Information services/databases in the following areas are accessible:
1 Agriculture
2 Arts/Humanities
3 Business/Economics
4 Education
5 Scientific
6 Weather/Time/Earthquakes
7 Other Services

Press RETURN alone to see previous menu
Press Control-C Q<return> to exit at any time

Enter the number of your choice: **3**

The Pennsylvania State Data Center maintains this database of population and economic statistical data which includes, among other things, the Commerce Business Daily. EDIN is accessible through the EBB service of Penn State.

Note the following instructions carefully
Once you are connected:
Type: info <return> at the first prompt
Type: EDIN <return> at the next prompt
Press Control-C Q <return> to exit at any time
Do you want to connect now? (Y or N):

How can you get LIBS?

The LIBS software is available for free via anonymous FTP from the host **sonoma.edu** in the directory *pub* as filename *libs.com*. Remember to use binary mode for the transfer (type **binary** at the FTP prompt before the transfer).

Who created LIBS?

Mark Resmer, Director of Computing and Telecommunications at California State University, Sonoma (**resmer@sonoma.edu**) originally developed this useful program.

LIBS opening screens:

```
LIBS - Internet Access Software v2.0 (beta) Sonoma State
University, Sept 1992 (information omitted)
Copyright (c) 1991-92, Mark Resmer

 On-line services available through the Internet:

1 United States Library Catalogs
2 Library Catalogs in other countries
3 Campus-wide Information Systems
4 Databases and Information Services
5 Wide-area Information Services
6 Information for first time users

Press RETURN alone to see previous menu
Press Control-C Q <return> to exit at any time

Enter the number of your choice:   4
```

```
(ME)    Middle-Eastern Region      (EXIT)    Go Back to the BBS
To return to this screen during search press 'ctrl G'
Where would you like to go? not
```

```
 LUX Welcome to LIBTEL!                LIBERTAS

Libtel is an information resource access system that allows you,
the User, to visit University libraries and information systems
worldwide from the comfort of your own cubicle.  Organized by
geographical location, simply use the menus to travel to the area
you wish to search and then choose your destination library or
information resource.

Unfortunately, due to the occasionally unreliable nature of the
Internet (as well as local systems) some services will be
unavailable from time to time.  Should this occur, simply try again
later.

Should you have any problems with the program, or are aware of
inaccuracies or new services that you think should be added,
simply drop a line to the Libtel operator at:

                    Libtel@lambada.oit.unc.edu

Thank you for using Libtel, and the BBS.
[Please hit Enter to continue]
```

LIBS

What is LIBS?

Like LIBTEL, the LIBS program also operates in conjunction with the St. George OPAC directory but runs only on UNIX and VMS systems. LIBS uses a menu approach to help you select and connect to remote library catalogs and databases. It establishes the Telnet session for you. LIBS presents information on searching the remote service *before* it establishes the connection. Since this information will disappear once the remote system is in control, you may wish to write down the instructions or follow along using a print copy of the St. George directory. We have included a sample of the opening menu of LIBS below.

How can you use LIBS?

To take LIBS for a test drive, Telnet to the host **vax.sonoma.edu** and login as username ***libs***. Since the service is intended for the faculty, students, and staff of Sonoma State University, please only use LIBS on this machine for evaluation purposes. If you like the program, you are encouraged to get a copy of it for yourself.

Sample dialogue with LaUNChpad

Below is a sample interaction with the University of North Carolina system LaUNChpad, which gets you into LIBTEL:

```
Welcome to laUNChpad,
the Internet Service Mediator laUNChpad 2.0 running on
launchpad.unc.edu,
at the University of North Carolina at Chapel Hill
Courtesy of the Office of Information Technology

ABOUT THE NEW LAUNCHPAD:

HELP can be found by typing h, help, or ? at any laUNChpad
menu. More extensive HELP files and documents can be found in
5. Download files section. You may use the simple ACSII dump to
display the files on your screen. This system keeps track of users
by their first and last names.
Your name? Mary Engle
That name isn't familiar.  Would you like to open an account as
'Mary Engle'? yes
What kind of terminal do you use? [vt100] vt100
Slowly adding you to the system mail file.  Please be patient . .

      Main Menu

      1. Network News
      2. Electronic mail
      3. On-line Information Systems (LIBTEL)
      4. Topical document search (WAIS)
      5. Download files
      6. Find user
      7. User Options
(? or h)elp, (q)uit.  ==>  3
```

```
Internet Accessible Libraries and Information Systems

(NA)   North American Region        (MISC)  Miscellaneous Services
(EUR)  European Region              (BBS)   Other Bulletin Boards
(ANZ)  Pacifica Region              (NOT)   Notes on Libtel (Please Read)
(ASA)  Asian Region                 (CTP)   Contemporary Poetry
```

LIBTEL also requires that your UNIX or VMS host machine run the domain name server program BIND (also known as DNS or name service) for LIBTEL to use to establish remote connections.

LIBTEL includes some interesting services such as the Ham Radio Call Book, the Geographical Nameserver, and the Weather Server, as well as several Free-nets, a number of bulletin boards, and library catalogs in seven countries.

How can you use LIBTEL?

You can take LIBTEL for a test drive before you obtain it for your local machine via Telnet.

- Telnet to the host **launchpad.oit.unc.edu**
- Login as **bbs**
- Follow the instructions to get an ID.
- At the main menu, select: **9.** (Online Information Systems)

You can set up an account for yourself by typing in your first and last name at the appropriate prompt.

How can you get LIBTEL?

LIBTEL is available via anonymous FTP from the host **samba.oit.unc.edu** in the directory *pub/docs* as filename *libtel*. Both the UNIX and VMS versions are also available on the host **vaxb.acs.unt.edu** in the directory *library* as filename *libtel* (UNIX version) and *libtel.com* (VMS version).

Who created LIBTEL?

LIBTEL was originally developed by Terry Mancour (**mancour@samba.oit.unc.edu**), Tom Snee, Paul Jones (**pjones@mento.oit.edu**) and Dan Mahone (who wrote the first version).

What does CATALIST do?

CATALIST searches the Barron guide alphabetically by name or by geographic location. It provides instructions on how to access the catalogs you select, but it currently does not handle the Telnet connection for you. You will need to start a communications program separately, establish the connection to the host you use to access the Internet (if dial-up), Telnet to the remote catalog, and login.

After you login to the remote catalog, you can return to the CATALIST window for searching instructions and a notebook facility that allows you to make personal notes, including copying whole screens using the Windows Clipboard facilities, that will be retained and associated with the appropriate catalog.

How can you get CATALIST?

CATALIST is available free of charge from the following two anonymous FTP sites:

zebra.acs.udel.edu	directory:	*pub/library*
vaxb.acs.unt.edu	directory:	*library/catalist*

The readme.txt file provides detailed information on how to get and extract the CATALIST program. As a software program, CATALIST must be transferred in binary mode. Type **binary** at the FTP prompt before you issue the **get** command.

Who created CATALIST?

Richard H. Duggan of the English Department at the University of Delaware developed CATALIST. You can contact the author at the Internet address **duggan@brahms.udel.edu** or the BITNET address **FCA02040@UDELVM**.

LIBTEL

What is LIBTEL?

LIBTEL is a shell script for UNIX and VMS systems that helps you access most of the OPACS and databases listed in the *Directory of Internet-Accessible Library Catalogs and Databases* (see Section 5). LIBTEL uses a menu-based approach to connect to over 200 library catalogs, databases, and bulletin boards on the Internet.

LIBTEL requires that you use the program TN3270, a Telnet adaptation that handles IBM 3270 terminals. You can also get a copy of TN3270 from the same FTP server from which you get LIBTEL--**samba.oit.unc.edu** in the directory *pub/tn3270* as the filename *disttn3270.unc.tar.Z*.

- Europe, including Scandinavia, Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom
- The Middle East: Israel
- Asia/Pacific, including Hong Kong, New Zealand, Taiwan
- Australia

Will HYTelnet run on my computer?

HYTelnet is available for IBM PC, Unix and DEC VMS systems.

What does HYTelnet look like?

You can test drive the UNIX version of HYTelnet by Telneting to **access.usask.ca** (IP address 128.233.3.1). Login as *hytelnet*.

How can you get HYTelnet?

The IBM pc version of HYTelnet is available for anonymous FTP from **access.usask.ca** in the directory *pub/hytelnet/pc* as file *hyteln63.zip*. Be sure to look at the directory listings with the "ls" command for the most recent version (for example, hyteln63.zip represents version 6.3. There may be later versions available, indicated by higher numbers). This file is archived using the ZIP utility so you must set the mode to "binary" before transferring the file. (Type *binary* at the FTP prompt.) Before you will be able to use it on your local computer, you will need to uncompress it with an unzip program. (Tennant, Ober, and Lipow, 1992).

Who developed HYTelnet?

HYTelnet was originally developed by Peter Scott (**scott@sklib.usask.ca**) at the University of Saskatchewan in Canada. The UNIX version was written by Earl Fogel, also of the University of Saskatchewan.

CATALIST

What is CATALIST?

CATALIST is a DOS program based on Windows Version 3.0 that presents a hypertext version of the OPAC directory *UNT's Accessing On-Line Bibliographic Databases*, commonly called the "Barron Guide" after its author Billy Barron. It is designed to run in a window by itself or alongside the window you use to connect to a remote OPAC.

Who created WWW?

W3 originated in the High Energy Physics community. Tim Berners-Lee at CERN (the European Particle Physics Laboratory in Geneva, Switzerland) is the project leader and may be reached at **timbl@info.cern.ch.**

Software Tools for Libraries

A few industrious Internet users have written software to make it easier to use the directories of online library catalogs. These software programs allow you to search the directories alphabetically or by geographic location, and pull up the logon and search instructions contained in the directory.

The programs vary in extent. Some merely help you browse the directories' contents, while some actually initiate the Telnet connection for you. This section provides a brief overview of these programs and tells you how to obtain them for free over the Internet.

HYTelnet

What is HYTelnet?

HYTelnet, a program that runs on many types of computers, makes it easier to reach the principal Internet-accessible library catalogs and databases. It is designed specifically for users who access the Internet using the Telnet program via modem or serial line. It is a memory-resident program (Terminate and Stay Resident - TSR), which is to say that, once you run HYTelnet, it exists in the background of your computer session, and is invoked when you wish to use a remote library database. To invoke the program, press the control (CNTL, CTRL, etc.) and Backspace keys simultaneously and follow the directions.

HYTelnet contains a database of Internet sites available by Telnet; the most recent version even handles the Telnet connection for you to library catalogs, Free-Nets, campus-wide information systems (CWIS), and library bulletin board systems. You can customize the program relatively easily to add new sites to its list using standard word processors, as long as they are capable of producing ASCII output files.

What systems does it include?

HYTelnet currently knows about online library catalogs in the following countries/regions:

- North America, including Canada, Mexico, United States

servers which includes descriptions of the contents of hundreds of servers (Kahle 1991). Telnet to **quake.think.com** and login as ***wais***.

How can you get WAIS software?

WAIS clients exist for the Macintosh, X-Windows, GNU emacs and simple shell (Unix systems). There is also a tool kit to build your own client.

How can you find out more about WAIS?

You can take WAIS for a test drive using a simple interface by Telneting to quake.think.com. Login as *wais*. From this same source, you can FTP a bibliography of reading materials about WAIS from the directory pub/wais/wais-discussion/ with the filename *bibliography.txt*. If you have a supported computer, FTP the free software from think.com in the directory *wais*. Finally, you can subscribe to the WAIS discussion list by sending a request to subscribe to wais-discussion-request@think.com, which is presented as a "Forum on Wide Area Information Servers and Electronic Publishing."

World Wide Web

Bebo White of Stanford Linear Accelerator Center made contributions to the information about World Wide Web.

What is WWW?

The World-Wide Web is a system designed to provide hypertext access to documents located anywhere on the Internet. The WWW (also called W^3) initiative ties together many varying information systems into a homogeneous browsable, searchable "web." By combining a hypertext user interface with index queries, the data model allows almost any existing information system to be represented in the web. The simple intuitive interface gives the impression of a seamless continuum, when data is in fact furnished by FTP, Gopher, NNTP and WAIS in addition to native W^3 servers.

A practical collaboration rather than research project, W^3 has seen success as a distributed information system, and will in the future extend to collaborative authoring and multi-format delivery. There are various browsers available for different platforms.

How can you use WWW?

To take WWW for a test drive, Telnet to **info.cern.ch.**

Who created Veronica?

Veronica was developed by Steve Foster and Fred Barrie at University of Nevada. You may send comments about Veronica to them at the mail address **gophadm@futique.scs.unr.edu**.

WAIS

What is WAIS?

Wide Area Information Server (WAIS) is a client-server system that uses a single user interface to assist you in searching quickly through vast archives and retrieving information from them. The client, which resides on your computer, allows you to enter an English-language question that you wish answered. It translates the request into the standard protocol and passes it over the Internet to a WAIS server on a remote computer. The server searches the full text of the database for the most relevant documents that satisfy the query and passes information about them back to your client. You examine the descriptions of the documents that are returned and decide if you would like the client to retrieve and display the actual document (Kahle 1991b).

The WAIS system consists of three parts -- clients, servers, and the protocol that connects them. Pronounced *ways,* it uses the Z39.50 computer-to-computer information server protocol to pass requests from client to server and responses from server back to client. In so doing, it makes it unnecessary for you to directly interact with the remote server and removes layers of complexity in finding documents.

WAIS is known for its relatively simple user interface, supplemented by a most interesting feature in the form of relevance feedback. It ranks documents it retrieves according to the degree to which they meet your search parameters. Thus, if you find a document that is precisely the type of information you are looking for, you can tell the client "find me more documents like this one." The client builds on your original search parameters using the information derived from the description of the successful document.

WAIS also knows about multimedia information stored on its servers and can search for and retrieve information in the form of text, formatted documents, pictures, spreadsheets, graphics, sound, and video.

What do WAIS servers contain?

Though the software is technically unsupported by its original developers, hundreds of WAIS servers have been developed and placed on the Internet. They contain such diverse things as weather maps and forecasts, poetry, and business information. Thinking Machines Corporation maintains a directory of WAIS

```
    11.  Search lots of places at the U of M
<?> Press ? for Help, q to Quit, u to go up a menu:
```

Who developed Gopher software?

Gopher was originally developed by the University of Minnesota Microcomputer, Workstation, and Networks Center to help the campus community find answers to computer questions. Gopher developers can be reached via e-mail at **gopher@boombox.micro.umn.edu**.

Veronica

The material in this section is derived from the Veronica introductory announcement written by Steven Foster, November 17, 1992 (posted to the CWIS-L list on November 18).

What is Veronica?

Veronica is a new, experimental service that offers a keyword search of most Gopher-server menus in the entire Gopher web. As Archie is to FTP archives, Veronica is to the Gopher service. Unlike Archie, Veronica takes the search one step further by letting you *select the data* from a menu and *connect directly to the data source* without having to know where it is. Since Veronica is used through a Gopher client, it offers access to all types of data supported by the Gopher protocol.

Veronica *does not perform full-text searches* of the data at server sites, but *searches only the names of files* at those sites. Since its data source is titles, Veronica will be most effective if Gopher administrators use very descriptive titles on their menus.

A Veronica search returns an automatically generated Gopher menu, drawn from many servers, and customized according to your keyword specification. The items in Veronica's menu are now available for you to access -- you can double-click on items to open directories, read files, or perform other searches, without ever needing to know which server is filling your request for information.

Veronica's acronym stands for "Very Easy Rodent-Oriented Net-wide Index to Computerized Archives."

How can you use Veronica?

To take Veronica for a test drive, Telnet to the Minnesota Gopher server at **consultant.micro.umn.edu**. Select *Other Gophers* from the opening menu to receive a menu with options for Veronica.

System	Filename
Available from boombox.micro.umn.edu (134.84.132.2)	
Unix Curses & Emacs	pub/gopher/Unix/gopher1.03.tar.Z
Xwindows	pub/gopher/Unix/xgopher1.2.tar.Z
Macintosh Hypercard	pub/gopher/Mac_client/
Macintosh Application	pub/gopher/Macintosh-TurboGopher
DOS w/Clarkson Driver	pub/gopher/PC_client/
NeXTstep	pub/gopher/NeXT/
VM/CMS	pub/gopher/Rice_CMS/ or pub/gopher/Vienna_CMS/
VMS	pub/gopher/VMS/
OS/2 2.0	pub/gopher/os2/
MVS/XA	pub/gopher/mvs/
Available elsewhere:	
MacGopher	ftp.cc.utah.edu: in *pub/gopher/Macintosh*
GopherApp	ftp.bio.indiana.edu: in *util/gopher/gopherapp*
DOS with PC/TCP	oac.hsc.uth.tmc.edu: in *public/dos/misc/dosgopher.exe*
PC-NFS	bcm.tmc.edu: in *nfs/gophe.exe*
Xwindows/DECwindows	job.acs.ohio-state.edu

To receive news about new Gopher servers and software, you can subscribe to the Gopher-news mailing list by sending e-mail to: *gopher-news-request@boombox.micro.umn.edu*. There is also a USENET news discussion group called *comp.infosystems.gopher* where Internet Gopher is discussed.

To give you a sense of what Gopher looks like, this is the University of Minnesota Computer & Information Services opening menu for its Gopher.

```
--> 1.  Information About Gopher/
    2.  Computer Information/
    3.  Internet file server (ftp) sites/
    4.  Fun & Games/
    5.  Libraries/
    6.  Mailing Lists/
    7.  U of M Campus Information/
    8.  News/
    9.  Other Gopher and Information Servers/
    10. Phone Books/
```

How do you use Gopher?

Gopher developers recommend that you run the client software instead of logging into the public Telnet login sites. However, if you would like to take Gopher for a test drive, you can Telnet to one of many **public login sites**. Use the public login site closest to you to minimize impact on the network and speed things up:

Hostname	**IP Address**	**Login**	**Location**
for VT100 or other non-TN3270 terminals:			
consultant.micro.umn.edu	134.84.132.4	gopher	No. America
gopher.uiuc.edu	128.174.33.160	gopher	No. America
panda.uiowa.edu	128.255.40.201	panda	No. America
gopher.sunet.se	192.36.125.2	gopher	Europe
info.anu.edu.au	150.203.84.20	info	Australia
gopher.chalmers.se	129.16.221.40	gopher	Sweden
tolten.puc.cl	146.155.1.16	gopher	So. America
ecnet.ec	157.100.45.2	gopher	Ecuador
for TN327: terminals only:			
pubinfo.ais.umn.edu	128.101.109.1	none	No. America

Where can you get your own Gopher client?

To run a Gopher client (interface or "front-end" program for your own personal computer), get a *Gopher client* program that runs on your local computer. You can get Gopher software for free via anonymous ftp. Get the most recent releases from the server **boombox.micro.umn.edu** in the directory *pub/gopher*. A client uses the custom features of the local machine (for example, mouse and scroll bars), will be faster than the public Gophers, and reduces demands on already busy remote servers.

There are Gopher clients for the systems listed below. The second column shows the name of the client found in the directory *pub/gopher*. You can get most of these clients by using a Gopher client itself.

archie.mcgill.ca (unavailable at press time)	132.206.44.21	McGill University, Canada

Making your Archie searching easier

As the Internet grows, so will the number of FTP servers and files available for retrieval. Many files are duplicated from site to site for convenience. You can use these **set** commands when using Archie to make your searching easier:

set search changes from an exact search to a substring search. For example:
set search exact
set search sub

set maxhits prevents you from getting an overwhelming number of listings for the same file at different computers, for example:
set maxhits 12

(Set commands contributed by Michael Hart in a January, 1993, posting to the PACS-L list.)

Archie's creators

Archie was created by researchers at McGill University in Montreal, Canada. Send questions regarding Archie via e-mail to the list **archie-l@archie.rutgers.edu.**

Gopher

What is Gopher?

The term "Internet Gopher" describes both a client-server protocol and a software program used for distributed document search and retrieval. The software program is an information delivery system that searches for, retrieves, and displays requested information from remote servers on the Internet. Gopher servers store individual documents and are connected in a logical network. (They are already connected physically via the Internet). Together, they create a much larger-scale logical information server that can be expanded in small increments (by linking a new server or adding information to an existing Gopher). Gopher servers can query WAIS servers (discussed later in this section) and FTP servers, sending the results to Gopher clients. They can be queried by WWW (discussed below).

other information. If you are interested in learning what other files exist in that particular archive, Archie allows you to look at the entire file listing as well as the additional FTP archives known to it.

Archie documentation

There are several ways to access Archie servers, including e-mail, but the easiest way is certainly via a Telnet session. To get information on searching Archie via e-mail, send a mail message with the word **help** to the mail address **archie@archie.rutgers.edu** or **archie@ans.net**. This will prompt an automatic mail reply with details about how to use the e-mail Archie server. Additional documentation on using Archie interactively via Telnet is available via anonymous FTP from **archie.ans.net** in the subdirectory *pub/archie/doc*.

Connecting to Archie

Telnet to Archie using one of the IP addresses below and login as *Archie.* No password is required. Type **help** to bring up a set of instructions on using Archie. You can use the **server** command to locate an Archie server closer to your site. Use the **prog** command to search file names, the **whatis** command to search the file descriptions, and the **list** command to find out which FTP sites are tracked by the Archie you are using. The **site** command returns complete anonymous FTP listings of the various sites in the database.

Archie servers

You can find Archie servers at the following sites:

Server Name	IP Address	Physical Location
archie.rutgers.edu	128.6.18.15	Rutgers University, USA
archie.sura.net	128.167.254.179	SURANet server, USA
archie.unl.edu	129.93.1.14	University of Nebraska, USA
archie.ans.net	147.225.1.2	ANS server, USA
archie.au	139.130.4.6	Australian server
archie.funet.fi	128.214.6.100	European server, Finland
archie.doc.ic.ac.uk	146.169.11.3	United Kingdom server
archie.ncu.edu.tw	140.115.19.24	Taiwan server

another and are still in the early stages of development. The following information describes the major Internet utilities and was largely obtained from the files about each of them available online.

In this guide we will discuss nine of the prevalent information servers and resource-locator programs on the Internet today of interest to libraries: Archie, Veronica, Gopher, WWW, HYTelnet, LIBS, CATALIST, LIBTEL, and WAIS. These descriptions are brief, but are intended to provide a basic understanding upon which you can build your knowledge of Internet information resources and servers.

Archie

What is Archie?

Archie was originally created as a database system to provide a quick and easy way to scan the offerings of the many anonymous FTP servers on the Internet. Today it tracks the contents of over 1,500,000 files at 900 FTP sites around the world, continually updating its databases. It has two components: the software to scan FTP servers and a user-access component that allows you to log into the Archie server using Telnet and query its files database to find out where information that interests you is located. The ***Software Description Database*** consists of the names and descriptions of various software packages, documents, and data sets that are kept on anonymous FTP archive sites all around the Internet.

When Archie finds a match for your query, it presents the name of the FTP archive server, its location (IP address), the pathname to the file within that server's hierarchy of files, and

White Pages Projects

Imagine being able to get the name, address, and electronic mail address of a friend or colleague across the country or half way around the world by querying a database from your desktop. The availability of widespread directory information is one of the goals of White Pages Projects, which are international efforts to build a single logically connected, though physically distributed, database of user and institution information. Pieces of it will eventually exist on thousands of machines, all interconnected via the Internet and the X.500 standard. In the same way that the Domain Name Service (DNS) permits you to query remote computers for connection and naming information for Internet hosts, the X.500 standard defines a way to look up publicly available user information of all sorts. (Knopper and McGregor)

There are currently a number of experimental white pages projects for the Internet in Europe and one in the United States under the sponsorship of Performance Systems International (PSI) and NYSERNet (the New York State mid-level network). BITNET's equivalent is called the CREN White Pages Project after its corporate sponsor, the Corporation for Research and Educational Networking. All are active experiments from which we should see interesting results within the next few years.

Information Servers

The Internet has grown rapidly but without centralized management which normally would assume the role of tracking and providing documentation on what the network has to offer. Regardless, in a remarkable spirit of information sharing, FTP information servers have blossomed on hundreds of Internet computers around the world. Many have made available collections of text, software, graphics images, digitized sound recordings, technical papers, and other information of all types and forms. Finding out what is available on FTP servers that now number nearly 1,000 and keeping track of this dynamic environment on a day-to-day basis is challenging, in the least, but largely impossible for individual Internet users.

There have been similar efforts to simplify methods of discovering what FTP servers have to offer. A number of software tools of discovery have evolved independently of one

User enters:

whois cunyvm

System responds:

City University of New York (CUNYVM)
Computer Center
555 West 57th Street
New York, NY 10019

Hostname: CUNYVM.CUNY.EDU
Address: 128.228.1.2
System: IBM-3090/200 running VM

Coordinator:
Yalow, Ben (BY7)
YBMCU@CUNYVM.CUNY.EDU
(212) 903-3623
domain server

Record last updated on 29-May-92.
There are 167 registered users:
Would you like to see the registered users of this host?
etc.

Not every location supports **whois** for information on local users. There are central Whois servers located at network information centers (NICs) that make information available about hosts registered on the Internet.

On the Horizon

X.500 While there is no TCP/IP protocol defined for directory services, there is an OSI standard, called **X.500** for its number in the CCITT standards numbering scheme. The CCITT (International Consultative Committee for Telephony and Telegraphy) is a European standards body similar in scope to the American National Standards Institute (ANSI). The X.500 protocol defines the structure of a directory file and a number of different types of search mechanisms. OSI's X.500 is the only directory protocol currently available; there is no comparable technology that is part of the TCP/IP protocol suite. Although not yet widely implemented, it is designed to handle such entities as person-name files, yellow pages, and collective retrievals such as "all those who provide a certain service."

other publicized account name, or, depending on the originating system, send the **whois** command directly to the host where the Whois server resides. The **whois** command is followed by the information sought. Here is a brief sample of Whois interaction with the DDN NIC computer (resulting from a Telnet session on the NIC).

.Z	Encoded file (requires UNIX uncompress on your local computer).
.zip	DOS compressed file (requires an unzip utility on your local computer).

Directory Services

Domain name servers

If you do not know the name of an Internet host or the electronic mail address of an Internet user, how do you find out what it is? Internet directory services are still under development, but there are some rudimentary facilities in place now. The Domain Name System **(DNS)** mentioned above both describes a hierarchical naming convention for Internet hosts *and* defines the protocol used to determine the IP address of an Internet computer, given the host name (also called "name resolving"). Domain Name Servers exist to help you translate this information. For example, if you were told that the host "melvyl.ucop.edu" was available on the Internet, but there was no entry for it in your local configuration file (a table of known systems that your software uses to define the whereabouts of other systems), you might query the domain name server to get its IP address so that you could add it to your file and eventually Telnet to it.

DNS services are available across a wide variety of platforms. In fact, any TCP/IP implementation that supports mail (such as NCSA Telnet software) also supports directory services, although its functionality may be quite limited.

Whois

Directory services would be very useful in identifying the correct electronic mail address of a colleague when you do not know it, but they are still largely unavailable. However, one rudimentary facility called **Whois** exists at a number of sites.

Whois is a program publicly available on certain Internet hosts that allows you to find the IP addresses of systems, the names of network administrators, and the names of people who have accounts on that system or perhaps a larger local network. For example, the NIC at DDN has a **whois** server that allows you to search a database that consists of registered user names, host names, system contact persons, and other types of registered domain information. Generally, you Telnet to a remote host known to support a Whois server and enter "Whois" or some

type **mget *** to get all files in the directory

2. To get all files with a similar name, regardless of file extension, in one command:

   type **prompt** to toggle prompting

   type **mget zoo214*** (gets all z00214 files - for example, .exe, .doc, .src).

Tips on using FTP

There are additional FTP commands, but the FTP environment is limited and the command set is terse, so you need to pay close attention to where you are. Here are some hints to help out:

- When exploring a new machine, check for *readme* or *index* files which explain how the directories are organized and describe file contents available for anonymous FTP. Check the left and right screen borders.
- Type the filename exactly as displayed. Case sensitivity and limits on file name lengths and extensions may prevail. Be sure to use upper and lower case exactly as you see it listed in the directory.
- Be sure to use the correct file type in transferring files. The default is usually text (ASCII). Filename extensions are meaningful. Here are some common file extensions and their meanings:

ASCII transfer OK:	**.asc** or **.txt**	ASCII file.
	.doc	Normally an ASCII text file, but could be a MS Word file, which would put it in the binary category below..
	.hqx	Mac encoded file (requires BinHex decoding on the other end).
	.ps	PostScript file formatted for PostScript printers.
	.uu	Encoded file (requires UNIX uudecode on your local computer).
Binary transfer required:	**.com**	DOS executable file.
	.exe	DOS executable file.
	.tar	Encoded file (use the UNIX command **tag -xvf** at the other end, on your local computer).
	.wp	Word Perfect file.

quit <enter**>** (exits from FTP program)
logoff command for local system

FTP Commands

Though FTP is an application program which may vary for different systems, and all may not be implemented on every system, there is a set of commands that seem to be universal. Since some systems are case sensitive (they require upper or lower case in specific circumstances), the safest course is to use lower case for FTP commands, and lower and upper case, exactly as you see them used in the directory listings, for transferring files.

The basic FTP commands that are common to most FTP systems are:

Command	Function
ftp ***machine name***	Establishes FTP session using machine's virtual name
ftp ***IP address***	Establishes FTP session using machine's numeric address
ls	Lists files and directories in the current directory
cd ***directory name***	Changes to the directory specified
dir	Lists files and directories in the current directory
ascii	Sets file transfer type to ascii (the default; used for plain text files)
binary	Sets file transfer type to binary (used for program files)
get ***filename***	Transfers file specified to your computer's disk
put ***filename***	Transfers file specified from your computer to the remote computer
mget ***file designation***	Initiates transfer of multiple files to your computer's disk (e.g., mget *.doc, where all files with the suffix *.doc* will be transferred)
mput ***file designation***	Initiates transfer of multiple files to the remote computer
help	Displays a help screen, if available
close	Closes the connection
quit	Closes the connection
bye, quit, exit	Exits the FTP program

Retrieving Multiple Files Via FTP

If you wish to get many files with a single FTP command, here are a few tips on how to do it (contributed by Michael Hart in a January 1993 PACS-L list posting):

1. To get whole directories:

   type **prompt** to toggle prompting

particular host, and includes the names of any directories and subdirectories, as well as the actual filename.

Anonymous FTP

Normally, to use a remote computer, you need an account on it. *Anonymous FTP* is a service which authorizes use of a system without this restriction, but within a limited environment. Some system administrators have dedicated either disk space or an entire machine for the purpose of making electronic files publicly available. Anonymous FTP is a way of setting up a computer to permit users anywhere in the world to access it remotely without an ID or password; that is, anonymously. You may log in to such a host under the user name *anonymous* to a special account which works only with FTP in order to access the FTP archive offered. Supply either your user ID on your local system or the word *guest* for a password, depending on the FTP location to which you connect.

Once you make the connection, use FTP commands (listed below) to browse public directories and transfer files to your local disk. Anonymous FTP cannot be used to send files to a remote host without a special login account on that host, so the transfer is normally from the remote host to your computer.

How to use FTP

In general, the steps required for FTP transfer are as follows:

1. Log on to your local system.
2. Invoke the FTP program, providing the host name or its IP address. For example,
   FTP ftp.cs.widener
3. Once connected, log in with user ID and password. For example,
   login: **anonymous** <enter>
   password: **gen@magnum.ucop.edu** <enter>
4. Change directories to the one with the files that interest you.
   cd pub <enter>

   cd zen <enter>
5. Issue command(s) to get copies of the files.
   get zen-1.0.ps <enter>
6. Log off from the remote host and exit the FTP program.

Tips on using Telnet

Multiple versions of Telnet software running on different hardware and operating systems create a technically complex communications environment, making trouble-shooting a challenge. Some suggestions to keep in mind (Farley 1991):

- Avoid prime time logins: between 9:00 a.m. and 6:00 p.m. Eastern standard time is the busiest for network traffic and contention for access on remote hosts. Avoid normal office hours at the remote hosts for best results.
- Use VT100 terminal emulation whenever possible, since VT100 is the most universally supported terminal type.
- For IBM environments, try TN3270, a variation on the Telnet protocol that handles full screen emulation of an IBM-3270 type terminal, if it is available.
- Some systems offer a choice of terminal types, whereas others may not be flexible. If you are unable to change your terminal type, you may not be able to use some systems.

File Transfer Protocol

What is FTP?

File Transfer Protocol (FTP) is the primary method of moving a file from one computer to another across the Internet, regardless of the file's storage format or operating system software. FTP allows you to open a session on a remote host anywhere in the world, execute a few simple commands, and transfer files to your local computer in seconds. While TCP/IP allows computers on the Internet to interoperate, the FTP application (like Telnet and e-mail) makes it useful and practical for the normal user.

FTP files

Files may be any data, programs, or text stored online. FTP file transfer is direct, disk-to-disk transfer, that occurs while your terminal session is active. Depending on the concurrent network traffic and the speed of the Internet connection, the speed at which FTP operates allows even large files to be transferred quickly. Not every file can be transferred with FTP-- only those available for public read access.

Files are stored in archives with directories (subdivisions by topic). The *pathname* describes the location of a file on a

To open a connection on another computer, you must have the Telnet software on your (the service provider's) system and either the virtual (domain) name or IP address of the remote computer. Because the Telnet protocol has been implemented on a variety of systems, the actual commands for opening a connection vary from system to system, depending on the source or type of software (e.g., NCSA Telnet from the National Center for Supercomputing Applications or CU/TCP Telnet from Clarkson University). Fortunately, all versions function similarly. To effectively use Telnet, know your software commands, and check local documentation for information on specific functions and the correct escape character to use. It is always necessary to know how to use the remote computer.

Connecting to a remote computer

The procedures for using Telnet are:

- Log in to your local host.
- Invoke the Telnet program on that host (e.g., type **telnet**).
- Identify the host name or address of the machine you wish to access (type **open** ***hostname***).
- Once connected to the remote host, log in with the appropriate user name and password for that host, if required (many databases do not require them).
- When finished working on the remote host, type the command to log off (e.g., **logoff**, **logout**, **end**, **stop**, or **quit**). Then break the connection, if it is not broken automatically at log off. You should now be returned to where you began on the local host.

Disconnecting

Once connected to another machine, all commands you now issue will be executed in the remote host's operating environment (unless preceded by an escape sequence which returns you temporarily to your local operating environment). To disconnect from a remote system, you must know the command to terminate a session on that remote computer. Be aware that some systems offer no graceful exit for remote users. If you get stuck, try any of the following logoff commands: *logoff, logout, quit, end, exit, stop*. The logoff command returns you to the Telnet program on the local computer, at which point you can end the Telnet session with the *quit* command and regain the local prompt. If no exit is offered, you must use your own system's command for closing a Telnet session or breaking the connection.

INDex	filelist_name	Obtain a list of LISTSERV files
GET	filename filetype	Obtain a file from LISTSERV
REGister	full_name|OFF	Tell LISTSERV about your name

Sending a message to all subscribers

To post a message that will be distributed to all subscribers of a BITNET LISTSERV, address your mail directly to the list name (e.g., **PACS-L@UHUPVM1.BITNET**), not to the LISTSERV program (e.g., **LISTSERV@UHUPVM1.BITNET**). Messages and replies sent to the list itself are broadcast to all list subscribers. A frequent mistake is to send the **subscribe** command to the list, rather than to the LISTSERV host, flooding hundreds of mailboxes with the request. Be careful to distinguish between sending mail to or replying to the intended person(s) or LISTSERVer.

Replying to an individual

The caveat is the same for Internet lists: Some lists place the actual sender's e-mail address in the field of the posted message. If you intend to reply only to the individual (rather than the entire list), be sure to address your reply only to the sender's e-mail address. Be careful *not* to use the automatic reply key (if your system has one) in such cases to avoid broadcasting your message to the entire list.

Telnet

Telnet is the Internet standard protocol for connecting to another computer and conducting a terminal session (similar to the way your communications software handles this process for your computer). It is the terminal handler portion of the TCP/IP protocol suite, which enables a user on a computer at one site to connect to and work on a computer at another site, which may be across the street or on the other side of the world. Once connected and logged in to the remote host, you can use the remote computer to the extent allowed, which may include querying a database, running programs, or doing any other operation as if you were logged in to the remote host directly. When the remote session terminates, Telnet returns you to the local system.

LISTSERV

LISTSERV is an automatic mailing list server, one of the services offered by EARN and BITNET, although it is accessible to Internet sites as well. LISTSERV lists come into being when a site decides to host a list, and, once the list is set up, the LISTSERV program maintains a list of subscribers (makes additions and deletions) and performs other tasks by responding to prescribed user commands. There are hundreds of lists available on technical and non-technical issues. Some lists have a moderator who manages the information content, whereas others are more free-form. For a complete list of LISTSERV lists, send the command *list global* to **listserv@bitnic.educom.edu**.

Subscribing to a LISTSERV list

Users can add and remove themselves from a LISTSERV list using electronic mail containing simple commands in the message body. For example, to subscribe to a list, send a mail message to the LISTSERV host machine (in the form listserv@hostname), with a message body containing the command:

subscribe <listname> <first name last name>

for example, **subscribe PACS-L Jane Smith**. To retrieve a help file listing common LISTSERV commands type **help** as the body of a message and send it to the host **listserv@bitnic.educom.edu**.

Here are the most commonly used commands. The vertical lines separate the command's options:

Info	topic | ?	Get detailed information files
List	Detail | Short | Global	Get a description of all lists
SUBscribe	listname <full_name>	Subscribe to a list
SIGNOFF	listname	Signoff from a list
SIGNOFF	NETWIDE	Signoff from all lists on all servers
REView	listname <options>	Review the list of subscribers
STats	listname <options>	Review list statistics
Query	listname	Query personal distribution options
SET	listname options	Set personal distribution options

one big file and mailed periodically as one message to the entire list of subscribers. Typically, a table of contents is added to the beginning of each posted message.

Usenet newsgroups

Information in *netnews*, also known as USENET newsgroups, is divided into specific areas of interest. There are thousands of newsgroups, although not all are available on every system. The list of available newsgroups varies from site to site at the discretion of the site administrator, as does the location of the file detailing which groups are available. The newsgroups are arranged in hierarchical (tree) fashion, with each root of the tree devoted to a major topic. Some of the major roots are:

alt	Alternative newsgroups; anything and everything goes; anarchy
bionet	Biology-related newsgroups
bit	BITNET-related groups
biz	Business and related topics
comp	Computer topics: hardware, software packages, operating systems, and network protocols are included
gnu	News covering software from the Free Software Foundation
ieee	IEEE-related newsgroups (engineering topics)
k12	For students in kindergarten through twelfth grade, and the discussion of education
misc	Miscellaneous newsgroups that do not fit into other categories; multiple topics
news	Newsgroups about news, news network
rec	Recreation-related newsgroups
sci	Science newsgroups: research or applications of established sciences
soc	Sociology and socializing issues related to world cultures
talk	Newsgroups for the discussion on a specific topic; long debates

In addition to major roots, there are local roots containing information for your state or the local domain. A list of Internet-connected bulletin board systems (BBSs) that carry newsgroups and discussion groups can be obtained from **wuarchive.wustl.edu** in the *pub* directory.

Subscribing to an Internet list

The general method for having your name added to or deleted from an Internet mailing list is to send a simple request to an address in the form **list-request@hostname**—– for example, **cni-request@cni.org**. This sends a message to the person who maintains the list rather than to every recipient on the mailing list. (The method of subscribing to BITNET LISTSERV lists is different and is discussed in the "LISTSERV" section.)

Sending a message to the list

Once you subscribe to the list, all messages that are sent to the list will appear in your electronic mailbox. If you wish to send a message to the list, compose your message or response on your local system and send it to the **list address** (that takes the form **listname@host**; for example, **cni-directories@cni.org**). It will be automatically distributed to everyone subscribed to the list. If you are replying to a message you see posted on the list, many systems allow you to press a special "REPLY key" that automatically picks up the list's address.

As a courtesy to other participants, please sign your messages at the end with either your name or your electronic mail address.

Replying to an individual

E-mail discussion lists can be prolific and difficult to keep up with, and most people try to limit the traffic to pertinent messages. If you wish to reply to a list message that you receive, consider for a moment whether your reply is appropriate for the whole list or chiefly for the person who sent the original message. If not appropriate for the whole list, find the sender's electronic mail address in the header or at the end of the original message and send your reply only to that mail address. Be careful not to use the automatic reply key (if your system has one) in such cases to avoid broadcasting your message to the entire list.

Types of mailing lists

There are several types of mailing lists. One type, known as an *unmoderated list*, allows free-form discussion. There is no restriction on the number or content of messages sent to the list, and anyone can participate. Another type is a *moderated list*. Messages sent to these lists are first reviewed by the moderator, then posted to the list if appropriate. The quality of messages on these lists is usually higher than those on an unmoderated list, since inappropriate messages are removed before they are circulated. *Digests* are another common type of mailing list. Messages sent to such lists are gathered by the moderator into

Internet e-mail addresses

When addressing mail to another user on the Internet, use the form of addressing: **user@host.domain**. The user is the name of the recipient's mail account, or the names of a distribution list that in turn sends mail to many users. **Host.domain** is the full name of the host on which the user has a mail account or of the host relaying mail to the recipient's host. The host name may contain many parts that denote its location in a hierarchy of networks. Examples of Internet addresses are:

lib3@uccvma.ucop.edu
nilesinc@well.sf.ca.us
tom@apple.com

A network provider usually allows a user to send mail not only to users on the local network and the Internet, but to users on other networks as well. Since various mail systems have developed, there are varying formats for electronic mail addresses. The bibliography includes references which provide more in-depth information on electronic mail and focus on addresses used for sending mail outside your local network. Your system administrator (sysadmin) or "postmaster" may be able to help you formulate addresses to users in networks outside the Internet proper. Sending mail within your local network, or even from one Internet site to another is rarely a problem.

Internet mailing lists

One way to get started on the Internet and to exchange information about shared interests is to subscribe to a special interest group mailing list. A file containing a list of the Internet mailing lists can be found on **ftp.nisc.sri.com** in the directory *netinfo/interest-groups*. The list is large (over 700 list names), updated regularly, and covers almost every subject imaginable.

Electronic discussion groups, once tied to particular hardware platforms and networks, are now distributed internationally through many networks, via numerous gateways. These forums are commonly known as newsgroups, discussion groups, LISTSERV lists, bulletin boards, and mailing lists. The means of distributing the mail or news varies depending on the type of network service (and need not normally concern users of the lists). The real difference lies in how you subscribe. However, participation is easy.

may vary from system to system; however, the components of the recipient's address must be correct, or the mail system will return the mail (bounce it back) to the sender.

With the mail header automatically supplied, the user enters the content of the message by typing it in or by including a previously composed file. The completed mail is sent to one or more recipients, who at some later time, can read, reply, delete, print, forward, or save a copy on their computer's disk. The following is an example of a mail header and message text.

```
Received:  from MAINE (GIBSON) by MAINE (AMATO)
 id 0521; (Mail R2.5) Thu, 12 Nov 92 12:42:33 EST
Received:  by MAINE (Mailer R2.08 PTF008) id 5496;
Thu, 12  Nov 92 12:19:10 EST
Subject:  Re:  Library Survey
References: <AMATO.921111141141@maine.maine.EDU>
Message-ID: <GIBSON.921112121817@maine.maine.EDU>
From: GIBSON@maine.maine.edu (Ginny Gibson)
To:     AMATO@MAINE (KIM AMATO)
Date:  Thu, 12 Nov 92 12:18:17 EST

        Can't make the 10:am meeting.  Can we
reschedule for a later time when things will not be so
 hectic?
```

The way you actually send off the mail depends on what system you are using. It may be as simple as pressing the F5 key.

Tips on e-mail etiquette and ethics

Some often-repeated guidelines for dealing with electronic communication have become widely accepted on the Internet:.

- Try to stick to one subject per e-mail message. It makes it easier for people to reply to and forward it.
- Use both upper and lower case. YOU APPEAR TO BE SHOUTING IF YOU ONLY USE UPPER CASE.
- Give yourself time to think before replying in anger. Computer-readable messages are easily recorded and "played back."
- Use a "sideways smile" :-) when you want to show humor or ;-) for a wink.

Electronic Mail

Electronic mail (often called e-mail) is the most prevalent tool because it addresses a widespread need for rapid, easy, inexpensive communication with individuals and groups, anywhere in the world, all of whom need not be available simultaneously. It allows the exchange of information between the Internet and the networks that do not use Internet protocols, thereby setting the stage for rapidly developing global communications.

Creating e-mail

The steps you follow to create e-mail depend on the system you are using. Normally, you will be able to start the mail program by typing "mail" or something similar. You may be prompted to fill in the addressee information first or may be able to start right out typing your message.

An electronic mail message has a specific structure that is standardized across every type of Internet computer system and non-Internet systems that wish to exchange mail with the Internet, and is essential for the correct delivery of e-mail. Mail messages have two discrete parts—the header and the body. The header provides network routing data that can be useful in diagnosing problems. The body holds the text of the message itself. The most recognizable components of an e-mail header are:

Date:	date and time message was sent
From:	sender's user identification
To:	e-mail address of the mail recipient; computer identification varies depending on the system; may include multiple addresses or the name of a predefined list, like "staff"
Subject:	a few key words typed by the sender that describes the message

The header also lists information about the sender's system, the posting date and time of the message, some of the intervening systems, and carbon copies, forwarding information, etc. *Most mail programs set up the header automatically.* Mail headers use system-supplied "Received from:" and "Message ID:" lines to identify the sources of mail, the systems that handle it en route to the final destination, and network routing data. Normally, users may disregard these lines. The order of the mail header

Chapter 4: Networking Tools and Software Applications

The cooperative nature of the Internet has inspired participants to create an interesting and diverse collection of freely available electronic services and resources, along with software tools useful in exploring, finding, and moving information across great distances. This chapter introduces the basic tools you will be using. However, the Internet is still in its infancy, as are the tools developed to use it. Although the underlying functions they perform may be highly sophisticated, many of these applications still have a "look and feel" that will seem primitive to the librarian whose in-library systems are continually becoming easier to use. So, too, will Internet applications become more refined in time. For now, they are challenging and still fairly rudimentary, but persistence is rewarding!

All the applications listed in this section build on one or more of the basic services (electronic mail, login to remote computers, and file transfer to and from remote computers) to increase the functionality and flexibility, and lessen the amount of time and effort required. This section begins with the basics of e-mail, remote login, and file transfer, and then covers the extended software tools that are freely available to assist you in your Internet discoveries.

The principal sources for definitions and descriptions in this section are *Internet: Getting Started* (Marine 1992), *Library Resources on the Internet: Strategies for Selection and Use* (Farley 1991), *New User's Guide to Useful and Unique Resources on the Internet* (NYSERNET 1991), and *Exploring Internet Resources* (Merit Network, Inc., 1991).