
* make your queries as specific as possible; the response will be quicker and shorter.
* user interfaces installed on your computer contribute to reduce the load on the server sites, please use them.
* use the archie server closest to you and, in particularly, don't overload the transatlantic lines.

How to get to ARCHIE

The archie database is maintained in 17 different locations.

archie.edvz.uni-linz.ac.at	Austria
archie.univie.ac.at	Austria
archie.au	Australia
archie.funet.fi	Finland
archie.th-darmstadt.de	Germany
archie.doc.ic.ac.uk	Great Britain
archie.cs.huji.ac.il	Israel
archie.wide.ad.jp	Japan
archie.kuis.kyoto-u.ac.jp	Japan
archie.sogang.ac.kr	Korea
archie.nz	New Zealand
archie.luth.se	Sweden
archie.ncu.edu.tw	Taiwan
archie.ans.net	USA
archie.rutgers.edu	USA
archie.sura.net	USA
archie.unl.net	USA

There are three ways to access the archie database: via a local client, interactive Telnet session or electronic mail. Each type of access is described below in the Using ARCHIE section.

Using ARCHIE

The format of the parameters is given at the end of this section. Angle brackets (<>) indicate an optional parameter; a vertical bar (|) indicates a choice of parameters.

Using a local client:

Usage of these clients is encouraged since they provide quick and easy non-interactive access to the archie servers, and thus, better performance of the servers and better response time for the user.

Public domain clients for accessing archie servers are available for: Macintosh, MS-DOS, OS/2, VMS, NeXT, Unix and X Window.

The clients are available for anonymous FTP from the archie sites in the directory /archie/clients.

Archie client command and parameters

The archie client is a command with parameters that you enter on your local machine. With most versions of the archie client, if you type archie with no parameters, you will get a list of the possible parameters and a short description of each.

The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  archie    <-options> string | pattern                    |
|                                                             |
+-------------------------------------------------------------+
```

where the options are:

o — specifies an output file name to store the results (not available with all clients).

l — lists the result one match per line. This form is suitable for parsing by programs.

t — sorts the result inverted by date

m# — specifies maximum number of matches to return (# within the range 0 to 1000). The default value is 95.

h archie_server — specifies an archie server to send the query to; if this parameter is not given, then the query will be sent to the default archie server, if one is defined.

L — lists known servers and current default

The following group of options determines the kind of search performed on the database. They are mutually exclusive.

s — a match occurs if the file/directory name contains string. The search is case insensitive.

c — as above, but the search is case sensitive.

e — string must EXACTLY match (including case) the file/directory name in the database. This is the DEFAULT search method.

r — searches the database using pattern. It contains special characters which must be interpreted before performing the search.

There may be some slight differences in the options available with different clients on different platforms.

The result is a list of FTP site addresses with entries matching the argument, the size of the resource, its last modification date and its directory. By default, the list is sorted by host address. See the Examples section below for an example of archie output.

Using Telnet:

To access an archie server interactively, telnet to one of the existing servers (see the list of servers in the section How to get to ARCHIE above). At the login: prompt enter archie, the login procedure ends leaving the user at a archie> prompt. The server is ready for the user requests and the following commands are available:

exit, quit, bye
: exits archie.

list <pattern>
: provides a list of the sites in the database and the time at which they were last updated. The optional parameter limits the list to specific sites.

  The result is a list of site names, sites IP address and date of the last update in the database.

  The command list with no pattern will list all sites in the database (more than 1000 sites!). The command: list ".de$ will lists all German sites.

site site-name
: lists the directories and, recursively, the subdirectories, of site-name in the database. The result may be very long.

whatis string
: searches the database of software package descriptions for string. The search is case-insensitive.

prog string | pattern
: searches the database for string or pattern which represents the name of the resource to be found in the database. Searches may be performed in a number of different ways specified in the variable search (set command) which also decides the interpretation of the parameter as string or pattern.

  The result is a list of FTP site addresses with matching entries, the size of the resource, its last modification date and the directory to find it. The number of hits is limited by the maxhits variable (set command).

  The result of prog can be sorted in different ways, depending on the value of the sortby variable (set command).

  By default, the variables search, maxhits and sortby are set to, respectively, exact match search on string, 1000 hits and unsorted resulting list.

  Typing the keyboard interrupt character during a search will abort it. The results up to that time are displayed.

  See the Examples section below for an example of the prog command and its results.
  prog

mail <email> <,email2...>
: sends the result of the last command in a mail message to the specified e-mail address(es,. If issued with no

argument, the result is sent to the address specified in the variable mailto (set command).

show variable
: displays the value of the given variable name. If issued with no argument, it displays all variables. See the set command below for the possible variables.

set variable value
: sets one of the archie's variables. Values of these variables affect how archie interacts with the user.

Variables and values are:

mailto email <,email2 ...>
: specifies the e-mail address(es) to mail the result of the last command when mail is issued with no arguments.

maxhits number
: specifies the maximum number of matches prog will generate (within the range 0 to 1000). The default value is 1000.

search search-value
: determines the kind of search performed on the database by the command: prog string | pattern. search-values are:

  sub
  : a partial and case insensitive search is performed with string on the database, eg:

    "is" will match "islington" and "this" and "poison"

  subcase
  : as above but the search is case sensitive, eg:

    "TeX" will match "LaTeX" but not "Latex"

  exact
  : the parameter of prog (string) must EXACTLY match (including case) the string in the database. The fastest search method of all, and the default.

  regex
  : pattern is interpreted before performing a search on the database.

  sortby sort-value
  : describes how to sort the result of prog. sort-values are:

    hostname
    : on the FTP site address in lexical order.

    time
    : by the modification date, most recent first.

    size
    : by the size of the found files or directories, largest first.

    filename
    : on file or directory name in lexical order.

    none
    : unsorted (default)

    The reverse sorting orders from those

described here are obtained by prepending r to the sortby value given. (eg, reverse hostname order hostname is rhostname).

term terminal-type <number-of-rows <number-of-columns>>
tells the archie server what type of terminal you are using, and optionally its size in rows and columns, eg:

set term xterm 24 100

Using electronic mail:

Users limited to electronic mail connectivity can access the archie servers by sending mail to the domain address of one of the servers listed in the section How to get to ARCHIE. The commands are sent in the body part of the mail.

An archie server recognizes eight commands: help, path, prog, whatis, list, site, compress and quit. Particularities to the electronic mail interface are described below. If an empty message, or a message containing no valid requests is received, it will be considered to be a help request.

Command lines begin in the first column. All lines that do not match a valid command are ignored. The Subject: line is processed as if it were part of the message body.

help sends you the help file. The help command is exclusive, ie, other commands in the same message are ignored.

path return-address
specifies a return e-mail address different from that which is extracted from the message header. If you do not receive a reply from the archie server within several hours, you might need to add a path command to your message request.

prog pattern <pattern2 ...>
searches the database for each interpretation of pattern which represents the name of a resource to be found in the database.

If multiple patterns are placed on one line, in that case, the results will be mailed back in one message. If multiple prog lines appear, then multiple messages will be returned, one for each prog line. Results are sorted by FTP site address in lexical order. If pattern contains spaces, it must be quoted with single (') or double (") quotes.

The search is case sensitive.

whatis string <string2 ...>
searches the database of software packages descriptions for each string. The search is case insensitive.

list pattern <pattern2 ...>
provides a list of the sites in the database that match pattern and the time at which they were last updated.

The result is a list with site names, sites IP address and date of the last update in the database.

site site-name
: lists the directories and, recursively, the subdirectories, of site-name in the database.

compress
: causes the result of the current request to be compressed and uuencoded. When you receive the reply, you should run it through uudecode. This will produce a .Z file. You can then run uncompress on this file and get the result of your request

quit
: nothing past this point is interpreted. Useful when a signature is automatically appended at the end of your mail messages.

Description of pattern

A pattern describes a character string including characters which take a special meaning. The special meaning is lost when "\" is put before the character. The special characters are:

.
: (period) this is the wildcard character that replaces any other character, eg, "...." will match any 4 character string.

^
: (caret) if "^" appears at the beginning of the pattern, then the searched string must start with the substring following the "^". If it occurs anywhere else in the pattern it is regarded as non-special, eg:

    "^efghi" will match "efghi" or "efghijlk" but not "abcefghi"

$
: If "$" appears at the end of the pattern, then the searched string must end with the substring preceding the "$". If occurring anywhere else in the pattern, it is regarded as non-special, eg:

    "efghi$" will match "efghi" or "abcdefghi" but not "efghijkl"

Examples

If you are using an archie client, and enter the command:

    archie -s eudora

or if you send, by e-mail or during a Telnet session, the command:

    prog eudora

then archie will send you the following results:

```
Host dorm.rutgers.edu

 Location: /pub/Mac/comm
   DIRECTORY drwxr-xr-x     512  Oct  2 1990  Eudora
 Location: /pub/Mac/comm/unsorted
        FILE -rwxr-xr-x  634517  Sep  1 1990  eudora.tar.Z

Host extro.ucc.su.oz.au

 Location: /pub
   DIRECTORY drwxr-xr-x     512  May  6 1992  eudora
```

```
Location: /pub/eudora
       FILE -rw-r--r-- 1140708  Mar  6 1991  eudora1.1ctb1.i.hqx
       FILE -rw-r--r-- 1138727  Mar  6 1991  eudora1.1ctb2.i.hqx
       FILE -rw-r--r-- 1140546  Mar  6 1991  eudora1.1tcp.i.hqx
```

etc.

If you send the command list ".de$ by e-mail or in a Telnet session, then you will get the following results:

```
41 currently stored site names match '\.de$'

alice.fmi.uni-passau.de              132.231.1.180  17:54 3 Mar 1993
askhp.ask.uni-karlsruhe.de           192.67.194.33  19:20 3 Mar 1993
athene.uni-paderborn.de               131.234.2.32  19:26 3 Mar 1993
charly.bl.physik.tu-muenchen.de     129.187.160.10  20:26 3 Mar 1993
coma.cs.tu-berlin.de                 130.149.29.10  21:17 3 Mar 1993
dsrbg2.informatik.tu-muenchen.de     131.159.0.110  21:57 2 Mar 1993
etc.
```

If you send the command whatis archie by e-mail or in a Telnet session, then you will get the following results:

```
archie        A Prospero client for archie
awl           Layout language for widget hierarchies (X11)
perl_archie   An archie client in perl
xarchie       X11 client for the archie system
```

Learning more about ARCHIE

However you communicate with the archie server, on-line help is available.

If you have any questions about archie, write to the Archie Group, Bunyip Information Systems Inc. at info@bunyip.com.

Bug reports, comments, suggestions, etc. should be mailed to archie-group@bunyip.com.

Mailing list: archie-people@bunyip.com
To subscribe send a mail to: archie-people-request@bunyip.com

Archie was developed by Alan Emtage, Peter Deutsch, and Bill Heelan from the McGill University Computing Center, Canada.

WHOIS

A detailed description of WHOIS
By: The EARN Association

Acquired from LISTSERV@EARNCC.BITNET

WHOIS

What is WHOIS

WHOIS provides directory service to network users. This service is a way of finding e-mail addresses, postal addresses and telephone numbers. It may also deliver information about networks, networking organizations, domains and sites.

The main database of networking-related names (organizations, sites, networks, people, etc.) is maintained by the Internet Registration Service (InterNIC). Actually, the names of the

administrative and technical contacts for registered domains are automatically entered into the database when domain or IP number applications are processed by the Internet coordination authority. Each entry of the database has a handle (a unique identifier), a name, a record type, and various other fields depending on the type of record. This database will be used as an example in the descriptions below.

Before April 1, 1993, the Network Information Center (NIC) of the Defense Data Network (DDN) was the Internet coordination authority and, therefore, maintained the database (known as the NIC database). The NIC database is now restricted to information about the .mil domain. Many documents still refer to these names.

Many academic sites maintain their own database to offer information about their staff members and students.

Who can use WHOIS

WHOIS is available to users on the international TCP/IP network (the Internet).

A WHOIS server is accessible across the network from a user program running on local machines or via an interactive Telnet session to the site which hosts the server.

How to get to WHOIS

There are many WHOIS servers throughout the network and a comprehensive list would be too long to be included here. A WHOIS server offers information about the organization to which it belongs: it doesn't share a common directory with other WHOIS servers and doesn't know either where to find information about other institutions.

Using WHOIS

WHOIS has become the familiar name of the user program for accessing a WHOIS database, although NICNAME is the original name.

In the following, angle brackets (<>) indicate an optional parameter.

Using a local client:

Unix computers have a native whois command. On non-Unix machines, ask your system administrator whether your computer has it or not. This command searches the database on the specified site for entry which contains identifier. The format is:

```
+-----------------------------------------------------------+
|                                                           |
|  whois     <-h site-name> identifier                      |
|                                                           |
+-----------------------------------------------------------+
```

where:

site-name is the domain address of the site which hosts the database you want to query (eg, whois.internic.net). On some installations, the default value is set to the NIC database site (nic.ddn.mil).

identifier
is a name (person, host, domain or network), an IP number or a handle.

Special characters may be used to specify the search:

. before the identifier will cause a name-only search.

! before the identifier will cause a handle-only search.

... or . after the identifier will cause a partial search: everything starting with identifier will match.

@ in the identifier will cause a search on the e-mail addresses.

* before the identifier will return the entire membership list of the entry that match identifier (eg, shows a site and its registered users).

% before the identifier will return only the entire membership list of the entry that match identifier (eg, shows the registered users of a site).

The special characters may be used together.

The results are displayed in one of 2 ways:

* a full detailed display for a single match,
* a list of summary lines for multiple matches.

In both cases, the handle is shown in parenthesis after the name to be used in further searches.

Using Telnet:

To access interactively the InterNIC database, telnet to the InterNIC site (whois.internic.net). There is no specific login. Other WHOIS databases have a Telnet access and offer most of the functions below (eg, whois.ripe.net which hosts the WHOIS database of the European IP Networks). In the following, CAPITAL letters indicate acceptable abbreviation.

WHOIS invokes the information retrieval program.

? displays a short on-line help.

HElp accesses the full on-line help.

Q, QUIT, RETURN key
exits WHOIS

<keyword> identifier
searches the database for entry which contains identifier. The default action is to do a broad search, looking for matches in many fields: handle, name, nicknames, hostname, IP number, etc, and finding all record types. keyword may be used to narrow the search to a

specific record type.

Special characters may be used in identifier to specify the search:

. before the identifier will cause a name-only search.

! before the identifier will cause a handle-only search.

... or . after the identifier will cause a partial search: everything starting with identifier will match.

@ in the identifier will cause a search on the e-mail addresses.

* before the identifier will return the entire membership list of the entry that match identifier (eg, a host and its registered users).

% before the identifier will return only the entire membership list of the entry that match identifier (eg, registered users)

~ before the identifier will return the entry that match the identifier only, no membership list.

The special characters may be used together.

keyword specifies the record type to limit the search. It may be one of:

PErson limits the search to persons.

DOmain limits the search to domains (eg, DO EARN.NET).

HOst limits the search to hosts (eg, HO PRINCETON).

NEtwork limits the search to networks (eg, NE EBONE).

Organization
limits the search to organizations (eg, O CREN).

NAme same as leading '.' in identifier.

HAndle same as '!' in identifier.

PArtial same as trailing '.' in identifier.

Mailbox same as '@' in identifier.

EXPand same as '*' in identifier.

SUBdisplay
same as '%' in identifier.

Full or '='
shows detailed display for EACH match.

SUMmary or '$'
shows summary always, even if just one match.

Except if Full or SUMmary are specified, the results are displayed in one of 2 ways,:

* a full detailed display for a single match,
* a list of summary lines for multiple matches.

In all cases, the handle is shown in parenthesis after the name to be used in further searches.

Etiquette

In general, WHOIS servers should only be used for isolated queries about specific information. Typically, it is not acceptable to make an extended series of queries to obtain large sections of the directory. Such a strategy is unfair both because of excessive consumption of server resources, and because the directory information belongs to individuals. In particular, extracting lists of people for commercial purposes is strictly prohibited.

Examples

```
whois \!EARN...        (remark: """ is an escape character)

EARN (EARN-HST)  SEINE.EARN.NET
130.84.8.204
European Academic Research Network (EARN-DOM)
EARN.NET


whois EARN-DOM

European Academic Research Network (EARN-DOM)
   EARN Office
   CIRCE BP 167
   91403 ORSAY CEDEX, France

   Domain Name: EARN.NET

   Administrative Contact:
      Deckers, Hans  (HD35)  deck@FRORS12.CIRCE.FR
      +33 1 6982 3973
   Technical Contact, Zone Contact:
      Bovio, Daniele  (DB355)  hi@FRORS12.CIRCE.FR
      +33 1 6982 3973

   Record last updated on 23-Oct-92.

   Domain servers in listed order:

   LUMIERE.CIRCE.FR  130.84.8.14
   SEINE.EARN.NET  130.84.8.204

whois hi@f...

Bovio, Daniele (DB355)  hi@FRORS12.CIRCE.FR
   EARN
   EARN Office
   CIRCE BP 167
   91403 ORSAY CEDEX, France

   +33 1 6982 3973

   Record last updated on 23-Oct-92.
```

Learning more about WHOIS

The WHOIS service is documented in an Internet Request For Comments (RFC 1400).

If you have any questions about WHOIS write to nic@nic.ddn.mil.

Bug reports, comments, suggestions, etc. should be mailed to suggestions@nic.ddn.mil.

NETSERV

A detailed description of NETSERV
fast access to data files

By: EARN Association

Acquired from LISTSERV@EARNCC.BITNET

What is NETSERV

NETSERV is a server, which allows fast access to data files and programs of general interest. The main functions of the server can be divided into three general categories: File Server, Node Management and User Directory services.

As a file server, NETSERV provides a file repository consisting of information files, and programs. It allows users to retrieve files, to store files and to subscribe to the files of their choice. The latter two functions however, require the user to be a privileged user meaning, a user who has a password for NETSERV.

As a node management tool, NETSERV provides data files and programs for node administrators and network coordinators, and allows the registration of new nodes or changes in the network.

Finally, each NETSERV keeps a separate user directory of the users who have chosen to register themselves to the server. Users can specify a wide variety of information on themselves, permitting queries to be performed by others on any of the available fields.

In order to achieve a balanced load on the network and a faster response time to users, NETSERV uses a distributed server concept: this is achieved by the installation of a large number of servers on the network to ensure that the user can locate a nearby server. All servers communicate with each other to distribute updated information and make it available from each copy of the server.

NETSERV's file server functions include retrieving any file present in its filelists, storing new versions of a file, and subscribing to files stored on the server. Its file directories are arranged in an hierarchical method, with NETSERV FILELIST being on top or at the root of the filelists. This filelist can be obtained by sending a GET NETSERV FILELIST command to any NETSERV. Filelists contain short descriptions of the files, and two access codes for each file. These codes represent the get and put privileged required for that file. These codes are explained at the beginning of the NETSERV FILELIST file.

NETSERV's user directory allows users to search for registered users on any of the available fields, such as name, network address, profession, phone number, etc.

Who can use NETSERV

The server is available in almost every country. To find the closest server for your area send a QUERY SERVICE command to a server. The following are examples of NETSERV server addresses:

```
NETSERV@FRMOP11.BITNET
NETSERV@HEARN.BITNET
NETSERV@BITNIC.BITNET
```

In general, there is only one NETSERV permitted for one country. However, in some limited cases, such as when the country has a large number of nodes, additional servers may be installed. In any case, the user is not required to run NETSERV to be able to access and use the server.

How to get to NETSERV

NETSERV accepts e-mail access from users on any network. Commands to NETSERV should be placed in the body of the mail file, and not in the Subject: line.

For users in the EARN/Bitnet network, NETSERV is accessible via interactive message. Commands from privileged users requiring a password must be sent this way.

NETSERV does not have delivery limitations, except that a file ordered from NETSERV cannot be ordered again on the same day.

Using NETSERV

NETSERV offers a complete set of commands for every task. In particular, its HELP feature is thorough: a short help info about a single command or message can be requested by the command HELP helptype where helptype is either a command, a sub-command or the message number that was displayed by the server.

Commands For General Users:

Use the GET command to retrieve a file, or a filelist stored on NETSERV. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  GET<xx>   filename filetype <prologtext>                   |
|                                                             |
+-------------------------------------------------------------+
```

where:

XX (optional)
: defines the transfer format of the file, and can be one of: ND for NETDATA, DD for DiskDump, PP for Punch or Print,LP for LISTSERV-Punch, and 80 to split records at 80 columns, in Punch format. If XX is omitted then NETSERV will use the format best suited to your site.

filename is the filename of the file.

filetype is the filetype of the file.

prologtext
is any text that you wish placed at the top of the file.

Use the GET NODENTRY command to extract an entry for a node in the Master Nodes file, which contains complete network and contact information about all nodes in EARN, Bitnet and cooperating networks. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  GET NODENTRY      entryid                                  |
|                                                             |
+-------------------------------------------------------------+
```

where:

entryid is the name of a node in the BITEARN NODES file.

Use the QUERY command to display various information about the server. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  QUERY     keyword                                          |
|                                                             |
+-------------------------------------------------------------+
```

where keyword determines the behavior of the command. Acceptable keywords are:

CMD to see the available NETSERV commands,

CONTROLLER
to display the network address of this NETSERV's Controller,

FILE filename filetype
to display information about a file stored on NETSERV

SERVICE <nodeid>
to provide information about which countries or subnetworks this NETSERV provides service for, and which NETSERV is responsible for your node area, or for another node specified by nodeid.

Use the SERVE command to have service reinstated, if your access to NETSERV has been suspended. This command must be issued from another user address. The format of this command is:

```
+-------------------------------------------------------------+
|                                                             |
|  SERVE     user@node                                        |
|                                                             |
+-------------------------------------------------------------+
```

where:

user@node is your address.

Use the UDS command to add information about yourself to the server, or to update or delete it. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  UDS       option keywords                                  |
|                                                             |
+-------------------------------------------------------------+
```

where:

option can be ADD, REP, FIND, GET or DEL.

keywords are the keywords that may be required for that option.

The format of the ADD option is:

```
UDS ADD
:USERID.xxxxxxxx  :NODE.xxxxxxxx
:NAME.firstname middle lastname
:PHONE.phone number
:ADDR.institute name;city;country
:DESCR.job title;activities;interests;etc
```

The GET and FIND options can be used to locate other users on the network. FIND only returns one line per entry, whereas GET returns entire entries for the matching users. These options must be followed first by the maximum desired matching and also by the search criteria. The criteria must be specified as:

:fieldname searchvalue <:fieldname searchvalue ...>

The fieldname can be any of the ones listed in the above example, and the search value can be a subset of the actual sought value, such as SM instead of Smith. Example:

```
UDS FIND 30 :name Harry :addr New York
```

The search is case-insensitive and additional blanks are ignored.

NETSERV has a wide variety of clients that provide a local interface to the service. The most widely used one is called NETSRV EXEC and runs on IBM/VM systems. It features on-line help and facilitates sending commands to NETSERV. It is available via GET NETSRV EXEC command from any NETSERV.

The NODES EXEC program provides a full screen interface to information within the BITEARN NODES file.

Examples

If you want to find out what NETSERV server provides service for your node, then send the command:

```
QUERY SERVICE
```

to: NETSERV@HEARN.BITNET (or to any other NETSERV server).

If you want to get details on the node ROEARN, then send the command:

```
GET NODENTRY ROEARN
```

to your nearest NETSERV.

If you want to get an up-to-date listing of all nodes in the international NJE network, then send the command:

```
GET BITNET NODELST
```

to your nearest NETSERV.

Learning more about NETSERV

The server provides a large helpfile which can be obtained by sending a GET NETSERV HELPFILE command to any NETSERV. A list for NETSERV maintainers is available as NETSRV-M@HEARN.BITNET. Additional information can be obtained from the NETSERV maintainer, Ulrich Giese at U001212@HEARN.BITNET.

TRICKLE

A detailed description of TRICKLE file retrieval system
By: EARN Association

Acquired from LISTSERV@EARNCC.BITNET

TRICKLE

What is TRICKLE

TRICKLE is a service which will send you files on request, or by subscription. TRICKLE works with various anonymous FTP sites, computers in the Internet network that allow public access and retrieval of software and files. It provides a quick and easy alternative to FTP, whether or not you have access to the Internet.

There are several TRICKLE servers throughout the world that cooperate to distribute the files efficiently. To request files the user issues commands to the nearest TRICKLE server, which delivers the software either from its local cache disk, from the cache of another TRICKLE server, or from an FTP site that holds the software.

Who can use TRICKLE

There are currently TRICKLE servers at the following addresses:

Location	EARN/BITNET	Internet
Austria	TRICKLE@AWIWUW11	
Belgium	TRICKLE@BANUFS11	TRICKLE@ccs.ufsia.ac.be

Colombia	TRICKLE@UNALCOL	TRICKLE@unalcol.unal.edu.co
France	TRICKLE@FRMOP11	TRICKLE@frmop11.cnusc.fr
Germany	TRICKLE@DEARN	TRICKLE@vm.gmd.de
Israel	TRICKLE@TAUNIVM	TRICKLE@vm.tau.ac.il
Italy	TRICKLE@IMIPOLI	
The Netherlands	TRICKLE@HEARN	TRICKLE@hearn.nic.surfnet.nl
Sweden	TRICKLE@SEARN	TRICKLE@searn.sunet.se
Turkey	TRICKLE@TREARN	TRICKLE@ege.edu.tr
Turkey	TRICKLE@TRMETU	TRICKLE@3090.cc.metu.edu.tr

When you send a command to a TRICKLE server, it either executes the command or sends you a message with the address of the TRICKLE server for your area.

The files which are available from TRICKLE are organized in main directories which contain many subdirectories. The main directories which are currently available are:

Directory	Source FTP Site	Contents
MSDOS	simtel20.army.mil	Large MS-DOS software archive
MISC	simtel20.army.mil	Software for VM, VMS, Unix
SIGM	simtel20.army.mil	SIG/M CP/M archive
PC-BLUE	simtel20.army.mil	PC-BLUE MS-DOS archive
CPM	simtel20.army.mil	CP/M Software Archive
ARCHIVES	simtel20.army.mil	Various discussion group archives
UNIX-C	simtel20.army.mil	Unix and C code software archives
MACINTOS	simtel20.army.mil	Apple Macintosh software archives
OS2	ftp-os2.nmsu.edu	Large archive of OS/2 software
AMIGA	nic.funet.fi	Large Amiga collection
KERMIT	watsun.cc.columbia.edu	Kermit network software
TEX	rusinfo.rus-uni-stuttgart.de	TeX software and fonts
WUARCHIVE	wuarchive.wustl.edu	MS-DOS and others
EXPO-MIT	export.lcs.mit.edu	Unix and others
UUNET	ftp.uu.net	Unix and others
SUMEX-AIM	sumex-aim.stanford.edu	Macintosh and others

How to get to TRICKLE

You send commands to TRICKLE by electronic mail. The commands should be in the body of the mail message, one command per line. Any number of commands (up to your daily command limit) may be placed in one message. Note that all TRICKLE commands begin with a slash (/). Users on the EARN/Bitnet network may also send commands to TRICKLE by interactive message.

Using TRICKLE

All commands begin with a slash (/). Note that the angle brackets (<>) are part of the command, NOT an indication of an optional parameter.

Use the /PDDIR command to obtain directory listings.

```
+-------------------------------------------------------------+
|                                                             |
|  /PDDIR                                                     |
|                                                             |
|  /PDDIR    <dirname>                                        |
|                                                             |
|  /PDDIR    <dirname.subdirname>pattern                      |
|                                                             |
+-------------------------------------------------------------+
```

where:

dirname is the name of a main directory,

subdirname
is the name of a subdirectory,

pattern is the first characters of a filename, to limit the directory listing.

Use /PDDIR without any parameters to get a listing of the main directories. With: PDDIR <dirname> you will get a listing of the subdirectories under that directory. If you specify both directory and subdirectory, it will list the files that are available in that subdirectory. pattern may be used to reduce the size of the listing.

Use the /PDGET command to get files.

```
+-------------------------------------------------------------+
|                                                             |
|  /PDGET    <dirname.subdirname>filename ( delivery option   |
|                                                             |
+-------------------------------------------------------------+
```

where:

dirname is the name of a main directory

subdirname
is the name of a subdirectory

filename is the name of a file

delivery option
specifies the format to which the file(s) should be translated before being sent to you. The possible values are:

EBC80 UUE XXE HEX BTOA

The option EBC80 should be used to get text files if you work on an IBM mainframe system. The other options are formats for translating binary files so that they can be sent via electronic mail. You will need a program to translate the file back to its original form. The default for EARN/Bitnet users is to send the file as-is. The default for others is UUE.

You can use an asterisk (*) as a wildcard character in the subdirname or filename fields. This will cause TRICKLE to send the file(s) matching your specification.

The /SUB command is used to subscribe both to directories and to individual files.

```
+-------------------------------------------------------------+
```

```
+-------------------------------------------------------------------+
|                                                                   |
|  /SUB       <dirname>                                             |
|                                                                   |
|  /SUB       <dirname.subdirname>pattern                           |
|                                                                   |
|  /SUB       QUERY                                                 |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

dirname is the name of a main directory,

subdirname
is the name of a subdirectory,

pattern is the first characters of a filename

If you subscribe to a directory, you will get a summary of added files about once a week, depending on how active the FTP site is. This listing shows the names, sizes and dates of each file added. If you subscribe to files, a new version of the file will be sent to you as soon as TRICKLE is informed that it has been stored at FTP site.

pattern consists of the first few letters of a filename. Since filenames usually reflect the version number of the file, it is a good idea to omit the number when specifying a pattern. For example, it is better to send a

```
/SUB <MSDOS.VIRUS>SCANV
```

command rather than

```
/SUB <MSDOS.VIRUS>SCANV102
```

since, as new versions of the file are stored, the name might change to SCANV103, SCANV104, etc.

The /SUB QUERY command allows you to get a list of the files you are subscribed to.

The /UNSUB command may be used to cancel a subscription.

```
+-------------------------------------------------------------------+
|                                                                   |
|  /UNSUB     <dirname>                                             |
|                                                                   |
|  /UNSUB     <dirname.subdirname>pattern                           |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

dirname is the name of a main directory,

subdirname
is the name of a subdirectory,

pattern is the first characters of a filename

Optionally, you can put a '*' instead of pattern to remove all entries for that subdirectory.

Examples

For a listing of the files in the VIRUS subdirectory of SIMTEL20 (the MSDOS directory), send the command:

```
/PDDIR <MSDOS.VIRUS>
```

To get the file 00-INDEX.TXT from <MSDOS.VIRUS> in EBCDIC format, send the command:

```
/PDGET <MSDOS.VIRUS>00-INDEX.TXT ( EBC80
```

To subscribe to automatically get new versions of the SCANV software from <MSDOS.VIRUS>, send the command:

```
/SUB <MSDOS.VIRUS>SCANV
```

To unsubscribe from all files in the VIRUS subdirectory, send the command:

```
/UNSUB <MSDOS.VIRUS>*
```

Learning more about TRICKLE

The /HELP command may be sent to any TRICKLE server to obtain a very detailed help file from the server. The LISTSERV@EARNCC.BITNET also holds a file describing this server. This file can be obtained by sending a GET TRICKLE MEMO command to LISTSERV@EARNCC.BITNET.

BITFTP

A detailed description of the BITNET FTP server
and file retrieval

By: EARN Association

Acquired from LISTSERV@EARNCC.BITNET

BITFTP

What is BITFTP

BITFTP, BITNET FTP Server, allows users of EARN, Bitnet and associated networks to access FTP sites on the Internet.

The BITFTP server provides a mail interface between a user on the EARN/Bitnet network to FTP sites on the Internet. BITFTP handles this task by passing the commands specified in the mail message from the user to another server that actually makes the connection to the FTP sites. When the server finishes the interaction with the FTP site, or fails due to an error, a transcript of the result is sent back to the user, as well as the requested file(s), if any.

The format of the files sent to the user can be defined within the mail message. BITFTP can deliver files in NETDATA and UUENCODE formats.

Who can use BITFTP

BITFTP is currently available only to users on EARN, Bitnet and other regional NJE networks. It currently does not accept access to European FTP archive sites from European users. Further, it

does not support putting files onto FTP sites or the mget (multiple get) command.

How to get to BITFTP

There are BITFTP currently running at:

```
+-------------------------------------------------------------+
|                                                             |
|         BITFTP@PUCC.BITNET                                  |
|         BITFTP@DEARN.BITNET                                 |
|                                                             |
+-------------------------------------------------------------+
```

Servers at other locations are planned.

BITFTP accepts requests via electronic mail, including IBM NOTE and PROFS-format messages, as well as by file transfer.

Using BITFTP

BITFTP implements a large subset of the FTP commands of the IBM's TCP/IP for VM, using the same syntax. This software is documented in the IBM manual TCP/IP for VM User's Guide. In the following, angle brackets (<>) indicate an optional parameter.

Use the FTP command to specify which host to connect to. This command must be the first command in your mail file. You can also specify the file format that you wish BITFTP to use to deliver files to you.

```
+-------------------------------------------------------------+
|                                                             |
|  FTP       hostname <fileformat>                            |
|                                                             |
+-------------------------------------------------------------+
```

where:

hostname is either the IP address or the domain name of the host to connect to.

fileformat
is the format in which BITFTP should deliver files to you. It can be either NETDATA or UUENCODE.

Use the USER command to tell the host the username and the password to be used for the FTP connection. Note that on Unix systems, both username and password are case-sensitive.

```
+-------------------------------------------------------------+
|                                                             |
|  USER      username password                                |
|                                                             |
+-------------------------------------------------------------+
```

where:

username is the user-id to use for the FTP connection.

password is the password for the username you specified. It can be omitted if you specified anonymous for the userid.

Use the CD command to select a particular directory as current directory.

```
+-------------------------------------------------------------------+
|                                                                   |
|  CD        directory-name                                         |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

directory-name
is the name of the directory to be selected.

Use the DIR command to display a list of the files in the current, or specified, directory. The file names, and depending on the site, the file size, file creation date and other information will be listed.

```
+-------------------------------------------------------------------+
|                                                                   |
|  DIR       <pattern>                                              |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

pattern is a pattern that defines which file names should be displayed. Many FTP sites are case-sensitive, thus care must be used with the pattern. The pattern may contain any number of characters, and the wildcard character asterisk (*) may be used to represent any characters.

The LS command is similar to the DIR command, except that with most FTP sites, it only displays the filenames, without any other information. The pattern specification is identical to DIR.

```
+-------------------------------------------------------------------+
|                                                                   |
|  LS        <pattern>                                              |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

pattern is a pattern that defines which file names should be displayed. Many FTP sites are case-sensitive, thus care must be used with the pattern. The pattern may contain any number of characters, and the wildcard character asterisk (*) may be used to represent any characters.

Use the GET command to obtain a file from the current host.

```
+-------------------------------------------------------------------+
|                                                                   |
|  GET       foreignname <localname>                                |
|                                                                   |
+-------------------------------------------------------------------+
```

where:

foreignname
is the filename of the file, as stored at the FTP site. With many sites, the case of the filename must be

respected.

localname is an optional local filename. If you specify a local-name, it must be in the form: filename.filetype where neither part is longer than eight characters.

Use the BINARY command to set the FTP transfer mode. If this option is set then no EBCDIC-ASCII translation will take place. This should be used for non-text files.

```
+-----------------------------------------------------------------+
|                                                                 |
|  BINARY                                                         |
|                                                                 |
+-----------------------------------------------------------------+
```

Use the QUIT command to close the connection to the host, and to terminate the BITFTP session.

```
+-----------------------------------------------------------------+
|                                                                 |
|  QUIT                                                           |
|                                                                 |
+-----------------------------------------------------------------+
```

Examples

Here is a sample BITFTP command file:

```
+-----------------------------------------------------------------+
|                                                                 |
|  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                                                           |
|                                                                 |
+-----------------------------------------------------------------+
```

Learning more about BITFTP

A four-page instruction to the BITFTP service can be obtained by sending a HELP command in the body of a mail message to the BITFTP@PUCC.BITNET address.

Additional information on BITFTP may be obtained from EARN (NETHELP@EARNCC.BITNET). More information about TCP/IP and FTP in general can be obtained from a wide variety of sources, including the IBM TCP/IP for VM User's Guide, and the FTP site nis.nsf.net which provides good introductory documents on the subject.

NETNEWS

A detailed description of
NETNEWS communication
By: EARN Association

Acquired from LISTSERV@EARNCC.BITNET

NETWORKED INTEREST GROUPS

NETNEWS (USENET)

What is NETNEWS

NETNEWS, or Usenet as it is more commonly called, is a collection of newsgroups distributed electronically around the world. Netnews provides a means for local users to communicate with each other, and with other users nationally and internationally.

Usenet was developed for Unix systems in 1979 by two graduate students at Duke University. Within a year, fifty Unix sites, including Bell Labs, were participating. Now, there are thousands of sites running a number of operating systems on a variety of hardware platforms communicating via Usenet around the globe.

Site administrators control their own sites. No one has any real control over any site but his own.

Sites are not entirely without influence on their neighbors, however. There is a vague notion of upstream and downstream related to the direction of high-volume news flow. To the extent that upstream sites decide what traffic they will carry for their downstream neighbors, those upstream sites have some influence on their neighbors' participation in Usenet.

There are many misconceptions about Usenet. Despite the myths: Usenet is not an organization. Usenet is not a democracy. There is no person or group in charge of Usenet as a whole. Usenet is not an academic network. Although many Usenet sites are universities, research labs or other academic institutions, by plain count, most Usenet sites are commercial entities. Usenet is not the Internet. The Internet is only one of the various networks carrying Usenet traffic. For example, EARN carries Usenet traffic too. Usenet is not a UUCP network. UUCP is a protocol for sending data over point-to-point connections, typically using dialup modems. Sites use UUCP to carry many kinds of traffic, of which Usenet is only one. Usenet is not a Unix network. Usenet can be found on many operating systems. Usenet is not software. There are dozens of software packages used at various sites to transport and read Usenet articles. So no one program or package can be called the Usenet software.

Who can use NETNEWS

Usenet newsgroups can be read at thousands of sites around the world. In addition, there are several sites that provide public dial-up service, so that people who are not at a Usenet site can have access to newsgroups as well.

How to get to NETNEWS

If your site provides Usenet access, then there are a large num-

ber of software packages available for reading news (at least one is probably available on your computer). These packages either access a local news spool, or use the NNTP protocol to access the news spool on some other computer in the network.

Within EARN, a network of Netnews distribution has been developed, providing efficient distribution of Usenet traffic while minimising the load on the network for the participating countries.

Using NETNEWS

There are many software packages available for reading and distributing Netnews on a variety of platforms. Most, if not all, of these packages provide the same basic abilities:

* subscription to news groups, so that you can choose to read the postings of groups that interest you quickly and easily.
* keeping records of which postings you have already read.
* threads of discussion, so that you can follow groups of postings that deal with the same subject.
* posting to news groups, so that you can easily participate in group discussions.

The following, excerpted mostly from the article Usenet Software: History and Sources, by Gene Spafford, is not an exhaustive list of the existing news packages:

Unix:

Several popular screen-oriented news reading interfaces have been developed in the last few years to replace the traditional readnews interface. The first of these was vnews and it was written by Kenneth Almquist. vnews provides a readnews-like command interface, but displays articles using direct screen positioning. It appears to have been inspired, to some extent, by the notes system (described below). vnews is currently distributed with the standard 2.11 news source.

A second, more versatile interface, rn, was developed by Larry Wall (the author of Perl) and released in 1984. This interface also uses full-screen display with direct positioning, but it includes many other useful features and is very popular with many regular net readers. The interface includes reading, discarding, and/or processing of articles based on user-definable patterns, and the ability of the user to develop customized macros for display and keyboard interaction. rn is currently at release 4.4. It is being maintained by Stan Barber of the Baylor College of Medicine. rn is not provided with the standard news software release, but is very widely available because of its popularity. The software can be obtained from its official archive site, lib.tmc.edu, using FTP, and via mail from archive-server@bcm.tmc.edu

A variant of rn is trn by Wayne Davison. trn adds the ability to follow threads of discussions in newsgroups; its latest version 2.2 is based on rn 4.4. It uses a reference-line database to allow the user to take advantage of the discussion tree formed by an article and its replies. This results in a true reply-ordered reading of the articles, complete with a small ASCII representation of the current article's position in the discussion tree. trn can be obtained from ftp.coe.montana.edu in the /pub/trn directory, from UUnet in the news subdirectory, and from many other archive servers world-wide.

There are two popular macro packages named GNUS and Gnews that can be used with the GNU Emacs text editor. These allow reading, replying, and posting interaction with the news from inside the Emacs text editor. Client code exists to get the articles using NNTP rather than from a local disk. Copies can be found on most archive sites that carry the GNU archives.

nn is yet another reader interface, developed by Kim F. Storm of Texas Instruments A/S, Denmark, and released in 1989. nn differs from the traditional readnews and vnews by presenting a menu of article subject and sender-name lines, allowing you to preselect articles to read. nn is also a very fast newsreader, as it keeps a database of article headers on-line. (i.e. it trades space for time. A good rule of thumb is that the nn database size is 5%-10% of your news spool. So up to 110% of your news spool is the amount of space news and the nn database will take.) The current version of nn is 6.4.16. nn can be obtained via anonymous FTP from dkuug.dk, uop.uop.edu, or various other sites.

Yet another newsreader is the tin reader. It operates with threads, has different article organization methods, and is full-screen oriented. tin works on a local news spool or over an NNTP connection. It has been posted to alt.sources, and further information is available from Iain Lea (iain%anl433.uucp@Germany.EU.net). The current release of tin is 1.1 PL5. tin is based more on the Notes and tass systems than rn. There is an extensive list of features, including interfaces to batch modes and auto unpacking mechanisms.

X-window:

xrn is an X11-based interface to NNTP that was written by Rick Spickelmier and Ellen Sentovich (UC Berkeley). The current version is 6.17. xrn supports many features, including sorting by subject, user-settable key bindings, graceful handling of NNTP server crashes, and many of the features of rn (including KILL files and key bindings similar to rn). xrn is actively supported by the authors with bug fixing and feature addition support from many of the users. xrn can be retrieved from most of the popular FTP sites (gatekeeper.dec.com, ftp.uu.net, export.lcs.mit.edu).

Another X11-based newsreader is xvnews. This is a news reader designed primarily for Sun workstations running OpenWindows. It runs with NNTP and is compatible with rn style commands. It is available from export.lcs.mit.edu in the /contrib directory.

VMS:

ANU-NEWS is a news package written by Geoff Huston of Australia for VMS systems. ANU-NEWS is complete news system that allows reading, posting, direct replies, moderated newsgroups, etc. in a fashion closely related to regular news. The implementation includes the RFC 1036 news propagation algorithms and integrated use of the NNTP protocols (see below) to support remote news servers, implemented as a VAX/VMS Decnet object. An RFC 977 server implemented as a Decnet object is also included. The ANU-NEWS interface is similar to standard DEC screen oriented systems. The license for the software is free, and there are no restrictions on the re-distribution. For more info, contact Geoff Huston (gih900@fac.anu.oz.au). ANU-NEWS is available for anonymous FTP from kuhub.cc.ukans.edu. Contact sloane@kuhub.cc.ukans.edu for more info.

A screen-oriented news client for VMS is also available via FTP from ftpvms.ira.uka.de. Contact Bernd Onasch

(onasch@iravcl.ira.uka.de) for details.

Reader NNTP clients for VMS are also available, including VMS/VNEWS (current release 1.4) and an upcoming reader only version of ANU-NEWS. VMS/VNEWS is available for anonymous FTP from arizona.edu (contact jms@arizona.edu for more information) or at any site which archives vmsnet.source. Although the current release of ANU-NEWS is usable as a reader it can be difficult when used with a Unix server.

VM/CMS:

There is an IBM VM/CMS version of the Usenet software which is widely available. It is known as PSU NetNews, and it is maintained by Linda Littleton (lrl@psuvm.bitnet or lrl@psuvm.psu.edu). Version 2.4 of the software is available from listserv@psuvm. PSU NetNews supports only 3270 terminals, and uses XEDIT as its screen driver. Most major VM sites appear to use this package. NetNews supports locally-stored news, not NNTP reading.

There is NNTP support for PSU NetNews for bulk news receipt: NNTPXFER will poll another site for news, and NNTPRCVR will receive news sent from a Unix NNTPXMIT process. Either program sends the news articles to NetNews for processing. Contact Andy Hooper (hooper@qucdn.bitnet or hooper@qucdn.queensu.ca) for more information, or obtain them from listserv@qucdn in public filelist. These programs are provided with source, and require IBM's FAL TCP/IP and Pascal. An NNTPXMIT sender that works in cooperation with PSU NetNews is available from Herman Van Uytven (systhvu@ccl.kuleuven.ac.be).

There is at least one NNTP news-reader for VM using XEDIT as its screen manager: NNR. Contact Paul Campbell (pc@mbunix.mitre.org) for information. The program requires IBM's FAL TCP/IP. The software is available for anonymous FTP from rusmv1.rus.uni-stuttgart.de in the directory: /soft/kommunikation/news/beginner/software/vm-cms/*.

MVS:

An NNTP news reader is available for TSO/ISPF, called NNMVS. NNMVS is written by Stephen Bacher (seb1525@mvs.draper.com) at Draper Laboratory. It requires C/370 V1R2 (though V1R1 will work) and uses TCP/IP sockets. It is now available for anonymous FTP at ftp.uni-stuttgart.de under the directory /soft/kommunikation/news/beginner/software/nnmvs. The current release is Version 2 Release 3 Modification Level 1 (in pseudo-IBM parlance).

Macintosh:

An NNTP newsreader for Macintoshes is available called News. It is implemented as a HyperCard stack and depends on MacTCP. It is available from many Mac archives, including ftp.apple.com and sumex-aim.stanford.edu

MS-DOS:

Trumpet is an NNTP news reader for MS-DOS machines by Peter R. Tattam (peter@psychnet.psychol.utas.edu.au). It requires the use of a packet driver. It provides a user-friendly environment for news-reading and also supports the use of a mouse for point-and-click use. It is available as shareware from tasman.cc.utas.edu.au.

Note that the number of software packages available to run news, especially on PCs, is increasing. We have mentioned only a few of the many news packages available, and the presence or absence of any particular software package should not be construed as indicating anything about its suitability or usefulness.

In addition to the packages for Usenet access mentioned above, many other communications programs provide the possibility for Usenet access as well as their main function.

Learning more about NETNEWS

News programs communicate with each other according to standard protocols, some of which are described by Internet Request For Comments (RFC). Copies of RFCs are often posted to the network and obtainable from archive sites. Current news-related RFCs include the following:

- RFC 977 specifies NNTP, the Network News Transfer Protocol,
- RFC 1036 specifies the format of Usenet articles.

Several articles on Usenet are posted periodically to the newsgroup: news.announce.newusers.

LISTSERV

A detailed description of
LISTSERV communication
By: EARN Association

Acquired from LISTSERV@EARNCC.BITNET

LISTSERV

What is LISTSERV

LISTSERV is a distribution list management package. It runs on IBM VM/CMS systems in the international NJE network (EARN/Bitnet). It allows groups of computer users with a common interest to communicate among themselves, while making efficient use of computer and network resources. It makes it easy for even novice users to discover, join, and participate in these interest group mailing lists. LISTSERV also provides facilities for logging and archiving of mail traffic, file server functions, and database searches of archives and files.

There are LISTSERV lists on every subject under the sun, with names ranging from AARPUB-L (AAR Electronic Publication list) to Z3950IW (Z39.50 Implementors Workshop). LISTSERV lists are international and eclectic. You will find lists in every imaginable field, for every audience, in many different countries and in many different languages.

See the description of the List command below for instructions on getting an up-to-date list of lists.

Who can use LISTSERV

Anyone who can send electronic mail to an EARN/Bitnet address can participate in a mailing list and access other LISTSERV facilities, as long as the message format is valid (according to the RFC822 standard), and has a usable return address. Every day, people use LISTSERV from HEPnet, Internet,

Compuserve, MCIMail and many other networks throughout the world.

Ask your local support people if you don't know how to send electronic mail to EARN/Bitnet.

How to get to LISTSERV

To use LISTSERV facilities, send electronic mail with your LISTSERV commands to: LISTSERV@host-id where host-id is the host computer's NJE address (eg, TAUNIVM.BITNET) or its Internet domain name (eg, VM.TAU.AC.IL). There may be some local variation on the format needed to send mail to Bitnet or Internet addresses. Check with your local support people.

More than one command can be sent to LISTSERV in the same mail message. Each command must be on a separate line. LISTSERV will ignore the Subject: line of the mail header.

For EARN/Bitnet users, interactive messages are the fastest and most convenient way to send commands to LISTSERV, but bear in mind that interactive messages only work when the links between your computer and LISTSERV are up; if the message fails, you can always send your command via mail. To send interactive messages from an IBM computer running VM/CMS, the format is:

```
TELL LISTSERV AT node_id listserv_command
```

On a VAX/VMS system, the format is:

```
$  SEND LISTSERV@node_id "listserv_command"
```

The LISTSERV command must be in quotes.

Note: To join a list, you send a message with your SUBscribe command to LISTSERV. To make an announcement to the members of a list, you send mail to the list address. For example, to join the EARN Users Group list (list name: EARN-UG, host site: IRLEARN), send a SUBscribe command to LISTSERV@IRLEARN.BITNET This can be done interactively, from VM:

```
TELL LISTSERV AT IRLEARN SUB EARN-UG Name Lastname
```

or from VMS:

```
$ SEND LISTSERV@IRLEARN "SUB EARN-UG Name Lastname"
```

or by mail, to LISTSERV@IRLEARN.BITNET, with the line:

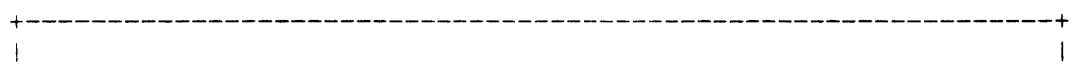
```
SUB EARN-UG Name Lastname
```

in the text of the message.

To send a message to all list members, send mail to:

```
EARN-UG@IRLEARN.BITNET
```

There are more than 250 sites in over 30 countries throughout the world running LISTSERV as part of the world-wide network. Here is a list of some of the LISTSERV sites:



Host Computer	Site	Contry
DEARN	GMD Bonn	Germany
BITNIC	BITNET Network Information Center	USA
HEARN	Katholieke Universiteit Nijmegen	Netherlands
CUNYVM	City University of New York	USA
PUCC	Princeton University, New Jersey	USA
ICNUCEVM	CNUCE Istituto del CNR, Pisa	Italy
UKACRL	Rutherford Appleton Laboratory	Great Britain
QUCDN	Queen's University Computing Services	Canada
FRMOP11	CNUSC, Montpellier	France
TREARN	Ege University Bornova, Izmir,	Turkey
UCHCECVM	Universidad de Chile, Santiago	Chile
TWNMOE10	Ministry of Education, Taipei	Taiwan
JPNSUT00	Science University of Tokyo	Japan
KRSNUCC1	Seoul National University	South Korea
UFRJ	cUniversidad Federal do Rio de Janeiro	Brazil
SEARN	Kungliga Tekniska Hoegskolan, Stockholm	Sweden
ANDESCOL	Universidad de Los Andes, Bogota	Colombia
SAKFU00	King Faisal University, Hofuf	Saudi Arabia
HKUVM1	The University of Hong Kong	Hong Kong
PTEARN	Faculdade de Ciencias de Lisboa	Portugal
GREARN	Institute of Computer Science, Heraklion	Greece
PLEARN	Warsaw University	Poland
AEARN	Vienna University, Wien	Austria
CSEARN	Czech Technical University, Prague	Czech Republic
HUEARN	Hungarian Academy of Sciences	Hungary
TAUNIVM	Tel Aviv University	Israel
EARNCC	EARN Office, Paris	France

Using LISTSERV

The following summary of LISTSERV commands is divided into list subscription commands, informational commands, and file and file-list commands. This is followed by a brief description of the LISTSERV database facilities.

The list of commands included in this document is not exhaustive.

CAPITAL letters indicate acceptable abbreviation; angle brackets: < > indicate an optional parameter; vertical bar (|) indicates a choice of parameters. Format of parameters is given at the end. There are two basic versions of LISTSERV in use: LISTEARN 1.3 and Revised LISTSERV 1.7. The two versions differ only in certain command parameters. Parameters marked with a (#) are for LISTEARN 1.3 only, those marked (+) are available only in Revised LISTSERV 1.7. To find out which version is installed at the server you wish to use, send the command: SHOW VERSion.

List subscription commands:

Use the SUBscribe command to join a list: The format of the command is:

```
SUBscribe listname  Your full name
```

where listname is the name of a mailing list. Note that you do not send your electronic mail address. LISTSERV automatically determines your electronic mail address from your mail (or interactive message.)

Subscription to a list can be open, closed, or by-owner. If it is open, you will be automatically added to the list and sent notification. If it is closed, you will not be added to the list, and LISTSERV will send you a message telling you that your request has been rejected. If it is by-owner, your subscription request will be forwarded to the list owner(s), who will decide whether or not to add you to the list (LISTSERV will inform you to whom your request has been forwarded). To see what kind of subscription a list has, use the REView command. If you send a SUBscribe command for a list to which you already belong, then LISTSERV will interpret the command as a request to change your full-name on the list.

You can send your SUBscribe command to the LISTSERV site that manages the list you wish to join, or to any backbone LISTSERV site. All backbone sites have an up-to-date listing of all non-confidential lists at every LISTSERV site. If there are several sites with (unconnected) lists of the same name, then LISTSERV will send you a list of those sites and advise you to send your SUBscribe command direct. Otherwise, the backbone LISTSERV will SUBscribe
automatically forward your request to the appropriate site.

When you join a list, LISTSERV at that site adds your name and e-mail address to its signup file. Once you have joined a list at a particular site, you need not include your name in subsequent SUBscribe commands for lists at that site. LISTSERV will use the name it has for you in its signup file.

Use the UNSUBscribe (or SIGNOFF) command to leave a mailing list. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  UNSUBscribe  listname | *  <(NETWIDE>                      |
|                                                             |
|  SIGNOFF                                                    |
|                                                             |
+-------------------------------------------------------------+
```

where listname is the name of a mailing list. You can signoff all the lists you belong to at a particular LISTSERV by using the '*' (asterisk) character in place of a list-name. If you want your UNSUBscribe command to be propagated to all LISTSERV sites on the network, include the (NETWIDE option.

Use the SET command to change your personal options for a mailing list. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  SET       list-name  |  *   < options >                    |
|                                                             |
+-------------------------------------------------------------+
```

where list-name is the name of the mailing list for which you are changing your options. You may change your options for a specific list or for all the lists you belong to at a particular LISTSERV by using the '*' (asterisk) character in place of a listname. The Query command can be used to display your current option settings

for any list. The options you include with the SET command may be one or more of the following:

Mail/NOMail
: This indicates whether you want to receive mail from the list or not. The default is Mail.

Files/NOFiles
: This indicates whether or not you want to receive files from the list. Use NOFiles if your system can not accept non-mail files. The default is Files.

ACK/NOACK/MSGAck
: This indicates the kind of acknowledgement you want to receive from LISTSERV when you send mail to a list. ACK means that you want to receive a mail message from LISTSERV indicating if your message was successfully processed. NOACK specifies that no feedback should be sent to you about the processing of your message. MSGAck is meaningful for EARN/Bitnet users only. With MSGAck, the server will send you the acknowledgement via interactive message. The default is ACK.

REPro/NOREPro
: Indicates whether or not you want to receive a copy of the mail which you send to the list. The default is NOREPro, meaning that mail which you send to the list will be distributed to all members of the list but you.

SHORThdr/FULLhdr/IETFhdr
: Indicates the type of headers you want to receive on mail from the list. SHORThdr means that the header will include only the essential fields: Date:, To:,From:, Subject:,Sender: and Reply-to:. FULLhdr means that all non-essential fields of the mail header will also be sent. IETFhdr is like FULLhdr except that a Message-id: field is added (if none was present in the mail sent to the list). The default is SHORThdr.

CONCEAL/NOCONCEAL
: Indicates whether or not you want your name and mail address to appear in the display of list members which is given in response to a REView command. The default is NOCONCEAL.

After having issued a SET command, LISTSERV will confirm to you the successful alteration of your mailing list options. For lists which require validation of all commands, your SET request is forwarded to the list owner. For example, if you want to get a copy of your own messages sent to list EARN-UG at IRLEARN, send the command:

SET EARN-UG REPRO

to LISTSERV at IRLEARN. If you want to stop receiving mail from all the list at FRORS12 to which you belong, send the command:

SET * NOMAIL to LISTSERV at FRORS12.

Use the CONFIRM command to renew your subscription to a list. Some mailing lists require subscription renewal at regular intervals, usually once a year. A mail message is automatically sent to list members indicating that they must send a CONFIRM command within a given number of days or they will be removed from the list. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  CONFIRM   list-name  |  *                                  |
|                                                             |
+-------------------------------------------------------------+
```

where list-name is the name of a distribution list to which you are confirming your subscription. You can confirm your subscription to all the lists you belong to at a particular LISTSERV by using the '*' (asterisk) character in place of a listname. LISTSERV will send a message that your subscription has been confirmed. For example, if you receive a message from LISTSERV@IRLEARN to confirm your subscription to the EARN-UG list, then send the command: CONFIRM EARN-UG to LISTSERV at IRLEARN.

Informational commands:

Use the Help command to get a brief description of the most useful LISTSERV commands and also the names and network addresses os the server's postmaster(s). The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  Help                                                       |
|                                                             |
+-------------------------------------------------------------+
```

Use the Info command to get an informational (or help) file from a LISTSERV server. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  Info      < ?   |  topic  >    < F= format > < CLASS= class >|
|                                                             |
+-------------------------------------------------------------+
```

where the '?' option will give you a list of topics for which informational files can be requested. If you require the file in a specific file format or spoolfile class, this can be specified in the F= and CLASS= keywords

Use the List command to find out what LISTSERV lists are available. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  List      <Global <string>>                                |
|                                                             |
+-------------------------------------------------------------+
```

Send the command List with no parameters to find out what lists are run locally. For example, to find out what lists are available at EARNCC, send mail (or an interactive message) to LISTSERV@EARNCC.BITNET with the word List in the message body. Send the command List Global to get a listing of all the lists in all the LISTSERVs throughout the world. This command should be sent to your closest LISTSERV (since all LISTSERVs have the same global list). Note that this file is rather large (over 3500 lines). To get a subset of the global file, send the command: List Global string. You will get a listing of all lists which contain string in the list name, host computer, or title.

Use the Query command to get information on the settings of your personal options for a list. The format of the command is:

```
+-----------------------------------------------------------------+
|                                                                 |
|  Query      listname | *                                        |
|                                                                 |
+-----------------------------------------------------------------+
```

where listname is the name of a list to which you are subscribed. If you use an '*' (asterisk) instead of the name of a list then you will get information on all lists to which you belong at the LISTSERV where you send the command.

Use the REView command to get the parameters of a list and the names and addresses of the list members. For some lists, the names and addresses of the members are not available to non-members. The format of the command is:

```
+-----------------------------------------------------------------+
|                                                                 |
|  REVIEW     listname <Short | NOHeader>                         |
|                                                                 |
+-----------------------------------------------------------------+
```

If you add the Short parameter, you will get only the list parameters without the list members. With the NOHeader parameter, you will get the list of members without the list parameters.

The SHOW command can be used to display a diverse selection of information from a LISTSERV server. This ranges from displaying the names and electronic addresses of the administrators of a LISTSERV server to showing a list of all known LISTSERVs in a given country. The format of the command is:

```
+-----------------------------------------------------------------+
|                                                                 |
|  SHOW       show-option                                         |
|                                                                 |
+-----------------------------------------------------------------+
```

where show-option can be:

HELP(#) give a brief summary of all show-options.

ADmin node-list(#)
show the names and electronic addresses of the LISTSERV administrator(s) for the nodes given in node-list.

ALIAS node-list
show a list of network defined aliases by which the nodes given in node-list are also known.

DISTribute get LISTSERV distribution job statistics

INcoming (#) display statistics of incoming files and messages processed by the server.

NODE node-list
show information regarding all the nodes given in node-list.

TRee(#) node < depth >
display a network tree map from the given node to a level of depth branches. If depth is not given, one level is assumed.

PEer(#) cntry-list
show a list of all LISTSERVs for the countries given in cntry-list. These may be full names or country codes.

User(#) user-list
display all names and electronic addresses that match (or partially match) the userids or real names given in user-list.

OWNer(#) list-name
show the name and electronic address of the owner(s) of the lists given in list-name.

VERSion show the version and release of the LISTSERV server and its operating system.

File and filelist commands:

Use the GET or SENDme command to get a file from LISTSERV. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  GET       filename filetype                                |
|                                                             |
|  SENDme                                                     |
|                                                             |
+-------------------------------------------------------------+
```

The names of the files follow the IBM VM/CMS convention: the two parts of the name are each one to eight characters in length, separated by a space. No matter how you send your GET command (e-mail or interactive message), LISTSERV will automatically send you the file in the most appropriate way.

Use the INDex command to review a list of files or packages referenced in a particular filelist. The list is sent onto the requester as a file. The format of the command is:

```
+-------------------------------------------------------------+
|                                                             |
|  INDex      < filelist > < F= format > < CLASS= class >      |
|                                                             |
+-------------------------------------------------------------+
```

where filelist specifies the name of the filelist you wish to index. If no name is specified, the index of the root filelist will be sent to you (called LISTSERV FILELIST). This command is functionally equivalent to a GET command with filename and filetype parameters of the filelist name and FILELIST respectively (qqv). If you require that the file or package be shipped in a specific file format or spoolfile class, you can include this information in the F= and CLASS= keywords.

Parameter description:

```
*              = all lists
userid         = any valid RFC822 network address not longer than 80 characters
                 If omitted, the node defaults to the command sender's node
full name      = first name middle initial surname (*not* "userid at node")
```

For each command that causes the server to send you a file, a file format option can also be specified by adding F=format to the end of the command. Acceptable formats are:

Netdata	Card	Disk	Punch	LPunch	UUe
XXE	HEX(#)	BTOa(#)	VMArc(#)	EBCdic(#)	Split(#)
VMSdump(+)		MIME/text(+)		MIME/Appl(+)	

LISTSERV Database Facilities:

The archives of mailing lists, as well as certain other databases, can be searched using LISTSERV's database facilities. To find out what databases are accessible at a LISTSERV site send the command:

DATABASE LIST

To perform a database search, you send mail to LISTSERV containing a batch command job with your database query. In addition, EARN/Bitnet users on VM or VMS systems can access the database facilities interactively via the LDBASE program.

For more details on the LISTSERV database facilities, send the command:

Info DATABASE

Examples

To subscribe to the EARNEWS list, which is located at the node FRMOP11, if your name is Ada Byron Lovelace, then send the command:

SUB EARNEWS Ada Byron Lovelace

to: LISTSERV@FRMOP11.BITNET

To get a listing of all distribution lists that have "europe" in the name or title, send the command:

LIST GLOBAL EUROPE

to your nearest LISTSERV.

To get the file PCPROG ZIP in XXE format the command is:

GET PCPROG ZIP F=XXE

Learning more about LISTSERV

Detailed documentation on LISTSERV, and related services, is available from: LISTSERV@EARNCC.BITNET

For a list of available documents send the command: INDex DOC

A standard set of help files are available upon request from each LISTSERV server. Use the Info command to retrieve these files.

GOLD IN THE

INTERNET

Search for gold in the Internet

By: J. Martin
Ohio State University

Acquired by anonymous ftp nic.merit.edu
cd documents/fyi/fyi_10.txt

Network Working Group
Request for Comments: 1402
FYI: 10
Obsoletes: 1290

J. Martin
Ohio State University
January 1993

There's Gold in them thar Networks!
or
Searching for Treasure in all the Wrong Places

Status of this Memo

This RFC provides information for the Internet community. It does not specify an Internet standard. Distribution of this memo is unlimited.

Abstract

A wealth of information exists on the network. In fact, there is so much information that you could spend your entire life browsing. This paper will present some of the "gold nuggets" of information and file repositories on the network that could be useful.

The ultimate goal is to make the route to these sources of information invisible to you. At present, this is not easy to do. I will explain some of the techniques that can be used to make these nuggets easier to pick up so that we all can be richer.

Table of Contents

1.0 Introduction

This paper is a list of the essential things, in my view, that a people who are responsible for providing network information should have in their hands as reference material. One of the basic problems with information is making it easily available to those who need the data. Libraries have been performing a cataloging function for many centuries. Information flow is now being provided so fast that it is difficult to keep up with it, even partially. Computer networks have only added to the problem by opening up access to even more information.

Attempting to make this wealth of information available to those who would find it useful poses some problems.

First, we need to know of its existence. To that end, this paper provides an index to the vast realm of network information. Most of the documents listed here are POINTERS to the final information.

Second, even if you know of a document's existence, you may not know if it is important or relevant. Few of us are knowledgeable in more than a limited area. We need to rely on others to make us aware of the importance of databases in a specific discipline. Librarians can be of great assistance here. They are familiar with the research databases that individuals search in law, mathematics, and many other fields.

Finally, once existence and importance are known, the information needs to be indexed so that researchers can find it. This is the most difficult task to accomplish. Information available on the network is rarely static. It is always moving, growing, changing, and dying. Computers should be able to assist us in managing this ever-changing environment. Right now, we have to catalog the information as it passes through the network. In my case, I generally save it in a file somewhere and spend far too much time trying to retrieve it again when I need it.

1.5 Access to the Internet

A frequently asked question concerns how the average mortal gets access to the Internet. The most common way is via electronic mail. Using e-mail, it is possible to communicate with anyone on the Internet and on any other networks as well, and there are many "gateways" to the Internet from other networks and systems. For instance using CompuServe, a large commercial electronic information and communication service, you can send e-mail to and from individuals on the Internet.

A direct connection to the Internet provides some additional capabilities that e-mail cannot. One of these is the ability to establish a connection to a remote computer connected to the Internet from your own personal computer or from one connected to the Internet. The program that establishes this connection is called Telnet. Many universities and large research companies have Internet connections. They pay rather large fees to have these high speed (more than one million bits per second) connections. If you are associated with a large university or company you already may have access or can gain access to the Internet using one of their computers.

A direct connection to the Internet also allows you to transfer a file from a remote computer. This program is referred to as FTP (file transfer protocol). Section 4.0 covers the many places that have files and programs available using FTP.

The following information was taken from a Frequently Asked Question posting by Aydin Edguer to the alt.bbs newsgroup.

If you do not have access to a service connected to Internet, you can get access for a fee. The following companies provide Internet access to individuals or companies at various rates depending on the time of access, speed of access desired, and several other factors.

The first method to gain access to the Internet is by getting an account on a public access bulletin board system that is connected to the Internet. There are a growing number of such systems available. For information on some of these systems, send electronic mail to:

info@world.std.com
info@netcom.com
info@concert.net
info@panix.com
info@holonet.net
info@msen.com
info@csn.org
sysadmin@ids.com

Any of these systems is open to the public for a monthly access fee.

A second method to gain access to the Internet is by getting an account with a network service provider who offers a dial-in service. See the "How do I get connected to the Internet?" section for more information.

How do I get connected to the Internet?

Traditionally, connections to the Internet were dedicated connections. This is still the most common type of connection. Monthly costs for the connection range anywhere from $250 per month [plus line charges] for a dialup 9600-bps connection to $4,000 [plus line charges] for a T1 [1.44-Mbps] connection. There is also an initial one-time startup fee of anywhere from $100 to $8,000 [plus equipment charges].

Some service providers also are offering part-time dialup connections. Customers share a set of phone lines and dialup when needed. This is usually less expensive than dedicated dialup connections for customers who need a connection less than 80 hours per month. Monthly costs range from $40-100 per month [plus line charges] plus an hourly charge of $2-4.

Some service providers have begun to offer a new dial-in service. The name for dial-in service varies from vendor to vendor. The dial-in service is usually provided as a way for Internet-connected users to connect back to their home sites from remote locations. But most service providers do not limit their service to this audience, it is open to people not already on the Internet. The dial-in service provides either a terminal server connection [with password] or an account on the service provider's equipment [with password] which permits you to use Telnet to connect to other sites on the Internet. This service differs from the normal dialup IP services because it does not require the user to run any IP software like PPP (Point-to-Point protocol) or SLIP (serial line IP). The cost for this service usually range from $35 to $250 per month [plus line charges]. There is also an initial $35 to $500 connection fee [plus equipment charges].

The following is a list of known Internet service providers, along with the services they offer, an e-mail address to contact for more information, a phone number to contact for more information, or an FTP archive for more information.

```
ALTERNET
Full time connections
 speed          9.6K 14.4K 56K   T1   T3
Leased Line      y     y    y    y    n
Dialup Line      y     y    -    -    -
 note: T1=1.544Mbs T3=45Mbps
Part time connections: no
Dial-in Service: none
Region: national (USA)
Contact: alternet-info@uunet.uu.net
Phone: (800)4UUNET3
FTP: ftp.uu.net:/uunet-info/

PSINet
Full time connections
 speed          9.6K 14.4K 56K   T1   T3
Leased Line      y     y    y    y    n
Dialup Line      y     y    -    -    -
 note: T1=1.544Mbs T3=45Mbps
Part time connections: yes
Dial-in Service: Global Dialup Service (GDS)
Region: national (USA)
Contact: info@psi.com
Phone: (800)82PSI82
FTP: ftp.psi.com:/press.releases/

CERFnet
Full time connections
 speed          9.6K 14.4K 56K   T1   T3
Leased Line      n     y    y    y    n
Dialup Line      y     y    -    -    -
 note: T1=1.544Mbs T3=45Mbps
Part time connections: yes
Dial-in Service: DIAL'n'CERF (nationwide USA)
Region: California
Contact: help@cerf.net
Phone: (800)876-CERF
FTP: nic.cerf.net:/cerfnet/
```

```
ANSNET
Full time connections
 speed          9.6K 14.4K 56K   T1   T3
Leased Line      n     n    y    y    y
Dialup Line      n     n    -    -    -
 note: T1=1.544Mbs T3=45Mbps
Part time connections: no
Region: national (USA)
Contact: info@ans.net
Phone: (914)789-5300 or (313)663-2482
FTP: nis.ans.net:/pub/info/

MSEN
Full time connections
 speed          9.6K 14.4K 56K   T1   T3
Leased Line      y     y    n    n    n
Dialup Line      y     y    -    -    -
 note: T1=1.544Mbs T3=45Mbps
Part time connections: yes
Dial-in Service: yes [*note* it is a local call from any 313 #]
Region: Michigan
Contact: info@msen.com
Phone: (313)741-1120
FTP: ftp.msen.com:/pub/vendor/msen/

OARnet
Full time connections
 speed          9.6K 14.4K 56K   T1   T3
Leased Line      y     y    y    y    y
Dialup Line      y     y    -    -    -
 note: T1=1.544Mbs T3=45Mbps
Part time connections: yes
Dial-in Service: none
Region: Ohio
Contact: nic@oar.net
Phone: (614)292-0700
```

Please note, although this is a Frequently asked Question, this newsgroup, alt.bbs.internet, is NOT for the discussion of how to get connected to the Internet. This is the correct newsgroup to discuss your bulletin board system and what it offers once you are connected to the Internet.

The above excerpt is from a frequently asked questions Usenet posting to alt.bbs.internet and crossposted to news.answers. The news.answers newsgroup is a very good group to subscribe to read the frequently asked questions sent to many newsgroups. See 12.6 Usenet entry in the Glossary for more information on newsgroups.

Further investigation in the above groups yields a great deal of information about techniques and rates to access the Internet. Of course one common question is about getting free access. As mentioned before if you are associated with a university, a large company, or research group you may very well have access via one of their computers. If you are a student or faculty member and are away from your local campus, you may be able to get a guest account from the local university.

Some campuswide information systems may give limited access to the network in a read-only mode. Also some communities (such as Cleveland) operate a FREENET which enables you to read newsgroups and if you register send mail at no charge. See section 8.0 for more information.

For example, you can Telnet to Holonet below to get an idea of how it works. This is not an endorsement of this system but it does give you a good idea how this type of access to an Internet BBS works.

1.7 Holonet (Commercial access to Internet)

Source:

Telnet holonet.net
Login with userid of guest

2.0 Lists and Indexes of Network Resources/Bibliographies/ Information Available over the Network

2.01 Internet Resource Guide (document)

This is an excellent guide to major resources available on the network. The table of tontents includes chapters on Computational Resources, Library Catalogs, Archives, White Pages, Networks, Network Information Centers, and Miscellaneous.

Source:
Anonymous ftp to NNSC.NSF.NET
cd resource-guide
get resource-guide.ps.tar.Z (PostScript) or
get resource-guide.txt.tar.Z (ASCII text)

Search:
Telnet to pac.carl.org (Colorado Alliance of Research Libraries)
Select terminal type.
Choose Item 3 (Information Databases).
Choose Item 65 (Internet Resource Guide).
You can then browse or do a keyword search.

To quit type //EXIT

2.02 Anonymous FTP Sites (document)

This document offers a list of all the sites on the Internet that support anonymous FTP.

Source:
Anonymous ftp to pilot.njin.net
cd pub/ftp-list
get ftp.list

Search:
Telnet to archie.ans.net
Login as user archie
Type help to get a list of commands
Type prog topic - where topic is the keyword for the search of a program topic.

See section 4.05 for more information about using Archie.

2.03 INDEX - Index of all RFCs - (document)

RFC-1118 - The Hitchhiker's Guide to the Internet
RFC-1175 - A Bibliography of Internetworking Information
RFC-1173 - Responsibilities of Host and Network Managers
RFC-1325 - Answers to Commonly Asked "New Internet User" Questions
RFC-1207 - Answers to Commonly Asked "Experienced Internet User" Questions
RFC-1208 - Networking Glossary of Terms
RFC-1359 - Connecting to the Internet
RFC-1392 - Internet Users' Glossary
RFC-1402 - Gold in the Network (this file)

Source:
Anonymous FTP to nis.nsf.net
cd documents/rfc
get INDEX.rfc
get rfc1118.txt
get rfc1175.txt
get rfc1173.txt
get rfc1206.txt
get rfc1207.txt
get rfc1208.txt
get rfc1359.txt
get rfc1392.txt
get rfc1402.txt

2.04 Interest Groups List-of-Lists (document)

This is a document that list existing mailing lists and groups. To get on the list to receive updates, send e-mail to Interest-groups-request@nisc.sri.com.

Source:
Anonymous ftp to ftp.nisc.sri.com
cd netinfo
get interest-groups

2.05 Regional network policies (documents)

Many regional networks have developed policies on responsible use of their network. You can retrieve copies of these policies on line by anonymous FTP.

Source:
Anonymous ftp to ftp.nsic.sri.com
cd netinfo
dir
get ???.policy

where ??? is the name of the regional network. The dir command will give you a directory of the filenames.

2.06 Campus ethics/policy statements (documents)

Many universities have developed more complete policies based on the regional network policies. If you want to look at some to use as guidelines for your own campus, you can get them through anonymous FTP.

Source:
Anonymous ftp to ariel.unm.edu
cd ethics
dir
get ???.policy

where ??? is the name of the university or college. The dir command will give you a directory of the filenames.

2.07 VAX Book (document)

Joe St. Sauver of the University of Oregon has developed a complete guide of information on the network available via anonymous FTP. The following is a quote from the README file: "While it is tailored to the University of Oregon's VAX8000 system, the skills it illustrates are general enough to be of

interest to users at most other VAX sites, and even users at many non-VAX sites connected to the national networks." A major section on Network Topics is excellent. It is a large document, more than 300 pages.

Source:
Anonymous ftp to decoy.uoregon.edu
cd pub/vaxbook
get vms.ps (PostScript format)
get vms.mem (lineprinter format)

2.08 Network Tidbits COMPUNET BIBLIO (document)

This is a "Network Bibliography" by Elliott Parker from the Journalism Department of Central Michigan University. It contains a bibliography of network related documents that he finds helpful.

Source:
Listserv

Send e-mail to comserve@rpiecs (BITNET)
The message should contain the following one-line request:

SEND COMPUNET BIBLIO

You will receive the file "COMPUNET BIBLIO" via return mail as well as a "Welcome to Comserve" message and a "Getting Started with Comserve message." If you are unfamiliar with how the program Listserv works on BITNET, these documents are a good start.

2.09 Internet Tour Macintosh HyperCard 2.0 Stack (program)

This is a Macintosh HyperCard 2.0 stack that does a nice job of describing some of the functions of the Internet. It has a section that you can modify for your own institution's needs.

Source:
Anonymous ftp to nnsc.nsf.net
cd internet-tour
get Internet-Tour-README
get Internet-Tour.sit.hqx

Note this is a stuffed and binhexed file. You must have the program Stuffit to convert it to an executable file on the Macintosh.

2.10 A Survey of Educational Computer Networks (document)

This is a fact-finding project to examine the current status of computer networks in K-12 education, including ways in which networking linkages are impacting educational tasks. This is a good summary for educators.
Source:
Anonymous ftp to ariel.unm.edu
cd library
get networks survey

2.11 Internet Resource Directory

A group of teachers compiled a Internet Resource Directory that would be of specific interest to teachers. It is available in four parts:

Listservers, Telnet sites, FTP sites, and general infusion-ideas.

Source:
Anonymous ftp to ftp.virginia.edu
cd public_access
get IRD-listservs.txt
get IRD-Telnet-sites.txt
get IRD-FTP-sites.txt
get IRD-infusion-ideas.txt

2.12 Network Managers' Reading List (document)

This document is an annotated list of books and other resources for network managers who are using TCP/IP, UNIX, and Ethernet technologies.

Source:
Anonymous ftp to ftp.utexas.edu
cd pub/netinfo/docs
get net-read.txt

2.13 Network Resources List (document)

This document lists of many resources available on the network, including weather, online databases, book reviews, a ham radio callbook, and many more. Author Scott Yanoff (yanoff@csd4.csd.uwm.edu) routinely posts lists to newsgroups alt.bbs.internet, news.lists, alt.bbs.ads, and biz.comp.services.

Source:

Anonymous ftp to csd4.csd.uwm.edu
cd pub
get inet.services.txt

2.14 Zen and the Art of the Internet (document; version 1)

This document is the first version of what has become a book (see section 10 for information on version 2) in book format. The first version has some very good information on the Internet and is designed for the beginning user.

Source:

Anonymous ftp to ashley.cs.widener.edu
cd pub/zen
get README
get zen-1.0.PS

2.15 Hytelnet (Program)

Hytelnet is a must-have program available for UNIX, Macintoshes, and PCs. It is designed to help you reach all of the Internet-accessible libraries, freenets, CWISes, library BBSs, and other information sites by Telnet. Peter Scott is the developer of this program, and he also maintains a list if you want to receive the latest updates on network information.

Contact: scott@sklib.usask.ca

Source:

Anonymous ftp to access.usask.ca

cd pub/hytelnet
get README

Change directory to the computer you want to run hytelnet from:

cd pub/hytelnet/pc
cd pub/hytelnet/amiga
cd pub/hytelnet/mac
cd pub/hytelnet/pc
cd pub/hytelnet/unix
cd pub/hytelnet/vms

2.16 World Wide Webb

The WWW project merges the techniques of information retrieval and hypertext to make an easy but powerful global information system.

The project is based on the philosophy that academic information should be freely available to anyone. Its aim is to permit information sharing within internationally dispersed teams and dissemination of information by support groups. Originally aimed at the High Energy Physics community, it has spread to other areas and attracted much interest in user support, resource discovery, and collaborative work areas.

Reader View

The WWW world consists of documents and links. Indexes are special documents which, rather than being read, can be searched. The result of such a search is another ("virtual") document containing links to the documents found. A simple protocol ("HTTP") is used to allow a browser program to request a keyword search by a remote information server.

The web contains documents in many formats. Those hypertext documents (real or virtual) contain links to other documents or places within documents. All documents, whether real, virtual or indexes, look similar to the reader and are contained within the same addressing scheme.

To follow a link, you either click with a mouse or type in a number. To search an index, give keywords or other search criteria. These are the only operations necessary to access the entire world of data.

You can try the simple line mode browser by Telnetting to info.cern.ch (no user or password) From UK JANET, use the gateway. You also can find out more about WWW in this way. This is the least sophisticated browser; remember that the window-oriented ones are much smarter.

It is much more efficient to install a browser on your own machine. The line mode browser is currently available in source form by anonymous FTP from node: info.cern.ch [currently 128.141.201.74] as:

/pub/www/src/WWWLineMode_v.vv.tar.Z.

(v.vv is the version number - take the latest.)

Also available is a hypertext editor for the NeXT (WWWNeXTStepEditor_v.vv.tar.Z), the ViolaWWW browser for X11, and a skeleton server daemon (WWWDaemon_v.vv.tar.Z).

Documentation is readable using www. A plain text version of the installation instructions is included in the tar file. Printable (PostScript) documentation and articles are in /pub/www/doc

Source:

Telnet to info.cern.ch
No login required.

Telnet to eies2.njit.edu
Login as www

3.0 Libraries Available over the Network

Hundreds of libraries are accessible over the network, far too many to list here. Several documents listInternet-accessible libraries including two major ones: Internet-Accessible Library Catalogs and Databases, coauthored by Dr. Art St. George of the University of New Mexico (stgeorge@bootes.unm.edu [Internet] or stgeorge@unmb [BITNET]) and Dr. Ron Larsen of the University of Maryland; and UNT's Accessing On-Line Bibliographic Databases by Billy Barron, (billy@vaxb.acs.unt.edu [Internet]).

3.1 Internet-Accessible Library Catalogs and Databases (document)

Source:
Anonymous ftp to ariel.unm.edu
cd library
get library.ps (PostScript format)
get internet.library (ASCII text version)

3.2 UNT's Accessing On-Line Bibliographic Databases (document)

Source:
Anonymous ftp to ftp.unt.edu
cd pub/library
get libraries.ps (PostScript format)
get libraries.txt (ASCII text version)
get libraries.wp5 (WordPerfect 5.1 source)

4.0 The Mother Lode of Anonymous FTP Sites

Throughout this document, sites are listed for specific documents. Most are only indexes to more information. A big problem is

searching through all this information to find what you want. One of the best search methods is Archie, described below.

Several sites contain large repositories of files and other sites that are the source for specific programs such as Kermit, the public domain file transfer program.

4.05 archie

One of the best ways of searching for a program available via anonymous FTP is with archie (Archive Server Listing Service), several of these servers scattered throughout the world. The fastest one I have found is the Advanced Network & Services, Inc. located in the United States.

Archie goes to every site that offers anonymous FTP files, collects the file structure from that site, and places it in a database it can search.

A real-life example. I was reading an article about Windows in the July 1992 issue of PC World, and it mentioned a shareware program called ZiPaper on page 212. The name of the program is zipapr.zip. I can use Archie to locate this program.

Source:

telnet archie.ans.net

login as archie

At the archie prompt type

prog zipapr.zip

The response is

Host wuarchive.wustl.edu (128.252.135.2)
Last updated 17:22 13 July 1992

```
   Location:  /mirrors3/archive.umich.edu/msdos/mswindows/desktop
    FILE      rw-rw-r--   41984  Jan 30 1991  zipapr.zip
```

This tells you the file is available via anonymous FTP to wuarchive.wustl.edu in the directory mirrors3/archive.umich.edu/msdos/mswindows/desktop and the file is zipapr.zip.

4.1 Washington University (anonymous FTP)

Washington University represents perhaps one of the most popular sites for software on the network. The Mirrors directory contains a copy of all of the wsmr-simtel20.army.mil files. Wsmr-simtel20-army.mil is the originator and keeper of major amounts of public domain software. Their site, however, is often overloaded and difficult to connect to.

You will find enough software in the Mirrors directory to keep you busy for the rest of your life. The MS-DOS and Macintosh subdirectories contain files for those specific machines.

Anonymous FTP to wuarchive.wustl.edu
cd mirrors

cd msdos

For income tax time cd taxes
For unzipping files cd zip, type binary, and get pkz110eu.exe
For education software cd education
For graphics files cd giff, tiff or graphics

cd macintosh

For the Macintosh there are directories for applications, inits, sounds, reviews, and many more.

4.2 KERMIT (anonymous FTP)

Kermit is a public domain file transfer protocol available for just about all microcomputers, minicomputers, andmainframes. It is very popular and has been has been used at computer facilities everywhere.

Anonymous FTP to watsun.cc.columbia.edu

cd kermit
get read.me

For executable versions of kermit:

cd bin

get READ.ME file and read for specifics of what file to get.

For the IBM PC, I get msvibm.exe after typing binary to activate the binary transfer mode.

4.3 NCSA Software for Network Access from PCs (anonymous FTP)

Source:
Anonymous ftp to ftp.ncsa.uiuc.edu
cd NCSA_Telnet
cd PC/Telnet (for IBM PC Software)
get telxxbin.zip where xx is the current version number
(in binary format; I also suggest getting readme files)

cd Mac/Telnet
get telnet.x.sithqx where x is the current version number
(in binary format; I also suggest getting readme files)

4.4 Other Popular Ftp Sites (anonymous FTP)

Name of Site	What's there
ftp.apple.com	Macintosh system software/technical notes
ftp.cayman.com	Gatorbox archive site
dragonfly.wri.com	Mathematica archive site
mac.archive.umich.edu	Macintosh software
sumex-aim.stanford.edu	Macintosh software
rascal.ics.utexas.edu	Macintosh software
ftp.acns.nwu.edu	Disinfectant archive site (virus software)
microlib.cc.utexas.edu	GateKeeper archive site (virus software)
bert.cs.byu.edu	NCSA Telnet archive site (BYU version)
ftp.ncsa.uiuc.edu	NCSA Telnet archive site
beach.gal.utexas.edu	F-Prot/Scan & Clean archive site (virus software)
cert.sei.cmu.edu	Virus Documentation
msdos.archive.umich.edu	MS-DOS software
ux1.cso.uiuc.edu	MS-DOS software (PC-SIG CD)
oak.oakland.edu	MS-DOS software
wuarchive.wustl.edu	MS-DOS software
cica.cica.indiana.edu	MS-DOS software (Windows software)
archive.cis.ohio-state.edu	UNIX software

5.0 Network Information Centers - NICs

Contact NICs if you want information on what networking is all about and how you can connect. They can put you in contact with the individuals in your area who can help you get a network connection. They can also provide assistance if you don't know who else to ask about network topics.

5.1 Goverment Systems, Inc. (GSI) (Internet NIC)

Government Systems, Inc. (GSI)
Attn: Network Information Center
14200 Park Meadow Drive
Suite 200
Chantilly, VA 22021
(800) 365-3642 or (703) 802-4535
FAX: (703) 802-8373

NIC@NIC.DDN.MIL

The main NIC on the Internet. The source for network numbers, domain names, and much more.

5.2 NSF Network Service Center (NNSC) (NIC)

NSF Network Service Center
Bolt Beranek and Newman Inc.
10 Moulton St.
Cambridge, MA 02138
(617) 873-3400

NNSC@NNSC.NSF.NET

Publishes a newsletter called NSF Network News; to subscribe, contact them at the address above.

5.3 NSFNET Information Services (NIS)

NSFNET Information Services
Merit Network, Inc.
ITI Building
2901 Hubbard, Pod G
Ann Arbor, MI 48109-2016
(313) 936-3000 or (800) 66MERIT

NSFNET-INFO@MERIT.EDU

Publishes a newsletter called Linkletter; to subscribe send e-mail to NSFNET-Linkletter-request@merit.edu.

5.4 SRI International Network Information Systems Center (NISC)

SRI International
Network Information Systems Center
333 Ravenswood Avenue, Room EJ291
Menlo Park, CA 94015

(415) 859-6387 or (415) 859-3695
Fax: (415) 859-6028

NISC@NISC.SRI.COM

5.5 BITNET (NIC)

BITNET Network Information Center
Corporation for Research and Educational Networking (CREN)
1112 16th Street, N.W.
Suite 600
Washington, DC 20036
(202) 872-4200

INFO@BITNIC

Lisa Covi, BITNET Support

5.6 NASA Science Internet Network Information Center (NIC-NSI)

NASA NSI
Goddard Space Flight Center
Code 930.4
Greenbelt, MD 20771
Hotline: (303) 286-7251
FAX: (301) 286-5152

help@nic.nsi.nasa.gov

NSI is an international dual-protocol network (TCP/IP and DECnet), which supports scientists and engineers worldwide. The NSI-NIC supports a help desk, online services, anonymous FTP, and interoperability gateways, along with other services.

Bill Yurick, NSI-NIC Staff

6.0 Network Statistics

If you would like to publish statistics in your newsletter about your institution's network traffic into and out of the NSFNET backbone, you can obtain information on either the packets or bytes sent. I prefer bytes which can be translated into an understandable figure.

6.1 Files containing monthly information on NSF Internet backbone traffic by packets or bytes (document)

Source:
Anonymous FTP to nis.nsf.net

cd statistics/nsfnet

get INDEX.statistics

cd 19?? where ?? is the year you are interested in.

Files are availble for traffic by ports, country, delay, bytes and packets for T1 and T3 networks.

7.0 Campuswide Information Systems - CWISes

The information in this section is intended primarily for those who are providing access methods from their own computing environments. Although standards have been proposed, there are no "packages" that give you access to all of the information presented here. What The Ohio State University and several other universities have done is provide a menu to the user that accesses these services and databases behind the scenes. In fact, I had to refer to the shell scripts to look up the network addresses of these machines, because I rely on the menu for access as well.

As the name implies, information systems provide access to information the user knowing exactly how to get to it. In this way, the network is invisible to end users. All they need to know is what they want, not the command structure needed to actually get the information.

At present, the menu system seems to be the easiest way in In the background is a knowbot, a program that knows how to go out and locate services on the network using a keyword search.

You can connect to the following sites for a demonstration of their capabilities.

Many CWIS systems are converting to Gopher (see section 8.96). Hytelnet (see section 2.15) also has complete listings of CWIS systems.

7.1 Appalachian State University

conrad.appstate.edu (152.10.1.1)
Login as info
Emulate a VT100.

Hardware/software: DEC/VTX
Contact: Ernest Jones (jonesel@appstate.bitnet)

7.2 Arizona State University PEGASUS and ASEDD

asuvm.inre.asu.edu
Login as helloasu
Use tn3270.

Hardware/software: Running PNN News Network Software under VM/CMS (with Profs and FOCUS)
Contact: Joy Kramer (iejxk@asuvm.inre.asu.edu)

Contains two databases: Personal Guide to ASU Stuff (PEGASUS) and Arizona State Economic Development Database (ASEDD).

7.3 Clemson University

eureka.clemson.edu
Login as public
Emulate a VT100.

Hardware/software: DEC/VTX
Contact: Amy Slankard (amy@clust1.clemson.edu)

System contains information on weather for South Carolina, North Carolina, and Georgia; economics; plants; animals; engineering; food; home; health; family; and youth.

7.4 Columbia University

cal.cc.columbia.edu Login as calendar

Contact: David Millman (dsm@cunixf.cc.columbia.edu)

7.5 Cornell CUINFO

cuinfo.cornell.edu Connect to port 300. Use Telnet or tn3270. Different versions of Telnet or tn3270 have different syntax for defining the port. The following are the most common:

TELNET cuinfo.cornell.edu 300 TELNET cuinfo.cornell.edu::300
TELNET cuinfo.cornell.edu..300

Hardware/software: VM/CMS; IBM S/370 assembler; locally written
Contact: Steve Worona (slw@cornella.bitnet)

CUINFO of interest to nonCornell community members:

Uncle Ezra The electronic counselor - first program of its kind; a must read

Directories Student and staff directories - includes staff electronic addresses Ski Reports Up-to-the-minute upstate New York ski reports
(Seasonal) Jobs Listings and descriptions of jobs at Cornell Computing Extensive online information regarding computing at
Cornell Patents Descriptions of current patents held by Cornell Various Newsletters Newsletters from numerous campus groups Weather Up-to-the-minute local weather forecast

7.6 Lafayette Integrated, Networked Campus - LINC

lafibm.lafayette.edu (139.147.8.4) Use Telnet or tn3270. When you see the LINC logo, ignore the ALT-L advice and clear the logo by pressing Enter. On next screen, instead of logging on, type DIAL MUSIC (case does not matter). On login screen that appears, use GUEST as ID, and GUEST as password.

Hardware/software: IBM 9375 running MUSIC/SP Contact: Patrick Ciriello (ciri@lafayacs.bitnet)

7.7 Lehigh

ibm1.cc.lehigh.edu Use tn3270. At the VM prompt, type DIAL MUSIC, and at the /ID prompt, type LUNA.

Hardware/software: IBM 4381 running MUSIC. Planning to move to AIX on RS/6000s. Contact: Timothy J. Foley (tjf0@ns.cc.lehigh.edu)

7.8 Mississippi State University (MSUinfo)

isis.msstate.edu (130.18.164.2) Login as msuinfo Terminal type: enter yours; most are supported.

Hardware/software: UNIX/TechInfo Contact: Bennet George (George_Bennet@admin.msstate.edu)

Contains announcements, campus events, community events, continuing education offerings, jobs, recent press releases, research funding opportunities, and more.

7.9 MIT TechInfo

Accessible either via Telnet, or via a native Macintosh application that uses the MacTCP drivers to access the TechInfo server; requires a MacPlus with one Meg memory or better, System 6.0.3 or better, and licensed MacTCP drivers.

Source code is freely available to other schools seeking to get started quickly - contact folks listed below.

For Telnet access:

telnet techinfo.mit.edu (18.72.1.146)
No username/password is required.
Once you're in, you can use upper- or lower-case commands.
To exit the system, use the QUIT command.

For native Macintosh access:

anonymous FTP to net-dist.mit.edu, look in the /pub/techinfo directory, fetch techinfo.hqx; Binhex (a public domain tool) is required to decode the binary.

Contact: Tim McGovern (tjm@mit.edu), (617) 253-0505
Bugs: bug-techinfo@mit.edu
Comments: comment-techinfo@mit.edu
Administration: admin-techinfo@mit.edu

7.10 New Mexico State University NMSU/INFO

info.nmsu.edu
Login as info
Emulate a VT100.

Hardware/software: DEC/VTX
Contact: D. Brian Ormand (bormand@nmsuvm1.bitnet) or (bormand@nmsu.edu)

7.11 North Carolina State University Happenings!

ccvax1.cc.ncsu.edu (128.109.153.4)
Login as info
Emulate a VT100.

Hardware/software: DEC/VTX
Contact: Harry Nicholos (hmn@ncsuvax.bitnet)

7.12 NYU ACF INFO system

info.nyu.edu (information.nyu.edu) (128.122.138.142)
Emulating a VT100 or better enables some additional suboptions.

Contact: Stephen Tihor (tihor@ACFcluster.nyu.edu) or (tihor@nyuacf.bitnet)

7.13 Pima Community College

pimacc.pima.edu
Login as pimainfo
Emulate a VT100.

Hardware/software: DEC/VTX
Contact: Terry Loftus (tloftus@pimacc.pima.edu) or Al Camberos (acamberos@pimacc.pima.edu)

7.14 Princeton News Network PNN

pucc.princeton.edu
Use Telnet or tn3270. When you see the VM 370 logo, clear it, and instead of logging on, enter pnn (case does not matter). Clear the information screen that appears.

Hardware/software: VM/CMS; locally written. A UNIX version and a Mac HyperCard version are up, running, and available. All versions (CMS, UNIX, and HyperCard) are available to universities at no cost.

Contact: Rita Saltz (rita@pucc.bitnet)
System and Development: Howard Strauss (howard@pucc.bitnet)

7.15 Rutgers University

info.rutgers.edu 98
No password required.
Can be accessed from any microcomputer or terminal.

Hardware/software: written in lush (a public domain program); runs on any SUN workstation.
Contact: Leny Struminger (struming@zodiac.rutgers.edu)

INFO contains universitywide activities, graduate course catalogs, faculty/taff phone directory, computer services, library online catalog, weather, news, bus schedules, and more.

7.16 San Diego State University

wintermute.sdsu.edu
Login as sdsuinfo
Emulate a VT100.

Hardware/software: pnn & nmm
Contact: Richard Caasi (caasi@sdsu.edu)

7.17 University of Arkansas

uafsysb.uark.edu
Login as info

Hardware/software: IBM 4381-14, VM/HPO 6.0, Cornell's CUINFO module
Contact: Susan Adkins (sa06037@uafsysb.bitnet) or (sa06037@uafsysb.uark.edu)

System contains information on calendar of events, campus e-mail directory, and hours and services.

7.18 University of Colorado at Boulder

culine.colorado.edu 852 (128.138.129.2 852)
Login as CULINE

Contact: Donna Pattee (pattee@spot.colorado.edu)

7.19 University of Denver

du.edu
Login as atdu

Contact: Bob Stocker (bstocker@ducair.bitnet)

7.20 University of Minnesota at Duluth

ub.d.umn.edu
Login as info
Emulate a vt100.

Contact: Frank Simmons (fsimmons@ub.d.umn.edu)

This system contains more than 700 documents ranging from athletic schedules to microcomputer prices to art gallery showing schedules. All commands are displayed at the bottom of each screen, and separate online help is available. Keyword searching is available, although at this time only words in the titles of documents are used.

7.21 University of New Brunswick, Canada, INFO

unbmvs1.csd.unb.ca (131.202.1.2)
Login with application id INFO
No password is required.
INFO is a full-screen CICS application running under MVS.

tn3270 emulation.

Contact: Bonita Mockler (bgm@unb.ca)

System contains university calendar; class timetable; phone/fax numbers for faculty, staff, and students, faculty and staff e-mail IDs; seminar schedules; minutes; newsletter; and more.

7.22 University of New Hampshire VideoTex

unhvtx.unh.edu (132.177.128.58)
USERNAME: student (no password required).
Control-z to log off.
VT100/VT200 terminal emulation.

Hardware/software: DEC/VTX
Contact: Robin Tuttle (r_tuttle1@unhh.unh.edu)

System includes phone directories, campus calendar, job listings, off-campus housing list, undergraduate catalog, class schedules, newsletters, services and programs, rights and rules of conduct, athletics and recreation information, activities, and workshops.

7.23 University of North Carolina at Chapel Hill INFO

info.oit.unc.edu (128.109.157.1)
Login as info
Emulate a VT100.

Hardware/software: DEC/VTX
Contact: Judy Hallman (hallman@unc.bitnet)

System contains campus directory; job openings; "TheIndependent Study" catalog (correspondence courses); undergraduate catalog; continuing education classes; and several campus newsletters, including "Newsbrief," the weekly campus computing newsletter.

7.24 University of North Carolina at Greensboro MINERVA

steffi.acc.uncg.edu
Login as info or MINERVA
Emulate a VT100.

Hardware/software: DEC/VTX
Contact: Norman Hill (hillnr@uncg.bitnet)

7.25 University of North Carolina at Wilmington SEABOARD

vxc.uncwil.edu (128.109.221.3)
Log in as info
Emulate a VT100.

Hardware/software: DEC/VTX
Contact: Eddy Cavenaugh (cavenaughd@uncwil.bitnet) or (cavenaughd@vxc.uncwil.edu)

System includes class schedule listings, institutional statistics, library services, faculty and staff publications, current university news releases, phone directories, and facilities schedules.

7.26 University of Northern Iowa

infosys.uni.edu
Log in as public
Prefers a vtxxx terminal, but works with unknown terminal types.

Hardware/software: The program uses UNIX tput clear, tput mc4, and tput mc5 (for printing).
Contact: Mike Yohe (yohe@iscsvax.uni.edu)

7.27 University of Pennsylvania PennInfo

penninfo.upenn.edu
(no login id is needed.)
Emulate a VT100.

Hardware/software: MIT's Techinfo; type HELP for directions
Contact: Valerie Glauser (glauser@dccs.upenn.edu)
Comments: penninfo-comments@dccs.upenn.edu
Bugs: penninfo-bugs@dccs.upenn.edu
Contact: Valerie Glauser (glauser@dccs.upenn.edu)

PennInfo can be accessed via MIT's TechInfo Mac client program as well. We've modified the MAC client slightly because we have different contact information at Penn than MIT does.

7.28 Ohio State University

oasis.acs.ohio-state.edu
Login as oasis
Emulate a VT100.

Hardware/software: DEC 5500 using Ultrix, shell scripts and

modified Gopher code to allow Gopher access.
Contact: Clifford Collins (collins+@osu.edu)
Comments: oasis@magnus.acs.ohio-state.edu
Bugs: oasis@magnus.acs.ohio-state.edu

8.0 Internet Bulletin Board System/Interactive Databases/Freenet

These are systems that you connect to through an anonymous Telnet session to access a variety of services/information. In some respects they resemble campuswide information systems; in others, they are more like bulletin boards or interactive databases.

A file containing the most frequently asked questions about bulletin board systems is available via anonymous FTP.

Source:
Anonymous FTP to polyslo.calpoly.edu
cd pub
get alt.bbs.faq

Listed below are some of these types of systems.

8.1 Cleveland Freenet - Case Western Reserve University

Telnet to freenet-in-a.cwru.edu
Follow the menu driven instructions.

8.2 Heartland Freenet

heartland.bradley.edu (136.176.10.10)
Login as fnguest

8.3 Youngstown Freenet - Youngstown State University

Telnet yfn.ysu.edu

Type visitor at userid prompt and follow menu driven instructions.

8.4 Ocean Network Information Center

Telnet delocn.udel.edu
When the Userid: prompt appears, type INFO and press Enter/Return key.

8.5 Geographic Name Server

Telnet martini.eecs.umich.edu 3000

For informatin on a place, type the name of the city and state as you would on the last line of a postal address. Example: Zanesville, OH

8.6 ISAAC

ISAAC, the Information System for Advanced Academic Computing, serves as a clearinghouse for information about the use of IBM-compatible hardware and software as aids to instruction and research in higher education. Membership is free to all students, faculty, and staff at institutions of higher education.

For more information call (206) 543-5604.

ISAAC requires that you register before you can access the system. To register, type register for the userid and password and fill in the information using the tab key to go from field to field. Once registered, you will be assigned a userid and password; then you must reconnect, this time typing your assigned userid and password.

To access ISAAC, you need to establish a Telnet connection over the network. If you do not have network access, you also can call over phone lines. Call (800) 237-5551 in the United States or, within the local Seattle area or outside the United States, call (206) 543-3761.

telnet isaac.engr.washington.edu or 128.95.32.61

8.7 FEDIX

FEDIX is an online information service that links the higher education community and the federal government to facilitate research, education, and services. The system provides accurate and timely federal agency information to colleges, universities, and other research organizations. There are no registration fees and no access charges for using FEDIX. The only cost is for the phone call.

FEDIX provides daily information updates on:

Federal education and research programs (including descriptions, eligibility, funding, and deadlines).

Scholarships, fellowships, and grants.

Used government research equipment available.

New funding for specific research and education activities from the Commerce Business Daily, Federal Register, and other sources.

Minority assistance research and education programs.

News and current events within participating agencies.

General information such as agency history, budget, organizational structure, and mission statement.

For more information, contact the HELPLINE at (301) 975-0103 Monday-Friday, 8:30 am to 4:30 pm EST, except on federal holidays.

telnet 192.111.228.1
At the login: prompt type fedix

8.8 STIS

STIS is the Science and Technology Information System at the National Science Foundation.

Information includes the NSF Bulletin, guide to programs, grants booklet (including forms), program announcements, press releases, NSF telephone book, reports of the National Science Board, descriptions of research projects funded by NSF (with abstracts), and analytical reports and news from the International Programs Division.

Publications may be searched by using a keyword, such as japan or volcano; using a phrase, such as exchange of scientists and soviet union; or by selecting a broad topic like biosciences.

For more information, contact the National Science Foundation, Pone (202) 357-7555, FAX (202) 357-7745, TDD (202) 357-7492 or via e-mail to stis@nsf.gov (Internet), or stis@nsf (BITNET).

telnet stis.nsf.gov
At the login: prompt type public

At the terminal type prompt, type vt100nkp

Enter your terminal type [blank=vt100]: vt100nkp

You are asked for a userid of up to eight characters. If you are

a new user, you will be asked to supply your name and address for record keeping. You can search the NSF publications for information and have the information sent to your e-mail address if you wish. STIS provides a menu system. To get back to the main menu, press the esc key until you have the main menu on the screen. Press the arrow key until Exit is highlighted, and press enter to exit STIS.

8.9 Weather

Source:
Telnet madlab.sprl.umich.edu 3000

8.93 NASA Spacelink

A space-related information database provided by the NASA Educational Affairs Division.

Source:

Telnet spacelink.msfc.nasa.gov
Login with userid newuser
and password newuser

8.95 WAIS

Wide Area Information Server; this system uses a standard query system for access to information databases on the Internet. It is a client server model with clients available for Macintoshes, NeXTs, UNIX and PCs.

Source:

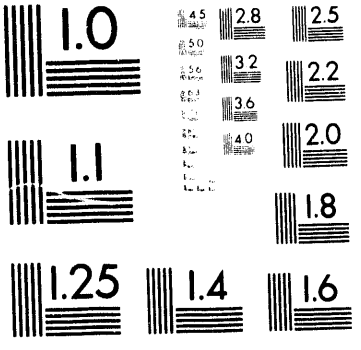
Telnet quake.think.com

Login as wais

Files avaialable via anonymous FTP to quake.com
cd wais

8.96 Gopher

Gopher is a client server system that accesses information on the Internet. Clients exist for Macintoshes, PCs, NeXTs, X Windows, and UNIX terminals. The use of Gopher as Campus Wide Information Systems has been exploding in the past year. If you have not tried Gopher I would highly recommend giving it a try. It is truly a golden Gopher.


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6

3 of 4

Source:

Telnet to consultant.micro.umn.edu
Login as gopher

Files available via anonymous FTP to boombox.micro.umn.edu
cd pub/gopher

9.0 WHOIS - E-mail white pages

WHOIS is a program available on many workstation/mini/mainframe computers that can connect to another computer. By supplying a persons name, it will respond with information it has on the person. A similar program called finger does the same type of thing, except it only supplies information on individuals with an account on that specific computer. A WHOIS database generally is contains information on most of the individuals at a university, not just on the machine you connect to.

In a larger sense WHOIS is a technique for finding a person's e-mail address. There is no master list of e-mail addresses on the network. Standards have been established for supplying e-mail addresses, but it will take some time for it to be globally implemented. In the meantime, the easiest way to find out is to call and ask!

I can just hear the gasps of horror, using the phone for anything but talking to your mom, sacrilege. There are, of course, many ways of finding a person's e-mail address. But what you don't know is if the person even reads his/her e-mail, and in the case of multiple e-mail addresses, which one is correct. A simple phone call the first time will answer those unknowns quickly.

The following documents and resources will assist in finding a person's e-mail address.

9.03 College E-mail Address

Mark Kantrowitz (mkant@cs.cmu.edu) of Caregie-Mellon University has compiled an extensive list of techniques for locating e-mail addresses for many universities. This document contains an alphabetic listing of universities and searching techniques unique to each.

Source:
Anonymous ftp to a.gp.cs.cmu.edu
Note: for password you must use your e-mail address in the form of name@computer.
cd /afs/cs.cmu.edu/user/mkant/Public/Email

Note: you must cd to this directory as above, because intermediate directories are protected.

get college-email.-#.text.##

Note: the files are separated into several sections and you need to specify the sections you want by replacing the # shown above with a number 1, 2, 3 etc.

You also can send mail to mail-server@pit-manager.mit.edu with no subject and the body of the text message (with no signature)

send usenet/soc.college/FAQ:_College_Email_Addresses _1_2_[Monthly_posting]

send usenet/soc.college/FAQ:_College_Email_Addresses _2_2_[Monthly_posting]

Note the above commands should be all on one line.

9.05 Netfind

Netfind is a program that goes out and queries the network in an organized way to find e-mail addresses.

Source:
Telnet bruno.cs.colorado.edu
Login is netfind

9.07 Inter-Network Guide

When mailing from one network to another you need to know what address to use to access the gateway. For instance, if you want to send a message from the Internet to someone on CompuServe, you address it to 12345.1234@compuserve.com, where the 12345.1234 is the person's CompuServe ID in the form 12345,1234.

The Inter-Network Mail Guide by John Chew provides this information.

Source: Send a mail message to listserv@unmvm.unm.edu No subject Message body of: GET NETWORK GUIDE

9.09 WHOIS List

The following is a list of universities that have a WHOIS service working. A more complete list has been collected by Matt Power of MIT (mhpower@athena.mit.edu).

Source:

Anonymous ftp to sipb.mit.edu
cd pub/whois
get whois-servers.list

The following is a short list of WHOIS servers.

9.1 The Ohio State University

Telnet to osu.edu
Use WHOIS command whois -h osu.edu
Enter firstname.lastname
Example: whois -h osu.edu jerry.smith

9.2 University of Oregon

Use WHOIS command whois -h oregon.uoregon.edu
Enter firstname.lastname
Example: whois -h oregon.uoregon.edu Rose.Smith

9.3 University of Virginia

Use WHOIS command whois -h whois.virginia.edu
Enter lastname, firstname middlename
Example: whois -h whois.virginia.edu Smith, John James

9.4 University of Pennsylvania

Use WHOIS command whois -h whois.upenn.edu
Enter lastname, firstname
Example: whois -h whois.upenn.edu Smith, Judy

9.5 University of Wisconsin

Use WHOIS command whois -h wisc.edu
Enter firstname lastname
Example: whois -h wisc.edu Jane Smith

9.6 MIT

Use WHOIS command whois -h mit.edu
Enter firstname_lastname
Example: whois -h mit.edu Robert_Smith

9.7 Indiana University

Use WHOIS command whois -h iugate.ucs.indiana.edu
Enter firstname_lastname
Example: whois -h iugate.ucs.indiana.edu Gerald_Smith

9.8 Stanford University

Use WHOIS command whois -h stanford.edu
Enter firstname lastname
Example: whois -h stanford.edu "shirley smith"

9.9 University of California at Davis

Use WHOIS command whois -h ucdavis.edu
Enter lastname,firstname
Example: whois -h ucdavis.edu smith,sandra

9.95 Directory of ERNET users in India

Use WHOIS command whois -h sangam.ernet.in help
(will give the help screen with examples)

Enter city name
Example: whois -h sangam.ernet.in bombay
(will list all computer names at bombay)

Enter name@computer
Example: whois -h sangam.ernet.in joshi@shakti
(will match all users on shakti matching the pattern "johsi")

10.0 Books

For a more complete listing, see sections 2.08 and 2.11.

Internetworking with TCP/IP Principles, Protocols, and Architecture by Douglas Comer, Prentice Hall, ISBN 0-13-470154-2.

The Matrix, Computer Networks and Conferencing Systems Worldwide by John S. Quarterman, Digital Press, ISBN 0-13-565607-9.

!%@:: A Directory of Electronic Mail Addressing and Networks, by Donnalyn Frey and Rick Adams, O'Reilly & Associates, Inc., ISBN 0-937175-39-0.

The User's Directory of Computer Networks, Edited by Tracy L. LaQuey, Digital Press, ISBN 0-13-950262-9.

Zen and the art of the Internet: A Beginner's Guide, Second Editon, by Brendan Kehoe, Prentice Hall, ISBN 0-13-010778-6.

11.0 Free Periodicals/Tabloids/Magazines

Below are just a few of the periodicals available to qualified subscribers.

The first four, PCWeek, MacWeek, Info World, and Network World, are the ones I try to glance over routinely. Others are dedicated to specific network, LAN, or UNIX topics that are useful if you need that information.

PC Week
P.O. Box 1767
Riverton, NJ 08077-9767

MacWEEK
P.O. Box 1764
Riverton, NJ 08077-9764

Info World
P.O. Box 3013
Northbrook, IL 60065-3013

Network World
161 Worchester Road
Framingham, MA 01701

Computer System News
Circulation Dept.
P.O. Box 2030
Manhasset, NY 11030-7030

Network Management
Circulation Department
Box 2417
Tulsa, OK 74101-2417

Unix Review
Circulation Department
P.O. Box 7439
San Francisco, CA 94120-7439

Communication News
2504 North Tamiami Trail
Nokomis, FL 34275-9987

LAN Times
P.O. Box 652
Hightstown, NJ 08520

Communications Week
Circulations Dept.
P.O. Box 2070
Manhasset, NY 11030

LAN Computing
101 Witmer Road
O.O. Box 322
Horsham, PA 19044-0322

Midrange Systems
P.O. Box 445
Horsham, PA 19044-0445

Unix Today!
Circulation Dept.
P.O. Box 2170
Manhasset NY 11030-4376

12.0 Glossary

I use some terms here that may not be familiar to all. The following is a brief explanation.

12.1 BITNET:

A network of mainframes or minicomputers. BITNET connects many universities and colleges. It provides e-mail and file transfer capabilities, but does not have the ability to do remote login (Telnet session capability).

12.2 Internet:

A very large network that connects just about any types of computers. It supports e-mail, file transfer (FTP), and remote login (Telnet).

12.3 Anonymous FTP:

The ability to transfer a file from a remote computer connected to the Internet without having an account on the remote computer. The program that performs the file transfer is normal FTP. To connect to a remote computer offering anonymous FTP, you can use the following commands from a computer connected to the Internet.

FTP Internet computer name
When prompted for a userid, type anonymous
When prompted for a password, type your e-mail address
To get a listing of files type dir
To change directory, type cd directory name
To get a file, type get filename
To get a binary file, type binary then get filename
To end session, type quit

Example:
FTP pilot.njin.net
Username: anonymous
Password: yourname@computer.edu
cd pub/ftp-list
get ftp.list
quit

12.4 Telnet:

The ability to establish a connection to a remote computer connected to the Internet network. Two types of programs are used to do this. One, usually called Telnet, establishes a VT100-type terminal emulation to the remote computer. The second, TN3270, establishes a full-screen IBM 3270-type terminal connection.

12.5 Listserv:

A program available on many BITNET connected computers that can act as a mail forwarding system and as a file repository. BITNET is another network that links many colleges and universities It does not normally link to military or government institutions as does the Internet. To subscribe to a listserv, you usually send mail to the machine that has the mailing list with the command to subscribe. As an example, to subscribe to a list for discussion of topics pertinent to mechanical engineering, send e-mail to listserv@utarlvml with a message containing the one-line command to subscribe:

SUB MECH-l John Doe (Where John Doe would be your full name)

12.6 Usenet/Read News

Newsgroups are like public bulletin boards that you can post and read messages from other individuals world wide. More than 1500 groups cover topics ranging from arts and recreation to more research oriented topics such as physics, philosohy, microbiology and many many others. Normally you gain access through a computer that has lots of disk space and is connected directly to the

Internet. You can read many of the newgroups from the Cleveland Freenet (section 8.1) or from commercial providors of Intenet access; for example, Holonet (section 1.7).

Disclaimer

The information provided in the previous sections has been put together from multiple sources acquired from the network. Much of it came from reading newsgroups and trying things out to see how they worked. The information is as accurate as I have been able to determine, as of July 17, 1992.

I used a DEC5500 system running Ultrix to check most of these sources. Most of the information is oriented toward Internet, since it has remote login (Telnet) and file transfer (FTP).

Security Considerations

Security issues are not discussed in this memo.

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Phone: (614) 292-4843
EMail: nic@osu.edu (Internet)
nic@ohstmail (BITNET)

FYI: INTERNET QUESTIONS & ANSWERS

Answers to frequently asked questions
by new Internet users
By: G. Malkin

Acquired by anonymous ftp nic.merit.edu
cd documents/fyi/fyi_04.txt

Network Working Group
Request for Comments: 1206
FYI: 4
Obsoletes: RFC 1177

G. Malkin
FTP Software, Inc.
A. Marine
SRI

February 1991

FYI on Questions and Answers
Answers to Commonly asked "New Internet User" Questions

Status of this Memo

This FYI RFC is one of two FYI's called, "Questions and Answers" (Q/A), produced by the User Services Working Group of the Internet Engineering Task Force (IETF). The goal is to document the most commonly asked questions and answers in the Internet.

This memo provides information for the Internet community. It does not specify any standard. Distribution of this memo is unlimited.

Table of Contents

1. Introduction

New users joining the Internet community have the same questions as did everyone else who has ever joined. Our quest is to provide the Internet community with up to date, basic Internet knowledge and experience, while moving the redundancies away from the electronic mailing lists so that the lists' subscribers do not have to read the same queries and answers over and over again.

Future updates of this memo will be produced as User Services members

become aware of additional questions that should be included, and of deficiencies or inaccuracies that should be amended in this document. An additional FYI Q/A will be published which will deal with intermediate and advanced Q/A topics.

The Q/A mailing lists are maintained by Gary Malkin at FTP.COM. They are used by a subgroup of the User Services Working Group to discuss the Q/A FYIs. They include:

quail@ftp.com	This is a discussion mailing list. Its primary use is for pre-release review of the Q/A FYIs.
quail-request@ftp.com	This is how you join the quail mailing list.
quail-box@ftp.com	This is a write-only list which serves as a repository for candidate questions and answers. It is not necessary to be on the quail mailing list to forward to the quail-box.

2. Acknowledgements

The following people deserve thanks for their help and contributions to this FYI Q/A: Vint Cerf (CNRI), Ralph Droms (Bucknell), Tracy LaQuey Parker (UTexas), Craig Partridge (SICS), Jon Postel (ISI), Joyce K. Reynolds (ISI), Karen Roubicek (BBNST), Marty Schoffstall (PSI, Inc.), Patricia Smith (Merit), Gene Spafford (Purdue) and James Van Bokkelen (FTP Software, Inc.).

3. Questions About the Internet

What is the Internet?

The Internet is a large collection of networks (all of which run the TCP/IP protocols) that are tied together so that users of any of the networks can use the network services provided by TCP/IP to reach users on any of the other networks. The Internet started with the ARPANET, but now includes such networks as NSFNET, NYSERnet, and thousands of others. There are other major wide area networks, such as BITNET and DECnet networks, that are not based on the TCP/IP protocols and are thus not part of the Internet. However, it is possible to communicate between them and the Internet via electronic mail because of mail gateways that act as "translators" between the different network protocols involved.

Note: You will often see "internet" with a small "i". This could refer to any network built based on TCP/IP, or might refer to networks using other protocol families that are composites built

of smaller networks.

I just got on the Internet. What can I do now?

You now have access to all the resources you are authorized to use on your own Internet host, on any other Internet host on which you have an account, and on any other Internet host that offers publicly accessible information. The Internet gives you the ability to move information between these hosts via file transfers. Once you are logged into one host, you can use the Internet to open a connection to another, login, and use its services interactively (this is known as remote login or "TELNETTING". In addition, you can send electronic mail to users at any Internet site and to users on many non-Internet sites that are accessible via electronic mail.

There are various other services you can use. For example, some hosts provide access to specialized databases or to archives of information. The Internet Resource Guide provides information regarding some of these sites. The Internet Resource Guide lists facilities on the Internet that are available to users. Such facilities include supercomputer centers, library catalogs and specialized data collections. The guide is published by the NSF Network Service Center (NNSC) and is continuously being updated. The Resource Guide is distributed free via e-mail (send a note to resource-guide-request@nnsc.nsf.net to join the e-mail distribution) and via anonymous FTP (in nnsc.nsf.net:resource-guide/*). Hardcopy is available at a nominal fee (to cover reproduction costs) from the NNSC. Call the NNSC at 617-873-3400 for more information.

How do I find out if a site has a computer on the Internet?

Three good sources to consult are "!%@:: A Directory of Electronic Mail Addressing and Networks" by Donnalyn Frey and Rick Adams; "The User's Directory of Computer Networks", by Tracy LaQuey; and "The Matrix: Computer Networks and Conferencing Systems Worldwide", by John Quarterman.

In addition, it is possible to find some information about Internet sites in the WHOIS database maintained at the DDN NIC at SRI International. The DDN NIC (Defense Data Network, Network Information Center) provides an information retrieval interface to the database that is also called WHOIS. To use this interface, TELNET to NIC.DDN.MIL and type "whois" (carriage return). No login is necessary. Type "help" at the whois prompt for more information on using the facility. WHOIS will show many sites, but may not show every site registered with the DDN NIC (simply

for reasons having to do with how the program is set up to search the database).

4. Questions About TCP/IP

What is TCP/IP?

TCP/IP (Transmission Control Protocol/Internet Protocol) [4,5,6] is the common name for a family of over 100 data-communications protocols used to organize computers and data-communications equipment into computer networks. TCP/IP was developed to interconnect hosts on ARPANET, PRNET (packet radio), and SATNET (packet satellite). All three of these networks have since been retired; but TCP/IP lives on. It is currently used on a large international network of networks called the Internet, whose members include universities, other research institutions, government facilities, and many corporations. TCP/IP is also sometimes used for other networks, particularly local area networks that tie together numerous different kinds of computers or tie together engineering workstations.

What are the other well-known standard protocols in the TCP/IP family?

Other than TCP and IP, the three main protocols in the TCP/IP suite are the Simple Mail Transfer Protocol (SMTP) [8], the File Transfer Protocol (FTP) [3], and the TELNET Protocol [9]. There are many other protocols in use on the Internet. The Internet Activities Board (IAB) regularly publishes an RFC [2] that describes the state of standardization of the various Internet protocols. This document is the best guide to the current status of Internet protocols and their recommended usage.

5. Questions About the Domain Name System

What is the Domain Name System?

The Domain Name System (DNS) is a hierarchical, distributed method of organizing the name space of the Internet. The DNS administratively groups hosts into a hierarchy of authority that allows addressing and other information to be widely distributed and maintained. A big advantage to the DNS is that using it eliminates dependence on a centrally-maintained file that maps host names to addresses.

What is a Fully Qualified Domain Name?

A Fully Qualified Domain Name (FQDN) is a domain name that

includes all higher level domains relevant to the entity named. If you think of the DNS as a tree-structure with each node having its own label, a Fully Qualified Domain Name for a specific node would be its label followed by the labels of all the other nodes between it and the root of the tree. For example, for a host, a FQDN would include the string that identifies the particular host, plus all domains of which the host is a part up to and including the top-level domain (the root domain is always null). For example, PARIS.NISC.SRI.COM is a Fully Qualified Domain Name for the host at 192.33.33.109. In addition, NISC.SRI.COM is the FQDN for the NISC domain.

6. Questions About Internet Documentation

What is an RFC?

The Request for Comments documents (RFCs) are working notes of the Internet research and development community. A document in this series may be on essentially any topic related to computer communication, and may be anything from a meeting report to the specification of a standard. Submissions for Requests for Comments may be sent to the RFC Editor, Jon Postel (POSTEL@ISI.EDU).

Most RFCs are the descriptions of network protocols or services, often giving detailed procedures and formats for their implementation. Other RFCs report on the results of policy studies or summarize the work of technical committees or workshops. All RFCs are considered public domain unless explicitly marked otherwise.

While RFCs are not refereed publications, they do receive technical review from either the task forces, individual technical experts, or the RFC Editor, as appropriate. Currently, most standards are published as RFCs, but not all RFCs specify standards.

Anyone can submit a document for publication as an RFC. Submissions must be made via electronic mail to the RFC Editor. Please consult RFC 1111, "Instructions to RFC Authors" [10], for further information. RFCs are accessible online in public access files, and a short message is sent to a notification distribution list indicating the availability of the memo. Requests to be added to this distribution list should be sent to RFC-REQUEST@NIC.DDN.MIL.

The online files are copied by interested people and printed or displayed at their sites on their equipment. (An RFC may also be

returned via electronic mail in response to an electronic mail query.) This means that the format of the online files must meet the constraints of a wide variety of printing and display equipment.

Once a document is assigned an RFC number and published, that RFC is never revised or re-issued with the same number. There is never a question of having the most recent version of a particular RFC. However, a protocol (such as File Transfer Protocol (FTP)) may be improved and re-documented many times in several different RFCs. It is important to verify that you have the most recent RFC on a particular protocol. The "IAB Official Protocol Standards" [2] memo is the reference for determining the correct RFC to refer to for the current specification of each protocol.

How do I obtain RFCs?

RFCs can be obtained via FTP from NIC.DDN.MIL, with the pathname RFC:RFCnnnn.TXT or RFC:RFCnnnn.PS (where "nnnn" refers to the number of the RFC). Login using FTP, username "anonymous" and password "guest". The NIC also provides an automatic mail service for those sites which cannot use FTP. Address the request to SERVICE@NIC.DDN.MIL and in the subject field of the message indicate the RFC number, as in "Subject: RFC nnnn" (or "Subject: RFC nnnn.PS" for PostScript RFCs).

RFCs can also be obtained via FTP from NIS.NSF.NET. Using FTP, login with username "anonymous" and password "guest"; then connect to the RFC directory ("cd RFC"). The file name is of the form RFCnnnn.TXT-1 (where "nnnn" refers to the number of the RFC). The NIS also provides an automatic mail service for those sites which cannot use FTP. Address the request to NIS-INFO@NIS.NSF.NET and leave the subject field of the message blank. The first line of the text of the message must be "SEND RFCnnnn.TXT-1", where nnnn is replaced by the RFC number.

Requests for special distribution should be addressed to either the author of the RFC in question, or to NIC@NIC.DDN.MIL. SRI International operates NIC.DDN.MIL and has a hardcopy subscription service for RFCs as well as several publications which incorporate a selection of RFCs defining Internet standards. Unless specifically noted otherwise on the RFC itself, all RFCs are for unlimited distribution.

How do I obtain a list of RFCs?

The NIC maintains a file that is an index of the RFCs. It lists each RFC, starting with the most recent, and for each RFC provides

the number, title, author(s), issue date, and number of hardcopy pages. In addition, it lists the online formats (PostScript or ASCII text) for each RFC and the number of bytes each such version is online on the NIC.DDN.MIL host. If an RFC is also an FYI, that fact is noted, with the corresponding FYI number. (There is a parallel FYI Index available). Finally, the Index notes whether or not an RFC is obsoleted or updated by another RFC, and gives the number of that RFC, or if an RFC itself obsoletes or updates another RFC, and gives that RFC number. The index is updated online each time an RFC is issued.

This RFC Index is available online from the NIC.DDN.MIL host as RFC:RFC-INDEX.TXT. The FYI Index is online as FYI:FYI-INDEX.TXT. It is also available from the NIC in hardcopy for $10, as are individual RFCs. Call the NIC at 1-800-235-3155 for help in obtaining the file.

Which RFCs are Standards?

See "IAB Official Protocol Standards" (currently, RFC 1140) [2].

What is an Internet Draft? Are there any guidelines available for writing one?

Internet Drafts (I-D's) are the current working documents of the IETF. Internet Drafts are generally in the format of an RFC with some key differences:

- The Internet Drafts are not RFC's and are not a numbered document series.
- The words INTERNET-DRAFT appear in place of RFC XXXX in the upper left-hand corner.
- The document does not refer to itself as an RFC or as a Draft RFC.
- An Internet Draft does not state nor imply that it is a proposed standard. To do so conflicts with the role of the IAB, the RFC Editor, and the Internet Engineering Steering Group (IESG).

An Internet Drafts Directory has been installed to make available, for review and comment by the IETF members, draft documents that will be submitted ultimately to the IAB and the RFC Editor to be considered for publishing as an RFC. The Internet Drafts Directories are maintained primarily at the NSFNET Network Service Center (NNSC). There are several "shadow" machines which contain

the IETF and Internet Drafts Directories. They are:

NSF Network Service Center: nnsc.nsf.net
DDN NIC: nic.ddn.mil
Pacific Rim: munnari.oz.au
Europe: nic.nordu.net (192.36.148.17)

To access these directories, use anonymous FTP. Login with username, "anonymous", password, "guest". Once logged in, change to the directory, "cd internet-drafts". Internet Draft files can then be retrieved.

For further information on the Internet Drafts of the IETF, or if you have problems with retrieving Internet Draft documents, contact Megan Davies (mdavies@nri.reston.va.us) or Greg Vaudreuil (gvaudre@nri.reston.va.us) for assistance.

How do I obtain OSI Standards documents?

OSI Standards documents are NOT available from the Internet via anonymous FTP due to copyright restrictions. These are available from:

Omnicom Information Service
501 Church Street NE
Suite 304
Vienna, VA 22180 USA
Telephone: (800) 666-4266 or (703) 281-1135
Fax: (703) 281-1505

However, the GOSIP specification which covers the use of OSI protocols within the U.S. Government is available from the NIC and from the National Institute of Standards and Technology (NIST). The final text of GOSIP Version 2 is now available from both sites. Version 2 is expected to become a Federal Information Processing Standard (FIPS) in early 1991.

Online sources:

Available through anonymous ftp from osi.ncsl.nist.gov (129.6.48.100) as:

```
./pub/gosip/gosip_v2.txt        -- ascii
./pub/gosip/gosip_v2.txt.Z      -- ascii compressed
./pub/gosip/gosip_v2.ps         -- PostScript
./pub/gosip/gosip_v2.ps.Z       -- PostScript compressed
```

Available through anonymous ftp from nic.ddn.mil (192.67.67.20) as:

```
PROTOCOLS:GOSIP-V2.TXT        -- ascii
PROTOCOLS:GOSIP-V2.PS         -- PostScript
```

Hardcopy sources:

Standards Processing Coordinator (ADP)
National Institute of Standards and Technology
Technology Building, Room B-64
Gaithersburg, MD 20899
(301) 975-2816

Network Information Systems Center
SRI International, Room EJ291
333 Ravenswood Ave.
Menlo Park, CA 94025
1-800-235-3155

7. Questions about Internet Organizations and Contacts

What is the IAB?

The Internet Activities Board (IAB) is the coordinating committee for Internet design, engineering and management [7]. IAB members are deeply committed to making the Internet function effectively and evolve to meet a large scale, high speed future. The chairman serves a term of two years and is elected by the members of the IAB. The current Chair of the IAB is Vint Cerf. The IAB focuses on the TCP/IP protocol suite, and extensions to the Internet system to support multiple protocol suites.

The IAB performs the following functions:

1) Sets Internet Standards,

2) Manages the RFC publication process,

3) Reviews the operation of the IETF and IRTF,

4) Performs strategic planning for the Internet, identifying long-range problems and opportunities,

5) Acts as an international technical policy liaison and representative for the Internet community, and

6) Resolves technical issues which cannot be treated within the IETF or IRTF frameworks.

The IAB has two principal subsidiary task forces:

1) Internet Engineering Task Force (IETF)

2) Internet Research Task Force (IRTF)

Each of these Task Forces is led by a chairman and guided by a Steering Group which reports to the IAB through its chairman. For the most part, a collection of Research or Working Groups carries out the work program of each Task Force.

All decisions of the IAB are made public. The principal vehicle by which IAB decisions are propagated to the parties interested in the Internet and its TCP/IP protocol suite is the Request for Comments (RFC) note series and the Internet Monthly Report.

What is the IANA?

The task of coordinating the assignment of values to the parameters of protocols is delegated by the Internet Activities Board (IAB) to the Internet Assigned Numbers Authority (IANA). These protocol parameters include op-codes, type fields, terminal types, system names, object identifiers, and so on. The "Assigned Numbers" Request for Comments (RFC) [1] documents the currently assigned values from several series of numbers used in network protocol implementations. Internet addresses and Autonomous System numbers are assigned by the Network Information Center at SRI International. This responsibility has been delegated by the IANA to the DDN NIC which serves as the Internet Registry. The IANA is located at USC/Information Sciences Institute.

Current types of assignments listed in Assigned Numbers and maintained by the IANA are:

Address Resolution Protocol Parameters
ARPANET and MILNET X.25 Address Mappings
ARPANET and MILNET Logical Addresses
ARPANET and MILNET Link Numbers
BOOTP Parameters and BOOTP Extension Codes
Domain System Parameters
IANA Ethernet Address Blocks
Ethernet Numbers of Interest
IEEE 802 Numbers of Interest
Internet Protocol Numbers
Internet Version Numbers
IP Time to Live Parameter
IP TOS Parameters
Machine Names

Mail Encryption Types
Multicast Addresses
Network Management Parameters
Point-to-Point Protocol Field Assignments
PRONET 80 Type Numbers
Port Assignments
Protocol and Service Names
Protocol/Type Field Assignments
Public Data Network Numbers
Reverse Address Resolution Protocol Operation Codes
TELNET Options
Terminal Type Names
Unix Ports
X.25 Type Numbers

For more information on number assignments, contact IANA@ISI.EDU.

What is a NIC? What is a NOC?

"NIC" stands for Network Information Center. It is an organization which provides network users with information about services provided by the network.

"NOC" stands Network Operations Center. It is an organization that is responsible for maintaining a network.

For many networks, especially smaller, local networks, the functions of the NIC and NOC are combined. For larger networks, such as mid-level and backbone networks, the NIC and NOC organizations are separate, yet they do need to interact to fully perform their functions.

What is "The NIC"?

"The NIC" is the Defense Data Network, Network Information Center (DDN NIC) at SRI International, which is a network information center which holds a primary repository for RFCs and Internet Drafts. The host name is NIC.DDN.MIL. Shadow copies of the RFCs and the Internet Drafts are maintained by the NSFNET on NIS.NSF.NET.

The DDN NIC also provides various user assistance services for DDN users; contact NIC@NIC.DDN.MIL or call 1-800-235-3155 for more information. In addition, the DDN NIC is the Internet registration authority for the root domain and several top and second level domains; maintains the official DoD Internet Host Table; is the site of the Internet Registry (IR); and maintains the WHOIS database of network users, hosts, domains, networks, and

Points of Contact.

What is the IR?

The Internet Registry (IR) is the organization that is responsible for assigning identifiers, such as IP network numbers and autonomous system numbers, to networks. The IR also gathers and registers such assigned information. The IR may, in the future, allocate the authority to assign network identifiers to other organizations; however, it will continue to gather data regarding such assignments. At present, the DDN NIC at SRI International serves as the IR.

What is the IETF?

The Internet has grown to encompass a large number of widely geographically dispersed networks in academic and research communities. It now provides an infrastructure for a broad community with various interests. Moreover, the family of Internet protocols and system components has moved from experimental to commercial development. To help coordinate the operation, management and evolution of the Internet, the IAB established the Internet Engineering Task Force (IETF).

The IETF is chaired by Phill Gross and managed by its Internet Engineering Steering Group (IESG). The IETF is a large open community of network designers, operators, vendors, and researchers concerned with the Internet and the Internet protocol suite. It is organized around a set of several technical areas, each managed by a technical area director. In addition to the IETF Chairman, the area directors make up the IESG membership.

The IAB has delegated to the IESG the general responsibility for making the Internet work and for the resolution of all short- and mid-range protocol and architectural issues required to make the Internet function effectively.

What is the IRTF?

To promote research in networking and the development of new technology, the IAB established the Internet Research Task Force (IRTF).

In the area of network protocols, the distinction between research and engineering is not always clear, so there will sometimes be overlap between activities of the IETF and the IRTF. There is, in fact, considerable overlap in membership between the two groups. This overlap is regarded as vital for cross-fertilization and

technology transfer.

The IRTF is a community of network researchers, generally with an Internet focus. The work of the IRTF is governed by its Internet Research Steering Group (IRSG). The chairman of the IRTF and IRSG is David Clark.

8. Questions About Services

How do I find someone's electronic mail address?

There are a number of directories on the Internet; however, all of them are far from complete. The largest directories are the WHOIS database at the DDN NIC, the PSInet White Pages, and KNOWBOT. Generally, it is still necessary to ask the person for his or her email address.

How do I use the WHOIS program at the DDN NIC?

To use the WHOIS program to search the WHOIS database at the DDN NIC, TELNET to the NIC host, NIC.DDN.MIL. There is no need to login. Type "whois" to call up the information retrieval program. Next, type the name of the person, host, domain, network, or mailbox for which you need information. If you are only typing part of the name, end your search string with a period. Type "help" for a more in-depth explanation of what you can search for and how you can search. If you have trouble, send a message to NIC@NIC.DDN.MIL or call 1-800-235-3155. Bug reports can be sent to BUG-WHOIS@NIC.DDN.MIL and suggestions for improvements to the program can be sent to SUGGESTIONS@NIC.DDN.MIL.

How do I become registered in the DDN NIC's WHOIS database?

If you would like to be listed in the WHOIS database, you must have an electronic mailbox accessible from the Internet. First obtain the file NETINFO:USER-TEMPLATE.TXT. You can either retrieve this file via anonymous FTP from NIC.DDN.MIL or get it through electronic mail. To obtain the file via electronic mail, send a message to SERVICE@NIC.DDN.MIL and put the file name in the subject line of the message; that is, "Subject: NETINFO USER-TEMPLATE.TXT". The file will be returned to you overnight.

Fill out the name and address information requested in the file and return it to REGISTRAR@NIC.DDN.MIL. Your application will be processed and you will be added to the database. Unless you are an official Point of Contact for a network entity registered at the DDN NIC, the DDN NIC will not regularly poll you for updates, so you should remember to send corrections to your information as

your contact data changes.

How do I use the White Pages at PSI?

Performance Systems International, Inc. (PSI), sponsors a White Pages Pilot Project that collects personnel information from member organizations into a database and provides online access to that data. This effort is based on the OSI X.500 Directory standard.

To access the data, TELNET to WP.PSI.COM and login as "fred" (no password is necessary). You may now look up information on participating organizations. The program provides help on usage. For example, typing "help" will show you a list of commands, "manual" will give detailed documentation, and "whois" will provide information regarding how to find references to people. For a list of the organizations that are participating in the pilot project by providing information regarding their members, type "whois -org *".

For more information, send a message to WP-INFO@PSI.COM.

How do I use the Knowbot Information Service?

The Knowbot Information Service is a white pages "meta-service" that provides a uniform interface to heterogeneous white pages services in the Internet. Using the Knowbot Information Service, you can form a single query that can search for white pages information from the NIC WHOIS service, the CSNET WHOIS service, the PSI White Pages Pilot Project, and MCI Mail, among others, and have the responses displayed in a single, uniform format.

Currently, the Knowbot Information Service can be accessed through TELNET to port 185 on hosts nri.reston.va.us and sol.bucknell.edu. From a UNIX host, use "telnet nri.reston.va.us 185". There is also an electronic mail interface avaliable by sending mail to netaddress at either nri.reston.va.us or sol.bucknell.edu.

The commands "help" and "man" summarize the command interface. Simply entering a user name at the prompt searches a default list of Internet directory services for the requested information. Organization and country information can be included thorgh the syntax: "userid@organization.country". For example, the queries "droms@bucknell" and "kille@ucl.gb" are both valid. Note that these are not Domain Names, but rather a syntax to specify an organization and a country for the search.

The default list of directory services currently includes the

whois services at the SRI NIC and the CSNET NIC and the white pages service for MCIMail. If an organization is specified, the PSI X.500 service is also searched. Other services can be requested explicitly.

What is Usenet? What is Netnews?

Usenet and Netnews are common names of a distributed computer bulletin board system that some computers on the Internet participate in. It is not strictly an Internet service: many computers not on the Internet also participate. Netnews can be a valuable tool to economize what might otherwise be a large volume of traffic from electronic mailing lists.

How do I get on Usenet? How do I get Netnews on my computer?

To get on Usenet, you must acquire the software, which is available for some computers at no cost from some anonymous FTP sites across the Internet, and you must find an existing Usenet site that is willing to support a connection to your computer. In many cases, this "connection" merely represents additional traffic over existing Internet access channels.

What is anonymous FTP?

Anonymous FTP is a conventional way of allowing you to sign on to a computer on the Internet and copy specified public files from it [3]. Some sites offer anonymous FTP to distribute software and various kinds of information. You use it like any FTP, but the username is "anonymous". Many systems will allow any password and request that the password you choose is your userid. If this fails, the generic password is usually "guest".

What is "TELNET"?

The term "TELNET" refers to the remote login that's possible on the Internet because of the TELNET Protocol [9]. The use of this term as a verb, as in "telnet to a host" means to establish a connection across the Internet from one host to another. Usually, you must have an account on the remote host to be able to login to it once you've made a connection. However, some hosts, such as those offering white pages directories, provide public services that do not require a personal account.

9. Mailing Lists

What is a mailing list?

A mailing list is really nothing more than an alias that has multiple destinations. Mailing lists are usually created to discuss specific topics. Anybody interested in that topic, may (usually) join that list. Some mailing lists have membership restrictions, others have message content restrictions, and still others are moderated. Most large, "public" mailing lists, such as IETF and TCP-IP, have an additional mail address to which requests to be added or deleted may be sent. Usually, these are of the form listname-request.

There is a "list-of-lists" file available on the host ftp.nisc.sri.com that lists most of the major mailing lists, describes their primary topics, and explains how to subscribe to them. The file is available for anonymous ftp in the netinfo directory as interest-groups (that is, the path is: netinfo/interest-groups). It can also be obtained via electronic mail. Send a message to mail-server@nisc.sri.com with the body of the message reading, "Send netinfo/interest-groups" and the file will be returned in moderate size pieces via electronic mail.

How do I contact the administrator of a mailing list rather than posting to the entire list?

For every mailing list mentioned in the "interest-groups" file, there is a description of how to join the list or send other such administrative messages to the person in charge of the list. In general, however, it is usually safe to assume that you can send a message to an address in the format of ListName-request@domain. The convention of having a parallel mailbox conforming to the "-request" format is very widely followed. All administrative messages regarding using, joining, or quitting the list should be sent to that mailbox instead of to the whole list so that the readers of the list don't have to read them.

What are some good mailing lists or news groups?

The TCP-IP, IETF, and RFC Distribution lists are primary lists for new Internet users who desire further information about current and emerging developments in the Internet. The first two lists are unmoderated discussion lists, and the latter is an announcement service used by the RFC Editor.

How do I subscribe to the TCP-IP mailing list?

To be added to the TCP-IP mailing list, send a message to:

TCP-IP-REQUEST@NIC.DDN.MIL

How do I subscribe to the IETF mailing list?

To be added to the IETF mailing list, send a message to:

IETF-REQUEST@ISI.EDU

How do I subscribe to the RFC Distribution list?

To be added to the RFC Distribution list, send a message to:

RFC-REQUEST@NIC.DDN.MIL

10. Miscellaneous "Internet lore" questions

What does :-) mean?

In many electronic mail messages, it is sometimes useful to indicate that part of a message is meant in jest. It is also sometimes useful to communicate emotion which simple words do not readily convey. To provide these nuances, a collection of "smiley faces" has evolved. If you turn your head sideways to the left, :-) appears as a smiling face. Some of the more common faces are:

:-) smile

:) also a smile

:-D laughing

:-} grin

:-] smirk

:-(frown

;-) wink

8-) wide-eyed

:-X close mouthed

:-o oh, no!

What do "btw", "fyi", "imho", "wrt", and "rtfm" mean?

Often common expressions are abbreviated in informal network postings. These abbreviations stand for "by the way", "for your information", "in my humble [or honest] opinion", "with respect to", and "read the f*ing manual" (with the "f" word varying according to the vehemence of the reader).

What is the "FAQ" list?

This list provides answers to "Frequently Asked Questions" that often appear on various Usenet newsgroups. The list is posted every four to six weeks to the news.announce.newusers group. It is intended to provide a background for new users learning how to use the news. As the FAQ list provide new users with the answers to such questions, it helps keep the newsgroups themselves comparatively free of repetition. Often specific newsgroups will have and frequently post versions of a FAQ list that are specific to their topics.

Other information is also routinely posted. Here are the subject lines of several general information postings provided on Usenet:

Answers to Frequently Asked Questions (the "FAQ" list)
Introduction to news.announce
Rules for posting to Usenet
How to Create a New Newsgroup
How to Create a New Trial Newsgroup
A Primer on How to Work With the Usenet Community
Emily Postnews Answers Your Questions on Netiquette
Hints on writing style for Usenet
USENET Software: History and Sources
List of Active Newsgroups
Alternative Newsgroup Hierarchies
How to Construct the Mailpaths File
Regional Newsgroup Hierarchies
List of Moderators
Publicly Accessible Mailing Lists
List of Periodic Informational Postings
How to Get Information about Networks
A Guide to Social Newsgroups and Mailing Lists

11. Suggested Reading

For further information about the Internet and its protocols in general, you may choose to obtain copies of the following works:

Bowers, K., T. LaQuey, J. Reynolds, K. Roubicek, M. Stahl, and A. Yuan, "Where to Start - A Bibliography of General Internetworking Information", RFC 1175, FYI 3, CNRI, U Texas, ISI, BBN, SRI, Mitre, August 1990.

Comer, D., "Internetworking with TCP/IP: Principles, Protocols, and Architecture", Prentice Hall, New Jersey, 1989.

Krol, E., "The Hitchhikers Guide to the Internet", RFC 1118, University of Illinois Urbana, September 1989.

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[3] Postel, J., and J. Reynolds, "File Transfer Protocol (FTP), RFC 959, USC/Information Sciences Institute, October 1985.

[4] Postel, J., "Internet Protocol - DARPA Internet Program Protocol Specification", RFC 791, DARPA, September 1981.

[5] Postel, J., "Transmission Control Protocol - DARPA Internet Program Protocol Specification", RFC 793, DARPA, September 1981.

[6] Leiner, B., R. Cole, J. Postel, and D. Mills, "The DARPA Internet Protocol Suite", IEEE INFOCOM85, Washington D.C., March 1985. Also in IEEE Communications Magazine, March 1985. Also as ISI/RS-85-153.

[7] Cerf, V., "The Internet Activities Board" RFC 1160, CNRI, May 1990.

[8] Postel, J., "Simple Mail Transport Protocol", RFC 788, USC/Information Sciences Institute, November 1981.

[9] Postel, J., and J. Reynolds, "TELNET Protocol Specification", RFC 854, USC/Information Sciences Institute, May 1983.

[10] Postel, J., "Request for Comments on Request for Comments - Instructions to RFC Authors", RFC 1111, USC/Information Sciences Institute, August 1989.

13. Condensed Glossary

As with any profession, computers have a particular terminology all their own. Below is a condensed glossary to assist in making some sense of the Internet world.

ACM Association for Computer Machinery
A group established in 1947 to promote professional development and research on computers.

address There are two separate uses of this term in internet networking: "electronic mail address" and "internet address". An electronic mail address is the string of characters that you must give an electronic mail program to direct a message to a particular person. See "internet address" for its definition.

AI Artificial Intelligence
The branch of computer science which deals with the simulation of human intelligence by computer systems.

AIX Advanced Interactive Executive
IBM's version of Unix.

ANSI American National Standards Institute
A group that certifies organizations which develop U.S. standards for the information processing industry. ANSI accredited groups participate in defining network protocol standards.

ARP Address Resolution Protocol
An Internet protocol which runs on Ethernet and all IEEE 802.X LANs which maps internet addresses to MAC addresses.

ARPA Advanced Research Projects Agency
The former name of what is now called DARPA.

ARPANET Advanced Research Projects Agency Network
A pioneering long haul network funded by ARPA. It served as the basis for early networking research as well as a central backbone during the development of the Internet. The ARPANET consisted of individual packet switching computers interconnected by leased lines.

AS Autonomous System
A collection of gateways (routers) under a single administrative authority using a common Interior Gateway Protocol for routing packets.

ASCII American Standard Code for Information Interchange

B Byte
One character of information, usually eight bits wide.

b bit - binary digit
The smallest amount of information which may be stored in a computer.

BBN Bolt Beranek and Newman, Inc.
The Cambridge, MA company responsible for development, operation and monitoring of the ARPANET, and later, the Internet core gateway system, the CSNET Coordination and Information Center (CIC), and NSFNET Network Service Center (NNSC).

BITNET Because It's Time Network
BITNET has about 2,500 host computers, primarily at universities, in many countries. It is managed by EDUCOM, which provides administrative support and information services. There are three main constituents of the network: BITNET in the United States and Mexico, NETNORTH in Canada, and EARN in Europe. There are also AsiaNet, in Japan, and connections in South America. See CREN.

bps bits per second
A measure of data transmission speed.

BSD Berkeley Software Distribution
Term used when describing different versions of the Berkeley UNIX software, as in "4.3BSD UNIX".

catenet A network in which hosts are connected to networks with varying characteristics, and the networks are interconnected by gateways (routers). The Internet is an example of a catenet.

CCITT International Telegraph and Telephone Consultative Committee

core gateway
Historically, one of a set of gateways (routers) operated by the Internet Network Operations Center at BBN. The core gateway system forms a central part

of Internet routing in that all groups had to advertise paths to their networks from a core gateway.

CREN The Corporation for Research and Educational Networking
BITNET and CSNET have recently merged to form CREN.

CSNET Computer + Science Network
A large data communications network for institutions doing research in computer science. It uses several different protocols including some of its own. CSNET sites include universities, research laboratories, and commercial companies. See CREN.

DARPA U.S. Department of Defense Advanced Research Projects Agency
The government agency that funded the ARPANET and later started the Internet.

datagram
The unit transmitted between a pair of internet modules. The Internet Protocol provides for transmitting blocks of data, called datagrams, from sources to destinations. The Internet Protocol does not provide a reliable communication facility. There are no acknowledgements either end-to-end or hop-by-hop. There is no error control for data, only a header checksum. There are no retransmissions. There is no flow control. See IP.

DCA Defense Communications Agency
The government agency responsible for installation of the Defense Data Network (DDN), including the ARPANET and MILNET lines and PSNs. Currently, DCA administers the DDN, and supports the user assistance and network registration services of the DDN NIC.

DDN Defense Data Network
Comprises the MILNET and several other DoD networks.

DDN NIC The network information center at SRI International.
It is the primary repository for RFCs and Internet Drafts, as well as providing other services.

DEC Digital Equipment Corporation

DECnet Digital Equipment Corporation network
A networking protocol for DEC computers and network devices.

default route
A routing table entry which is used to direct any data addressed to any network numbers not explicitly listed in the routing table.

DNS The Domain Name System is a mechanism used in the Internet for translating names of host computers into addresses. The DNS also allows host computers not directly on the Internet to have registered names in the same style, but returns the electronic mail gateway which accesses the non-Internet network instead of an IP address.

DOD U.S. Department of Defense

DOE U.S. Department of Energy

dot address (dotted address notation)
Dot address refers to the common notation for Internet addresses of the form A.B.C.D; where each letter represents, in decimal, one byte of the four byte IP address.

EARN European Academic Research Network
One of three main constituents of BITNET.

EBCDIC Extended Binary-coded Decimal Interchange Code

EGP Exterior Gateway Protocol
A protocol which distributes routing information to the gateways (routers) which connect autonomous systems.

Ethernet
A network standard for the hardware and data link levels. There are two types of Ethernet: Digital/Intel/Xerox (DIX) and IEEE 802.3.

FDDI Fiber Distributed Data Interface
FDDI is a high-speed (100Mb) token ring LAN.

FIPS Federal Information Processing Standard

FTP File Transfer Protocol
The Internet standard high-level protocol for transferring files from one computer to another.

gateway See router

GB Gigabyte
A unit of data storage size which represents 2^30 (over 1 billion) characters of information.

Gb Gigabit
2^30 bits of information (usually used to express a data transfer rate; as in, 1 gigabit/second = 1Gbps).

GNU Gnu's Not UNIX
A UNIX-compatible operating system developed by the Free Software Foundation.

header The portion of a packet, preceding the actual data, containing source and destination addresses and error-checking fields.

host number
The part of an internet address that designates which node on the (sub)network is being addressed.

HP Hewlett-Packard

HYPERchannel
High-speed communications link.

I/O Input/Output

IAB Internet Activities Board
The IAB is the coordinating committee for Internet design, engineering and management.

IBM International Business Machines Corporation

ICMP Internet Control Message Protocol
ICMP is an extension to the Internet Protocol. It allows for the generation of error messages, test packets and informational messages related to IP.

IEEE Institute for Electrical and Electronics Engineers

IETF Internet Engineering Task Force
The IETF is a large open community of network designers, operators, vendors, and researchers whose purpose is to coordinate the operation, management and evolution of

the Internet, and to resolve short- and mid-range protocol and architectural issues. It is a major source of proposed protocol standards which are submitted to the Internet Activities Board for final approval. The IETF meets three times a year and extensive minutes of the plenary proceedings are issued.

internet
internetwork
Any connection of two or more local or wide-area networks.

Internet
The global collection of interconnected local, mid-level and wide-area networks which use IP as the network layer protocol.

internet address
An assigned number which identifies a host in an internet. It has two or three parts: network number, optional subnet number, and host number.

IP Internet Protocol
The network layer protocol for the Internet. It is a packet switching, datagram protocol defined in RFC 791.

IRTF Internet Research Task Force
The IRTF is a community of network researchers, generally with an Internet focus. The work of the IRTF is governed by its Internet Research Steering Group (IRSG).

ISO International Organization for Standardization

KB Kilobyte
A unit of data storage size which represents 2^10 (1024) characters of information.

Kb Kilobit
2^10 bits of information (usually used to express a data transfer rate; as in, 1 kilobit/second = 1Kbps = 1Kb).

LAN Local Area Network
A network that takes advantage of the proximity of computers to offer relatively efficient, higher speed communications than long-haul or wide-area networks.

LISP List Processing Language
A high-level computer language invented by Professor John McCarthy in 1961 to support research into computer based logic, logical reasoning, and artificial intelligence. It was the first symbolic (as opposed to numeric) computer processing language.

MAC Medium Access Control
For broadcast networks, it is the method which devices use to determine which device has line access at any given time.

Mac Apple Macintosh computer.

MAN Metropolitan Area Network

MB Megabyte
A unit of data storage size which represents over 2^20 (one million) characters of information.

Mb Megabit
2^20 bits of information (usually used to express a data transfer rate; as in, 1 megabit/second = 1Mbps).

MILNET Military Network
A network used for unclassified military production applications. It is part of the DDN and the Internet.

MIT Massachusetts Institute of Technology

MTTF Mean Time to Failure
The average time between hardware breakdown or loss of service. This may be an empirical measurement or a calculation based on the MTTF of component parts.

MTTR Mean Time to Recovery (or Repair)
The average time it takes to restore service after a breakdown or loss. This is usually an empirical measurement.

MVS Multiple Virtual Storage
An IBM operating system based on OS/1.

NASA National Aeronautics and Space Administration

NBS National Bureau of Standards
Now called NIST.

network number
The part of an internet address which designates the network to which the addressed node belongs.

NFS Network File System
A network service that lets a program running on one computer to use data stored on a different computer on the same internet as if it were on its own disk.

NIC Network Information Center
An organization which provides network users with information about services provided by the network.

NOC Network Operations Center
An organization that is responsible for maintaining a network.

NIST National Institute of Standards and Technology
Formerly NBS.

NSF National Science Foundation

NSFNET National Science Foundation Network
The NSFNET is a highspeed "network of networks" which is hierarchical in nature. At the highest level is a network that spans the continental United States. Attached to that are mid-level networks and attached to the mid-levels are campus and local networks. NSFNET also has connections out of the U.S. to Canada, Mexico, Europe, and the Pacific Rim. The NSFNET is part of the Internet.

NSFNET Mid-level Level Network
A network connected to the highest level of the NSFNET that covers a region of the United States. It is to mid-level networks that local sites connect. The mid-level networks were once called "regionals".

OSI Open Systems Interconnection
A set of protocols designed to be an international standard method for connecting unlike computers and networks. Europe has done most of the work developing OSI and will probably use it as soon as possible.

OSI Reference Model
An "outline" of OSI which defines its seven layers and their functions. Sometimes used to help describe other networks.

OSPF Open Shortest-Path First Interior Gateway Protocol
A proposed replacement for RIP. It addresses some problems of RIP and is based upon principles that have been well-tested in non-internet protocols. Originally acronymed as OSPFIGP.

packet The unit of data sent across a packet switching network. The term is used loosely. While some Internet literature uses it to refer specifically to data sent across a physical network, other literature views the Internet as a packet switching network and describes IP datagrams as packets.

PC Personal Computer

PCNFS Personal Computer Network File System

POSIX Portable Operating System Interface
Operating system based on UNIX.

PPP Point-to-Point Protocol
The Point-to-Point Protocol (PPP) provides a method for transmitting datagrams over serial point-to-point links.

protocol
A formal description of message formats and the rules two computers must follow to exchange those messages. Protocols can describe low-level details of machine-to-machine interfaces (e.g., the order in which bits and bytes are sent across a wire) or high-level exchanges between allocation programs (e.g., the way in which two programs transfer a file across the Internet).

RFC The Internet's Request for Comments documents series
The RFCs are working notes of the Internet research and development community. A document in this series may be on essentially any topic related to computer communication, and may be anything from a meeting report to the specification of a standard.

RIP Routing Interchange Protocol
One protocol which may be used on internets simply to pass routing information between gateways. It is used on may LANs and on some of the NSFNET intermediate level networks.

RJE Remote Job Entry
The general protocol for submitting batch jobs and retrieving the results.

RLOGIN Remote Login
A service on internets very similar to TELNET. RLOGIN was invented for use between Berkeley Unix systems on the same LAN at a time when TELNET programs didn't provide all the services users wanted. Berkeley plans to phase it out.

router A special-purpose dedicated computer that attaches to two or more networks and routes packets from one network to the other. In particular, an Internet gateway routes IP datagrams among the networks it connects. Gateways route packets to other gateways until they can be delivered to the final destination directly across one physical network.

RPC Remote Procedure Call
An easy and popular paradigm for implementing the client-server model of distributed computing.

server A computer that shares its resources, such as printers and files, with other computers on the network. An example of this is a Network Files System (NFS) Server which shares its disk space with one or more workstations that may not have local disk drives of their own.

SLIP Serial Line Internet Protocol
SLIP is currently a defacto standard, commonly used for point-to-point serial connections running TCP/IP. It is not an Internet standard but is defined in RFC 1055.

SMTP Simple Mail Transfer Protocol
The Internet standard protocol for transferring electronic mail messages from one computer to another. SMTP specifies how two mail systems interact and the format of control messages they exchange to transfer mail.

SNA System Network Architecture
IBM's data communications protocol.

SNMP Simple Network Management Protocol
The Simple Network Management Protocol (RFC 1157) is the Internet's standard for remote monitoring and management of hosts, routers and other nodes and devices on a network.

subnet A portion of a network, which may be a physically independent network, which shares a network address with other portions of the network and is distinguished by a subnet number. A subnet is to a network what a network is to an internet.

subnet number
A part of the internet address which designates a subnet. It is ignored for the purposes internet routing, but is used for intranet routing.

T1 A term for a digital carrier facility used to transmit a DS-1 formatted digital signal at 1.544 megabits per second.

T3 A term for a digital carrier facility used to transmit a DS-3 formatted digital signal at 44.746 megabits per second.

TCP Transmission Control Protocol
A transport layer protocol for the Internet. It is a connection oriented, stream protocol defined by RFC 793.

TCP/IP Transmission Control Protocol/Internet Protocol
This is a common shorthand which refers to the suite of application and transport protocols which run over IP. These include FTP, TELNET, SMTP, and UDP (a transport layer protocol).

Telenet A public packet-switching network operated by US Sprint. Also known as "SprintNet".

TELNET The Internet standard protocol for remote terminal connection service. TELNET allows a user at one site to interact with a remote timesharing system at another site as if the user's terminal was connected directly to the remote computer.

THEnet The Texas Higher Education Network, a multiprotocol network connecting most major academic and research institutions in the State of Texas, as well as several institutions in Mexico.

Token Ring
A type of LAN. Examples are IEEE 802.5, ProNET-10/80 and FDDI. The term "token ring" is often used to denote 802.5

Tymnet A public character-switching/packet-switching network operated by British Telecom.

UDP User Datagram Protocol
A transport layer protocol for the Internet. It is a datagram protocol which adds a level of reliability and multiplexing to IP datagrams. It is defined in RFC 768.

ULTRIX UNIX-based operating system for Digital Equipment Corporation computers.

UNIX An operating system developed by Bell Laboratories that supports multiuser and multitasking operations.

UUCP UNIX-to-UNIX Copy Program
A protocol used for communication between consenting UNIX systems.

VMS Virtual Memory System
A Digital Equipment Corporation operating system.

WAN Wide Area Network

WHOIS An Internet program which allows users to query a database of people and other Internet entities, such as domains, networks, and hosts, kept at the NIC. The information for people shows a person's company name, address, phone number and email address.

XNS Xerox Network System
A data communications protocol suite developed by Xerox. It uses Ethernet to move the data between computers.

X.25 A data communications interface specification developed to describe how data passes into and out of public data communications networks. The public networks such as Sprintnet and Tymnet use X.25 to interface to customer computers.

14. Security Considerations

Security issues are not discussed in this memo.

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INTERNET
&
EDUCATION

A survey of Educational Computer Networks
By: Thomas R. Mcange

Acquired by anonymous ftp ariel.unm.edu
cd library

A SURVEY OF EDUCATIONAL COMPUTER NETWORKS

June 1990

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Thomas R. McAnge, Jr.
Project Coordinator

Introduction

In January 1990, EDUCOM and IBM Corporation undertook a fact-finding project to examine the current status of computer networking in K12 education, including ways in which network linkages are impacting educational tasks. The project originated with Ken King, President of EDUCOM; Sam Matsa, University Relations, IBM; Robert Heterick, Vice President, Information Systems, Virginia Polytechnic Institute and State University, and Gary Augustson. Executive Director, Computer and Information Systems, Pennsylvania State University, all of whom share the vision and commitment to foster a global community by electronically linking university faculty, K- 12 educators, and students at all educational levels.

The fact-finding project of current and planned network activities was conducted by a research group at Virginia Polytechnic Institute and State University. This document summarizes and reports the results of that research under the following sections.

Student Activities. Several examples of the impact of telecommunications on the educational experiences of children are documented in this section. The reader can't help but share the enthusiasm generated by these activities.

States' Educational Computer Networks. This section contains the bulk of the research findings which are grouped into four categories. Statewide Networks refers to networks in which nearly every school in the state is connected; Intrastate Networks refers to those networks that are available to every school or school district in the state and the option of connection rests with the school or school district; Networking Projects refers to those networks that exist to support a specific function, i.e., first-year teacher support, science classes, or those that now

function as a pilot projects within the state; and, finally, Proposed Networks refers to networks that are still in the planning stages or are not yet fully operational.

Public Access Networks and Databases. This section is devoted to the wide variety of networks and databases available to supplement the educational needs of K-12 nationwide. These services are offered by many types of agencies, including non-profit organizations, private corporations, universities, and the federal government.

The objective of this study was to gather information and report current networking activities. The process, more so than the findings, led to a number of observations. First, the proliferation of computers in secondary schools has created an increased interest with linking to resources at all educational levels. Second, there is no doubt that telecommunications activities provide useful educational experiences. Thus, a telecommunications network that fosters an exchange of ideas among educators and allows students greater access to academic data, located at universities, is inevitable. Finally, it is also apparent that, given the fragmentation of the current networking environment, an avenue is needed for interested parties to coordinate their activities.

Student Activities

Walpole,
Massachusetts

"Why are there fewer pets in a certain small Louisiana town than there are in Walpole, Massachusetts? Mrs. Griffith's fourth grade class sits in deep thought. They had already gathered the data, talked about classifying it, and through their telecommunications network, compared the findings with their Louisiana counterparts.

"Hands soon shot up. One thinks the difference has to do with climate. Another that parental attitudes are more restrictive. Still another thinks the Louisiana town might be poorer. 'I know,' shouts Joshua a student classified learning disabled. 'I bet it has nothing at all to do with that stuff. I bet that school is in a place where there's government housing, and that the kids can't have any pets.'

"Mrs. Griffith and the rest of the class seem stunned. Not only had no one thought of this as a possible (and plausible) explanation, but no one had expected Joshua to think of it.

The students got busy. At Joshua's lead, they contacted their Louisiana counterparts, and much to everyone's amazement, discovered that Joshua had been right. The Louisiana town does have a large proportion of its population housed in government housing, and yes, there are very explicit restrictions against owning pets.

"No one looks at Joshua the same way anymore. Especially Joshua. Buoyed by his success, he begins assuming a more assertive role in his small team."1

1)Bruce Goldberg, "Restructuring and Technology: Part One", Radius, October/ November, 1988, p. 3.

Lincoln, Nebraska

Kids in the Lincoln, Nebraska. School District set up the Kids'

Travel Agency as part of a summer school project. Using CMS School-Net, a survey was sent only to kids, requesting information such as their favorite restaurants, motels and historical attractions. Several classes from San Diego, California, responded. These students were excited with the idea of being able to tell 'land-bound' students about Sea World, the Pacific Ocean, and Disneyland. The Lincoln students eagerly read, edited, and processed the data, then developed information packets from a kid's perspective for each area surveyed.

Juneau, Alaska

In the Fall of 1989, ninth grade teachers and students from Juneau, Alaska, and Moscow, USSR, communicated over a seven-day period in a joint project known as World 2000. E-mail and computer conferencing were the vehicles by which the students discussed global health issues and their vision of world health in the year 2000. Their research results are to be published. The participants hope to continue this project each year.

Binghamton, New York

"The research was really important because it helped us ask intelligent questions,"2 said one student. Another said, "It has made school really special for me these past few weeks. I still get excited when I think about it." 3

2) U.S. Congressional Office of Technology Assessment. Linking for Learning: A New Course for Education, November, 1989, p. 9.

3) Ibid., p. 9

These comments were made by students in the Chenago/Delaware area of New York about a telecommunications project called the "Electronic Field Frip". The Electronic Field Trip is an inexpensive way to put students in isolated areas in contact with professionals in a variety of fields. Field trips included "visits" to the local mayor, activists, steelmill workers, international students in Australia, Alaska, and England, and musicians.

One electronic field trip was scheduled with a rock musician. Only those students interested enough to do background research were allowed to participate. The school's music teacher, telecommunications coordinator, and librarian guided the research. After two weeks of preparation, an enthusiastic audience of eight students, a mix of aspiring musicians, college-bound students, and kids with no stated future plans, communicated for over an hour.

Afterward, the students proudly talked about the project. One commented, "We would like to talk to another musician who has not made it big and compare the interviews." 4 Another student regretted the lack of reporting from the local paper: "If this had been a local football game, they would have given it two columns of reporting.

The students' hard work paid off in many ways. They learned how to organize their thoughts on paper and on their feet, how to work together as a team, and how to plan; and, they learned more about a career to which some of them aspire.

4) U.S. Congressional Office of Technology Assessment. Linking for Learning:A New Course for Education, November, 1989, p. 9.

5) Ibid.,p.9.

Dublin, Ireland

As an extracurricular activity, students in the Dalkey School Project in the suburbs of Dublin, Ireland, found pen-pals in the United States and Canada. Initially, the objectives were to share student writing and learn a little more about other cultures. This pen-pal project has opened up a new world to these students.

From the Kidsnet distribution list, contacts were made with other children from several locations in the U.S., including Aurora, Colorado; Charlottesville, Virginia; Franklinville, New York; and Tallahassee, Florida; and from British Columbia, Canada. Students' tele-letters often contained information about themselves, their families, schools, and neighborhoods.

The students have begun to understand the nature and operation of the network, and have become very interested in people in distant places and how they live, primarily because they have been able to make friends so easily over the network. The students' keyboarding, editing, and word-processing skills have also improved.

On March 24, 1990, the Dublin Computer Fair opened featuring exhibits from computer students in dozens of schools in the Dublin area. The Dalkey School Project group went online during the fair to send and receive messages from the Dublin area and worldwide, and to demonstrate to students, teachers, administrators, and a few government officials the educational benefits and fun of telecommunications.

Next year, the students hope to enter the 1991 Aer Lingus Young Scientists' Exhibition.

Toronto, Canada

"What a wonderful learning experience it has been. It has given me a new perspective on learning and learning how to learn. With other writers of the world, we have all responded and contributed to one another. I see this as something that has changed my life. Education shouldn't always be within classroom walls."

This is what one 12th grade student wrote about her English class after telecommunications technology projects had been introduced into the curriculum. Students, teachers, and writers throughout Canada, the U.S., and the world correspond and the students' work is critiqued by the professionals. The "Writers in Electronic Residence" program of the Riverdale Collegiate Institute in Toronto is supported by the College of Education at Simon Fraser University, and forms the basis of these language-based studies.

Students' works, primarily poetry and short fiction, are posted in an electronic conference ares established for their use. The students are in control of the media befcre them and use them to broaden their classroom experiences. The "Electro-Poets" project involved a class in Toronto, one in British Columbia, and a poet also in British Columbia. During this four-month project, over 200 pages of original writing and comments were generated by the students. They readily accepted the telecommunications activities as part of their daily classroom activity. Another project, "New-Voices", involved a poet, a science-fiction writer, and a short-fiction author, and schools in Ontario and British Columbia. A third project, "Wired Writer", connects ten schools and one author from a past project.

These language-based telecommunications projects inspired students to develop language appropriate to the activity, and offered direct and personal access to computer activities that are relevant today. These telecommunications projects increased the students' access to the world and, as a result, brought to the classroom experiences to meet and enhance existing curricular needs.

6) DISTED Electronic Journal. March 1990, pp. 5-6.

Middlebury, Vermont

Earth Day 1990 (April 22) was the culmination of an eight-week project by children in classrooms from South America, Europe, Asia, and North America. The "World Class" project was sponsored by BreadNet, the network of the Bread Loaf School of English at Middlebury College in Vermont, in conjunction with Iris, MECC's online network of teachers, and Campus 2000, British Telecomm's educational network.

This year's topic was global warming. The common curriculum was based on Time's "Planet of the Year" issue. The students exchanged ideas and proposed solutions to environmental issues. They had the opportunity to pose questions to environmental leaders and politicians, and share their opinions and reactions to these issues. Senator Al Gore, of Tennessee, was available as this year's guest speaker to interact with teachers and their classes.

The project, called World Class [1990], opened officially March 4th of this year. While the results of this project are not yet available, it is expected that it will prove to be a larger collaborative project than the previous year's.

The December 1988 National Geographic article on Brazil's rain forests served as the topic for World Class [1989]. The discussions generated astounding results: students in an Eastern Kentucky coal-mining area compared their situation with that in Brazil; students in New York contributed more Sources of information than an environmental group could generate; a Washington professional suggested debt-for-nature swaps; and, finally, student essays from Chile summarized the ideas as part of an international essay exchange.

Roxboro, North Carolina

A Global Grocery List has been posted on FrEdMail's IDEAS bulletin board by the Person County Schools in North Carolina. Students ask for the local price in local currency of specific quantities of 14 items. To date, students from Michigan, Illinois, California, North Carolina, and England have responded.

The Person County School students expect to use the data in other classroom projects including math, social studies, and science to study economics in the marketplace. Data are periodically compiled and posted to the IDEAS bulletin board for other classes who may wish to access the information.

Alconbury, England

Peanut Butter and JAM -- food for thought. JAM (Junior Atlantic Monthly) is one of several future on-line projects of the Department of Defense Dependents Schools(DoDDS) Stars and Stripes Bulletin Board System at Alconbury Elementary School. JAM, a

student-generated magazine, will contain classroom work from students in grades four through six. A special kindergarten through third grade section, called Peanut Butter, is being planned.

The magazine will include all sorts of creative writing, including short stories, poetry, essays, and interviews. A schedule of topics for each issue will be posted on the bulletin board, as JAM hopes to integrate with current classroom curriculum. Submissions will be uploaded to a special area on the bulletin board and editing will be performed by editorial groups, located at various schools, as part of their language arts curriculum. Rejected articles will be returned to the author with comments or explanations. Final works will be uploaded to the bulletin board for publication and distribution.

Talahassee, Florida

Learning disabled students at Rickards High School now have a bulletin board message area they can call their own. Knowing the educational value of being able to communicate with others around the world, the Leon County Schools in Tallahassee, Florida. established an electronic bulletin board at Rickards High School, available to those in the Tallahassee area with a computer and a modem.

Among others, the Special Students message area is designed for learning disabled students. Initially, their communication is limited to other Rickards High School students, as an intermediate step for those overwhelmed by the variety of message areas. Reading and writing skills are reinforced as messages are exchanged. Deaf and blind students have joined the fun through the use of adaptive devices on their computers

When these students are ready to advance, they may join several projects which were developed for the bulletin board, including Alien Visit - where a teacher, parent, or other adult logs on and poses as an alien, asking questions on various topics; writing their own surveys and collecting data; writing and reading messages in foreign languages; establishing a county-wide magazine by and for students about their school's activities; and the on-line serial novel - - where one class composes a section and posts it on the bulletin board for another class to continue.

Barriers of academic ability have broken down and a challenging and motivating curriculum has been provided for students, thanks to the foresight of the administrators in the Leon County School System.

STATEWIDE NETWORKS

Alaska

UACN

University of Alaska Computer Network

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UACN is a statewide system linking all parts of the university

with each other and national/regional networks by satellite and landline communication facilities. Its purpose is to serve the computer and communications needs of the students, faculty, staff, and administration of the University of Alaska. The university portion of the network has 13 sites, including ten colleges. Each of the state's 56 school districts has access to UACN.

UACN uses a circuit-switched statewide computer data network to link to host computers within the university system. It is operated by university staff and is available as a free resource to all University of Alaska students, faculty, and staff.

Approximately one-third of the messages sent on UACN require satellite transmission. Networks available through UACN include Alaska Teleconferencing Network (ATN, also operated by the University of Alaska), BITNET, NSFNET, State of Alaska IRM, North WestNet, and AlaskaNet (Tymnet). AlaskaNet is a statewide computer data network operated by Alascom providing data links to both public and private host computer services within the state and data links to other networks and services outside the state. In addition, the State's Department of Administration operates the State of Alaska Computer Network, consisting of interconnected IBM mainframe computers, which are also interconnected with the UACN IBM mainframe via a statewide SNA data communications network. Users of either system are able to access the resources of the other.

Arizona

AZ EdLink

Department of Education Network

Contact:
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Phoenix, AZ 85015
602/255-5061

AZ EdLink provides bulletin board services to Arizona educators. For an $80 cost recovery fee to Leids Communication, Ltd. (the software provider), AZ EdLink subscribers can use e-mail and access outside databases and FrEdMail services.

Florida

FIRN-Florida Information Resource Network

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FIRN appears to be the most advanced educational data communications network in the nation. FIRN links all state universities, community colleges, and public schools to a comprehensive data communications network which serves as the Department of Education's primary data communications facility, providing interconnectivity between all of these educational agencies. Data communications equipment, located throughout the state, connect all school districts and area vocational/technical centers, 28 community colleges, and nine state universities into the FIRN network. Students and faculty have access to unique

computing capabilities available on other campuses, administrators in the more remote districts, and colleges can use the computer resources of more sophisticated districts and institutions. FIRN also supports a statewide automated library search system called LUIS (Library User Information Service).

Two physically distinct data communcations networks comprise FIRN. One is based on IBM's System Network Architecture (SNA) and the other on Tymnet's networking system, sometimes called an X.25 network. FIRN/SNA is a multiple-domain multiple-subnet SNA network with over 30 host nodes, and over 40 minicomputers connected as nodes. FIRN/TYMNET is a packet-switching network using FIRN-owned Tymnet communications processors to provide interconnectivity for ASCII terminals and hosts. Gateways and bridges between the two networks allow users connected to one network to reach systems attached to the other. The Tymnet side is a state-owned private network with access into Tymnet's international public data network.
The majority of use is devoted to administrators, followed by students at all educational levels. Future plans include allowing public school students to communicate with their peers through the use of the written "electronic" word for the purpose of expanding their language arts skills.

Georgia

University of Georgia College of Education
Bulletin Board

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Athens, Georgia 30602
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This statewide bulletin board system offers services to administrators, educators, and students at all educational levels. It provides long distance educational and administrative support through conferences and email on any educational topic, including technology. The dial-in system uses RBBS software.

Indiana

IDEAnet

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Mike Huffman, Director
Educational Information System
State House
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Indiana Department of Education Access Network is a Department of Education database, bulletin board, conferencing, and professional employment referral system. All educators have access to these services, and a database which provides testing, demographic, and other relevant administrative information. There is no charge for this service.

INTELENT

INdiana

TELEcommunications NETwork

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INTELENET is a statewide fiber-optic network, managed by the Intelenet Commission and built by GTE. The network is designed to provide telecommunications services to state, county, and municipal government offices, and primary, secondary, vocational, and higher education institutions in Indiana. Each of these agencies has its own network and now they have access to the statewide backbone. INTELENET serves concentrated sites in Indiana where customers will access the network for transport and switching of voice, video, and data services, and obtain other value-added information services. GTE built the network and the Intelenet Commission leases it.

INTELENET customers include state governments, Indiana University Computer network, and the Indiana Higher Education Telecommunication System (IHETS). IHETS, a consortium of public and private universities and colleges provides closed circuit educational television services, and telephone networking services.

Maryland

METNET

Maryland Education Technology Network

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METNET is a telecommunications network sponsored by the State Department of Education for the institutions of higher education and K-12 schools to share information and ideas. METNET uses Learning Link as a platform and allows Maryland educators access to all services Learning Link provides, including special forums, interest groups, special programs, and the ability to communicate with educators nationwide. It's bulletin board service uses a unix-based MS-DOS system. Educators across the state can access the system through toll-free telephone lines. Although there is no direct student use on the system, teachers upload and download student writing projects in a special program called, ''Writing Across the Curricula".

Montana

Big Sky Telegraph

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Big Sky Telegraph (BST) is a grassroots telecommunications system linking Montana's rural schools with resources and other rural teachers region-wide. BST offers e-mail, conferencing, educational databases, library services, free ERIC searching, copyrighted software loan library, and on-line training classes. It was founded by Frank Odasz and Regina Odasz, both education professors at Western Montana College, with grants from U. S. West and the M. J. Murdock Charitable Trust.

On January 1, 1988, BST went online to offer telecommunications remotely to Montana school teachers in 114 one-room schools via existing microcomputers in the schools, with the addition of a grant-provided modem. Access is free to all interested in rural education and rural community support. Users come from all across Montana. In addition, 15 states use it for economic development, and both county and city governments use it to access data. University faculty use BST as a collaborative with elementary and secondary school teachers. Courses are also being taught out of Western Montana College for college credit. The newest on-Line service supports the health-care industry.

BST is an Intel 386-based machine running XENIX. The conferencing software is a version of a customized XXBS bulletin board program. BST also runs on the Foxbase database program. A Compaq machine was installed which runs MSDOS.

New Mexico

Technet

Contact
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Technet was formed to encourage economic development by promoting the use of the vast amounts of information generated by the state's national laboratories, universities, and government offices. The not-for-profit computer network links research laboratories, universities, government agencies, and private businesses, allowing a wide range of users access to nearly 1,000 computers, including Cray-class supercomputers. World class research and development institutions, stretching along the Rio Grande Research Corridor from Los Alamos National Laboratory southward 340 miles to Las Cruces and the White Sands Missile Range, are linked via fiber optics. This fiber-optic cable, installed by U. S. West, serves as Technet's communications backbone along this corridor.

In addition to the corridor's fiber system, Technet reaches every corner of the state via normal phone lines and computer modems. State offices, private businesses, and schools now subscribe to Technet services. An NSF grant allowed Technet to link the University of New Mexico, New Mexico State University, and the New Mexico Institute of Mining and Technology to Westnet. Westnet further connects universities in Arizona, Utah. Idaho, Colorado, and Wyoming to colleges and supercomputer centers throughout the nation. The University of New Mexico supports a large number of secondary schools by providing access to its LAN.

Technet offers several public service programs, including a statewide educators' electronic network called NEDCOMM, an

acronym for New Mexico Network for Educational Communications. Sponsored by the University of New Mexico and U. S. West, NEDCOMM offers e-mail and facilitates administrative reporting and idea and course plan exchanges through computer conferencing, bulletin boards, and statewide databases. Access to consultants at educational institutions is also provided to network users. Public school students use NEDCOMM to access information at the University of New Mexico and the UNM general and medical school libraries.

New York

Teacher Resource Centers' Electronic Network

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The Teacher Resource Centers are professional development centers organized and operated by teachers across the state. The focus is on technology and the effective utilization of computers, video discs, and other technology in the classroom. Through the use of the Teacher Center Electronic Network and its bulletin board, e-mail services, satellite broadcasts, information services, and databases, teachers share ideas and support one another in developing materials, collaborating on research, and helping less-experienced teachers gain technological confidence.

The mainframe is located at the New York Institute of Technology. The conferencing software used is COsy. Future plans are to connect to the statewide TNT network.

TNT
Technology Network Ties

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TNT is a comprehensive, statewide network linking school districts, BOCES, libraries, and other educational agencies with the New York State Department of Education. The TNT system is designed for use at all educational levels and features PROFS, e-mail, conferencing using COsy, regional conferences, programs that address specific topic areas, and electronic clearinghouses of information about resources, funding, and research.

The backbone infrastructure has been in place since Spring 1988. It links all of the BOCES, many school districts within each Regional Information Center, and the New York City Regional Information Center with the State Education Department. In some districts, all school buildings are linked, including the City of Buffalo and two New York City Community School Districts.

The Telecom5 Educational Network has continued planning for delivery of integrated network services to 77 school districts in five Southern Tier BOCES areas. The future for TNT includes a comprehensive student information system, increased curriculum-based computer conferencing, and financial applications for education management, instructional applications, management, and support.

North Carolina

WCU MicroNet

Western Carolina University MicroNet

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WCU MicroNet has been operational since 1982, serving schools across the State of North Carolina by providing access to the WCU MicroNet telecommunications system through a toll-free number. Students and teachers can link with each other, the WCU faculty and staff, and with resource agencies, such as AT&T, Bell Labs, University of North Carolina at various campuses, and Morehead Planetarium. Network services include e-mail, conferencing, databases of class activities, on-line quiz programs, access to the university libraries, etc. Users include pre-college and K-12 students for science, mathematics, foreign languages, English, and history classes.

North Dakota

ND HECN

North Dakota Higher Education Computer Network

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The State of North Dakota has a statewide computer network that links the State Department of Education, state agencies, eleven colleges and universities, and supports a statewide library system of public, private, and state libraries. It is a hub-and-spoke network that consists of 13 nodes in 13 cities, nine of which have routing capabilities. All state government departments share the same backbone with higher education. State agencies use the system to access a database of human services information. The system at the University of North Dakota supports the administrative functions of higher education, while the North Dakota State University system supports the academic and research demands of higher education.

ND HECN runs on the North Dakota Information Network, the IBM system backbone. Maintenance and funding are shared. Ownership is 50% state and 50% shared between North Dakota State University and the University of North Dakota.

Distance Learning North Dakota is a proposal to link K-12 and local governments into the T1 backbone. DLND is actually two networks. The first is a video network to connect schools within eight regions across the state. Grants will be given to regional areas which will implement networks to meet their delivery needs. These regional networks will later hook into the backbone for additional services. The second is a comprehensive statewide network for use by students, faculty, and administrators in K-12, as well as college extension, GED, and Native Americans. DLND will support voice, video, and data transmission. K- 12 and local government offices are expected to be linked to the T1 backbone by Fall 1990.

Ohio Education Computer Network

Computer Network

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The Ohio Education Computer Network, which links over 80% of Ohio's school districts, is a state-owned microwave communications network. E-mail and data are shared among network users.

Pennsylvania

PENN*LINK

Department of Education Computer Network

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PENN*LINK is the official electronic communications network for the Pennsylvania Department of Education (PDE). Established in November 1986, it provides e-mail service to school districts, school superintendents, intermediate units, and area vocational and technical schools (AVTS). An electronic bulletin board provides users with information on a range of topics, including new, legislative updates, fiscal notices, announcements, policies, meeting calendars, lists of publications, and directories.

Penn State's Cooperative Extension Service operates the communications network. The computer host is located at the Pennsylvania State University.

South Carolina

CUFAN

Clemson's Forestry and Agriculture Network

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Clemson University has established a statewide data communications system to provide service to the South Carolina Cooperative Extension Service Offices located in each county. The network is composed of four major nodes linked by 19.2-kbps lines and 9.6-kbps lines to the other 47 locations. The host computer is a VAX located at Clemson University. Schools in South Carolina access CUFAN with a local telephone call to the communications equipment located in the county Extension offices. CUFAN is the communications portion of the statewide telecommunications network, Pathways, which is operated by the Department of Education for the transfer of administrative information.

Texas

TEA-NET

Texas Education Agency Network

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Statewide Networks

From the Fall of 1985 to the Spring of 1987, the Texas Education Agency (TEA) contracted with the National Information System to conduct a pilot program to study the effectiveness of electronic communications between agency school districts and one regional educational service center. One service center and 14 school districts (a total of 48 sites) used the 'Electric Pages', an electronic network service, to communicate with TEA and other educational and professional entities via bulletin board services, e-mail, and teleconferencing. The results of this project indicated that a statewide telecommunications network can support information exchange for administrative uses, plus provide supplemental course instruction. In January 1986, TEA established a network on the 'Electric Pages' called TEA-NET.

The vision for TEA-NET is to become a network whereby teachers, school districts, administrators, TEA, regional service centers, colleges, universities, and other educational and state agencies can communicate electronically. The agency computer network will support, multiple phone-line use, multiple operating systems, standard communications software, e-mail, bulletin board systems, conferencing systems, different baud rates, and a transparent interface. Batch capabilities will provide access to other states and national information providers. Since 1985, this network service has been provided by GTE. Currently, two-thirds of the school districts are connected. A contract is to be awarded for conferencing and database access services in the Fall of 1990.

In addition, the Beginning Teacher Induction Plan (BTIP) is expected to be implemented statewide on TEA-NET during the 1992-93 school year. This pilot program is designed to improve the performance of beginning teachers in their first year of teaching

by maximizing the use of existing computerized telecommunications systems that link teachers, school districts, colleges, and universities, service centers, and teacher centers.

West Virginia

Administrative Network

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The West Virginia Administrative Network is a closed system that provides educational administrative information directly from state superintendents to local county superintendents at local education agencies. The administrative network is accessed through three dial-in lines and provides e-mail, bulletin boards, and financial updates.

INTRASTATE NETWORKS

Colorado

UNC Telecommunications Systems

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The Western Institute for Distance Education (WIDE) is an assessment, development, and evaluation center administered by the University of Northern Colorado's (UNC) Division of Continuing Education to support its mission to deliver graduate teacher education programs statewide. It is primarily available to assist UNC staff, faculty, and students with statewide graduate teacher education endeavors. WIDE provides technical and instructional support to develop, produce, and evaluate distance education activities, serves as a facility to design and develop instructional materials, and manages the UNC Telecommunications System, the vehicle by which its graduate teacher education program is achieved.

The UNC Telecommunications System provides for the development of "Community Campus Centers" located in partnership at post-secondary institutions at sites across the state. Centers are interactively linked to each other and the UNC campus in Greeley by a telecommunications system, which carries data, voice, and compressed video signals over copper telephone wire. Each center will provide access to student information. Library, computer, and advising facilities, collegiate amenities, a telecommunications link to the UNC campus, U.S. West, the Colorado Department of Education, other post-secondary institutions, Colorado Alliance of Research Libraries (CARL), and SUPERNET. K-12 institutions are to be linked in the future. The system employs T-1 telephone technology to transport interactive,

two-way compressed video voice, and data on a dedicated network. Five sites are currently linked and as many as 15 will be linked in the future.

Delaware

Statewide Telecommunications Network

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The Statewide Telecommunications Network is a dial-up system that consists of three major computers. Any school district, state agency, or university may access the system after purchasing time-sharing services. Funding is subsidized by the state with 50% of the costs covered by user fees.

One computer supports the administrative computing needs of the state. One third of the states school districts access the State Department of Education's central VAX computer to transfer administrative information and student records, and to access database packages, statistical packages, and utilities, which are available for use by school administrators and teachers.

A bulletin board currently provides conferencing facilities and e-mail services to users. The state is negotiating with Minnesota Educational Computer Corporation (MECC) to have the bulletin board service become an Iris node.

Georgia

GC EduNET

Georgia College Educator's Network

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In 1987, Georgia College was awarded a continuous grant from special initiative funds by the Georgia State Legislature to improve teacher education in the middle Georgia area. This led to the development of the Regional Teacher Education Center (RTEC). RTEC funded the GC EduNET project, which was designed to provide electronic conferencing, e-mail, file sharing, on-line database searching, and other communications activities to educators and educational administrators in the State of Georgia.

The primary server is a Macintosh II with 100-Mb disk storage capability. Both internal and external access to GC EduNET is managed by AppleShare protocols, plus software developed by Russ Systems of Santa Cruz, California. The service is available free

to all schools in Georgia College's primary service area and at low cost to others in the state. Participating schools are provided telecommunications software and a 2400-baud modem for an Apple IIe or IIgs.

GC EduNET went online October 1, 1988. There are 212 members authorized for remote access to GC EduNET. During the first months of operation, there were 1,935 calls from remote sites, totaling 291 hours of connect time. In the future, it is hoped that every school in the state will be a member of the network.

Illinois

Electronic Educational Service Centers

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Student Assessment Section
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The State of Illinois has 18 educational service centers (ESC) that serve the school districts within their respective regions. Each ESC is linked electronically with the State Board of Education. The schools will be linked by way of a LAN and a dial-up process. Twenty-five schools have been added to the network, with more to follow. Users access the system for e-mail, file transfer, information retrieval, and to set up workshops. A bulletin board system will be established with the State Department of Education. There is no student participation.

Iowa

Interactive Computer Conferencing and Electronic Distribution System

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The University of Northern Iowa, with funding from the State of Iowa, is organizing educators throughout the state in an Interactive Computer Conferencing and Electronic Information Distribution System. This network connects elementary through post-secondary teachers around the state via computer conferencing to coordinate policy and administrative affairs related to student teaching. Users can also access the ERIC CD ROM database for searches. By September 1990, this system should be in place and operational. This network will become a part of the statewide network Iowa Communications Network (ICN).

Several pilot projects are under way. In Waterloo and Council Bluffs, Iowa, student teachers are able to access their supervisors and peers, as well as resources at other universities around the state. A third project links first-year teachers with university faculty for computer conferencing.

CAUCUS software, running on an IBM PS/2 Model 80 with a Xenix operating system, is connected to the host side of a Gandalf Starmaster dataswitch. A combination of toll-free phone lines, local lines, on-campus terminals, and directly connected PC's complete the network.

Iowa

Kirkwood Community College Network

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Kirkwood Community College has five fully interactive educational networks. Telelink is a microwave-based two-way audio, two-way video network that connects the main campus with students in its 4300-square-mile, seven-county service area for coursework toward a two-year degree. A secondary school network connects 23 K-12 school districts to provide shared high school programs and college credit courses through the use of ITFS. In addition, the Business Industrial Training Network (BITNET) uses ITFS to provide on-site training to selected businesses and industries. Urban Network is used by the Cedar Rapids School District to link schools for in-service teacher training and classes at the high school level, A full-service cable network serves 17 communities and 70,000 homes. Finally, a public radio service is provided over a seven-county area.

Additional community college networks have sprung up, based upon Kirkwood's success. The other regional network systems are Iowa Lakes Community College at Estherville and Iowa Central Community College at Fort Dodge. Systems are being built at the Southeast Community College in Creston, and in 1991, at the Hawkeye Institute of Technology at Waterloo. All of these regional networks are to be incorporated into the system backbone during Phase I of the ICN network.

Maine

ME-LINK

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ME-LINK is an electronic telecommunications network. It is part of a larger organization called the Maine Computer Consortium and is the medium through which members communicate. It is a dial-in, e-mail, and bulletin board system. Users include teachers and computer coordinators in the schools. Student use is typically short-term and project oriented.

Nebraska

Statewide Network

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K-12 teachers in the State of Nebraska can access the Iris Network to communicate with each other or to supplement their classroom teaching. Teachers get on the system in their classrooms and communicate with teachers and students in another classroom elsewhere on the network. While there is no individual student-to-student use, there is teacher-to-teacher classroom use. Student use is comprised of shared writing projects with other schools in the state or in the nation.

The state subscribes to and privately contracts for the Iris Network services. Nebraska educators have their own "conference area" on the Iris Network where they can interact with other state educators about issues of local interest. Currently, 100 Nebraska educators use this network. There is limited university participation from the University of Nebraska and Kearney State College, whose faculty members serve as resources.

The state is discussing implementing a statewide educational and state agency network to function as a separate telecomputing network.

New Jersey

Education Technology Network

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This telecommunications network features e-mail, discussion centers, forums, and databases. This is a data transfer telecommunications, bulletin board, and information retrieval service. Membership is open to anyone interested in education. Current membership has reached 3600 users and includes universities, teachers, administrators, board members, parents, and classrooms. Universities have held curriculum related and professional development forums and workshops on the network.

West Virginia

WVMEN

West Virginia Microcomputer Educational Network

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Brenda Williams

State Computer Network Coordinator
West Virgina Department of Education
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Charleston, WV 25305
304/348-7880

WVMEN is an instructional network for all West Virginia residents. It offers community service postings such as job openings for educators, grant information, calendars of events, Senate and House bills, and teleconference schedules. Teachers, students, parents, businesses, etc., access the system to use e-mail, bulletin boards, and download public domain software. Conference areas are available on the bulletin board for topic areas such as math, science, and debate.

NETWORKING PROJECTS

Connecticut

SNET Links to Learning

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SNET, an acronym for the Southern New England Telecommunications Corporation, provides the telecommunications services used by Statenet and SNET Links to Learning. SNET Links to Learning is an educational technology project which provides three types of telecommunications technology including voice, video, and database acquisition to 34 schools within the state. SNET and the State Department of Education are partners in the SNET Links to Learning project.

SNET Links to Learning consists of three pilot projects, one of which provides 17 school districts the ability to link their schools through the public system, an X.25 packet switch network called Connet, into databases for news services and libraries. Participants include students and teachers in K-12 public schools. Several pen-pal projects have taken place. There is no university participation at this time.

Hawaii

ChemNet

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Curriculum R and D Group
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University of Hawaii
Honolulu, HI 96822
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ChemNet is for chemistry teachers who are interested in learning and sharing ideas with other chemistry teachers. It is a cooperative venture among Hawaiian schools, the University of Hawaii Lab School, and the Hawaii Science Teacher's Association.

Members from the Department of Education, Hawaii high schools, and the University of Hawaii meet via synchronous telecommunications media, such as e-mail and bulletin boards, and through synchronous media, such as telephone, slow-scan TV, or the Hawaii Interactive Television System (HITS).

TELEclass

The Hawaii Global TELEclass Project

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808/733-2007

The Hawaii Global TELEclass (Telecommunications Enriches Language Experiences) project began as a multilevel program to enhance the learning of foreign languages. By 1987, Hawaiian students in foreign language classes had linked with their counterparts in Japan, Korea, Taiwan, Hong Kong, People's Republic of China, Canada, Puerto Rico, Tahiti, Spain, France, and Germany.

TELEclass involves the use of a central computer to coordinate the project. In Hawaii, all schools are linked through the University of Hawaii's DEC20 computer mail and electronic bulletin board systems. The project has been facilitated by a partnership with Career Kokua, the Computerized Information Delivery System (CIDS), that has placed computer terminals and phone lines in every high school in Hawaii. TELEclass has expanded through the use of international computer networks. Electronic Information Exchange System (EIES) of the New Jersey Institute of Technology has been the main communications system.

Idaho

First Year Teacher Project

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College of Education
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208/385-3683

In 1989, Boise State University began the First Year Teacher Project to support first- year teachers by providing the opportunity to maintain contact with university faculty and peers. This bulletin board service uses the Learning Link and all the services it provides as a foundation. In addition, the First Year Teacher Project was given a "corner" of the network for its own uses. No other Learning Link users can access the First Year Teacher Project, although First Year Teacher Project participants have access to all features of the Learning Link network.

The university selected 25 first-year public teachers within the state to participate in the project. The State Board of Education provides funding for the phone line needed for dial-in service. U.S. West, the local telephone company, provided funding for 25 Macintosh computers with modems, printers, and software.

Indiana

ESD

Electronic School District

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ESD, a model electronic school district, is an experimental computer network simulating academic and administrative functions in a school district. The ESD project is a cooperative effort among IBM, the Department of Education at Purdue University, Computing Services Department at Indiana University, Indiana State Department of Education, and several school districts in Indiana. Its purpose is to investigate the benefits to administrators, educators, and students of using a computer network to link school districts with the Indiana Department of Education and state universities to exchange ideas and information. Using an operating system called STEPS, Students and Teachers Electronic Productivity System, users can explore the educational and administrative possibilities of large-scale computer connectivity.

The ESD project began in July 1987, with an initial grant of $2.5 million in hardware and equipment maintenance from IBM, who continues to support the project with extensive training and other support. By October 1989, seven participating schools installed "electronic classrooms," each containing 20 or more microcomputers. The microcomputers are connected to a local area network (LAN) and the LANs are connected to the IBM 4381 mainframe at Indiana University in Bloomington. Using TCP/IP technology, the ESD will, in 1990, connect to Internet.

Kansas

UNITE

Unified Network for Informatics in Teacher Education

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913/864-3057

UNITE is a computer network which establishes an environment to facilitate communication and exchange instructional computing resources among students, teachers, and administrators. With a grant from Apple Corporation, faculty and students in the School of Education at the University of Kansas use Macintosh computers to develop educational resources for educators. Instructional development and on-line resources are developed for administrators, teachers, and educators in six school districts. This development takes place in the School of Education's Instructional Technology Center, a local area network that

connects 16 schools through a bulletin board service.

Future plans include connecting all public schools and educational resources nationwide to foster communication and collaboration.

Massachusetts

The Beginning Teacher Computer Network

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The Beginning Teacher Computer Network is a teacher-link program developed by Harvard University's Graduate School of Education to continue the training and support efforts of its teacher education programs. This network allows Harvard graduates to receive teaching advice by linking to veteran teachers and Harvard faculty via personal computers and telephone lines. Today, over 40 alumni from Virginia, Maryland, Illinois, Michigan, California, New York, New Hampshire, and Massachusetts participate in the network.

Common Ground, a bulletin board/computer conferencing software package, designed by the Educational Technology Center at Harvard, is used by the network's single host, an IBM XT with 640K ram and 20-mg hard disk. The host modem is a 1200-baud Hayes Smart Modem. All types of PC compatibles connect to the system, including Apples, IBM's, and Macintoshes.

Funding sources include a grant from the Mellon Foundation to cover telephone charges and a grant of 25 IBM PCs from IBM Corporation.

Massachusetts

SCHOLE

Boston University School of Education

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Boston University
School of Education
Schole Office
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Boston, MA 02215
617/353-3295

SCHOLE is a computer network designed, created, and operated by the School of Education at Boston University to teach children, assist teachers, aid researchers, and link students and scholars. It features e-mail, bulletin boards, teleconferencing, and special interest databases, including UPI News, encyclopedias, and an educational film library.

SCHOLE is committed to equal access for all societal segments. Since its beginning in March 1985, SCHOLE has served individuals and groups worldwide. Participants now include universities, public schools, teachers, researchers, families, children, professionals, and organizations.

Virginia

Teacher LINK

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University of Virginia
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Charlottesville, VA 22903
804/924-7471

Teacher LINK grew out of a simple e-mail project for teachers in local schools when the Curry School of Education at the University of Virginia decided to further investigate the impact of a computer network on the teaching process. Teacher LINK allows local educators access to users across the nation and worldwide via BITNET. This has encouraged teachers and interns to help their students communicate with teachers and students in many states, including Alaska, California, and Florida, and in other countries, such as Israel, Denmark, and Spain.

Major funding from IBM provided an IBM 4361 mainframe running the VM/IMS Operating System, 100 portable computers with built-in modems, monitors, printers and software. The Curry School provided the support personnel. Grants from the university provided a networked classroom for participant workshops. ProComm and CAUCUS are the software used for this project.

Virginia

VT-HSNet

Virginia Tech K-12 Computer Network Project

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Virginia Tech
Blacksburg, VA 24061
703/231-6460

In February 1989, several school district representatives and staff from Virginia Tech met to discuss a pilot project to link secondary school teachers and students with university resources. Operating for one year, the pilot project currently involves 15 high schools, five universities, the State Department of Education, and other individuals. Participants at secondary schools are connected to Virginia Tech's IBM 3090 mainframe computer by dialing a local Virginia Education and Research Network (VERnet) node. Users have access to e-mail, the Virginia Tech Library, and other national resources via BITNET and Internet.

PROPOSED NETWORKS

Arizona

Arizona Statewide Telecommunications Network

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The Arizona Education Telecommunications Cooperative (AETC) was formed in the summer of 1988 to provide a forum to share information about education telecommunications activities and technologies. AETC includes representatives from public universities, community colleges, K-12 school systems, and the State Department of Administration. This group is seeking the implementation of a statewide computer network to serve the state's public education institutions, including K-12, community colleges, universities, academic and public libraries, as well as government agencies, nonprofit community service groups, business and industry with instructional programming, video teleconferencing, file transfer, e-mail, bulletin board access, and access to information through on-line catalogs, library media services, and test banks.

The statewide network is expected to employ a mix of technologies, including satellite, microwave, ITFS, fiber optics, computer, telephone, and cable TV to provide the needed statewide voice, video, and data services. This makes use of existing technologies and adds a satellite and a land-based infrastructure for full-broadcast video, compressed video, and high-speed data transmission. Full network development is expected to take several years.

Connecticut

Statenet

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Statenet is the vehicle for statewide public sector voice and data transmission. The fiber-optic and copperwire backbone was built by Southern New England Telecommunications (SNET). All state voice, data, and video traffic will be moved onto the DS-3 backbone network by June 1992. It will be used by all state agencies, including the State Department of Education, and will support the transfer of administrative and student data.

The state network will include 336 miles of fiber optics, deployed in the public switched network. Traffic will be hubbed in 21 SNET central offices. The backbone will be based on a ring-mesh architecture that conforms to AT&T engineering

standards for DS-0, T1, and DS-3 transmissions, as well as DACS standards.

Regional networks will connect Statenet and the metropolitan area networks (MetroNets). These regional networks will be targeted at areas that economically cannot be served by Statenet but that offer potential cost and service benefits in specific geographic areas. MetroNet will comprise the last leg of the network. One MetroNet, The University of Connecticut at Storrs, is implementing an advanced network based on an AT&T fiber-optic cable, and integrated services digital network technology. The system will include a fiber-optic network linked to a SNET central office that also acts as a Statenet node.

Georgia

GEIS

Georgia Educational Information System

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404/656-2435

GEIS is a statewide network operated by the State Department of Administrative Services. It is designed to connect all 186 school district offices, every school library, and regional educational service to state offices. Forty-eight school district offices are connected. The remaining district offices should be connected in 1991. The entire network should be operational and every school connected by 1995. At the district level, the network will be used as a repository for all school information. Financial and student information will then be forwarded to state offices.

GEIS is an SNA network using T1 digital lines that are nearly in place statewide and multidrop lease lines to the schools and district offices.

Illinois

Distance Learning Network

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309/694-5231

The Distance Learning Network is a microwave, fiber-optic, ITFS, network with educational, business, and health care industry users. It offers two-way interactive audio, video, and data. Illinois Central Community College proposes to develop this telecommunications network to provide interactive instruction between the college and rural school districts.

The bulk of this telecommunications network is expected to be video based, but a data link is also proposed which will connect Illinois Central Community College with local schools for the transfer of administrative student data. Illinois Central College links with Bradley University to transfer administrative information via two-way microwave link. The purpose of this network is to provide additional curricula to those schools that are unable to do so because of costs or low enrollment.

A high school proposal exists to link school districts, including high schools and community colleges in the Illinois Central Community College (ICCC) district. Over half of the school districts in the ICCC district have committed themselves to this network project. The Distance Learning Network is expected to be completed by Fall of 1991.

Iowa

ICN

Iowa Communications Network

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Des Moines, IA 50319
515/281-3336

Based in part on the success of the Kirkwood Community College Network and various regional and local networks throughout the state, the Iowa State Legislature appropriated $50 million, $10 million per year over a five-year period, to build a statewide educational network to link every school, library, and state agency.

ICN will absorb the current ITN (Iowa Telecommunications Network), a cooperative project among state agencies, which handles administrative digital traffic. The T1 equipment is owned, and some of it is located in telephone company central offices.

ICN will be a multitiered system, which will embrace several levels of technology and will be developed in three phases. Phase I will establish a backbone system which interactively connects the ICN system hub in Des Moines with 19 regional centers, including all 15 community colleges, the Iowa Department of Education, three universities, and the Iowa Public TV. Bids are currently due for a fiber-optic network that will serve as the telecommunications backbone for the voice and date transmissions. Each regional center will then act as a hub with responsibility for the nearly 2000 schools within its locality. Within each regional center, eight to 22 sites will be linked by two-way audio and video. All 19 regional centers will be able to broadcast by ITFS to its local sites. In the second phase, local systems will connect interactively within their regions. Phase 3 is for ITFS delivery. Administrative end users will be linked by the fiber-optic network and educational end users will rely on the ITFS to meet their informational needs. ICN will handle distance learning needs, teachers' meetings, continuing education, government-related data transmission, and town meetings.

Kentucky

KENS

Kentucky Educational Networking System

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502/564-6900

In April 1990, KENS received legislative approval and funding to link the State Department of Education and all levels of the state's 178 public school districts. KENS will be a computerized communications system, which will provide each school district equal access to available and easy-to-use instructional resources and support; expose students, teachers, and administrators of the state's public elementary and secondary schools to the effective application of modern technology; and provide for the exchange of management performance data between the Kentucky Department of Education (KDE) and the local districts.

Each school district, approximately 1500 schools, will receive a minicomputer and enough remote terminals to serve each teacher, as well as some administrators. System usage is expected to be largely from teachers for instructional support in the form of curriculum information, lesson plans, and software reviews. Administrators at the schools or the local education agency central offices are also expected to be frequent users.

KENS will have the capacity to incorporate existing state-level hardware and applications, including the Kentucky Network for Educational Communication, the Vocational Education Networking System, various KDE in-house computer systems, and the state data systems. Communications with the KDE will be through SNA. All processing components will have the ability to participate on the SNA network. Transition from hierarchical to peer-to-peer network communications will be managed using SNA, LU6.2. District level, peer-to-peer communications will be ethernet technology. Communications from school district office in the same educational district will be over T1 data lines and fiber-optic technologies, and communications between buildings located in the same geographic area will be over twisted pair wiring.

Maine

The Community College of Maine

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The Community College of Maine is the name of Maine's statewide distance learning network which uses fiber-optic cable, point-to-point microwave, ITFS and telephone lines to allow distance learners to participate in regular campus-based courses. The state's goal is to improve educational opportunities in the state and to reach older, part-time, and commuter students. In effect, telecommunications will create the community college system for

the state. The plan calls for classes to be transmitted from electronic classrooms at seven university campuses to the university's off-campus centers, high schools, technical college campuses, and other locations statewide. Five hours of programming per day are devoted to high school students. All high schools are to be connected when the system is completed in 1993. The network is also available to government agencies and businesses for education and training purposes and for teleconferencing.

Seven campuses of the University of Maine system are currently connected by fiber optics. The technical colleges, Maine Maritime Academy, and 12 off-campus university centers currently receive ITFS programming and will eventually be connected to the fiber-optic backbone.

The technical specifications call for a fiber-optic spine linking the campuses, each of which will serve as a transmission site. Several off-campus centers will also have transmission capability when the system is complete. The fiber-optic spine will carry three channels of full duplex (two-way) video, audio, and data, with audio return. The University of Maine at Augusta will serve as both the hub of the terrestrial system and the site for satellite linkages. Dishes at all high schools, state and local government buildings, hospitals, businesses, and cable television systems will make live programming available to users across the state. Course materials and data can be distributed electronically between sites.

Minnesota

STARS

Statewide Telecommunications Access and Routing System

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The State of Minnesota has committed itself to STARS. During its 1989 session, the Minnesota Legislature gave its approval to develop a statewide broadband telecommunications transmission facility for voice, data, and video that will serve a large number of government agencies, educational institutions, etc. STARS will provide the opportunity to access existing local and regional networks through one common statewide facility.

STARS is in the conceptual stage of its development. As it is planned. Stars will lease facilities from telecommunications companies who will own and operate the system. It will be publicly managed. Private providers will engineer, build, and maintain STARS.

Several local and regional networks exist throughout the State of Minnesota. State agencies, the University of Minnesota Systems, the State University System, local school districts, the courts, the Community College System, libraries, Minnesota Technical

Colleges, and others, have custom-designed networking systems that are generally unable to communicate with each other. STARS seeks to increase the telecommunications capabilities of these offices, as well as provide the opportunity for them to interact.

New Hampshire

EDLINK

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603/432-6779

The Governor's Initiatives for Excellence in Education for the State of New Hampshire has funded a project to establish a statewide network for educators. Apple Computer, Inc., has agreed to help with network development. Funding has been approved for the project to operate into the 1991-1992 school year. EDLINK is being designed as a flexible information and communication utility that can adapt to operated as a LAN to serve individual unit needs, serve as a network for educators and administrators, and act as a resource link for teachers. Student participation is allowed only through special application. It is hoped that every school district in the state will participate.

The network will operate on AppleLink. Software needed to access the network will be provided free for the project. All standard AppleLink features, such as e-mail, file transfer, existing bulletin boards, and searchable databases will be available. EDLINK member will also have access to a special New Hampshire Educator's bulletin board that will contain folders of information of particular interest to special groups of the state's educators.

Oregon

Ed-Net

Integrated Statewide Telecommunications Network

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503/378-3921

The Ed-Net Committee, under the auspices of Governor Neil Goldschmidt, submitted a bill to the Oregon Legislature in May 1989 to establish a statewide telecommunications network with an estimated $8 million start-up cost. The Ed-Net design uses an existing telecommunications structure and adds satellite transmission of full-broadcast video, compressed video, and high-speed data. The Oregon Public Broadcasting (OPB) System has an extensive microwave network; thus, all sites can receive signals using existing antennas and hardware without interfering with OPB operations.

Ed-Net's technical capabilities have been divided into three networks. Networks I and II involve video transmission. Network III will transmit data only and will allow access to state offices, library information, e-mail, computer conferencing, electronic bulletin boards, databases, and libraries of software.

This model has succeeded in course delivery and professional development and has helped solve the lack of class offerings in the K-12 domain due to a rural teacher shortage.

Texas

SchooLINC

School Interactive Network Consortium

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Texas Association of School Boards
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512/467-0222

SchooLINC is a proposed research project to bring high technology into public schools using a very high bandwidth fiber-optic network to link schools in Dallas, Waco, Austin, and San Antonio, Texas. A telecommunications and technology infrastructure will link public schools, government, high-tech businesses, nonprofit corporations, and higher education with a multitechnology, multipurpose network. Classrooms will have the latest instructional technology options, including digital, two-way, full-motion, multipoint-interactive-video, satellite programming, interactive videodisc, state-of-the-art computer workstations, and additional course-specific hardware and software.

The initial model involves an existing, wide-bandwidth fiber-optics network extending from Dallas, Texas, through Waco and San Antonio, with a planned link to Laredo, Texas. SchooLINC plans to expand this fiber network, link microwave and satellite into the network, bring a variety of new technologies into the public classroom, and determine ways in which to link the instructor with a world of instructional possibilities. The research project will address issues such as, "Can you teach a teacher to teach in an environment such as this?"

Project Bluebonnet, a consortium of businesses, corporations, and nonprofit groups, including higher education, has contributed to the organization, funding, and management of the research and development for this project. The goal of this group is to contribute to the economic independence and competitiveness of Texas through the appropriate use of advanced technologies. SchooLINC is the first endeavor of this consortium.

Public Access Networks and Databases

Educational Networks and Databases

Accu-Data

619 W. College Avenue
State College, PA 16801

814/238-0907
Contact: James Levin

This database service of Accu-Weather includes information on surface observations, upper-air data, National Weather Service hourly reports, forecasts, severe weather bulletins, and other geophysical and oceanographic products, Instructional materials are available.

AgEd Network and AgriData Network

AgriData Resources, Inc.
330 E. Kilbourn
Milwaukee, WI 53202
800/558-9044
Contact: Margie Dickmann

AgEd Network is an on-line informational database for agriculture and related departments in secondary and other educational institutions. It contains instructional units and teaching units to help coordinate curriculum lessons. It provides current news, prices, and weather information. AgriData Network provides thousands of agricultural reports, including price quotes from the wheat and corn grower's associations.

BITNET

EDUCOM
1112 Sixteenth St., NW
Washington, DC 20036
202/872-4200
Contact: Mike Hrybyk

BITNET links universities, colleges, and research centers in the U.S. Members are connected in a single logical network, including over 1300 sites in 35 countries, for the exchange of noncommercial information. Gateways allow the exchange of e-mail between BITNET, Internet, CSNET, and USENET. It is directly linked to several networks outside the U.S., including EUnet, the European Network with at least one backbone site in 19 countries; Gulfnet, the Middle East segment connecting ten academic and research institutions in Kuwait and Saudi Arabia; and JANET, the Joint Academic Network, connecting all British universities and research organizations, and the British, Scottish, and Welsh National Libraries.

Classmate

Dialog Information Services
3460 Hillview Avenue
Palo Alto, CA 94304
800/334-2564
Contact: Ann Caputo

This includes over 80 general interest full-text databases of journal, magazine, and newspaper articles in a variety of fields, including general science, social studies, and the humanities. Middle school and high school teachers use this service to teach their students about on-line searching. The Classmate

Instruction Program (CIP) offers the same services to college and graduate school students and educators. There is no subscription fee or monthly fee.

EdNET

Unison Telecommunications Service
700 West Pete Rose Way
Cincinnati, OH 45203
800/334-6122
Contact: Patricia Niehoff

EdNET is the Education Network on the UNISON network. In addition to the computer conferencing and e-mail features offered all UNISON subscribers, EdNET offers the tools for schools to build their own private electronic information and conferencing networks. Other services offered include financial, travel, and entertainment databases. A Mail System allows users to exchange e-mail with more than 25 on-line systems. An annual subscription fee, plus hourly access rates, is charged.

EIES - Electronic Information Exchange System

New Jersey Institute of Technology
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Newark, NJ 07802
201/596-3574
Contact: Howard Kimmel

EIES (Electronic Information Exchange System) is an electronic resource-sharing network that features e-mail, conferencing notebooks, and tailored communications structured to meet user's needs. Linkages are achieved through microcomputers and phone lines. Begun in 1976, it is one of the oldest conferencing systems in the world. It was developed by the New Jersey Institute of Technology and Fairleigh Dickinson University as one component of an in-service educational model for science teachers designed to increase opportunities for teacher interaction and resource availability, improve teaching skills and qualifications, and improve the science curriculum. Today, the EIES system is used by educational institutions in other states, including Hawaii. Science students use the system to communicate with university faculty or students at other schools.

European Academic Research Network (EARN)

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This network is the European segment of the BITNET Network and links over 400 educational and research institutions in 18 countries. Cyprus, Egypt, India, Morocco, Tunisia, and Yugoslavia are expected to connect to EARN in the near future.

FrEdMail

FrEdMail Foundation
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619/475-4852
Contact: Al Rogers

The FrEdMAil (Free Educational Mail) network is a product of the nonprofit consortium, the FrEdMail Foundation. The FrEdMail network is an informal grassroots telecommunications network to help students and teachers exchange information. It consists of a collection of cooperating bulletin boards operated at universities, district educational offices, in individual schools, school offices, and classrooms, and in teachers' homes at 120 sites throughout the U.S. FrEdMail projects range from simple pen-pal projects to problem solving and includes several system-wide conferences. One, IDEAS, provides technical support, locates resources, and allows teachers to suggest project ideas. The second, KIDWIRE, posts student's work. A third, called BRIDGES, will allow disabled students to work with nondisabled students.

A new board, called ORILLAS, features a multilingual educational technology project/bulletin board dealing with language and culture. Partnerships are formed between elementary and secondary teachers in bilingual education and foreign languages, university professors and international students, and educators interested in cross-cultural learning.

FrEdMail's growth over the past year has been spectacular. Several new projects and boards are expected to begin in September 1990.

GTE Education Network

GTE Education Services, Inc.
8505 Freeport Parkway
Irving, TX 75063
800/634-5644
Contact: Customer Service

The single largest provider of on-line informational services to American education, this system is used by more than one-third of the schools in America. Included on this system are the General Education Network (previously known as ED-LINE), which provides information on educational issues, management, statistics, research, federal legislation, etc., through many databases; SpecialNet, designed by and for educators in the field of special education; Local Exchange, links government officials with local administrators and contains e-mail facilities,bulletin boards, databases, and more; Electric Pages provides the software and support to help national, regional, and local organizations run their own networks; News Access, supplies in-depth current events resources from CNN; SchooLINK, an annual, school-year-based project specializes in the science and social studies curricula and is run on SpecialNet; and Sci-Tech which runs on SchooLINK, provides current climate, geography, health, and medicine, biology, ecology, and astronomy information to grades six through ten.

Iris

Metasystems Design Group (MDG), Inc.
Suite 103
2000 North 15th Street
Arlington, VA 22201
800/451-6549
Contact: Frank Burns

A network for teachers and schools, it is comprised of several centers: Welcome Center contains news, bulletins, and directions; Technology Center is for technical help about computer hardware and software; Teacher Center has on-line discussions, messages, and information sharing from colleagues; and Student Center provides student projects to be conducted on line and concurrently in classrooms nationwide.

Kidsnet

6856 Eastern Avenue, NW
Washington, DC 20012
202/291-1400
Contact: Karen Jaffee

Kidsnet is a small, nonprofit group that serves as a clearinghouse of information geared at children through the media. It maintains an off-line informational database on children's programs that are broadcast over cable, television, instructional television, etc. Schools, libraries, hospitals, etc., use this service.

Learning Initiatives International

Box 752
Georgia State University

Atlanta, GA 30303-3083
800/233-9233
Contact: Frances Atkinson

The Learning Initiatives International is an IBM-users group dedicated to improving education in pre-K through 12, adult/adolescent literacy, basic skills, and noncollegiate business/vocational learning environments. Access to the Learning Initiatives Electronic conferencing network is achieved using PSInet. Membership and subscribers fees apply.

Learning Link (National)

356 West 58th St.
New York, NY 10019
212/560-6674
Contact: Bob Spielvogel

Operating from individual PBS Stations and State Departments of Education, the Learning Link National Consortium provides databases, information resources, in-service teacher training, e-mail, and gateways to educational databases. It is targeted at educators who use TV, video, PC's, videodisc, and on-line databases as instructional tools. This system is in use in Idaho, Maryland, and the metropolitan New York area, among others.

There is also a Learning Link (Local) for the New York City area. The contact person is Ellen Chass at 212/560-6613.

NASA Spacelink

Mail Code CA20
Public Affairs Department
George C. Marshall Space Flight Center
Huntsville, AL 35812
205/544-0038
Contact: Jeff Ehmen

This database offer easy access to current and historical information on NASA aeronautical and space research. Classroom activities incorporate information in NASA projects to teach a number of scientific principles. All data and news are updated daily. Access is free.

NSFNet

MERIT
National Science Foundation
1075 Beal Avenue
NDSB Bldg.
Ann Arbor, MI 48109-2112
800/666-3748
Contact: Ken Horning

The National Science Foundation Network is a general purpose internet providing access to scientific computing resources data and information. It was initially organized and is partially funded by the National Sciences Foundation. Based on a backbone connecting supercomputer centers, NSFNet combined existing networks into an internet. NSFNet serves as the national U.S. research network by allowing access to NSF-funded computers and other scientific resources. NSFNet is managed by Merit, Inc., a

consortium of eight Michigan universities in partnership with the State of Michigan, IBM, and MCI. Merit re-engineered and now manages the backbone, along with the project's partners through its strategic fund.

OERI Toll-Free Bulletin Board System

Office of Educational Research and Improvement
U.S. Department of Education
Information Technology Branch
555 New Jersey Ave., NW
Washington, DC 20208-5725
202/357-6256
Contact: Joyce Benton

The United States Department of Education maintains this toll-free bulletin board featuring e-mail and conferencing for administrators, teachers, and others involved in education. Conference areas have been established by topic area, such as math, reading, and international exchange. Educators can also download files of interest. The Department of Education maintains three other boards run on Compuserve, GTE, or Alanet (American Library Association Network).

OASIS (On-Line Academic Software Information System)

Educational Computing Network
Governor State University
University Park, IL 60466
708/534-0209
Contact: Adalma Stevens

OASIS is an on-line catalog of current academic software packages for higher education. This is sponsored by the Illinois Educational Consortium and access is free.

PSI-NET

Center for Teacher Education
Drake University
Des Moines, IA 50311
515/271-3912
Contact: Jack Gerlovich

PSI-NET (People Sharing Information Network) is a telecommunications network for science educators built and available through IBM. It is organized by subject area into conferences. One application of the PSI-NET system is a network started by the Council of State Science Supervisors called CSSS network. CSSS network operates out of Ames, Iowa, and links all 50 states. Six intrastate networks link with the hub in Ames, including California, North Carolina, Florida, Montana, Minnesota, and Iowa

UNIBASE

3002 Harding Street
Regina, Saskatchewan
Canada
S4P 0Y4
306/729-9007
Contact: Leigh Calnek

UNIBASE is a dial-in system in Saskatchewan, Canada, that supports K-12 educational experiences. It provides teacher resource materials in health, special education, and science, databases of software and hardware abstracts, and current years of ERIC CIJE, and more. UNIBASE also serves as a hub for a distributed full-text document database. The articles are loaded into the "Electronic Library" and classified according to the Dewey Decimal System. Abstracts or full-text articles are available to browse or download. Access to Unibase!Library is open to anyone. UNIBASE also supports a full-conferencing system, including those that originate at other networks. The UNIBASE Distributed Course Management System, to support courses in rural areas, will be introduced in Fall 1990.

USA Today/Apple College Network

USA Today
Educational Services
1000 Wilson Blvd.
Arlington, VA 22229
703/276-5894
Contact: Matt Hickey

Through this network, schools retrieve high-quality news, information, and graphics in use by the Gannett newspapers by downloading the articles from a Macintosh bulletin board. Nearly 200 colleges and junior colleges subscribe to the network. Interns at USA Today scan the news services for articles and graphics they think might interest subscribers, and post these to the bulletin board.

Public Networks and Databases

BIX

One Phoenix Mill Lane
Petersborough, NH 03458
800/227-2983
Contact: Steven Laliberte

The Byte Information Exchange is an on-line computer conferencing system that offers conferences, vendor-support, access to experts, current updates on the computer industry, databases for products and systems, and public domain software. It is run in conjunction with BYTE Magazine and charges an annual or quarterly fee.

Cleveland Free-Net System

Case Western Reserve
319 Wickenden
Cleveland, OH 44106
216/368-5121
Contact: Tom Grundner

The Cleveland Free-Net System is available to Cleveland residents or users who have access to the Internet. It is maintained by Case Western University. It provides information on most aspects of community life, including government, administration, schools, medical issues, libraries, and recreation. It is an easy-to-use, menu-driven system. For example, school information and related projects can be found under a menu option entitled, "Schoolhouse."

Compuserve

5000 Arlington Center Blvd.
P.O. Box 20212
Columbus, OH 43220
800/848-8199
Contact: Vicky Young

This service provides comprehensive and varied information, such as on-line databases dealing with news, financial services, travel reservations, and forums and conferences dealing with computer and telecommunications software. Educational forums are established for a variety of educational fields, including science, math, space, astronomy, and computing. Compuserve provides access to IQuest, one of the largest databases in the world. IQuest is an information retrieval system that provides access to 800 databases, including DIALOG, ORBIT, and Grolier's Academic American Encyclopedia.

DELPHI

Three Blackstone Street
Cambridge, MA 02139
800/544-4005
Contact: Kevin Plankey

This is a multi-interest computer information service that provides e-mail, encyclopedia, news, games, travel information, etc., to its members worldwide. Users are charge a sign-up fee and hourly connect charges.

DIALOG

Dialog Information Services, Inc.
3460 Hillview Avenue
Palo Alto, CA 94304
800/334-2564
Contact: Ann Caputo

DIALOG, with over 370 databases, bills itself as the world's largest on-line "knowledgebank." Some of its features include: DIALINDEX, a master index of all databases; OneSearch, enables concurrent searching of up to 20 files; First Release, provides up-to-the-minute news; and DIALORDERS, with which full-text abstracts may be ordered online. DIALOG also offers a low-cost, after-hours, alternative called Knowledge Index which provides access to some of DIALOG's more popular database.

Dow Jones News/Retrieval

Box 300
Princeton, NJ 08540
609/452-1511
Contact: Cathy Boyle

This news retrieval service allows access to business and

financial information from over 50 databases, including general news, weather, and an on-line encyclopedia.

Federalist Bulletin Board System

Political Science Dept.
Oklahoma State University
Stillwater, OK 74078
405/744-5569

The Oklahoma State University's Political Science Department, with support from the Commission on the Bicentennial of the U.S., has set up a free 24-hour bulletin board for educators and students interested in the U.S. Constitution and the Federalist Papers. Essays and classroom materials devoted to constitutional issues are available for downloading. Registered users can leave messages for political science faculty and other users.

GEnie

401 N. Washington St.
Rockville, MD 20850
800/638-9636
Contact: Client Services

The GEnie (GE Network for Information Exchange) network provides hundreds of services, including conferencing, special interest groups, education round tables for the education community, and information retrieval in the finance, news, travel, shopping, reference, and entertainment areas. Computer-Assisted Learning Center (CALC) provides homework and tutoring, continuing education, self-enrichment, and college-level courses for credit. Students may study toward associate or bachelor degrees, offered by Edison State College in New Jersey. Other CALC services include downloadable software, libraries, quizzes, a student union "chat," and academic and career counseling.

Legi-Slate

111 Massachusetts Avenue, NW
Washington, DC 20001
800/877-6999
Contact: Ann Harris

Legi-Slate is The Washington Post Company's on-line service covering Congress and the Federal Register. It provides detailed information about current and past legislation in the U.S. Congress. Verbatim transcripts are available online, including selected committee hearings from both the House and the Senate, news briefings from the White House the Pentagon, and the State, Commerce, Justice, Treasury, and Energy Departments. Speeches, press conferences, and interviews from the President, cabinet secretaries, and other administration officials are also available online, as are transcripts from television news and interview programs, including "Face the Nation," "Meet the Press," CNN's major news interviews, "This Week with David Brinkley," "Good Morning America," "Morning News," "Today," and "Worldnet." It offers a Voting Analysis Service, searchable by subject, date, bill number, and committee, and a Congressional Service that provides a subject index and the full text of all versions of every bill since 1979. Today's and yesterday's Federal Registers are also available online in full text.

Maxwell Online, Inc.

Suite 400
8000 Westpark Drive
McLean, VA 22102
800/456-7248
Contact: Mary Ann Nash

This database service is comprised of several separate operations: ORBIT Search, which contains more than 100 databases of chemistry, energy, and earth science, health, safety, and the environment, engineering and electronics information; BRS Information Technologies has four product lines: BRS/Search Service contains more than 150 databases, concentrating primarily on the medical field, biomedical research, social sciences, business, and engineering; BRS Colleague, designed specifically for physicians and researchers, contains over 40 databases related to the health care industry; BRS/After Dark provides reduced rates for a limited database access during off hours; BRS

Search is a full-text retrieval software package; and Pergaman Search Center, which focuses on patents and trademarks. An Educator Line is geared to educators in K-12 to do their own searches for research or classroom instruction.

NewsNet

945 Haverford Road
Bryn Mawr, PA 19010
800/345-1301
Contact: Customer Service

This full-text database contains business information including over 300 industry newsletters and wire services.

PeaceNet-EcoNet-HomeoNet-ConflictNet

IGC Networks
Institute for Global Communications
3228 Sacramento Street
San Francisco, CA 94115
415/923-0900
Contact: Geoff Sears

These four networks represent the U.S. portion of the APC Network (Association for Progressive Communications), which consists of seven members worldwide, all of whom cooperate to provide services internationally. The bulletin-board style networks provide vehicles for world discussions on peace, the environment, homeopathic medicine, and conflict resolution. Users have access to e-mail, conferences, and a user directory.

VENDOR-SPECIFIC COMMERCIAL NETWORKS

America Online

8619 Westwood Center Drive
Vienna, VA 22180
800/545-5047
Contact: Danette Carroll

Previously known as Applelink Personal Edition, this on-line service provides e-mail, bulletin boards, conferences, a reference library, an encyclopedia, and guest speakers about products and home use to the Apple user community.

ISAAC (Information System for Advanced Academic Computing)

Mailstop FC-06
University of Washington
Seattle, WA 98195
206/543-5604
Contact: Tracy Maury

ISAAC is funded by IBM and is run out of the University of Washington in Seattle. It provides two services. A series of databases provide IBM-specific information on hardware and software to higher education institutions. A second service is to the conferencing/forum facility provided for educators to hold IBM-related discussions.

EDUCATIONAL NETWORKING PROJECTS

Apple Global Educational Network

AGE Product
Apple Computer Inc.
20525 Mariani Avenue
Cupertino, CA 95014
408/974-2872
Contact: Martin Engel

Apple Global Education (AGE) Network is a project being developed by Apple Computer Research to connect the students of the world using Applelink. It supports e-mail, file transfer, libraries, and bulletin boards. AGE projects will address social issues, pollution issues, demographics, recipes, and mathematical problem solving. AGE will provide the platform for various learning resources. It will include, for example, ecology databases, polar explorer's daily logs, and Greenpeace agendas.

AT&T Learning Network

AT&T P.O. Box 4012
Bridgewater, NJ 08807-4012
800/367-7225
Contact: Robert Brand

The AT&T Learning Network joins students who share common interests from the U.S., Canada, Australia, France, West Germany, the Netherlands, and Japan into learning circles. Students in elementary through high school classes join learning circles such as Computer Chronicles, Global Issues, Energy Works, Society Problems, Mind Works, and Places and Perspectives. AT&T provides the support, direction, and timeline for the learning circle curriculum. As of Spring 1990, there were 32 learning circles operating. The AT&T Learning Network was previously know as the Long Distance Learning Network, and prior to that, the InterCultural Learning Network.

BreadNet

Suite 600
1250 24th St., NW
Washington, DC 20037
202/466-0533
Contact: Bill Wright

Organized in 1984 by the Bread Loaf School of English at Middlebury College, this network links teachers and students in isolated areas for educational projects. During the summer months, the BreadNet Staff operates out of the Bread Loaf School of English, Rural Station, Middlebury, VT 05753, 802/388-7945.

Campus 2000

British Telecom
London, England
Contact: Gordon Jones

British Telecom provides the local connection for schools to participate in e-mail, conferencing, and database searches through special learning activities. Costs are incurred for log-on time, which must occur during school hours.

Computer Pals Across the World

Box 1206
Lake Oswego, OR 97035
503/691-1689
Contact: Emily Valdez

Started in 1984, this project connects students around the world in one of the largest pen-pal activities. Basically, it is an international writing program where classes from different schools are matched, based on age and special interests. Computer Pal's main goals are to improve written communication skills, provide an opportunity for cultural exchange, motivate less-interested students, and familiarize students with the use of international telecommunications. Participants include students in grades 3 through 12, plus college students. This network will be down through the summer months and will be up and running by late August 1990.

Educational Native American Network (ENAN)

Center for Technology and Education
Student Services Center
B88
University of New Mexico
Albuquerque, NM 87131
505/277-9441
Contact: Jack Gittinger

A project of the Bureau of Indian Affairs, the University of New Mexico, and Tandy, ENAN was originally targeted for Native American Schools. With approval, others may access this network for discussions and information, to converse with Native American children (Zuni, Navajo, etc), and for university courses offered by the University of New Mexico.

KIDSNET

Department of Physics and Astronomy
University of Pittsburgh
Pittsburgh. PA 15260
412/624-9027
Contact: Robert D. Carlitz

The KIDSNET Mailing List has been operating since May 8, 1989. Its goal is to create an international network for children and their teachers. It is open to anyone interested in education and networking topics. The mailing list includes a few hundred sites, from which information is redistributed to other sites. Members include students, teachers, school administrators, educators, scientists and sociologists from universities, programmers, hardware designers and network architects from industry, funding agencies, children, and parents.

The National Geographic Kids Network

National Geographic Society
Educational Media Division
17th and M Streets, NW
Washington, DC 20036
800/342-4660
Contact: Elizabeth Hossli

Funded by the National Science Foundation, the National Geographic Society, and the Technical Education Research Centers, Inc., The National Geographic Kids Network provides a set of prescribed materials and activities designed for classroom use. Students in the U.S. Canada, and Japan share data and scientific research, pose questions, and communicate with research scientists.

NYCENet

34-65 192nd Street
Flushing, NY 11358
718/461-8756
Contact: Fred Goldberg

Bulletin boards, databases, curriculum guides, and computer conferencing are supplied by the New York City Educational Network, which is run by the New York City Board of Education. The network also supports class projects in the New York City schools.

OASIS (Overseas American Schools Information Services)

International Telecomputing Consortium
Suite 600
1250 24th Street, NW
Washington, DC 20037
202/466-0533
Contact: Bill Wright

The International Telecomputing Consortium (ITC) is a nonprofit group whose goal is to support the electronic networking needs of rural and overseas teachers. ITC has plans to implement a network called OASIS to meet this need. It is investigating low-cost methods of linking international sites, including distributed conferencing and packet radio.

Science by Mail

Museum of Science
Science Park, MA
800/729-3300
Contact: Stephen Brandt

This pen-pal project brings together scientists and thousands of 4th through 9th grade children. Three science challenges are presented to the children each year, and they return their results in various forms (reports, video, audio-tapes, and drawings). Science by Modem and Science by Fax are proposed for the future.

TERC Star Schools Project

1696 Massachusetts Avenue
Cambridge, MA 02183
617/547-0430
Contact: Cecilia Lenk

Science and math classes in grades 7 through 12 use telecommunications to undertake large, cooperative investigations/projects. Results are shared among students, professors, and scientist nationwide. Currently, 1800 students and 600 teachers participate on the network. TERC develops the curricula and assists with implementation through resource centers around the country that teach and train teachers on curriculum usage. Classes select a module and participate in a four-week project. Funding is provided through the U.S. Department of Education Star Schools program.

APPENDIX B - CONTACT PERSONS

ALASKA

UACN

University of Alaska Computer Network

Tom Healy
Director of Computing Center
UACN
303 Tanana Drive
Fairbanks, AK 99775-5180
907/474-6280

ARIZONA

EdLink

Department of Education Network
John Cikelo
1900 West Thomas Avenue
Phoenix, AZ 85015
602/255-5061

Arizona Statewide Telecommunications Network

Kathryn Kilroy
Arizona Department of Education
1535 West Jefferson Street

Phoenix, AZ 85007
602/542-5040

COLORADO

UNC Telecommunications System

Lynn Thompson
WIDE
425 McKee Hall
University of Northern Colorado
Greeley, CO 80639303/351/2217

CONNECTICUT

Statenet

Daniel Colarusso
Executive Director
Office of Informations and Technology
Office of Policy and Management
State of Connecticut
80 Washington Street
Hartford, CT 06106
203/566-4310

SNET Links to Learning

Tom Buckley
SNET
227 Church Street
New Haven, CT 06506
203/771-3115

DELAWARE

Statewide Telecommunications Network

Thomas F. Brennan
Director of Computing Services
Department of Public Instruction
Townsend Building
P.O. Box 1402
Dover, DE 19903
302/736-3721

FLORIDA

FIRN

Florida Information Resource Network

Bill Schmid
Director of FIRN
Florida Educational Center
Tallahassee, FL 32399
904/487-0911

GEORGIA

GC EduNET

Georgia College Educator's Network

Frank Lowney
System Administrator
Georgia College Educator's Network
School of Education
Georgia College
Milledgeville, GA 31061
912/453-4546

GEIS

Georgia Educational Information System

Les Butler
Assistant State Superintendent for Technology Services
Georgia Department of Education
1554 East Tower
Atlanta, GA 30334
404/656-2435

University of Georgia, College of Education Bulletin Board

James Aberson
232 Aderhold Hall
University of Georgia
Athens, GA 30602
404/542-8824

HAWAII

ChemNet

John Southworth
University of Hawaii Lab School
Curriculum R and D Group
College of Education
University of Hawaii
Honolulu, HI 96822
808/948-6871

TELEclass

The Hawaii Global TELEclass Project

John Wollstein
TELEclass International
1103 9th Avenue
Honolulu, HI 96816
808/733-2007

IDAHO

First Year Teacher Project

Holly Anderson
College of Education
Boise State University
1910 University Drive
Boise, ID 83725
208/385-3683

ILLINOIS

Distance Learning Network

Steve Crady
Director
Distance Learning Network
Illinois Central College
One College Drive
East Peoria, IL 61635
309/694-5231

Electronic Educational Service Centers

Richard DeHart
Assessment Consultant
Student Assessment Section
Illinois State Board of Education
100 North First Street
Springfield, IL 62777-0001
217/782-4823

INDIANA

ESD

Electronic School District

Michael Halla
University Computing Services
1000 East 17th Street
Bloomington, IN 47405
812/855-2222

IDEAnet

Mike Huffman
Director
Educational Information System
State House
Indianapolis, IN 46204-2798
317/232-0808

Intelenet

Mark Commons
Executive Director
INTELENET Commissions
17 West Market St.
Indianapolis, IN 46204-2929
317/685-8990

IOWA

Interactive Computer Conferencing and Electronic Distribution System

William P. Callahan
Associate Dean
College of Education
University of Northern Iowa
Cedar Falls, IA 50614
319/273-2719

ICN - Iowa Communications Netork

Tony Crandall

Project Manager
Hoover Building
General Services
Des Moines, IA 50319
515/281-3336

Kirkwood Community College Network

Orville Thein
Director
Telecommunications Services
Kirkwood Community College
6201 Kirkwood Blvd., SW
Cedar Falls, IA 52406
319/398-5663

KANSAS

UNITE

Unified Network for Information in Teacher Education

Ronald Aust
Instructional Technology Center
Bailey Annex
University of Kansas
Lawrence, KS 66045
913/864-3057

KENTUCKY

KENS

Kentucky Educational Networking System

H.M. Snodgrass
Associate Superintendent for Research and Planning
Capitol Plaza Tower
Frankfort, KY 40601
501/564-6900

MAINE

ME-LINK

Cathy Glaude
Maine Computer Consortium
P.O. Box 620
Auburn, ME 04212
207/783-0833

The Community College of Maine

Pamela S. MacBrayne
Executive Director of Distance Education
University of Maine at Augusta
Augusta, ME 04330
207/622-7131

MARYLAND

METNET

Patricia Mullinex
Maryland Instructional Technologies
11767 Bonita Avenue
Owings Mills, MD 21117
301/581-4350

MASSACHUSETTS

The Beginning Teacher Computer Network

Diane Beals
Harvard University
Graduate School of Education
224 Longfellow Hall
Appian Way
Cambridge, MA 02138617/495-3498

SCHOLE

Boston University School of Education

Gerald S. Fain
Director
Boston University
School of Education
Schole Office
605 Commonwealth Avenue
Boston, MA 02215
617/353-3295

MINNESOTA

STARS

Statewide Telecommunications Access and Routing System

Bob Fischer
STARS Division Director
State of Minnesota
Department of Administration
InterTechnologies Group
500 Centennial Office Building
658 Cedar Street
St. Paul, MN 55155
612/296-6428

MONTANA

Big Sky Telegraph

Frank Odasz
Big Sky Telegraph
Western Montana College
Dillon, Montana 59725
406/683-7338

NEBRASKA

Statewide Network

Wayne Fisher
Technical Coordinator
NDE Technology Center
301 Centennial Mall South
Lincoln, NE 68509-4987
402/471-2918

NEW HAMPSHIRE

EDLINK

Larry Vaughn
Executive Director
Governor's Initiative Office
36 South Road
Londonderry, NH 03053
603/432-6779

NEW JERSEY

ETN-Education Technology Network

Theodore Smorodin
Educational Technology Specialist
New Jersey State Department of Education
225 West State Street
Trenton, NJ 08625-0500
609/984-1905

NEW MEXICO

TECHNET

Art St. George
2701 Campus Blvd., NE
Albuquerque, NM 87131
505/277-8046

NEW YORK

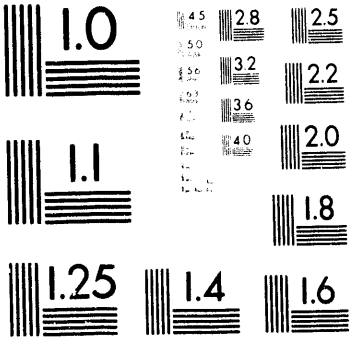
Teacher Resource Centers' Electronic Network

Helen Hartle
Office of Staff Development
New York State Education Department
Room 9D 58 CEC
Empire State Plaza
Albany, NY 12230
518/473-1234

TNT

Technology Network Ties

Michael S. Radlick
Director
New York State Education Department
Office of Elementary and Secondary Educational Planning
Testing and Technology Services
Room 867
Albany, NY 12234
518/473-9106


1.0
1.1
1.25
1.4
1.6
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2.0
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2.8
3.2
3.6
4.0
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5.6

4 of 4

NORTH CAROLINA

WCU MicroNet

Western Carolina University MicroNet

Lewis Sutton
WCU MicroNet
NS 316
Western Carolina University
Cullowhee, NC 28723
704/227-7633

NORTH DAKOTA

ND HECN

North Dakota Higher Education Computer Network

Dale Vetter
Director of Computing Center
University of North Dakota
P.O. Box 8218
Grand Forks, ND 58202
701/777-3789

OHIO

Ohio Education Computer Network

Jim Daubenmire
Assistant Director
Ohio Department of Education
Division of Computer Services
180 E. Engler Street
Columbus, OH 43266-0552
614/466-7000

OREGON

Ed-Net

Integrated Statewide Telecommunications Network

Dave Tilden
Office of Educational Policy and Planning
225 Winter Street, NE
Salem, OR 97310
503/378-3921

PENNSYLVANIA

PENN*LINK

Department of Education Computer Network

Ann Winter
Pennsylvania Department of Education
333 Market Street
Harrisburg, PA 17126-0333
717/787-2644

SOUTH CAROLINA

CUFAN-Clemson's Forestry and Agriculture Network

Jerry R. Lambert
McAdams Hall
Clemson University
Clemson, SC 29634
803/656-4063

TEXAS

SchooLINC

School Interactive Network Consortium

Linda Lloyd
Texas Association of School Boards
P.O. Box 2947
Austin, TX 78768
512/467-0222

TEA-NET

Texas Education Agency Network

Connie Stout
Division of Educational Technology
Texas Education Agency
1701 North Congress Avenue
Austin, TX 78701
512/463-9087

VIRGINIA

Teacher LINK

Judi Harris
Curry School of Education
University of Virginia
405 Emmet Street
Charlottesville, VA 22903
804/924-7471

VT-HSNet

Virginia Tech K-12 Computer Network Project

Phillip Bowden
Communications Resources
Virginia Tech
Blacksburg, VA 24061703/231-6460

WEST VIRGINIA

WV Administrative Network

John McClure
State Computer Network Coordinator
West Virginia Department of Education
Capitol Complex

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WVMEN

West Virginia Microcomputer Educational Network

Brenda Williams
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APPENDIX C - MAJOR REFERENCES

Our research into current information about telecommunications networks uncovered over 150 journal articles, books, and other publications. Several of these references are exceptional in terms of their comprehensive and current informational about networks and/or education and are recommended for further reading.

!%@::A Directory of Electronic Mail

Frey, Donnalyn and Rick Adams, August 1989

Published by O'Reilly & Associates, Inc.
632 Petaluma Avenue, Sebastopol, CA 95472.

This handbook of e-mail addressing and networks contains descriptions of 103 major e-mail networks worldwide. Addressing, architecture, future plans, and a geographic map are included with each network description. An introduction to e-mail is also included.

The Electronic School: Innovative Uses of Technology in Education

Sponsored by the National School Boards Association's Institute for the Transfer of Technology to Education, September 1989.

This publication is a series of articles that discusses distance learning via satellite, computer networks, and interactive video, and describes the implementation of this technology in schools.

Linking for Learning

U.S. Congress, Office of Technology Assessment, OTA-SET-430, Washington, DC: U.S. Government Printing Office, November 1989.

This resource documents distance education activities in today's classrooms. State-by-state profiles and federal and state involvement in distance education are included.

The Matrix, Computer Networks and Conferencing Systems Worldwide
Quarterman, John S. 1990.

Digital Press, 12 Crosby Drive, Bedford, MA 01730

An introduction and reference to worldwide data communications networks, this book is a comprehensive resource of international, national, regional, academic, and corporate networks and includes sections which discuss networks, layer, and management protocols.

Power On! New Tools for Teaching and Learning

U.S. Congress, Office of Technology Assessment, OTA-SET-379, Washington, DC: U.S. Government Printing Office, September 1988.

The report examines developments in the use of computer-based technologies, analyzes key trends in hardware and software development, evaluates the capability of technology to improve learning in many areas, and explores ways to substantially increase student access to technology. The role of the teacher, training needs, and the impact of federal support for educational technology research and development are also reviewed.

Telecommunications in the Classroom

Clark, Chris, Barbara Kurshan, and Sharon Yoder, 1989.

Co-published by Computer Learning Foundation, P.O. Box 60007, Palo Alto, CA 94306-0007, and International Society for Technology in Education (ISTE), University of Oregon, 1787 Agate Street, Eugene, OR 97403.

The bulk of this telecommunications guide for educators is devoted to lesson plans from the Teacher Telecommunications Lesson Plans Contest. A listing of educational computer services, electronic networks and exploratory projects, as well as a history of telecommunications and system terminology, are also included.

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