Guide to Network Resource Tools

EARN Association

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Notice

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Preface to the Third Edition

When the first version of the **Guide to Network Resource Tools** was released, we had no idea how popular it would become, and how quickly it would spread beyond the EARN community. While much had already been written on these tools, a booklet with brief explanations and instructions struck a responsive chord. With the second edition, we tried to make the various corrections and improvements which had been suggested by many people who had seen the first version.

In this third edition, we have tried to expand the scope, both in terms of the number of networking tools covered and the size of the audience at which it is aimed. While the Internet continues to grow at an explosive rate, there is still a large community of users, within EARN and beyond, with only electronic mail connectivity to the world-wide network. We have tried to show how they too can utilize these networking tools.

The work of many people is reflected here, but we owe our greatest debt of thanks to the developers and authors of the network tools and documentation. Their work serves as the basis for this guide.

We also wish to thank all those who have provided comments, criticisms and suggestions for the guide. Many of the improvements in the third edition are the result of their feedback and encouragement. In particular, we have benefitted from the cooperation of the RARE Working Group on Information Services and User Support. We look forward to close collaboration with them on future editions of this guide as well as on other projects.

The **Guide to Network Resource Tools** has been produced by the staff of the EARN Association, under the direction of the EARN Group on Information Services. Any errors or inaccuracies in this guide are the sole responsibility of the EARN staff. We welcome and encourage your feedback. Please send comments, criticisms, corrections, suggestions for future editions and even praise to the electronic mail address:

EARNDOC@EARNCC.EARN.NET (or **EARNDOC@EARNCC.BITNET)**

If you have any questions or queries on the use of these tools or on other aspects of networking, and you are in an EARN member country, you can get help and advice by sending your questions by electronic mail to the EARN consulting service at:

NETHELP@EARNCC.EARN.NET (or **NETHELP@EARNCC.BITNET**).

The EARN Staff

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Introduction

As the worldwide academic computer network grows and expands far beyond its previous confines, so the resources and services available on the network evolve and multiply at a dizzying rate. The typical user is hard-pressed to keep up with this explosive growth. Fortunately, a number of tools are available to facilitate the task of locating and retrieving network resources, so that users anywhere can utilize texts, data, software and information for public access. Facilities to explore public domain software repositories, to consult mailing list archives and databases, to retrieve directory information and to participate in global group discussions are now available to all.

The key to availability of network resources is the provision of *servers* on computers all over the network. A server consists of special software which accepts requests (or queries or commands) and sends a response automatically. Requests received by the server may have originated from a user on the same computer as the server software, or from a user on a computer on the other side of the world. Many servers accept requests via electronic mail, in which case requests can be received from computers which are not even on the same computer network as the server. Links have been established between many servers, so that once you have established contact with one server, you can easily communicate with other servers as well.

Software programs which ask for resources from servers are called *client* programs - they are clients of the server software. Clients send requests to a server, using a standardized format called a *protocol*. The server responds by supplying information, usually in the form of files containing text or data of various sorts.

New client software is being developed all the time, providing better and more convenient ways of interacting with servers. Different versions of a particular client may be developed for different desktop computers since these are increasingly more sophisticated, having advanced graphical, audio and storage capabilities. Thus different versions of a client will be provided for use on IBM PC's, Apple Macintosh, or Unix computers. There are X Window System versions of many of the clients.

The tools described in this guide have been divided into six functional areas. Several of the tools have more than one function, but they have been classified according to their main purpose. The first section, **Exploring the network**, covers two services, Gopher and World-Wide Web, which use the client-server model to provide a means of moving through a wide range of network resources in a uniform and intuitive way. WAIS (Wide Area Information Server), a tool for searching databases located throughout the network, is documented in the second section, **Searching databases**. The problem of knowing where to find files and programs in the network is addressed in the third section, **Finding network resources**, which describes archie, a client for searching archives of filenames, and Hytelnet, a hypertext compendium of online library catalogues and other network resources. Section four, **Finding people and computers**, covers three tools - WHOIS, X.500 and Netfind.

While just about all of these network tools can be used to get files of one sort or another, some servers are designed to obtain files easily and efficiently from various repositories in the network. Two of these servers, TRICKLE and BITFTP, are covered in section five on **Getting files**.

The sixth section **Networked Interest Groups** deals with what is perhaps the most popular of all the network resources: discussion groups on every imaginable topic. The two tools discussed in this section are LISTSERV and Usenet (Netnews).

The final section gives brief descriptions and pointers for a number of other tools. Some have not yet achieved widespread recognition (Prospero), some are relatively unknown outside a particular network (Netserv from EARN/Bitnet and Mailbase from JANET) or there is an alternative service within EARN (ftpmail) and some are meant for chatting rather than work (Relay and IRC).

The purpose of this guide is to supply the basic information that anyone on the network needs before trying out and starting to use these tools. A basic knowledge of networking terminology has been assumed, as well as familiarity with the basic tools of networking: *electronic mail* (often referred to as *e-mail* or simply *mail* throughout this guide) and, for those connected to the Internet, *FTP* (file transfer protocol) and *Telnet* (remote login). It is beyond the scope of this guide to describe these basic tools. Guides to email, FTP and Telnet are available elsewhere on the network, and the example in the BITFTP section of this guide shows how to obtain them.

Part 1
EXPLORING THE NETWORK

GOPHER

What is GOPHER

The **Internet Gopher** client is used to search for and retrieve files from Gopher servers anywhere on the Internet. It is thus a distributed document delivery service. Gopher servers store files containing text or binary data, directory information (loosely called *phone book*), images or sound. Links to other Gopher servers result in network wide cooperation to form the global Gopher web, often called *Gopherspace*.

Gopher clients also provide gateways to other information systems (World-Wide Web, WAIS, archie, WHOIS) and to network services (Telnet, FTP). Gopher is often the most convenient way to navigate in an FTP directory and to download files.

The Gopher client presents information to the user as a series of nested menus (resembling the organization of a directory with many subdirectories and files). However, the subdirectories and the files may be located either on the local Gopher server or on Gopher servers situated at remote sites. As far as the user need know, all information items presented on the menus appear to come from the same place.

Who can use GOPHER

In order to use an interactive Gopher client on your computer, you must be on the international TCP/IP network (the *Internet*). Electronic mail access to Gopher is also available, so that anyone on any other network who can send and receive mail with the Internet can also explore Gopherspace (see **GopherMail** in the section **How to get to Gopher**).

How to get to GOPHER

Local clients

Public domain Gopher clients are available for: MS-DOS, MS-Windows, OS/2 Macintosh, CMS, VMS, NeXT, Unix, X-Windows. The clients are available by anonymous FTP from many sites (e.g. **boombox.micro.umn.edu** in the directory **/pub/gopher**). See the list of freely available client software in Appendix A.

Remote clients

If you do not have a Gopher client on your computer, you can use a remote Gopher client via an interactive Telnet session, or by electronic mail to a GopherMail site. Some sites make Gopher clients available for anonymous public use. To access a remote Gopher 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.

GopherMail

You can communicate with gopher by carrying out email conversations with a GopherMail server. A list of GopherMail servers is given below.

gopher@earn.net	France
gopher@ftp.technion.ac.il	Israel
gopher@join.ad.jp	Japan
gopher@nig.ac.jp	Japan
gopher@nips.ac.jp	Japan
gopher@solaris.ims.ac.jp	Japan
gophermail@ncc.go.jp	Japan
gopher@dsv.su.se	Sweden
gophermail@calvin.edu	USA

Using GOPHER

Gopher client implementations look slightly different on different platforms, because they take advantage of the platforms' capabilities (mouse, graphic functions, X Window System). However all implementations offer the same set of functions and commands.

After issuing the **gopher** command, you will be connected automatically to a default Gopher server which was specified when your Gopher client was installed. The format of the command is:

gopher <hostname>

where *hostname* is optional, and can refer to an alternative Gopher server you wish to use instead of your default server.

The Gopher client presents 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 v2.0.12

                      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
```

Any item can be selected from the menu by typing its line number, then pressing the RETURN key, or by moving the cursor (-->) next to the item and pressing the RETURN key.

Each item on the menu may 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 on the Gopher menu have 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 (e.g. sound files), and some clients display only files of types they can handle or files they suppose you are interested in. Others display all types of files.

When an item is selected from the Gopher menu, it is processed according to its type, as shown below. If you select an item which represents a sound file, an image file, or a Telnet session, the Gopher client looks for the appropriate software on your computer to carry out the task of displaying the image, reproducing the sound, or starting the Telnet session. When the task is completed, control is returned to the Gopher client.

a subdirectory its contents are displayed. You can view the directory above the present one using the **up** command.

a text file the file is displayed. You can browse through the contents of the file, search for a particular string in the file, print the file on a local printer or copy (save) the file onto your local disk space. The last two functions may not be available to you - this will depend on your local conditions.

a binary file the file is simply copied onto your local disk space, under a name specified by you. Binary files are binhexed Macintosh files, archives (.zip, .tar,...), compressed files, programs, etc.

a sound file the file is played through your local audio device; this is only possible if you have a suitable audio device, with a utility to drive it. 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 has finished playing.

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. The phone book will be searched according to the procedures set up by the institution which owns and maintains it.

an index-search Gopher indexes are available to help users locate the information in a set of documents. You will be prompted for a search string, which may be one or more words, and may contain the special operators **and, or**, and **not**. The search is case-insensitive, and the **or** word test is non-exclusive. E.g.:

```
terminal and setting or tset
```

will find all documents in the index which contain both the words *terminal* and *setting*, or the word *tset*. The result of the index-search is presented in the form of a Gopher menu, where each menu item is a file containing the specified search string.

a Telnet session Telnet sessions are normally connections to text-based information services such as library catalogues.

At any time, it is possible to terminate the session (**quit**), to cancel the current processing (the command to do this will vary with Gopher clients), or to get the on-line help (**help**).

Most Gopher clients allow you to keep track of the exact location of Gopher items which you expect to use often, storing the information as a series of *bookmarks*. Your collection of bookmarks can be presented in the form of a customized Gopher menu. This facility is useful when you often need to reach a file or a service located far from the top-level directory.

Whichever Gopher server you are connected to, you can access other Gopher servers by exploring the *Other Gopher servers in the rest of the world* branch of the menu. Gopher servers are presented in geographical regions, to make them easier to find:

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

and then by countries within each region.

Using GOPHERMAIL

If you send the word **help** in the subject line of an e-mail message to one of the GopherMail servers, you will get instructions and information on using the system. The following information has been obtained from the help file.

You start a conversation with a GopherMail server by sending it an email message (with any or no subject and any or no message body). GopherMail will reply by sending you its main Gopher menu. Your email reply should contain the text of that menu, with the options you want to follow up marked by an "X" (or "x") anywhere near the beginning of the line, before the menu numbers for those options.

This process is repeated as many times as necessary.

Some items on Gopher menus are databases or college phone books. To search for a particular name or keyword(s), you simply send the name or keyword(s) on the *Subject:* line of the message in which you have put an "X" against the phone book or WAIS database menu option.

To save a few keystrokes, instead of putting X's at the start of menu lines, you can insert lines at the top of the reply which contain an "X" followed by the menu number that you want, such as:

```
x3
X15
```

The link information which the Gopher server will use to connect to the items on the menu is shown at the bottom of each email message, after the menu. You can make the GopherMail conversation more efficient by editing your replies to contain just the Gopher link information for the items you want.

You can build a type of *bookmarks* file by saving the links that you want to use again. Here's what you need:

```
Name=About GopherMail  <- Optional, it returns in the Subject:
Type=0                 <- Required, see below for a list of types
Port=70                <- Required only if different from port 70
Path=0/gophermail.helpfile
                       <- Usually required, depends on the link
Host=gopher.earn.net   <- Required. MUST be the last line
```

Supported types are:

0 Text File
1 Directory
2 CSO name server
4 Mac HQX file
7 Full Text Index (these are often WAIS database searches)
9 Binary File
s Sound

Binary and Sound Files are sent as uuencoded files.

GopherMail's options include:

- Message splitting after a certain file size
- Menu splitting after a certain number of menu items
- Re-using links saved in a *bookmarks* file
- Requesting the Gopher menu for a specific hostname
- Requesting the help file
- Selecting menu items using fewer keystrokes
- Requesting items from the Info-Mac Archive
- Requesting Gopher items with their raw link information

Many email gateways have size limits on email messages, so GopherMail output can be split into several messages if it exceeds a certain size. You can specify a maximum number of menu items to send in one message, or maximum size in bytes for text, HQX, binary and sound files.

There are two ways to specify size limits. The first way is to put *Menu=50* and/or *Split=30000* (for example) in the *Subject:* of your e-mail message. This would limit the output to 50 menu items per message, and would send files in messages of no more than 30,000 bytes.

The other way is to include these same instructions in the body of the message, on separate lines. For example:

```
Split=25K
Menu=75
```

You can include text after the *25K*. The "K" or "k" becomes "000" (which is a near approximation to 1024!).

Lines like these appear in all GopherMail menu messages, after the menu items and before the link information. They contain default values. You should edit these lines to contain the values that you want, and all subsequent menus will contain your preferred *Menu=* and *Split=* values. Setting these values to 0 (zero) has the effect of not splitting messages at all. The default is to split menus after 100 items, and files after 27,000 bytes. If *Split=* or *Menu=* appear in the *Subject:* of the message, these will override the values set in the message body.

You can specify a different host when requesting a top level Gopher menu by placing a fully qualified domain name as the *Subject:* of your message (such as *gopher.tc.umn.edu*). You can also specify a port other than the default of 70 by placing it after a fully qualified domain name in the subject (e.g. *darth.sdsc.edu 800*).

GopherMail was written in Perl by Fred Bremmer in September 1992. Nick Hengeveld helped with the TCP portion, and Matt Ranney provided the book on Perl and helped with some regular expressions. Several friends helped to find bugs and suggest improvements.

VERONICA

Veronica helps you find Gopher-based information without doing a menu-by-menu, site-by-site search. It provides a keyword search of more than 500 Gopher menus, so it is to the Gopher information space what archie is to the FTP archives. Veronica does not have to be started as another connection or another application, it is accessible from most top-level Gopher menus or from the *Other Gopher servers...* branch.

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

When you choose a veronica search, you will be prompted to enter a keyword or keywords. The simplest way to search with veronica is to enter a single word and hit the RETURN key. It does not matter whether the word is upper case or lower case. The veronica server will return a Gopher menu composed of items whose titles match your keyword specification. Items can be accessed as with any Gopher menu. E.g.:

```
eudora
```

will give you a list of menu titles which contain *eudora*, such as:

```
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.

The search string may contain keywords optionally separated by **and**, **or** and **not**. If there is no operator between two keywords, **and** is assumed. E.g.:

```
eudora and macintosh
```

will give you a list of menu titles which contain both *eudora* and *macintosh*, such as:

```
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.

"*" is the wildcard character. It can replace any other character or characters at the end of a keyword. E.g.:

```
desk*
```

will give you a list of menu titles, such as:

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

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 to the gopher-news mailing list, send a mail message to:
gopher-news-request@boombox.micro.umn.edu

Usenet newsgroup: **comp.infosystems.gopher**

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

What is WORLD-WIDE WEB

World-Wide Web (also called **WWW** or **W3**) is a hypertext-based information system. Any word in a hypertext document can be specified as a pointer to a different hypertext document where more information pertaining to that word can be found. The reader can open the second document by selecting the word (using different methods depending on the interface; in a mouse based system, a user would probably place the mouse over the word and click the mouse button); only the part of the linked document which contains relevant information will be displayed.

The second document may itself contain links to further documents. The reader need not know where the referenced documents are, because they will be obtained and presented as they are needed. World-Wide Web uses hypertext over the Internet: the linked documents may be located at different Internet sites.

The World-Wide Web also provides access to many of the other tools described in this guide, and is becoming widely used as the major means of access to Internet resources.

Special index documents have been created in the WWW information space and these can be searched for given keyword(s). The result is a new document which contains links to documents selected from the index.

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 the universe of network-accessible
information, an embodiment of human knowledge. It is an
initiative started at "CERN", now with many participants. It has
a body of software, and a set of protocols and conventions. W3
uses "hypertext" and multimedia techniques to make the web easy
for anyone to roam browse, and contribute to.
```

Selecting *hypertext* would display the following explanation for you:

```
                       WHAT IS HYPERTEXT
Hypertext is text which is not constrained to be linear.

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

```
HyperMedia is a term used for hypertext which is not constrained
to be text: it can include graphics, video and "sound", for
example. Apparently Ted Nelson was the first to use this term
too.
```

Then you could learn more about *links* and *Ted Nelson*.

The links in WWW are not confined to text only, so the term hypermedia is more accurate - for example, the link to *Ted Nelson* might point to a file containing a picture of Ted Nelson. The picture would be displayed on your screen, if your computer had a suitable screen and an image viewer.

Who can use WORLD-WIDE WEB

You must be on the international TCP/IP network (the *Internet*) in order to use a client on your computer to access WWW. If you are on the Internet, but don't have a WWW client on your computer, you can still enter the World-Wide Web because several sites offer public interactive access to WWW clients (see the **Remote clients** section under **How to get to World-Wide Web** below).

If you have e-mail access only, or if you are not on the Internet, then you can not fully exploit the vast potential of WWW. However, a *mail-robot* is available at the address: **listserv@info.cern.ch** which gives e-mail access to WWW-accessible files. (see **E-mail access** section under **How to get to World-Wide Web** below).

How to get to WORLD-WIDE WEB

Users access the World-Wide Web facilities via a client called a *browser*, which 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: this can be an easy way to start using WWW.

Local clients

Use of a local client is encouraged since it will provide 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-Windows. All these platforms support a simple line mode browser. In addition, graphical clients are available for: Macintosh, MS-Windows, X-Windows, NeXT and Unix. See the list of freely available client software in Appendix A.

Remote clients

To access a remote WWW client, telnet to the client site. If you are new to WWW, you should telnet to **info.cern.ch**. No login is needed for this, and you will immediately enter the WWW line mode browser.

Most remote clients are at sites with WWW servers holding information on specific areas. Telnet to the client site, and at the *login:* prompt enter **www**; no password is needed. Some of the publicly accessible clients were locally developed. The following remote client sites are available:

Site	Country	Server Specialization
info.funet.fi	Finland	
www.huji.ac.il	Israel	Environment
info.cern.ch	Switzerland (CERN)	High-energy physics
fatty.law.cornell.edu	USA	Law
www.cc.ukans.edu	USA	History
www.njit.edu	USA	

Using CERN as the entry point you will find information about WWW itself, with an overview of the Web and a catalogue of the databases sorted by subject.

E-mail access

You can obtain WWW files via mail to **listserv@info.cern.ch** using a **SEND** command. The **SEND** command returns the document with the given WWW address, subject to certain restrictions. Hypertext documents are formatted to 72 character width, with links numbered. A separate list at the end of the file gives the addresses of the related documents. A good file to start with would be: **http://info.cern.ch./hypertext/DataSources/bySubject/Overview.html**

Note that, despite the name *listserv* in the address of this *mail-robot*, it is not a LISTSERV server.

A note of caution from the WWW developers and maintainers:

*As the robot gives potential mail access to a *vast* amount of information, we must emphasise that the service should not be abused. Examples of appropriate use would be:*

- *Accessing any information about W3 itself;*
- *Accessing any CERN and/or physics-related or network development related information;*

Examples of INappropriate use would be:

- *Attempting to retrieve binaries or tar files or anything more than directory listings or short ASCII files from FTP archive sites;*
- *Reading Usenet newsgroups which your site doesn't receive;*
- *Repeated automatic use.*

There is currently a 1000 line limit on any returned file. We don't want to overload other people's mail relays or our server. We reserve the right to withdraw the service at any time. We are currently monitoring all use of the server, so your reading will not initially enjoy privacy.

Enjoy!

The W3 team at CERN (www-bug@info.cern.ch)

Using WORLD-WIDE WEB

The line mode browser:

The line mode browser is a simple user interface: references are shown as a number in square brackets next to each referenced word. Type the number and hit the RETURN key to follow a reference. For example, here is the beginning of the *Subject Catalogue* on the CERN server:

```
      The World-Wide Web Virtual Library: Subject Catalogue
         THE WWW VIRTUAL LIBRARY

This is a distributed subject catalogue. See also arrangement by
service type[1], and other subject catalogues of network
information[2].

Mail to maintainers of the specified subject or
www-request@info.cern.ch to add pointers to  this list, or if you
would like to contribute to administration of a subject area.

See also how to put your data on the web[3]

Aeronautics     Mailing list archive index[4]. See also NASA
                LaRC[5]

Agriculture     See Agricultural info[6], Almanac mail servers[7]
                the Agricultural Genome[8] (National Agricultural
                Library, part of the U.S. Department of
                Agriculture)

Archaeology[9]  Separate list

Astronomy and Astrophysics[10]
                Separate list.

1-64, Back, <RETURN> for more, Quit, or Help:
```

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 document other than the default, or if you want to change some other aspect of the usual interaction, a number of command line parameters and options are 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 the supplied keyword(s) are used to query the index specified by *docaddress*. 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 characters (FF).

-listrefs adds a list of the addresses of all document 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 following commands are available when using a line mode browser either as a local client or as a remote client. Some are disabled when not applicable (e.g. **Find** is enabled only when the current document is an index). CAPITAL letters indicate acceptable abbreviation; 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.

number type in one of the numbers shown in [] and hit the RETURN key to follow the link associated with the reference.

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

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 possible links to further details. **Find** can be omitted if the 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 relative 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.

Other interfaces:

When using a graphical interface, you access the WWW functions by pressing mouse buttons. Words are highlighted or underlined to indicate where a link exists. To follow a link, click on the word.

The most famous *graphical interface* is **Mosaic**, which is the state-of-the-art point and click interface. Mosaic is a WWW browser which also displays images and plays sounds, with the help of local utilities. Navigation within the web is intuitive and additional features (mailing feedback, customizing, etc.) are easy to use. Mosaic also provides an interface to the other information systems (WAIS, Gopher, etc.) thus giving access to all Internet resources from a single interface. Implementations for Macintosh, MS-Windows and X-Windows are available via anonymous FTP from **ftp.ncsa.uiuc.edu** in the directory **/Web**.

A good alternative for users without a graphical environment is **Lynx**. Lynx is a *full screen browser* for WWW using arrows and tab keys, cursor addressing and highlighted or numbered links to navigate within the web. Lynx has no image or sound capabilities: any images or sounds are replaced by a tag at display time and the corresponding files can be retrieved separately. Unlike the line mode browser, documents containing embedded images or enhanced document formats (e.g. formulaires) are handled properly by Lynx. A demonstration version of Lynx is available using Telnet to **www.cc.ukans.edu** (login as *www*). Implementations for various Unix flavours and for VMS are available via anonymous FTP from **ftp2.cc.ukans.edu** in the directory **/pub/WWW/lynx**.

Examples

WWW gives you access to an information universe. Let's say you want to know how many film versions of *The Three Musketeers* have been made. You browse *The WWW Virtual Library* and select Movies:

```
                                Cardiff's Movie Database Browser.
            CARDIFF'S MOVIE DATABASE BROWSER.

UK Postal Quiz [1] There's now a way to set permanent[2] links to
specific names and titles.


Movie title substring searching.[3] (for non-forms browsers) Movie
people substring searching.[4] (for non-forms browsers)

Lookup titles by genre.[5] (uses plot summary info. 652 titles so
far, many more on the way)

List my votes[6]. If you've voted for movies, your votes are here.

On this day in history..[7](who was born and who died)

The rec.arts.movies top 40 films[8] and  bottom 40 films.[9]

Top 20[10]s of busy people.

Famous marriages.[11]

1-18, Up, <RETURN> for more, Quit, or Help: 3
```

You select Movie titles, and then type *three musketeers* as keywords:

```
                                                    Movie Info (27/27)
Example, to search for movies with the word ``alien'' in their
title, type ``alien''.

This will return details on several movies, including Aliens

Note: if the title begins with A or The, leave it out. If you're
determined to include it, then put  ', A' or ', The' at the end
of the of the substring e.g.

   Enforcer, The

   Gauntlet, The

Searching is case insensitive.

[1]

                                                          Rob.H[2]

                                          Robert.Hartill@cm.cf.ac.uk

FIND <keywords>, 1-2, Back, Up, Quit, or Help: three musketeers
```

You find that there have been seven film versions of the story:

```
                                                          Movie Info
                               TITLE SUBSTRINGS.

Here are the results from the search for three musketeers

                      Three Musketeers, The (1921)[1]
                      Three Musketeers, The (1933)[2]
                      Three Musketeers, The (1935)[3]
                      Three Musketeers, The (1939)[4]
                      Three Musketeers, The (1948)[5]
                      Three Musketeers, The (1974)[6]
                      Three Musketeers, The (1993)[7]

                  I haven't found the item you wanted ?, why ?[8]

Note titles in quotes (") are TV series.

[9]
```

```
                                                              Rob.H[10]

                                           Robert.Hartill@cm.cf.ac.uk

FIND <keywords>, 1-10, Back, Up, Quit, or Help: 1
```

You decide to look for more information on the *1921* version:

```
                                                             Movie Info
                         MOVIE DETAILS.

                   THREE MUSKETEERS, THE (1921)

1921

Cast          Leon Barry[1] ......Athos
              Charles Belcher[2] ......Bernajoux
              Nigel De Brulier[3] ......Cardinal Richelieu
              Marguerite De La Motte[4] ......Constance Bonacieux
              Douglas Fairbanks[5] ......D'Artagnan
              Sidney Franklin[6] ......Monsieur Bonacieux
              Thomas Holding[7] ......Duke of Buckingham
              Boyd Irwin[8] ......Comte de Rochefort
              Barbara La Marr[9] ......Milady de Winter
              Mary MacLaren[10] ......Queen Anne of Austria
              Adolphe Menjou[11] ......Louis XIII
              Eugene Pallette[12] ......Aramis
              Lon Poff[13] ......Father Joseph
              Willis Robards[14] ......Captain de Treville
              George Siegmann[15] ......Porthos
              Charles Stevens[16] ......Planchet
1-37, Back, Up, <RETURN> for more, Quit, or Help: 11
```

You're hooked! You decide to look for more information on *Adolphe Menjou*, search more titles, find Oscar winners, etc.

Learning more about WORLD-WIDE WEB

World-Wide Web is being developed at CERN (European Particle Physics Laboratory) by the World-Wide Web team led 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**, via anonymous FTP or using the remote WWW client.

Mailing lists: **www-talk@info.cern.ch**
To subscribe send an e-mail message to **www-talk-request@info.cern.ch**

Usenet newsgroup: **comp.infosystems.www**

Mosaic is being developed at NCSA (National Center for Supercomputing Applications), Urbana Champain, Illinois, by Marc Andreessen and Eric Bina. Bug reports, comments, suggestions, etc. should be mailed to: **mosaic@ncsa.uiuc.edu**

On-line documentation is available from **ftp.ncsa.uiuc.edu**, via anonymous FTP, or from **www.ncsa.uiuc.edu**, using a WWW client.

Lynx is being developed at the University of Kansas by Lou Montulli.

On-line documentation is available from **ftp2.cc.ukans.edu**, via anonymous FTP, or from **www.cc.ukans.edu**, using a WWW client.

Part 2
SEARCHING DATABASES

WAIS

What is WAIS

WAIS, Wide Area Information Server, are databases containing mostly text-based documents (although WAIS documents may contain sound, pictures or video as well). WAIS databases are referred to as *sources*. The databases may be organized in different ways, using various database systems, but the user is not required to learn the query languages of the different databases. The WAIS client uses natural language queries to find relevant documents which contain the words of the query. WAIS databases are available on topics ranging from *Agriculture* to *Social Science*.

Who can use WAIS

You must be on the international TCP/IP network (the *Internet*) in order to use a WAIS client on your computer to access WAIS sources.

If you have e-mail access only, or if you are not on the Internet, you can still exploit some of the potential of WAIS. An interface which gives e-mail access to WAIS databases is available at the address: **WAISmail@quake.think.com** (see **E-mail access** section under **Using WAIS** below).

How to get to WAIS

There are many WAIS servers throughout the network. A *directory-of-servers* database is available at several sites, which can be queried to find out what databases are available on a particular subject. The *directory-of-servers* database is also available via anonymous FTP from **ftp.wais.com** in the directory **/pub/directory-of-servers** in the distribution **wais-sources.tar.Z** as file **directory-of-servers.scr**.

If you do not have access to a WAIS client, at least two demonstration sites are available to allow you to get acquainted with WAIS. You can telnet to:

quake.think.com	(login: wais)
sunsite.unc.edu	(login: swais)

The two demonstration sites above run *swais* (Screen WAIS), a simple WAIS client for Unix.

Using WAIS

There are many freely available WAIS client programs for various operating systems (Unix, VMS, MVS, MS-DOS, OS/2 and Macintosh) and for specific environments (e.g. X-Windows, Openlook, NeXT, and MS-Windows). See the list of freely available client software in Appendix A.

The client interface differs slightly on different platforms, but the queries are performed in the same way whatever interface is in use.

- Step 1: The user selects a set of databases to be searched.
- Step 2: The user formulates a query consisting of 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. The WAIS client retrieves the document and displays its contents on the screen.
- Step 6: If not enough documents are found, the user can state the question differently or can select a set of documents.
- Step 7: A further search will look for documents which have a large number of words in common with the selected documents.

E-mail access:

You can query WAIS databases and retrieve documents by sending commands in the body part of an e-mail message to **WAISmail@quake.think.com**. The *Subject:* line is ignored. The important commands are given below (a vertical bar (|) indicates a choice of parameters):

help to get the help file

maxres number to set the maximum number of results (i.e. documents) to be returned.

search source-name | "source-name1 source-name2 ..." keywords
where:

source-name is a source name as found in the directory-of-servers (with or without the .src ending). Use double-quotes (") to group several sources to be searched.

keywords are the words you would normally type into a query.

You may specify several search requests in a mail message. If you don't know what sources you can search, just try anything. If the source name is not recognised, you will be given a list of sources.

retrieve docid retrieves a document from a database. *docid* is a *Document IDentifier* as returned by a search. You may put more than one retrieval request in a mail message, but you must leave a blank line between requests. The *docid* must be written exactly as returned by a search request, including any spaces. You can retrieve non-text documents as well as text. If the document is of type *TEXT* or *WSRC* you will get the result directly. Other types will be UUENCODED before being transmitted.

DocID: docid same as **retrieve**. This form is identical to the form which is returned by a search request, which makes it easy to use the *reply* mail function to retrieve results.

Examples

When you log in to the demonstration site at **quake.think.com**, you have immediate access to the directory-of-servers database via the swais client software. To find recipes using papaya, you would select the *recipes* database and give *papaya* as the keyword. Here are the results of the search:

```
  #  Score Source                  Title                     Lines
001: 1000 (recipes) arielle@ta Re: Dawn's Muffins, Pt III     339
002: 1000 (recipes) arielle@ta Re: Muffins 3                  632
003: 1000 (recipes) arielle@ta Re: Pineapple                  678
004:  750 (recipes) arielle@ta Re: Pork and Papaya Salad       33
005:  750 (recipes) arielle@ta Re: Bread                      681
006:  500 (recipes) roder@cco. Re: NONFAT BAKERY COLLECTION   423
007:  500 (recipes) shiva@hoss Re: Juice Recipes               65
008:  250 (recipes) arielle@ta Re: Prawn Salad                 49
009:  250 (recipes) arielle@ta Re: COLLECTION: Lots of Avoca  447
010:  250 (recipes) mecca@acsu Re: REQUEST: blender-made fru   29
011:  250 (recipes) Ann.Adamci Re: Re: REQUEST: blender-made   38
012:  250 (recipes) patth@Pani Re: Re: REQUEST: blender-made   49
013:  250 (recipes) arielle@ta Re: Avocados                   459
014:  250 (recipes) red_trek@d Re: VEGAN: red beans and rice   78
```

You can then select any of the above documents for viewing. Here is the *Pork and Papaya Salad* recipe:

```
Newsgroups: rec.food.recipes
From: arielle@taronga.com (Stephanie da Silva)
Subject: Pork and Papaya Salad
Message-ID: <5BBP2SB@taronga.com>
Date: Mon, 29 Mar 1993 06:51:47 GMT
```

```
Lines: 23

1/4 cup dried currants
1/2 cup balsamic vinegar
1/4 cup walnut oil
1/4 cup chicken broth
1 tablespoon honey
1/4 teaspoon ground cinnamon
1 pound cooked boneless pork loin roast
1 head Belgian endive
Bibb lettuce leaves
2 papayas, seeded, peeled and sliced lengthwise
2 avocados, seeded, peeled and sliced lengthwise
1/4 cup broken walnut pieces

In a small bowl pour enough boiling water over currants to cover.
Let stand 5 minutes; drain. For dressing, in a screw-top jar
combine vinegar, oil, chicken broth, honey, and cinnamon. Cover;
shake well. Trim fat from pork; slice thinly. Separate leaves of
Belgian endive. Line 6 salad plates with lettuce leaves. Arrange
pork, endive, papaya, and avocado on plates. Sprinkle with
currants and walnuts. Drizzle dressing over salads.

Stephanie da Silva                              arielle@taronga.com
```

If you give more than one keyword, then all documents containing any of the keywords will be listed.

Learning more about WAIS

A bibliography of documents, services and sources for WAIS is maintained by Barbara Lincoln Brooks of WAIS Inc. The bibliography is available from **ftp.wais.com** in the directory **/pub/wais-inc-doc** along with many other WAIS documents. WAIS Inc. provides commercial WAIS software and services. The support for the freely available version, called **freeWAIS**, is assumed by the Clearinghouse for Network Information Discovery and Retrieval (CNIDR).

For information on **freeWAIS** software contact **freewais@cnidr.org**

There are currently four main FTP sites for WAIS documentation and software:

ftp.cnidr.org	ftp.wais.com
quake.think.com	sunsite.unc.edu

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.

Part 3
FINDING NETWORK RESOURCES

ARCHIE

What is ARCHIE

Archie is a service which helps users to locate files and directories on anonymous FTP servers anywhere on the *Internet*.

Administrators all over the world register anonymous FTP servers with the archie service; once a month the archie service runs a program which scans the directories and filenames contained in each of the registered FTP servers, and generates a grand merged list of all the files and directories contained in all the registered servers. More than 1000 anonymous FTP sites are now represented in this list, which is referred to as the archie database. The archie database currently contains more than 2,100,000 filenames.

The archie database is made available on several archie servers, all of which contain the same information.

Administrators can also provide a short description of software packages contained in the files or directories at their site, but do not have to do so. The descriptions may or may not be kept up to date: there is no pressure on administrators to do this.

Files made available at anonymous FTP sites contain software packages for various systems (MS-Windows, MS-DOS, Macintosh, Unix, etc.), utilities, information or documentation, mailing lists or Usenet group discussion archives. At most FTP sites, the resources are organized hierarchically in directories and subdirectories. The archie database contains both the directory path and the file names.

Who can use ARCHIE

The archie database is available to all users of the Internet, and can also be accessed via electronic mail. See the section **Using ARCHIE** below for details.

How to get to ARCHIE

The archie database is maintained in the following locations:

Host	Country	Host	Country
archie.au	Australia	archie.kr	Korea
archie.edvz.uni-linz.ac.at	Austria	archie.sogang.ac.kr	Korea
archie.univie.ac.at	Austria	archie.nz	New Zealand
archie.uqam.ca	Canada	archie.rediris.es	Spain
archie.funet.fi	Finland	archie.luth.se	Sweden
archie.th-darmstadt.de	Germany	archie.switch.ch	Switzerland
archie.doc.ic.ac.uk	GB	archie.ncu.edu.tw	Taiwan
archie.ac.il	Israel	archie.ans.net	USA
archie.unipi.it	Italy	archie.internic.net	USA
archie.kuis.kyoto-u.ac.jp	Japan	archie.rutgers.edu	USA
archie.wide.ad.jp	Japan	archie.sura.net	USA
archie.unl.edu	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

You are requested to respect a few basic rules when you look for information on 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 help to reduce the load on the server sites, so please use them.
- use the archie server closest to you and, in particular, don't overload the transatlantic lines.

The three ways of accessing the archie database, via a local client, via an interactive Telnet session or using electronic mail, are described below.

Note that version 3.0 of the archie server is now available, and some of the commands for interactive access and the e-mail interface are slightly different from previous versions of the server (2.11 and earlier). Command formats marked with a (+) are valid in version 3.0 only, those marked with a (*) are acceptable only in previous versions. You can use the **version** command to find out which version is installed at any particular server.

Using a local client:

You are encouraged to use a local archie client because the archie server does not then have to provide you with an interactive interface: requests from your local client to the archie server will be non-interactive, and will thus place less of a burden on the server. Server performance will be increased and response time will improve for all users.

Public domain clients for accessing archie servers are available for: Macintosh, MS-DOS, OS/2, VMS, NeXT, Unix and X-Windows. All these platforms support a simple command line client; the *xarchie* client for the X Window System provides a graphical user interface. The clients are available from the archie sites using anonymous FTP, and are in the directories **/pub/archie/clients** or **/archie/clients**.

Archie client command and parameters

A graphical interface (GUI), enables you to access the archie functions by pressing mouse buttons in order to select menu options.

Archie clients written for use without a graphical user interface require you to type in the command **archie**, followed by one or more parameters. If you omit the parameters you are given a list of the possible parameters with a short description of each one. A description of the parameters is given below, where angle brackets (<>) indicate an optional parameter and a vertical bar (|) indicates a choice of parameters.

archie <-parameters> string | pattern

where the optional parameters 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 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 which archie server should be used; 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 server.

The following group of optional parameters 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 slight differences in the options available with different clients on different platforms.

The result is a list of FTP site addresses which contain files or directories matching the argument, together with the size of the file, 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:

You can use Telnet to connect to an archie server interactively (see the list of servers in the section **How to get to ARCHIE** above). At the *login:* prompt enter **archie**. The login procedure leaves the user at the prompt *archie>* indicating that the server is ready for user requests.

Archie servers respond to the commands listed below; the way they respond can be defined using the special command set, which changes the values of a set of variables described at the end of this section.

The following commands are available:

exit, quit, bye exits archie.

help <command-name>
invokes the on-line help. If a *command-name* is given, the help request is restricted to that command. Pressing the RETURN key exits from the on-line help.

list <pattern> provides a list of the FTP servers in the database and the time at which they were last updated. The result is a list of site names, with the site IP address and date of the last update in the database. The optional parameter limits the list to sites matching *pattern*: the command **list** with no *pattern* will list all sites in the database (more than 1000 sites!). E.g.

```
list \.de$
```

will list all German sites

site(*) site-name lists the directories and subdirectories held in the database from a particular *site-name*. 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
find(+) string | pattern
searches the database for *string* or *pattern*. Searches may be performed in a number of different ways specified in the variable *search*, which also determines whether the parameter is treated as a string or as a pattern. The search produces a list of FTP site addresses which contain filenames matching the pattern or containing the string, the size of the file, its last modification date and its directory path. The number of matches is limited by the *maxhits* variable. The list can be sorted in different ways, depending on the value of the *sortby* variable. By default, the variables *search*,

maxhits and *sortby* are set to, respectively, exact match search on *string*, 1000 hits and unsorted resulting list. A search can be aborted by typing the keyboard interrupt character; the list produced at that point will be displayed. See the **Examples** section below for an example of the **prog** command and its results.

mail <email> <,email2...>
places the result of the last command in a mail message and dispatches specified e-mail address(es). If no mail address is specified as a parameter, the result is sent to the address specified in the variable *mailto*.

show <variable> displays the value of the given variable. If issued with no argument, it displays all variables. The archie variables are shown below with the details of the **set** command.

set variable value changes the value of the specified archie variable. The variables specify how other archie commands should operate.

Variables and values are:

compress(+) compress-method
specifies the compression method (*none* or *compress*) to be used before mailing a result with the mail command. The default is none.

encode(+) encode-method
specifies the encoding method (*none* or *uuencode*) to be used before mailing a result with the mail command. This variable is ignored if compress is not set. The default is none.

mailto email <,email2 ...>
specifies the e-mail address(es) to be used when the **mail** command 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, e.g.:

```
"is" will match "islington" and "this" and
"poison"
```

subcase as above but the search is case sensitive, e.g.:

```
"TeX" will match "LaTeX" but not "Latex"
```

exact the parameter of **prog** (*string*) must EXACTLY match the string in the database (including case). The fastest search method of all, and the default.

regex — *pattern* is used as a Unix regular expression to match filenames during the database search.

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 files or directories in the list, largest first.

filename — on file or directory name in lexical order.

none — unsorted (default)

Reverse sorts can be carried out by prepending *r* to the *sortby* value given (e.g. *rhostname* instead of *hostname*).

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, e.g.:

```
set term xterm 24 100
```

Using electronic mail:

Users limited to electronic mail connectivity can access the archie servers. The domain addresses of the servers are listed in the section **How to get to ARCHIE** (e.g. *archie@archie.ac.il*).

The electronic mail interface to an archie server recognizes a subset of the commands described in **Using Telnet**. These are described below. An empty message, or a message containing no valid requests, is treated as a **help** request.

Archie commands are sent in the body part of the mail message, but the *Subject:* line is processed as if it were part of the main body. Command lines begin in the first column; all lines that do not match a valid command are ignored.

help — sends you the help file. The **help** command is exclusive, so other commands in the same message are ignored.

path return-address
set mailto(+) 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.

list pattern <pattern2 ...>
requests a list of the sites in the database that match *pattern*, with the time at which they were last updated. The result is a list with site names, site IP addresses and date of each site's last update in the database.

site(*) site-name
lists the directories and subdirectories of *site-name* in the database.

whatis string <string2 ...>
searches the descriptions of software packages for each *string*. The search is case insensitive.

prog pattern <pattern2 ...>
find(+) pattern <pattern2>
uses *pattern* as a Unix regular expression to be matched when searching the database. If multiple *patterns* are placed on one line, the results will be mailed back in one message. If several lines are sent, each containing a prog command, 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 insensitive.

compress(*) causes the result of the current request to be *compressed* and *uuencoded*. When you receive the reply, you should run it through *uudecode*, to produce a .Z file. You can then run *uncompress* on the .Z file and get the result of your request.

set compress(+) compress-method
specifies the compression method (*none* or *compress*) to be used before mailing the result of the current request. The default is none.

set encode(+) encode-method
specifies the encoding method (*none* or *uuencode*) to be used before mailing the result of the current request. This variable is ignored if compress is not set. The default is none.

Note: set compress compress and **set encode uuencode** would produce the same result as the former **compress** command.

quit nothing past this point is interpreted. Useful if a signature is automatically appended to the end of your mail messages.

Description of *pattern*

A *pattern* is a specification of a character string, and may include characters which take a special meaning. The special meaning will be lost if "\" is put before the character. The special characters are:

. (period) this is the wildcard character that replaces any single character, e.g. "...." will match any 4-character string.

^ (caret) if "^" appears at the beginning of the pattern, then only strings which start with the substring following the "^" will match the pattern. If the substring occurs anywhere else in the string it does not match the pattern, e.g.:

```
"^efghi" will match "efghi" or "efghijlk" but not
"abcefghi"
```

**$** (dollar) if "$" appears at the end of the pattern, then the searched string must end with the substring preceding the "$". If the substring occurs anywhere else in the searched string, it is not considered to match, e.g.:

```
"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
```

or

```
find eudora
```

then archie will send you the following results:

```
Host ftp.ascii.co.jp    (133.152.1.1)
Last updated 03:38  8 Aug 1993

 Location: /pub/MAC
   DIRECTORY  drwxrwxr-x 2048 bytes 00:00  6 May 1992  eudora

Host ftp.ascii.co.jp    (133.152.1.1)
Last updated 03:38  8 Aug 1993

 Location: /pub/MAC/eudora
   FILE  -r--r--r-- 281139 bytes 00:00 21 Oct 1991  eudo-
ra1.2.2.sit.hqx

Host ftp.ci.ua.pt    (192.80.21.201)
Last updated 04:53  9 Aug 1993

 Location: /pub/NetNews/comp.binaries.mac
   FILE  -rw-r--r-- 438 bytes 12:04 10 Jul 1993  Eudora1.3.readme

Host ftp.ci.ua.pt    (192.80.21.201)
Last updated 04:53  9 Aug 1993

 Location: /pub/NetNews/comp.binaries.mac
   FILE  -rw-r--r-- 278912 bytes 12:04 10 Jul 1993  Eudo-
ra1.3.sit.bin
```

etc.

If you send the command **list \.de$** by e-mail or in a Telnet session, then you will get the following results:

```
alice.fmi.uni-passau.de          132.231.1.180  12:31  8 Aug 1993
askhp.ask.uni-karlsruhe.de       129.13.200.33  12:25  8 Aug 1993
athene.uni-paderborn.de           131.234.2.32  15:21  6 Aug 1993
bseis.eis.cs.tu-bs.de             134.169.33.1  00:18 31 Jul 1993
clio.rz.uni-duesseldorf.de        134.99.128.3  12:10  8 Aug 1993
cns.wtza-berlin.de                141.16.244.4  16:08 31 Jul 1993
```

etc.

If you send the command **whatis compression** by e-mail or in a Telnet session, then you will get the following results:

```
RFC 468      Braden, R.T. FTP data compression 1973 March 8; 5p.
arc          PC compression program
deltac       Image compression using delta modulation
spl          Splay tree compression routines
squeeze      A file compression program
uncrunch     Uncompression program
unsqueeze    Uncompression programs
```

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**. In addition, the database administrator at a particular archie server can be contacted at **archie-admin@address.of.archie.server**, e.g.: **archie-admin@archie.ac.il**.

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. Archie is now supported by Bunyip Information Systems Inc., Canada.

HYTELNET

What is HYTELNET

Hytelnet is a simple hypertext browsing system whose *database* contains addresses of Internet sites which can be reached via Telnet (these include libraries, Campus-Wide Information Systems, Gopher, WAIS, WWW systems, and Freenets), information about Telnet itself, information about using library catalogues, and an Internet glossary. The database is downloaded and stored locally, so it is possible to add new information to the local version of the database - perhaps to include new sites, or some local help information. An *html* version of the Hytelnet database is now available for use on World-Wide Web servers.

It is clearly important to possess the most uptodate version of the database, and there is an electronic mailing list which keeps its members informed about new versions of the Hytelnet program, and about changes and additions to the database files.

Commands embedded in the Hytelnet system make it easy for users to initiate Telnet sessions to sites selected from the database.

Who can use HYTELNET

Versions of Hytelnet are available for Unix, VMS, IBM PC, and Apple Macintosh computers which are connected to the Internet (worldwide TCP/IP network). The IBM PC version uses Neil Larson's *HYPERRES* browser, and the other versions listed above use the same file format as HYPERRES. An *html* version, suitable for use with a World-Wide Web (WWW) server, is now available.

How to get to HYTELNET

Hytelnet is normally used as a local system, but the Unix version is available for trial use via Telnet at **access.usask.ca**, with the login *hytelnet* (all lowercase, no password required). It is not possible to start Telnet sessions from this trial version.

The WWW version of the database can be viewed at the University of Kansas using the URL (Universal Resource Locator): **http://www.cc.ukans.edu/hytelnet_html/START.TXT.html**. This version of the database can be downloaded to a local WWW server using the URL **http://www.cc.ukans.edu/hytelnet_html.tar.Z**.

The files which will constitute a local Hytelnet system are available via anonymous FTP from **ftp.usask.ca**, in the directory **/pub/hytelnet**. The database files, for use with all versions of the software, are included in the directory containing the IBM PC version.

Using HYTELNET

The Hytelnet database is constantly being updated, with new sites being added to it regularly. Updates to the html version follow within a week of updates to the *master* version.

Local system:

The Unix version of the Hytelnet system is described here. Other versions are quite similar.

Hytelnet is started with the command:

hytelnet < options >

It is not necessary to specify any options, but the following options are available:

path location of the default database, if it is not stored in the same directory as the Hytelnet client.

filename Hytelnet displays the contents of this file, instead of its usual default start file. *filename* is assumed to be in the default Hytelnet database if no path is specified.

-secure disables external commands; no Telnet sessions can be started if this option is selected

-name disable use of Internet name; no Telnet sessions can be started if this option is selected.

-number disable use of Internet number; Telnet sessions can be started quoting the Internet name, but not the number.

After starting Hytelnet, you are presented with the following menu:

```
        Welcome to HYTELNET version 6.6
                October 10, 1993

       What is HYTELNET?          <WHATIS>
       Library catalogs           <SITES1>
       Other resources            <SITES2>
       Help files for catalogs    <OP000>
       Catalog interfaces         <SYS000>
       Internet Glossary          <GLOSSARY>
       Telnet tips                <TELNET>
       Telnet/TN3270 escape keys  <ESCAPE.KEY>
       Key-stroke commands        <HELP>
............................................................
```

```
Up/Down arrows MOVE  Left/Right arrows SELECT  ? for HELP anytime

   m  returns here     i  searches the index       q  quits
   .............................................................

              HYTELNET 6.6 was written by Peter Scott
             E-mail address: aa375@freenet.carleton.ca
```

The words enclosed in angle brackets (<>), are usually *references* to files which contain information, but they may be references to system commands. In the menu above, *<WHATIS>* is a reference to a file which contains help information about Hytelnet. This reference is highlighted when Hytelnet starts; using the downarrow key you can move down the list to highlight each reference in turn. The contents of any reference can be viewed by pressing the right arrow key while the reference is highlighted. The **uparrow key** is used to move back to the previous reference.

Some references point to files containing menus, which are used in the same way as the first menu described above. The **left arrow key** is used to return to a previous menu, and takes effect immediately from anywhere within a menu (in other words, it is not necessary to step backwards through the contents of the present menu in order to backtrack to the previous menu).

Some of the reference files contain large amounts of information (e.g. *GLOSSARY* contains a glossary of Internet terms, *SYS000* contains information on using the most common library catalog packages, *SITES2* contains references to other files which contain information on a large number of internet resources, together with their IP addresses).

Reference files may contain the text of a Telnet command, complete with IP address; selecting one of these will initiate a Telnet session. You will be asked to confirm that you really want to do this before a Telnet connection is started.

The keystrokes available are:

Downarrow move down to the next item on the current menu.

Uparrow move to the previous item on the current menu (if any).

Rightarrow select the currently highlighted item.

Leftarrow move back to the previous menu (if any).

q quit from Hytelnet.

m return to the first menu.

i an index file is maintained, which contains the name of every file in the Hytelnet database, with a sentence describing its contents. After pressing **i**, you will see the prompt *Search Index*. You should type a string of characters, and you will be shown a list of files in the local database whose title contains the string. You can select any of these in the usual way.

Slightly different keystrokes may be available for Hytelnet clients on different platforms, but all clients will offer the same functionality.

Examples

Starting Hytelnet with no options specified, you see the following menu:

```
             Welcome to HYTELNET version 6.6
                       October 10, 1993

              What is HYTELNET?          <WHATIS>
              Library catalogs           <SITES1>
              Other resources            <SITES2>
              Help files for catalogs    <OP000>
              Catalog interfaces         <SYS000>
              Internet Glossary          <GLOSSARY>
              Telnet tips                <TELNET>
              Telnet/TN3270 escape keys <ESCAPE.KEY>
              Key-stroke commands        <HELP>
   .............................................................
Up/Down arrows MOVE  Left/Right arrows SELECT  ? for HELP anytime

     m  returns here   i  searches the index   q  quits
   .............................................................

           HYTELNET 6.6 was written by Peter Scott
          E-mail address: aa375@freenet.carleton.ca


Search Index:
```

Using the downarrow key to highlight Other resources, then pressing the *rightarrow key*, you will see the following:

```
            Other Telnet-accessible resources

          <ARC000>  Archie: Archive Server Listing Service
          <CWI000>  Campus-wide Information systems
          <FUL000>  Databases and bibliographies

          <DIS000>  Distributed File Servers (Gopher/WAIS/WWW)
          <BOOKS>   Electronic books
```

```
<FEE000>  Fee-Based Services

<FRE000>  FREE-NETs & Community Computing Systems
<BBS000>  General Bulletin Boards
<HYT000>  HYTELNET On-line versions

<NAS000>  NASA databases
<NET000>  Network Information Services
<DIR000>  Whois/White Pages/Directory Services

<OTH000>  Miscellaneous resources
```

Selecting the first item on this list, you will see:

```
                 Archie: Archive Server Listing Service

<ARC005> Advanced Network & Services, Inc (USA)
<ARC003> Deakin File Server (Australia)
<ARC002> Finnish University and Research Network Server (Finland)
<ARC008> Hebrew University of Jerusalem (Israel)
<ARC006> Imperial College, London (England)
<ARC016> InterNIC Directory and Database Server
<ARC017> Johannes Kepler University, Linz, (Austria)
<ARC001> McGill School of Computer Science Server (Canada)
<ARC010> Melbourne (Australia)
<ARC012> National Central University, Chung-li, (Taiwan)
<ARC011> Rutgers University Archive Server (USA)
<ARC014> Sogang University (Korea)
<ARC004> SURAnet Server (USA)
<ARC013> Technische Hochschule Darmstadt (Germany)
<ARC015> University of Lulea (Sweden)
<ARC007> University of Nebraska, Lincoln (USA)
<ARC019> University of Quebec at Montreal
<ARC009> Victoria University, Wellington (New Zealand)
<ARC018> Vienna University (Austria)
```

---

and selecting the last item on this list, you will see:

```
                      Vienna University (Austria)

TELNET ARCHIE.UNIVIE.AC.AT or 131.130.1.23
login: archie

If you have any problems with archie, send mail to
archie-admin@univie.ac.at
# Bunyip Information Systems, 1993
# Terminal type set to `vt100 24 80'.
# `erase' character is `^?'.
# `search' (type string) has the value `regex'.
```

At this point, if you press the *rightarrow key*, you will see the following:

```
                      Vienna University (Austria)

TELNET ARCHIE.UNIVIE.AC.AT or 131.130.1.23
login: archie

If you have any problems with archie, send mail to
archie-admin@univie.ac.at
# Bunyip Information Systems, 1993
# Terminal type set to `vt100 24 80'.
# `erase' character is `^?'.
# `search' (type string) has the value `regex'.

TELNET ARCHIE.UNIVIE.AC.AT Proceed (y/n)?
```

at this point you can use *rightarrow* or *y* to start a Telnet session, or either *leftarrow*, *uparrow* or *n* to cancel the Telnet session.

Learning more about HYTELNET

Hytelnet and its database of Internet-accessible Telnet sites was developed by Peter Scott, Systems Department, University of Saskatchewan Libraries. He can be contacted at **aa375@freenet.carleton.ca**. Peter Scott's article *Using Hytelnet to Access Internet Resources* can be obtained by sending an email message to **LISTSERV@UHUPVM1.UH.EDU**; the message body should contain the line:

GET SCOTT PRV3N4 F=MAIL

The Unix version was developed by Earl Fogel of the University of Saskatchewan; enquiries about this version should be directed to **fogel@herald.usask.ca**. The Macintosh version was written by Charles Burchill of the University of Manitoba; enquiries to **burchil@ccu.umanitoba.ca**. Inquiries about the html version should be directed to Lou Montulli at **montulli@edu.ukans.cc.stat1**

You can join a mailing list, **HYTEL-L**, which will inform you about new versions of the Hytelnet program, and about new, updated, or deleted files. To subscribe to HYTEL-L, send mail to **LISTSERV@KENTVM.KENT.EDU** (or **LISTSERV@KENTVM.BITNET**). The body of the mail message should contain the single line:

subscribe hytel-l Your Full Name

Part 4
FINDING PEOPLE AND COMPUTERS

WHOIS

What is WHOIS

The **WHOIS** service provides a way of finding e-mail addresses, postal addresses and telephone numbers of network users. It may also deliver information about networks, networking organizations, domains and sites. This service was originally called *NICNAME*, but WHOIS is now the name in widest use.

The Internet Registration Service maintains an important database of networking information, the *InterNIC* database. 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 it maintained a database known as the NIC database. The NIC database is now restricted to information about the *.mil* domain. Many documents still refer to this database.

Individual Internet sites also maintain databases, containing information about their site only. Many academic sites maintain their own database with information about their staff members and students.

The information held in these databases is made available by WHOIS servers which receive requests from WHOIS clients, using the WHOIS protocol, search one of the databases, and send back information. The current implementation of WHOIS has limitations which mean that it is not efficient at dealing with a large volume of information and numerous requests: the various WHOIS servers have no knowledge of each other, a database is maintained at each server site, and, finally, new functionalities have been implemented locally at various sites and not propagated to other sites.

A new extended protocol, **WHOIS++**, is being specified. It will include the various local enhancements to the WHOIS service, it will have an improved query syntax and its architecture will allow a real distributed directory service for the entire Internet. The WHOIS++ protocol will be made available shortly.

Who can use WHOIS

WHOIS is available to all users on the international TCP/IP network (the *Internet*).

WHOIS servers can be accessed using a local WHOIS client, which will interact with the server across the Internet, or via an interactive Telnet session. In addition, the InterNIC offers an electronic mail interface to the database it maintains. These methods are described below in the **Using WHOIS** section.

WHOIS servers should only be used for isolated queries about specific information. It is not usually acceptable to make an extended series of queries in order 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.

How to get to WHOIS

A list of registered WHOIS sites is available via anonymous FTP from **rtfm.mit.edu** in the file **/pub/whois/whois-servers.list**. Each individual 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 where to find information about other institutions.

The InterNIC database is used in the examples at the end of this section; its address is **whois.internic.net**.

The WHOIS database of the European IP Networks is held at **whois.ripe.net**.

Using WHOIS

The three methods of using WHOIS are described below; 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 a WHOIS client or not. The format is:

whois <-h site-name> identifier

This will search the database on the specified site for an entry which contains identifier, where:

site-name is the domain address of the site which hosts the database you want to query (e.g. *whois.internic.net*). On some installations, the default value is still set to the old 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 in *identifier* to specify the search:

. before *identifier* will cause a name-only search.

! before *identifier* will cause a handle-only search.

... or . after *identifier* will cause a partial search: everything starting with *identifier* will match.

@ in *identifier* will cause a search on the e-mail addresses.

***** before *identifier* will return the entire membership list of the entry that matches *identifier* (e.g. a site and its registered users).

% before *identifier* will return only the membership list of the entry that matches *identifier* (e.g. the registered users of a site).

The special characters may be used together.

The results are displayed in one of two 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 parentheses after the name.

Using Telnet:

WHOIS databases may or may not have Telnet access; the InterNIC database does, and the functions shown below are available there. No login is required for this service.

In the following descriptions, CAPITAL letters indicate acceptable abbreviation; angle brackets (<>) indicate an optional parameter.

WHOIS invokes the information retrieval program.

? displays a short on-line help message.

HElp accesses the full on-line help.

Q, QUIT, RETURN key
exits WHOIS

<keyword> identifier
searches the database for an 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.

keyword may be one of:

PErson limits the search to persons.

DOmain limits the search to domains (e.g. DO EARN.NET).

HOst limits the search to hosts (e.g. HO PRINCETON).

NEtwork limits the search to networks (e.g. NE EBONE).

Organization
limits the search to organizations (e.g. 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.

Special characters may be used in *identifier* to specify the search:

. before *identifier* will cause a name-only search.

! before *identifier* will cause a handle-only search.

... or . after *identifier* will cause a partial search: everything starting with *identifier* will match.

@ in *identifier* will cause a search on the e-mail addresses.

***** before *identifier* will return the entire membership list of the entry that match *identifier* (e.g. a site and its registered users).

% before *identifier* will return only the membership list of the entry that matches *identifier* (e.g. the registered users of a site).

~ before *identifier* will return the entries that match *identifier* only, not a complete membership list.

The special characters may be used together.

Unless *Full* or *SUMmary* are specified, the results are displayed in one of two 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.

Using electronic mail:

Requests can be sent via electronic mail to the database maintained at the InterNIC; messages should be sent to **mailserv@internic.net**. The commands are normally sent in the *Subject:* field, with the body part of the mail being ignored. If the *Subject:* line is empty, the first line of the body part of the message is interpreted as a WHOIS command. Requests are processed automatically once a day.

This electronic mail interface recognizes all the commands described in **Using Telnet**. Requests should be prefixed with the word WHOIS.

Examples

If you are using a local client, and enter the command:

```
whois \!EARN...       (remark: "\" is required to shield "!"
                       from the Unix shell)
```

or if you e-mail the command:

```
whois !EARN...
```

you will get the following results:

```
EARN (EARN-HST)   SEINE.EARN.NET                    193.52.216.1
European Academic Research Network (EARN-DOM)          EARN.NET
```

To obtain detailed information on the second item, enter or send the command:

```
whois EARN-DOM
```

and you will get the following result:

```
European Academic Research Network (EARN-DOM)
   EARN Office
   PSI - Batiment 211
   91405 Orsay CEDEX
   FRANCE

   Domain Name: EARN.NET

   Administrative Contact:
      Bovio, Daniele  (DB355)  hi@EARNCC.EARN.NET
      +33 1 6941 2426 (FAX) +33 1 6941 6683
   Technical Contact, Zone Contact:
      Grange, Nadine  (NG4)  grange@EARNCC.EARN.NET
      +33 1 6941 2426 (FAX) +33 1 6941 6683

   Record last updated on 15-Dec-93.
```

```
   Domain servers in listed order:

   SEINE.EARN.NET                 193.52.216.1
   DNS.NIS.GARR.IT                192.12.192.5,131.114.2.5
   LUMIERE.CIRCE.FR               130.84.8.14
```

For a partial search, enter:

```
whois hi@ear...
```

and you will get the following result:

```
Bovio, Daniele (DB355)          hi@EARNCC.EARN.NET
   EARN
   EARN Office
   PSI - BP Batiment 211
   91405 ORSAY CEDEX, France
   FR
   +33 1 6941 2426 (FAX) +33 1 6941 6683

   Record last updated on 09-Dec-93.
```

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 **action@internic.net**.

Bug reports, comments, suggestions, etc. should be mailed to **action@internic.net**.

X.500

What is X.500

X.500 is a protocol which specifies a model for connecting local directory services to form one distributed global directory. Local databases hold and maintain a part of the global database and the directory information is made available via a local server called a *Directory System Agent (DSA)*. The user perceives the entire directory to be accessible from the local server. X.500 also supports data management functions (addition, modification and deletion of entries).

Each item (*entry*) in the X.500 directory describes one *object* (e.g. a person, a network resource, an organization) and has a unique identifier called a *Distinguished Name (DN)*. The entry consists of a collection of *attributes* (e.g. for a person this might be last name, organization name, e-mail address). The entries are found by navigating through a *Directory Information Tree (DIT)*. At the top of the tree is *the World*, which is subdivided at the next level into countries, and at the next into organizations. Information on people, resources, etc., is stored within organizations.

While most of the information available today via X.500 is about people and organizations, the design of the X.500 directory is also suitable for storing information about other entities (or *objects*), such as network resources, applications or hardware. Several projects utilize these directory capabilities (e.g. the Internet RFCs (Request For Comments) are listed in the global directory).

X.500 is an OSI (Open System Interconnection) protocol, named after the number of the CCITT (International Telegraph and Telephone Consultative Committee) Recommendation document containing its specification. The Paradise project aims to encourage the use of X.500 in European countries.

Who can use X.500

Although X.500 is part of the OSI standard definition, OSI access is not necessary to use the directory services. Many X.500 services are available both on the Internet, and by electronic mail. See the section **Using X.500** below for details.

How to get to X.500

There are three ways to access the X.500 services: via a local client, via an interactive session (Telnet or X.25 access) to a remote client, or by electronic mail. Each type of access is described below in the **Using X.500** section.

In addition, network tools such as WWW and Gopher provide access to X.500 directory services through gateways.

Public access to an X.500 client via Telnet or X.25 is an easy way to start querying the X.500 directory. Public access user interfaces are available at:

Telnet (login)	Public X.25	Country
jethro.ucc.su.oz.au (fred)		Australia
elem4.vub.ac.be (dua)	222100611	Belgium
x500.denet.dk (de)		Denmark
login.dkuug.dk (ds)		Denmark
nic.funet.fi (dua)		Finland
x500.tu-chemnitz.de (x500)		Germany
ashe.cs.tcd.ie (de)		Ireland
x500.ieunet.ie (de)	272432590024	Ireland
jolly.nis.garr.it (de or fred)	22225010083212	Italy
zoek.nic.surfnet.nl (no login)		Netherlands
elc1.mat.torun.edu.pl (de or dish)		Poland
chico.rediris.es (directorio)	2142160234013	Spain
hypatia.umdc.umu.se (de)	240374810306	Sweden
nic.switch.ch (dua)	22847971014540	Switzerland
dir.ulcc.ac.uk (dua)		UK
paradise.ulcc.ac.uk (dua)	23421920014853	Paradise

To connect to one of these sites, use either Telnet or X.25 and at the *login:* prompt type the appropriate login name (given above in brackets). Most remote clients use the national language, with the facility of switching into English.

Using X.500

X.500 is used primarily to search for information about people (postal address, telephone number, e-mail address, etc.). The basic fields for searching are a person's name, the name of the person's organization (and department within the organization) and the country.

In the following, angle brackets (<>) indicate an optional parameter; a vertical bar (|) indicates a choice of parameters.

Using a local client:

In the X.500 world, a local client is called a *Directory User Agent (DUA)*. Public domain and commercial DUAs are available for numerous platforms ranging from mainframes to personal computers. They range from simple command-line based clients to clients based on sophisticated graphical user interfaces which require a pointing device. For a comprehensive list of DUAs, their description and where to find them, consult the Internet document RFC 1292 / FYI 11 - **A Catalog of Available X.500 Implementations**.

Using Telnet or X.25:

DUAs provided by remote sites may have line-oriented, menu-driven or X Window System based user interfaces; examples of each are given below:

- line-oriented: de, dish, fred
- menu-driven: sd (formerly known as widget)
- X Window System: Xdi, Xlookup (or xlu), pod

The capabilities of these DUAs range from basic search facilities to full X.500 functionality. The X-Windows based DUAs require a local setup.

Novice users are recommended to try **de** (*directory enquiries*) since it has a very simple user interface. de was designed as a public access DUA and is accessible from any kind of terminal. It supports the basic X.500 functions: read, search, and list. Users who are new to querying the X.500 directory should use de's *Simple query mode*.

de invokes the X.500 interrogation user-interface.

q exits **de**.

?<topic> displays the on-line help on the specified *topic*, or general help if no *topic* is specified.

ˆC (Ctrl-C) is the interrupt character. It aborts a search in progress or resets the current query specification.

***** (asterisk) will list all entries of the specified field. It is also the wildcard character and can replace any other character in a name. It can appears anywhere in the name, e.g.: *smit** or **smit** are valid string formats.

- (dash) resets the default value to a blank string.

When **de** is invoked, the user is requested to fill in four fields to specify a request. In all fields, the value from the previous request is the default value. Press the RETURN key to accept it, or enter a new value. All searches are case insensitive.

The four fields to be filled in are:

Person's name
Wildcard characters may be used anywhere in the name. All matching names will be listed. Typing only "*" will match all people of the specified department or organization. If this field is *blank*, the search will be on department or organization only.

Department name
The name (or an acronym) of the department in the organization where the person works. *Wildcard* characters may be used anywhere in the name. Typing only "*" will match all departments. If no person's name has been entered, details on the department are displayed. If no department name is given, all departments will be searched. This field could be omitted in small organizations.

Organization name
The name (or an acronym) of the organization where the person works. *Wildcard* characters may be used anywhere in the name. Typing only "*" will match all organizations. If no person's name or department name has been entered, details of the organization are displayed.

Country name

The name of the country where the person works. Typing "*" will list all countries. The country name could be the 2-letter country code (e.g. DK stands for Denmark), the name or a part of it without wildcards (e.g. nether instead of The Netherlands).

If a large number of matching entries are found, they are listed so that the user can select one entry to get further details.

Using electronic mail:

The Norwegian networking organization (UNINETT) offers an e-mail interface to X.500. To use it, send a mail message to: **Directory@UNINETT.NO** with the word **find** in the *Subject:* field. The body part contains the search request, one per message. A help file is returned if the message body contains the word **help**.

The format of the search request is:

find	<person-name> <: org-name <; country-name>> | <; country-name>

If *org-name* and *country-name* are omitted, the sender's organization name and country name are used as default values. The mail interface guesses these values from the *From:* field of your mail, so the results can be surprising if your address ends with *.bitnet*!

"*" (asterisk) is the wildcard character and can replace any other characters in any name. It can appear anywhere in the name.

The result of the query is sent back in a mail message. The search is case insensitive.

Note: To avoid overloading the directory service, users are not allowed to search for a person without selecting an organization.

Examples

Using **de**, you can search for the *Anthropology* department of the *University College, London, United Kingdom*, with the following request:

```
Person's name, q to quit, * to browse, ? for help
:-
Department name, * to browse, ? for help
:- a*
Organisation name, * to browse, ? for help
:- ucl
Country name, * to browse, ? for help
:- uk
```

A few entries match the selected department, all are listed for further selection:

```
United Kingdom
  University College London

Got the following matches.  Please select one from the list
by typing the number corresponding to the entry you want.

United Kingdom
  University College London
      1 A.U.T. Office
      2 Academic Enterprise and Training Unit
      3 Anatomy and Developmental Biology
      4 Anthropology
      5 Audio Visual Centre
Department name, * to browse, ? for help
:- 4
United Kingdom
  University College London
    Anthropology
        Telephone Number      +44 71-387-7050 x2455
        fax                   +44 71 380 7728
```

If you are looking for *Erik Lawaetz* from *UNI-C* in *Denmark*, you can enter the following request:

```
Person's name, q to quit, * to browse, ? for help
:- law*
Department name, * to browse, <CR> to search all depts, ?
for help
:-
Organisation name, * to browse, ? for help
:- uni-c
Country name, * to browse, ? for help
:- dk
```

One entry matches the selected criteria, details are displayed:

```
Denmark
  UNI-C
      Erik Lawaetz
        surname               Lawaetz
        postalAddress         UNI-C
                              DTH
                              Bygning 305
                              DK-2800 Lyngby
        Post Code             DK-2800
        Telephone Number      +45 45 93 83 55
                              +45 42 88 39 99 x2018
        fax                   +45 45 93 02 20
        electronic mail       Erik.Lawaetz@uni-c.dk
```

If you send mail to Directory@UNINETT.NO with the request:

```
find geir ped* : *oslo ; no
```

you'll get the following result:

```
This message is in response to your request to the directory to
find

                         geir ped* : *oslo ; no

This is  interpreted as a  request to find  a person with  a name
matching  "geir  ped*"  in  an organisation  with  name  matching
"*oslo" in a country with a name matching "no".

There   were   8 organisations   with   a   name matching   the
organizational  name you  specified.  Within those  organisations
there were 7  persons that had a name matching  the personal name
you specified.  Directory information for the  located persons is
shown below.

Geir Pedersen : Universitetet i Oslo ; Norway

  Alternate        Geir Kenneth Pedersen
  Alternate        Geir K. Pedersen
  E-Mail (RFC)     Geir.Pedersen@usit.uio.no
  E-Mail (X.400)   /G=geir/S=pedersen/OU=usit/O=uio/PRMD=uninett/
                   ADMD= /C=no/
  Postal Address   Postboks 1059 - Blindern
                   0316 Oslo 3
                   NORWAY
  Phone            +47-22-852478
  Phone            +47-22-852470 (front-office)
  Fax-phone        +47-22-852730
  Description      Project leader for UNINETTs X.500 projects
  User ID          geirp
  Favorite Drink   Farris
  Street Address   Gaustadalleen 23
  Home Address     Gaustadveien 17A
                   0372 Oslo 3
                   NORWAY
  See also         Geir Pedersen : UNINETT ; Norway
  Entry updated    Tue Jun 15 11:51:31 1993
```

There will be six more lists of information in addition to this one.

Learning more about X.500

Several Internet RFC documents deal with X.500:

RFC 1292 A Catalog of Available X.500 Implementations,

RFC 1308 Executive Introduction to Directory Services Using the X.500 Protocol,

RFC 1309 Technical Overview of Directory Services Using the X.500 Protocol.

The official source of information on X.500 is the X.500 recommendation published by the CCITT (Blue Book, Volume VIII - Fascicle VIII.8, Data Communication Networks Directory, Recommendations X.500-X.521, CCITT, 1988, ISBN 92-61-03731-3). This document is also available electronic mail: send the command **GET ITU-5233** to **itudoc@itu.ch**; or via Gopher at **gopher.itu.ch**. This is not intended for the casual user!

NETFIND

What is NETFIND

NETFIND provides a simple Internet *white pages* directory facility. Given the name of a person on the Internet and a rough description of where the person works, Netfind attempts to locate telephone and electronic mailbox information about the person. It does so using a *seed* database of domains and hosts in the network. The person's first, last, or login name can be used.

If the person being sought is at a site that is not directly connected to the Internet (e.g. the site is connected only through a mail forwarding gateway), Netfind informs the user that the person cannot be found.

Netfind uses the Internet protocols *SMTP* and *finger*. Because of the dynamic nature of Netfind's search procedures, and variations in Internet availability, different results can be obtained for the same search on different occasions.

Who can use NETFIND

You must be on the international TCP/IP network (the Internet) in order to use Netfind. There is no e-mail access to Netfind.

The Netfind software is currently available only for Suns running SunOS 4.0 or later.

How to get to NETFIND

You can use the Netfind software at your site, or you can use Telnet to use it at one of the following hosts:

Host	Country	Host	Country
archie.au	Australia	bruno.cs.colorado.edu	USA
dino.conicit.ve	Venezuela	ds.internic.net	USA
eis.calstate.edu	USA	hto-e.usc.edu	USA
krnic.net	Korea	lincoln.technet.sg	Singapore
malloco.ing.puc.cl	Chile	monolith.cc.ic.ac.uk	England
mudhoney.micro.umn.edu	USA	netfind.anu.edu.au	Australia
netfind.ee.mcgill.ca	Canada	netfind.if.usp.br	Brazil
netfind.oc.com	USA	netfind.vslib.cz	Czech Rep.
nic.uakom.sk	Slovakia	redmont.cis.uab.edu	USA

Using NETFIND

Netfind requires the name of a person, with keywords to indicate where that person works; it then searches its *seed* database to find domains which match the specified keywords. If there is more than one matching domain, Netfind displays the list of matching domains, and asks you to select up to three to search. If there are more than 100 matching domains, Netfind will list some of the matching domains/organizations and ask you to form a more specific search. You can use any of the parts of an organization's name (or any of the components of its domain name) as keys in searches. Using more than one key implies the logical AND of the keys. Specifying too many keys may cause searches to fail.

When the search is completed (or interrupted by ˆC), Netfind summarizes the search results. The summary includes problems searching remote domains, information about the most promising email address for the person being sought (if available), and information about when and where the person most recently logged in (if available). If more than one person is located by a search, the summary does not include information about email targets and most recent/current logins.

Local access:

The format of the Netfind command is:

netfind <options> name-keyword place-keywords

where the most useful options are:

-t will report how many timeouts occurred. The *-T* option will set the timeout interval to the specified number of seconds. It may be necessary to use this option to increase the timeout value for intercontinental searches.

-D sets the maximum number of domains that Netfind will search at once. The default is 3. While it may seem convenient to set a high value for this number, we suggest you do not do this. The search will actually proceed faster (and waste less Internet bandwidth) if a small number of well chosen domains are searched.

-H sets the maximum number of machines that will be searched by Netfind. The default value is 50. Again, we suggest that you do not set this value higher.

The *name-keyword* specifies the first, last, or login name (only one name can be specified) of the person being sought.

The *place-keywords* describe where the person works, giving either the name of the institution or the city/state/country. If you know the institution's domain name (e.g. *cs.colorado.edu*, where the host name is *brazil.cs.colorado.edu*) you can specify the domain address as keywords, omitting the dots (e.g. *cs colorado edu*). The host parts of domain names (e.g. *brazil*) cannot be used as keywords. Keys are case insensitive and may be specified in any order, although using a very common key (like *university*) first will cause internal buffers to overflow and some domains to be missed.

Using more than one key implies the logical **and** of the keys. Specifying too many keys may cause searches to fail. If this happens, try specifying fewer keys.

Remote access:

Telnet to one of the remote Netfind sites (see **How to get to NETFIND**, above) and log in as **netfind**. No password is necessary. You will get the following menu:

```
Top level choices:
        1. Help
        2. Search
        3. Seed database lookup
        4. Options
        5. Quit (exit server)
```

If you select Search, you will be given an opportunity to enter name and place keywords.

Examples

To find the e-mail address of *Nadine Grange*, who works at the EARN office at *CIRCE* in *France*, you could try the keywords:

```
nadine circe france
```

Since there are more than three domains that fit the place keywords, you are asked to pick a few. The search proceeds, using the domains of your choice:

```
Please select at most 3 of the following domains to search:
0. circe.fr (centre national de la recherche scientifique, orsay ce
1. ciripa.circe.fr (centre inter-regional de calcul electronique, c
2. dnet.circe.fr (centre national de la recherche scientifique, ors
3. ibmmail.circe.fr (centre national de la recherche scientifique,
4. obspm.circe.fr (centre national de la recherche scientifique, or
5. oecd.circe.fr (centre national de la recherche scientifique, ors
6. phy.circe.fr (centre national de la recherche scientifique, orsa
7. ups.circe.fr (centre national de la recherche scientifique, orsa
8. cth.ups.circe.fr (centre national de la recherche scientifique,
9. lure.ups.circe.fr (centre national de la recherche scientifique,
10. lps.cth.ups.circe.fr (centre national de la recherche scientifi

Enter selection (e.g., 2 0 1) --> 0
( 1) check_name: checking domain circe.fr.  Level = 0
------
Search of domains completed.  Proceeding to search of hosts.
------
( 3) check_name: checking host loire.circe.fr.  Level = 0
( 4) check_name: checking host solrt.circe.fr.  Level = 0
( 5) check_name: checking host groucho.circe.fr.  Level = 0
( 1) check_name: checking host rsovax.circe.fr.  Level = 0
```

```
( 2) check_name: checking host ventura.circe.fr.  Level = 0
( 1) do_connect: Finger service not available on host rsovax.circe.
( 1) check_name: checking host earn-ng.circe.fr.  Level = 0
( 4) check_name: checking host luregate.circe.fr.  Level = 0
SYSTEM: loire.circe.fr
  Login name: nadine                      In real life: Nadine Grange
  Directory: /home/nadine                 Shell: /bin/csh
  On since Sep  7 08:48:05 on ttyp0      4 days 21 hours Idle Time
  New mail received Sun Sep 12 00:00:08 1993;
    unread since Fri Sep 10 11:53:17 1993
  No Plan.

  Login name: nadine                      In real life: Nadine Grange
  Directory: /home/nadine                 Shell: /bin/csh
  On since Sep  7 09:17:09 on ttyp6      1 day 12 hours Idle Time


SUMMARY:
- "nadine" is currently logged in from
  loire.circe.fr, since Sep  7 09:17:09.
- The most promising email address for "nadine"
  based on the above search is
  nadine@loire.circe.fr.
```

Remember that Netfind can find only Internet addresses on Unix machines.

Learning more about NETFIND

The remote access version of Netfind has a large *Help* section. There is also a set of *frequently asked questions* available with the software release, in the *Doc* directory. These questions cover Functionality, Methodology, Network and Remote Site Load, Privacy, Future Directions, and Related Work.

A noteworthy article on Netfind is:

Experience with a Semantically Cognizant Internet White Pages Directory Tool, by M. F. Schwartz and P. G. Tsirigotis, Journal of Internetworking Research and Experience, March 1991, pp. 23-50.

This publication discusses the research principles, performance, and scope measurements of Netfind, and compares it with other white pages facilities.

There is a mailing list for Netfind users (for software updates and other discussions). To be added to the list, send an email message to **netfind-users-request@cs.colorado.edu** with the body (not subject line): **subscribe netfind-users**

Part 5
GETTING FILES

TRICKLE

What is TRICKLE

TRICKLE provides a quick and easy alternative to FTP, whether or not you have access to the Internet. TRICKLE works with a number of *anonymous FTP* sites (computers in the Internet network that allow public access and retrieval of software and files) to distribute files on request or by subscription.

There are several TRICKLE servers throughout the world, and they cooperate to distribute the files efficiently. The user requests files by issuing commands to the nearest TRICKLE server, which delivers the files either from its local cache disk, from the cache of another TRICKLE server, or from an FTP site which holds the files. If you have subscribed to particular files or directories, you will receive a weekly summary of files which have been added to the directories you have subscribed to, and a new copy of any file to which you have subscribed, as soon as a new version of the file is stored at the TRICKLE server's FTP site.

Who can use TRICKLE

Anybody with access to electronic mail can use TRICKLE. EARN/Bitnet users can use interactive messages (such as **TELL** or **SEND**) to deliver their commands to TRICKLE.

How to get to TRICKLE

There are TRICKLE servers at the following addresses:

Austria	TRICKLE@AWIWUW11	TRICKLE@awiwuw11.wu-wien.ac.at
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	TRICKLE@imipoli.cdc.polimi.it
Netherlands	TRICKLE@HEARN	TRICKLE@hearn.nic.surfnet.nl
Poland	TRICKLE@PLEARN	TRICKLE@plearn.edu.pl
Sweden	TRICKLE@SEARN	TRICKLE@searn.sunet.se
Turkey	TRICKLE@TREARN	TRICKLE@ege.edu.tr
Turkey	TRICKLE@TRMETU	TRICKLE@3090.cc.metu.edu.tr
UK	TRICKLE@UKACRL	TRICKLE@ib.rl.ac.uk

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 same directory structure is used on all TRICKLE servers. The main directories which are currently available are:

Directory	Source FTP Site	Contents
MSDOS	oak.oakland.edu	Large MS-DOS software archive
MISC	oak.oakland.edu	Software for VM, VMS, Unix
SIGM	oak.oakland.edu	SIG/M CP/M archive
PC-BLUE	oak.oakland.edu	PC-BLUE MS-DOS archive
CPM	oak.oakland.edu	CP/M Software Archive
ARCHIVES	oak.oakland.edu	Various discussion group archive
UNIX-C	oak.oakland.edu	Unix and C code software archive
MACINTOS	oak.oakland.edu	Macintosh software archive
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
GARFIELD	garfield.catt.ncsu.edu	Multimedia (pictures and sounds)
X11	export.lcs.mit.edu	X-Windows software distribution
LINUX	nic.funet.fi	Linux system software distribution
VM-CMS	ubvm.cc.buffalo.edu	VM/CMS utilities

Not all directories are available at all servers. If your closest server does not provide the directory of your choice, you can use any other TRICKLE for the missing directory. If your closest server is temporarily unavailable, you can use any other TRICKLE instead.

Using TRICKLE

TRICKLE commands should be placed 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.

The number of commands you are permitted per day is defined by that server's administrator. It is usually between 25 and 50 commands.

All commands begin with a slash (/). Note that in the descriptions below, 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 part of a filename.

/PDDIR without any parameters will produce a listing of the main directories. **/PDDIR <dirname>** will get a listing of the subdirectories under that directory. If you specify both directory and subdirectory, you will obtain a list of the files available in that subdirectory. With *pattern*, you will get a listing of only those files that match or begin with that *pattern*. Wildcards "?" and "*" may be embedded into *subdirname* and *pattern* ("?" matches any single character; "*" matches any number of characters).

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 once you have received it. The default for EARN/Bitnet users is to send the file as-is. The default for other users is UUE.

Wildcards "?" and "*" may be embedded into *subdirname* and *filename* to get several files at the same time ("?" matches any single character; "*" matches any number of characters).

The **/SUB** command is used to subscribe to directories or to individual files.

/SUB	<dirname>
/SUB	<dirname.subdirname>keyword
/SUB	QUERY

where:

dirname is the name of a main directory,

subdirname is the name of a subdirectory,

keyword is left-justified part of a filename.

If you subscribe to a directory, you will receive summaries showing which files have been added to it. Summaries will arrive about once a week, depending on how active the FTP site is, and will show the names, sizes and dates of each file added. If you subscribe to a file, a new copy of the file will be sent to you as soon as your TRICKLE server is informed that a new version of the file has been stored at its FTP site.

Wildcards are not allowed with the **/SUB** command - any file starting with the letters you gave as a *keyword* is considered a match. For example, if you are subscribed to the *keyword* READ, this would match any file in the same subdirectory named READ, READ.ME, or README.TOO, but not 00READ.ME

Since filenames usually reflect the version number of the file, it is a good idea to omit the number when specifying a *keyword*. For example, it is better to send the command:

```
/SUB <MSDOS.VIRUS>SCANV
```

rather than

```
/SUB <MSDOS.VIRUS>SCANV106
```

since, as new versions of the file are stored, the name might change to SCANV107, SCANV108, etc. and your subscription will no longer match any stored file.

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 part of a filename.

The command **/UNSUB *** may be used to terminate all your directory and file subscriptions.

Examples

For a listing of the files in the VIRUS subdirectory of MSDOS 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
```

If you are not sure of the exact name of the file, you can use wildcards:

```
/PDGET <MSDOS.VIR*>*INDEX* ( EBC80
```

To subscribe to the SCANV software from <MSDOS.VIRUS>, so that you will automatically get new versions as they arrive in the FTP server, 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, which will return a very detailed help file.

A brief guide to TRICKLE is available from the EARN documentation filelist. Send mail to **LISTSERV@EARNCC.EARN.NET**. (or **LISTSERV@EARNCC.BITNET**). In the body of the message, write: **GET TRICKLE MEMO**

BITFTP

What is BITFTP

BITFTP provides a mail interface between users of EARN, Bitnet and associated networks, and FTP sites on the Internet. Commands are specified by the user in a mail message and passed to a BITFTP server which 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, together with the requested file(s), if any.

The format in which the files will be 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.

How to get to BITFTP

At present there are BITFTP servers at:

EARN/BITNET	**Internet**	**Country**
BITFTP@DEARN.BITNET	BITFTP@VM.GMD.DE	Germany
BITFTP@PLEARN.BITNET	BITFTP@PLEARN.EDU.PL	Poland
BITFTP@PUCC.BITNET	BITFTP@PUCC.PRINCETON.EDU	USA

Users are requested to use the server closest to them. If you are not sure, you can send your mail message to **BITFTP@BITFTP** (on EARN/Bitnet), and it will be forwarded to the correct BITFTP server.

BITFTP accepts requests via electronic mail, including IBM NOTE and PROFS-format messages, as well as by NJE 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**. BITFTP does not support multiple file request (the **mget** command) nor does it support sending files to FTP sites (the **put** command). In the following description, angle brackets (<>) indicate an optional parameter.

Use the **ftp** command to specify which host to connect to. This must be the first command in your mail file. You can also specify the file format that you wish BITFTP to use when it delivers 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 many FTP sites, 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 user-id.

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 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>

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 optional, and is the name the file should have when you receive it. If you specify a localname, 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

To get the file *how.to.ftp.guide* from the directory */pub/nic/network.service.guides* at the anonymous FTP site *nic.sura.net*, and to get a listing of the files in that directory, you could send the following commands by e-mail to BITFTP:

```
ftp nic.sura.net
user anonymous
cd pub/nic/network.service.guides
get how.to.ftp.guide
dir
quit
```

In response you will receive an e-mail containing the following lines (some lines have been removed for brevity):

```
> ftp nic.sura.net
> user anonymous
>> OPEN NIC.SURA.NET
>> USER anonymous

> cd pub/nic/network.service.guides
>> CD pub/nic/network.service.guides

> get how.to.ftp.guide
>>>> "how.to.ftp.guide" sent as "HOWTO FTPGUIDE".

> dir

total 60
-rw-rw-r--  1 mtaranto 120   344 Apr 14  1992 README
-rw-rw-r--  1 mtaranto 120 12759 Oct 30  1992 how.to.email.guide
-rw-rw-r--  1 mtaranto 120  6327 Mar 24 13:28 how.to.ftp.guide
-rw-rw-r--  1 root     120  2818 Mar  4  1992 how.to.telnet.guide
-rw-rw-r--  1 mtaranto 120  6136 Oct 30  1992 how.to.use.vi.guide
```

The above directory listing is typical of the format of Unix FTP sites. There is information on file permissions and ownership as well as the size of the file in bytes, the time and date of its last change, and the file name.

You could request the first two files by once again sending mail to BITFTP with the following commands:

```
ftp nic.sura.net
user anonymous
cd pub/nic/network.service.guides
get README
get how.to.email.guide
quit
```

Learning more about BITFTP

A four-page guide to the BITFTP service can be obtained by sending a **help** command in the body of an e-mail message to a BITFTP server.

Additional information on BITFTP may be obtained from EARN at **NETHELP@EARNCC.EARN.NET** (or **NETHELP@EARNCC.BITNET**). More information about TCP/IP and FTP in general can be obtained from a wide variety of sources, such as the documents mentioned in the example above.

Part 6
NETWORKED INTEREST GROUPS

LISTSERV

What is LISTSERV

LISTSERV is a distribution list management package. LISTSERV servers maintain lists containing names and electronic mail addresses of computer users. Any member of a list can send electronic mail messages addressed to the list, which the server will forward to all other members of the list. This service provides a convenient means for the exchange of ideas and information between list members. There are many different lists, each containing users who share particular interests. LISTSERV servers can also log mail traffic, store all the messages associated with their lists, and carry out database searches of archives and files. LISTSERV uses computer and network resources efficiently.

Who can use LISTSERV

Anyone who can send electronic mail, conforming to the RFC822 standard, to an EARN/Bitnet address, and who has a valid return mail address, can use LISTSERV. Every day, people use LISTSERV from HEPnet, Internet, Compuserve, MCIMail and many other networks throughout the world.

LISTSERV runs on IBM VM/CMS systems on the international NJE network (EARN/Bitnet).

How to get to LISTSERV

LISTSERV commands are sent in a mail message to a LISTSERV server, LISTSERV@host-id, where *host-id* is the host computer's NJE address (for example, TAUNIVM.BITNET) or its Internet domain name (in this case, VM.TAU.AC.IL). There may be some local variation in the format needed to send mail to Bitnet or Internet addresses. Check with your local support personnel.

LISTSERV will ignore the *Subject:* line of the mail header, so your commands must be in the body of the message. Several commands can be sent to LISTSERV in the same mail message, with each command on a separate line.

EARN/Bitnet users can also send interactive messages to LISTSERV, and this is the fastest and most convenient method to use. 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.

The most efficient way of using LISTSERV is to address mail to the specific LISTSERV server which hosts the list you are trying to contact. However if you want to subscribe to a list, but do not know which server it is on, you can use the special computer node **LISTSERV** on the

EARN/Bitnet network, or **LISTSERV.NET** on many other networks, and these will forward your message to the correct server.

For example, if you wanted to join the 3D-L mailing list that discusses 3D computer graphics, but are not sure of the address of the LISTSERV server hosting this list, you could send a subscription request to either of the following addresses:

```
LISTSERV@LISTSERV.NET
LISTSERV@LISTSERV        (on BITNET)
```

Your subscription request will be automatically forwarded to the LISTSERV server hosting the 3D-L mailing list (in this case, at the computer node ARIZVM1 or arizvm1.ccit.arizona.edu).

You can also use the special LISTSERV address when you need to send mail to a LISTSERV mailing list but are unsure of the list's address. For example, if you wanted to send mail to the BITFTP-L mailing list to request a copy of the BITFTP product, you could address your e-mail to BITFTP-L@LISTSERV.NET. It will be forwarded to the list's real address (in this case, BITFTP-L@EARNCC.EARN.NET). As soon as you find out the real address of a list, however, you should use it for all future mail to that list.

More than 250 sites in over 30 countries throughout the world run LISTSERV; here are some of the LISTSERV sites:

Host Computer	**Site**	**Country**
EARNCC	EARN Office, Paris	France
DEARN	GMD, Bonn	Germany
HEARN	Katholieke Universiteit Nijmegen	Netherlands
SEARN	Kungliga Tekniska Hoegskolan, Stockholm	Sweden
BITNIC	BITNET Network Information Center	USA
PUCC	Princeton University, New Jersey	USA

Using LISTSERV

LISTSERV provides special commands for list managers, who are given special privileges in order to use them. The commands described here are available for everyone and require no special LISTSERV command privileges. Only the most common commands are included here; a complete list of non-privileged LISTSERV commands is given in the **LISTSERV User Guide** in the **DOC FILELIST** from **LISTSERV@EARNCC.EARN.NET** (or **LISTSERV@EARNCC.BITNET**).

In the following descriptions, CAPITAL letters indicate acceptable abbreviation, angle brackets (<>) indicate an optional parameter, and vertical bar (|) indicates a choice of parameters. All parameters are fully explained in each command description.

A standard set of command keywords are available for use in some LISTSERV commands; they are shown in the command descriptions as optional parameters. The important standard keywords are:

PW= password
You can register a personal password on a LISTSERV server, and thereafter you will have to validate certain commands by using the *PW=* command keyword in the command text. See the **PW** command for details on registering personal passwords.

F= format
This keyword controls the file format (or internal file structure) in which files will be sent to you. If you are not a member of the EARN/Bitnet network, LISTSERV will use a default file format of *MAIL*. For members of the EARN/Bitnet network, the default is determined by information about your computer which is held in the *BITEARN NODES* file. Any user may specify a file format other than their default by using the *F=format* keyword in the commands where it appears as an option. The following file formats are valid for all users:

```
XXE  UUe  MIME/text  MIME/Appl  MAIL
```

In addition, EARN/Bitnet users may specify:

```
Netdata  Card  Disk  Punch  LPunch  VMSdump
```

Commands for Lists:

SUBscribe list-name <full-name>

Use the **SUBscribe** command to join a mailing list, or to alter the name (but not e-mail address) by which you are known on a mailing list you have already joined. The *list-name* parameter is the name of the list to which you want to subscribe. The optional *full-name* parameter allows you to give a name by which you want to be known on a mailing list. If specified, it should be your full, real name (at least your first name and last name) and not your e-mail address.

Subscription to a list may 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.

UNSubscribe list-name | * <(NETWIDE>

Use the **UNSubscribe** command to leave a mailing list. The *list-name* parameter is the name (not the address) of a mailing list from which you want to remove your subscription. You can sign off all the lists to which you are a member at any particular LISTSERV site by using the "*" (asterisk) character instead of a list name. If you want your **UNSubscribe** command to be propagated to all LISTSERV servers on the network, include the *(NETWIDE* option. Use this option if you are changing your e-mail address or are leaving your computer for an extended period.

List	<options> <F= format>

Use this command to get a listing of available mailing lists at a LISTSERV server. The important options are:

Short This is the default; it displays a summary of all the lists managed by a LISTSERV in a brief, one line description.

Long The *Long* (or *Detailed*) option will send you a file called *node-name* LISTS, containing a comprehensive description of the lists managed by a LISTSERV server.

Global <pattern>
This option gives a complete list of all known LISTSERV mailing lists at all servers at the time the command is issued. The optional *pattern* parameter can be used to match any string in the list name, list title or list address.

REView	list-name <(> <options>

Use this command to receive information about a mailing list, including list control information and a list of subscribers. Note that at the discretion of the list owner(s), viewing of the list of subscribers can be restricted to list members only. The important options are:

Short This option restricts the information you receive to the control section of a list (giving its definition parameters).

Countries The list of members will be organized by the nationality taken from their e-mail addresses.

LOCal LISTSERV lists can be peered (linked to other mailing lists of the same name but on different LISTSERV servers), and by default the **REView** command will include listings of all the mailing lists. The *LOCal* option restricts the scope of the **REView** command so that you receive a listing only from the server to which you send the **REView** command, and not its peers.

Query	list-name | *

When you join any mailing list, you will be assigned a default set of list options to control such things as how you will receive mail from the list, and the type of notification LISTSERV will give you when it distributes messages you have sent to a list (see the **SET** command for a complete description of these options and how to change them). The **Query** command can be used to review your personal list options. The *list-name* parameter is the name of a list to which you are subscribed. If you use an "*" (asterisk) character instead of a list name, you will receive information about your personal options for all lists to which you belong at the LISTSERV to which you send the command.

SET	list-name | * options

Use the **SET** command to change your personal options for a mailing list. The *list-name* parameter 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 list name. The important options are:

Mail | DIGests | INDex | NOMail

These options alter the way in which you receive mail from a mailing list. The *Mail* option is the default, and means that you wish to have list mail distributed to you as mail. The *DIGests* and *INDex* options are available only if a list has had these features enabled by its owner(s). Digests hold all the mail messages sent to a list over a certain period of time. The *INDex* option will provide you with only the date, time, subject, number of lines and the sender's name and address for all mail messages sent to a list. The text of the mail message will not be included. You may then select and retrieve any mail that interests you from the list archive. The *NOMail* option means that you will no longer receive mail sent to the list.

SHORThdr | FULLhdr | IETFhdr | DUALhdr

These options indicate the type of mail headers you want to include in the mail from a mailing list. *SHORThdr* means that only the essential mail headers will be included. This is the default. You may change this to *FULLhdr*, which means that all mail headers will be included. The *IETFhdr* option means that LISTSERV will not change the headers of a mail message it distributes, and is designed specifically for compatibility with SMTP exploders. Lastly, *DUALhdr* is very similar to the *SHORThdr* option except that LISTSERV will also insert mail headers at the beginning of the mail body. This option is useful for users of some PC based mail packages which do not display this information from the real mail headers.

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*. Note that a complete list of members is always given to list owners and LISTSERV administrators regardless of this option.

CONFIRM	list-name

Some mailing lists require subscription renewal at regular intervals, and the **CONFIRM** command is used for this. 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 *list-name* parameter is the name of the mailing list to which you are confirming your subscription.

Commands for Files:

Files can be stored at a LISTSERV server and made available for retrieval by users. LISTSERV stores files in a hierarchical system of *filelists* which, as the name suggests, are special files each containing a *list of files*. Filelists contain details for each file such as the file's name, size and access code (*FAC*) which describes who is authorized to retrieve it. These files may themselves be filelists.

Any mailing list can have an associated filelist, at the list owner's discretion. Regular files can be placed on this filelist, and the log files of the mailing list will automatically be stored there. Log files contain copies of all e-mail distributed on a particular mailing list over an interval of time (usually one month). These files can be retrieved so that users can recover any list mail distributed during a specific period. Mail items from the log files can also be retrieved via the database functions of LISTSERV.

The following LISTSERV commands enable general users to manipulate files stored at a server. File server commands to LISTSERV must be addressed to the server, not to any mailing lists. Where the *PW=* keyword appears in a command description, this need only be included in the command text if you have defined a personal password. The optional *F=* command keyword may be included as desired.

INDex <filelist> <F= format>

Use the **INDex** command to get a listing of the files in a particular filelist. The *filelist* parameter can be used to specify a particular filelist; if no name is specified, an index of the root filelist (called *LISTSERV FILELIST*) will be sent to you.

GET filename filetype <filelist> <F= format>

The **GET** command is used to retrieve a specific file or package from a filelist. You need authorization to do this. The *filename* and *filetype* parameters identify the file or package you wish to retrieve. The optional *filelist* parameter identifies the filelist within which the file or package resides; if this option is omitted, LISTSERV will determine the filelist through a search of its own internal filelist index.

Query File	filename filetype <filelist> <(FLags>

This command can be used to get update information on specified files and filetypes. You may specify a *filelist* name, but if you leave this out LISTSERV will locate the filelist through a search of its own internal filelist index. You may also specify the *(FLags* option to display additional technical data about the file (which can be useful when reporting problems to LISTSERV administrators).

PW	options

The **PW** command enables you to add, change or delete a personal password on any LISTSERV server. A personal password is designed to give you added command security, since it helps prevent impostors using your e-mail address: for this reason the use of personal passwords is strongly encouraged. Passwords consist of one to eight alphanumeric characters. You may change or delete your password at any time. The options parameter must be one of the following:

ADD new-password

Add a new personal password on the LISTSERV processing your command. Once you have registered a password on a LISTSERV server, you will be obliged to use the *PW=* command keyword in the commands where it appears as an option.

CHange old-password new-password

Change your personal password on a LISTSERV server where you already have one.

DELete old-password

Remove your personal password from a LISTSERV where you already have one. Once you have removed a password from a LISTSERV server, you will no longer be obliged to use the *PW=* command keyword in the commands where it appears as an option.

LISTSERV Database Functions:

Every LISTSERV list can have an associated database in which list mail is stored and from which old mail can be retrieved. This is called a *notebook* or *list archive* database, and consists of log files as described in the section **Commands for Files**. Databases are maintained at the discretion of each list's owner, so not all lists have an associated database.

Every LISTSERV server also has a database of all the EARN/Bitnet computer nodes (called the *BITEARN* database), which is available to all LISTSERV users. The *backbone* LISTSERV servers also have a database of all the LISTSERV computer nodes (called the *PEERS* database). In addition to these databases, a LISTSERV server may have any number of different databases which can be created locally. To find out what databases are accessible at a particular LISTSERV site, send the following command to that server:

DATABASE LIST

To perform a database search, you can mail a *batch database job* to LISTSERV, containing 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 an **Info DATABASE** command to your nearest (or any) LISTSERV server (see the section **Commands for Information**) or consult the **LISTSERV Database Functions** chapter in the **LISTSERV User Guide**.

Commands for Information:

The LISTSERV server can provide a diverse range of information to the general user, including help files, release levels of the server and important configuration files, statistics and information pertaining to the EARN/Bitnet network. Requests for information must be addressed to the LISTSERV server and not to any mailing lists it may manage. When using commands that result in files being sent to the requestor (for example the **Info** command), the format of the file can be specified by the optional command keyword *F=* in the command text.

Help

Use this command to get a brief description of the most commonly used LISTSERV commands and also the name and e-mail address of the server's postmaster.

Info <topic> <F= format>

Use this command to get a help file from a LISTSERV server. You can specify a topic using the *topic* option; you can get a list of valid topics by sending the **Info** command with no parameters.

Examples

You wish to subscribe to the EARNEWS list at the node FRMOP11. Your full name is Mark P. Waugh. Send the following command to LISTSERV@FRMOP11.CNUSC.FR (or LISTSERV@FRMOP11.BITNET):

```
SUBSCRIBE EARNEWS Mark P. Waugh
```

You wish to leave the INFO-MAC mailing list (to which you have already subscribed) at the node CEARN. The command:

```
UNSUBSCRIBE INFO-MAC
```

should be sent to the LISTSERV server at CEARN which manages the INFO-MAC list. To leave all the LISTSERV lists you belong to throughout the network, send the following command to your nearest (or any) LISTSERV:

```
UNSUBSCRIBE * (NETWIDE
```

You wish to receive a listing of all mailing lists that have the text *europe* in their name or title. Send the following command to your nearest (or any) LISTSERV server:

```
LIST GLOBAL EUROPE
```

You want to stop receiving mail from all the lists at SEARN to which you belong. Send the following command to the LISTSERV server at SEARN:

```
SET * NOMAIL
```

You have received a message from the LISTSERV server at IRLEARN asking you to confirm your subscription to the EARN-UG list. Send the following command to that server:

```
CONFIRM EARN-UG
```

You wish to receive a listing of the files in the *DOC FILELIST* Send the following command to the LISTSERV server at EARNCC where this filelist is located. This is the same as issuing a GET DOC FILELIST command.

```
INDEX DOC
```

You wish to retrieve the file *PCPROG ZIP* from a filelist, in *XXE* file format. Send the following command to the LISTSERV server that holds this file:

```
GET PCPROG ZIP F=XXE
```

Learning more about LISTSERV

A standard set of help files are available upon request from each LISTSERV server. To get a copy of these files, use the **Info** command (see the section **Commands for Information**).

Detailed documentation on LISTSERV (and related services) is available from the **DOC FILELIST** at **LISTSERV@EARNCC.EARN.NET** (or **LISTSERV@EARNCC.BITNET**). This includes the **LISTSERV User Guide** which is available in both postscript and plain text formats. To obtain a list of available documents use the **INDex** command (see the section **Commands for Files**).

There are several mailing lists for discussion of technical LISTSERV issues. They are not intended for casual users, but they should be of interest to advanced users. They are:

LSTSRV-L Technical forum on LISTSERV
LSTOWN-L LISTSERV list owners' forum
LDBASE-L Forum on LISTSERV database search capabilities

USENET (NETNEWS)

What is USENET

Usenet, sometimes called Netnews, is a huge collection of messages which are made available to users worldwide by means of the *UUCP* and *NNTP* protocols (Unix to Unix Copy Program, and Network News Transport Protocol, respectively). Individual computing sites appoint somebody to oversee the huge quantity of incoming messages, and to decide how long messages can be kept before they must be removed to make room for new ones. Typically, messages are stored for less than a week. An average weekday's batch of new Usenet messages occupies about 60 Mb disk storage space; they are made available via a news server.

Every Usenet message belongs to a newsgroup - there are a few thousand of these, each containing messages on a particular subject. Users sending Usenet messages must address each message to a particular newsgroup. There are newsgroups on subjects ranging from *education for the disabled* to *Star Trek* and from *environment science* to *politics in the former Soviet Union*. The quality of the discussion in newsgroups may be excellent, but this is not guaranteed. Some newsgroups have a moderator who scans the messages for the group and decides which ones are appropriate for distribution.

Some of the newsgroups provide a useful source of information and help on technical topics. Users needing to find out about a subject often send questions to the appropriate newsgroup, and an expert somewhere in the world can often supply the answer. Lists of *Frequently Asked Questions* or *FAQs* are compiled and made available periodically in some newsgroups.

The messages may contain both plain text, and encoded binary information. Each message has a series of header lines which define who the message came from, when it was posted, where it was posted, what newsgroup it was sent to, what route it has taken over the network, and other administrative information.

Usenet was originally developed for Unix systems in 1979. Within a year, fifty Unix sites 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. The messages of many Bitnet LISTSERV mailing lists are also distributed in Usenet.

Within EARN, a Usenet distribution network has been developed which provides efficient distribution of Usenet traffic while minimising the load on the network for the participating countries.

Who can use USENET

Usenet newsgroups can be read at thousands of sites around the world. In addition, several sites provide a public dial-up service. If you don't know whether your site has Usenet access, check with your local computer support people. Most computer networks can access the Usenet service via special software packages.

Many newsgroups are connected to mailing lists which you could join. For a list of these newsgroups and their associated mailing lists, send mail to **LISTSERV@AMERICAN.EDU** with the line: **GET NETGATE GATELIST**. Many of the documents which appear in newsgroups are available by e-mail from **mail-server@rtfm.mit.edu**. For instructions, send a message with the subject **HELP**.

How to get to USENET

If your site provides Usenet access, then you just need to use one of the many software packages available for browsing through the messages (at least one is probably available on your computer). These packages either access a local news server, or use the Network News Transfer Protocol (NNTP) to access the news server on some other computer in the network.

If Usenet is not available to you and you would like to arrange access for your site, contact your system administrator. You should also read the article **How to become a USENET site** which is posted periodically to the **news.answers newsgroup**. It is also available by anonymous FTP from **rtfm.mit.edu** as **/pub/usenet/news.answers/site-setup** or by mail to: **mail-server@rtfm.mit.edu** with the line: **send usenet/news.answers/site-setup**.

E-mail access

An experimental service is available which allows you to obtain Usenet messages via e-mail:

- send an e-mail message to **listserv@cc1.kuleuven.ac.be**. You will receive instructions in response to a message consisting of the command **/nnhelp**.

- send an e-mail message to **netnews@db.stanford.edu**. Instructions will be sent in response to a message consisting of the word **help**.

Using USENET

Many software packages are available for reading and distributing Usenet messages on a variety of operating systems (Unix, VMS, VM/CMS, MVS, Macintosh, MS-DOS and OS/2) and environments (X-Windows and MS-Windows), and the number is increasing all the time. See the list of freely available news reader software packages in Appendix A.

In addition to the software packages specifically designed to be news readers, many other communications programs, particularly mail interfaces, also provide Usenet access.

Most, if not all, of the news readers provide the same basic functions:

- *Subscribing* to newsgroups: Your news reading software will make these groups immediately accessible, so that you can read their contents quickly and easily.

- *Unsubscribing* from newsgroups: Removing groups from your easy access list.

- *Reading* newsgroup postings: Your news reader presents new messages - postings - to you, and keeps track of which postings you have and have not read.

- *Threads of discussion*: Replies to a posting are grouped together with the original posting, so that the reader can follow the messages within a newsgroup which are part of a particular discussion or a topic.

- *Posting* to news groups: You can participate in group discussions; your news reader knows where to send your posting.

- *Responding* to a posting: You can send a response to the newsgroup (often called *follow-up*) or to the author of a posting (often called *reply*).

Usenet newsgroups are themselves grouped into categories; eight of the major ones are called **alt**, **comp**, **misc**, **news**, **rec**, **sci**, **soc**, and **talk**, standing for alternative, computing, miscellaneous, related to the news system itself, recreational, science, social and talk. The messages of many Bitnet LISTSERV mailing lists are also distributed in Usenet under the major category **bit**.

Other major categories based on particular subject areas (e.g. bionet, biz, vmsnet) may be distributed worldwide as well, and there are categories based on geographical areas, on organizations (e.g. ieee), or commercial interests (e.g. clari). A fee is usually charged for access to commercial newsgroups.

Examples

When you enter the *tin* news reader, you get a listing of the newsgroups to which you are subscribed:

```
                         Group Selection (9)             h=help

   1 30637 bit.listserv.novell   local list
   2  1106 comp.mail.misc        General discussions about compu
   3  8031 comp.protocols.tcp-ip TCP and IP network protocols.
   4   840 comp.sys.mac
   5  8789 news.answers          Repository for periodic USENET
-> 6    29 news.lists            News-related statistics and lis
   7 15056 rec.woodworking       Hobbyists interested in woodwor
   8  7094 sci.psychology        Topics related to psychology.
   9 13093 soc.culture.celtic    Celtic, Irish, & Welsh culture


                         *** End of Groups ***
```

In *tin*, you select a newsgroup by using the arrow keys to move the -> sign alongside the newsgroup you are interested in, and press RETURN to select it. When you select a group, you get a listing of the articles:

```
                    comp.mail.misc (41T 64A 0K 0H)         h=help

    1 +   RIPEM Frequently Noted Vulnerabilities  Marc VanHeyningen
    2 +   RIPEM Frequently Asked Questions        Marc VanHeyningen
    3 +   Mail Archive Server software list       Jonathan I. Kamen
    4 + 1 UNIX Email Software Survey FAQ          Chris Lewis
```

```
    5 + 2 PC Eudora and Trumpet Winsock problem   Jim Graham
    6 +   X11 mail reader                         Dominique Marant
    7 +   MIME supporting e-mail                  Tim Goodwin
    8 + 1 IBM User name and Address Server        Wes Spears
    9 + 5 Newbie needs MHS/SMTP question answered Chris Pearce
   10 +   FAQ - pine                              Bruce Lilly
   11 +   FAQ: International E-mail accessibility Olivier M.J. Crep
-> 12 +   PC E-Mail and Dial-in                   Edward Vielmetti
   13 +   Prodigy Mail Manager "01/07"            an33127@anon.pene
   14 +   Prodigy Mail Manager "02/07"            an33127@anon.pene
   15 +   Prodigy Mail Manager "03/07"            an33127@anon.pene
```

tin is a *threaded* news reader: replies to a posting are grouped together with the original posting, so that the reader can follow a thread of discussion. The list above shows the threads, the number of replies in each thread, the subject and the author. The plus sign (+) indicates that not all postings in the thread have been read. Other news readers show other details.

Use the arrow keys to move the -> sign alongside the thread you are interested in, and then press RETURN to select it. The messages in that thread will appear on your screen:

```
Wed, 01 Sep 1993 07:05:49     comp.mail.misc     Thread  13 of 41
Lines 27          Re: PC E-Mail and Dial-in          No responses
emv@garnet.msen.com  Edward Vielmetti at Msen, Inc. --  Ann Arbor

Sherry H. Lake (slake@mason1.gmu.edu) wrote:

:    I am looking for an email package that will allow a user to
: dial-in to his mail machine download any messages to his local
: PC, delete the messages from the server and then automatically
: sign him off. The user can then use his client software (local)
: to read, compose and reply. He then would have to dial-in again
: to so his outgoing mail will be uploaded to the server.
Various POP clients for PCs or Windows Sockets will do roughly
this. You should look at:

-  NUPOP (MS-DOS)
-  Eudora for Windows (Windows)
-  WinQVT/Net (Windows)
-  various commercial POP clients listed in the 'alt.winsock'
   directory of commercial Windows systems

You'll want to look particularly for dial up IP software (SLIP or
PPP) that makes the process of connecting minimally onerous, e.g.
by scripting the session so that the users don't have to type
anything, perhaps by automatically dialing for you when you go to
read or otherwise open a network connection, and offering a
reasonable way to disconnect.
```

```
Edward Vielmetti, vice president for research, Msen Inc.
emv@Msen.com Msen Inc., 628 Brooks, Ann Arbor MI 48103
+1 313 998 4562 (fax: 998 4563)
```

Learning more about USENET

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.

Some newsgroups carry articles and discussions on the use of Usenet, notably: **news.announce.newusers**, **news.answers** and **news.newusers.questions**.

Many of the articles which appear periodically in these newsgroups or in others are also available from **rtfm.mit.edu** by anonymous FTP or by mail to: **mail-server@rtfm.mit.edu**

Part 7
OTHER TOOLS OF INTEREST

NETSERV

What is NETSERV

NETSERV is a server which provides fast access to a repository of data files and programs which are of interest to the EARN/Bitnet community. All users can retrieve files, and *privileged* users can store new versions of files and subscribe to the files of their choice. Privileged users have a NETSERV password.

In order to achieve a balanced load on the network and a faster response time to users, NETSERV uses distributed servers: there are a large number of servers on the network so that no user will be very far from a server. Updated information is distributed to all the servers, so the same information is available from any server.

NETSERV file directories (or *filelists*), are arranged hierarchically, with NETSERV FILELIST at the top. This filelist can be obtained by sending the command **GET NETSERV FILELIST** to any NETSERV. Filelists contain short descriptions of the files, and two access codes for each file. These codes represent the *get* and *put* privileges required for that file, and are explained at the beginning of the NETSERV FILELIST file.

How to get to NETSERV

There are NETSERV servers in many different countries. To find which is the closest to you, send the command **QUERY SERVICE** to any server. The following are examples of NETSERV server addresses:

EARN/BITNET	Internet
NETSERV@FRMOP11.BITNET	NETSERV@FRMOP11.CNUSC.FR
NETSERV@HEARN.BITNET	NETSERV@HEARN.NIC.SURFNET.NL
NETSERV@BITNIC.BITNET	NETSERV@BITNIC.CREN.NET

In EARN, only one NETSERV is permitted for one country. However, if a country has a large number of nodes, additional servers may be installed.

NETSERV accepts e-mail access from users on any network. Commands should be placed in the body of the mail file (the *Subject:* line is ignored).

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 any delivery limitations, except that you cannot order the same file more than once in one day.

Learning more about NETSERV

A large helpfile can be obtained by sending the command **GET NETSERV HELPFILE** to any NETSERV.

A mailing list for NETSERV maintainers is available as:
NETSERV@HEARN.NIC.SURFNET.NL (or **NETSERV@HEARN.BITNET**).

Additional information can be obtained from the maintainer of the NETSERV software, Ulrich Giese, at **U001212@HEARN.NIC.SURFNET.NL** (or **U001212@HEARN.BITNET**).

MAILBASE

What is MAILBASE

Mailbase is an electronic information service with much of the same functionality as LISTSERV. It allows United Kingdom groups to manage their own discussion topics (Mailbase lists) and associated files. The Mailbase service is run as part of the JANET Networked Information Services Project (NISP) based at Newcastle University.

How to get to MAILBASE

Commands should be sent in an electronic mail message to **mailbase@mailbase.ac.uk**. More than one command may appear in a message to Mailbase. Commands may be in any order, in UPPER, lower, or MiXeD case.

Learning more about MAILBASE

For a summary of Mailbase commands, send the command **help** in an e-mail message to **mailbase@mailbase.ac.uk**. For a list of on-line documentation about Mailbase, send the command: **index mailbase**.

You can then use the **send** command to retrieve those documents that interest you. For example, to retrieve a file of *frequently asked questions*, send the following command: **send mailbase user-faq**.

User support is also available by sending queries in an e-mail message to:
mailbase-helpline@mailbase.ac.uk.

Public files on Mailbase are also available by anonymous FTP to **mailbase.ac.uk**

FTPMAIL

What is FTPMAIL

Ftpmail is a system which makes the FTP utility available to users with electronic mail access to the Internet. Certain computers on the Internet offer an ftpmail service to all Internet users. These computers have a special ftpmail account, and users can include FTP requests in e-mail messages which are addressed to this account. FTP sessions are automatically carried out in response to the mailed FTP requests, and the results of the FTP sessions are sent back to users by e-mail.

If the ftpmail system fails to connect to the nominated FTP server, an appropriate e-mail message is sent to the user explaining what happened.

How to get to FTPMAIL

Several sites on the Internet offer an ftpmail service, and anyone with access to e-mail can use them. Users are requested not to make use of ftpmail services at sites remote from them. In France, there is a service at **ftpmail@grasp.insa-lyon.fr** and in the United Kingdom there is a service at **ftpmail@doc.ic.ac.uk**. There is an ftpmail service in the U.S.A at **ftpmail@decwrl.dec.com**.

Learning more about FTPMAIL

The ftpmail package is based on perl scripts, which are available from:

- src.doc.ic.ac.uk: /packages/ftpmail
- grasp1.univ-lyon1.fr: /pub/unix/mail/tools/ftpmail
- ftp.sterling.com: /mail/ftpmail

Ftpmail was written by Paul Vixie.

PROSPERO

What is PROSPERO

Prospero is a distributed file system containing virtual files, each of which represents an Internet resource. Thus a file may represent a Telnet session to a particular host, it may represent a file on a WAIS together with the information needed to access the server, it may represent a file in the archie filename index, or it may represent a file which is available using FTP together with the information needed to obtain the file.

Individual users are given a space in their site's virtual filesystem, where they can create new virtual files. They are also able to copy files into their virtual filespace from elsewhere in the global Prospero system. Since each virtual file is merely a link to a real file, any changes to the real files will be visible to the user.

Internet sites using Prospero are given a global prefix (similar to a site name) which means that sites can access each other's files. A master directory is maintained, and users are encouraged to organize their own projects and papers in a manner that will allow them to be easily added to the master directory. For example, users should consider creating a virtual directory (anywhere in their virtual system) that contains pointers to copies of each of the papers that they want to be available to the outside world. A link may be created from the virtual directory to the master author directory, thus making the virtual directory available to other users. Any future changes to the real files will be immediately available to other users.

How to get to PROSPERO

In order to use Prospero, you must be on the international TCP/IP network (the Internet) and you must have Prospero running on your computer.

Before you can begin using the Prospero file system a virtual system must be created for you. However, Prospero, as shipped, is configured so that once you compile the clients, you can type: *vfsetup guest* and start working straight away using a guest virtual system at the USC Information Sciences Institute.

The latest version of Prospero is available as file **prospero.tar.Z** via anonymous FTP from **prospero.isi.edu** in the directory **/pub/prospero.**

Learning more about PROSPERO

Prospero is being developed by Clifford Newman. Several documents and articles describing Prospero, by Newman and others, are available.

The following files are available via anonymous FTP from **prospero.isi.edu**. They are also available through Prospero.

- Anonymous FTP: /pub/papers/prospero/prospero-oir.ps.Z,
- Prospero: /papers/subjects/operating-systems/prospero/prospero-oir.ps.Z.

This is a useful first paper to read. It gives a good overview of Prospero and what it does. It also describes the Virtual System model, of which Prospero is a prototype implementation.

- Anonymous FTP: /pub/papers/prospero/prospero-bii.ps.Z,
- Prospero: /papers/subjects/operating-systems/prospero/prospero-bii.ps.Z.

This paper describes how Prospero can be used to integrate Internet information services, including Gopher, WAIS, archie, and World-Wide Web.

IRC

What is IRC

IRC, Internet Relay Chat, is a real-time conversational system. It is similar to the *talk* command which is available on many machines in the Internet. IRC does everything talk does, but it allows more than two users to talk at once, with access throughout the global Internet. It also provides many other useful features.

Fundamental to the operation of IRC is the concept of a *channel*: each channel is one conversation. When you join IRC, you enter the *null channel* first, and will be unable to send any messages until you enter a *chatting channel* (unless you have set up a private conversation in some way). The number of channels is essentially unlimited.

IRC is networked over much of North America, Europe, and Asia. Everything you type will instantly be transmitted around the world to other users who are connected to your channel. They can then respond to your messages.

Topics of discussion on IRC are varied. Technical and political discussions are popular, especially concerning current world events. IRC is also a way to expand your horizons, as people from many countries and cultures are on the system, 24 hours a day. Most conversations are in English, but there are always channels in German, Japanese, and Finnish, and occasionally other languages.

How to get to IRC

Clients and servers for IRC are available via anonymous FTP from several sites, notably from **cs.bu.edu**.

The many server hosts of Internet Relay Chat throughout the network are connected via a tree structure. They relay control and message data among themselves to advertise the existence of other servers and their users, and the channels and other resources being occupied by those users.

Learning more about IRC

To get help while in IRC, type **/help** and follow the instructions.

If you have problems, you can contact **Helen Rose (hrose@eff.org)**. You can also ask for help on some of the operator channels on IRC, for example #twilight_zone and #eu-opers.

Various documents on IRC, and the archives of IRC-related mailing lists, are available via anonymous FTP from **ftp.kei.com** and **cs.bu.edu**.

RELAY

What is RELAY

The **RELAY** system allows users to exchange messages. Each user signs on to a RELAY server and places their ID in its current user list. Next the user must sign on to a channel of the RELAY system, and is then ready to exchange messages with any other user currently signed on to that channel. Commands to the RELAY system start with a slash (/) character; anything not beginning with a slash is considered a message and is sent back out to all other current users.

All RELAY servers are on the global EARN/Bitnet network. Each RELAY server provides a service to a specific collection of one or more nodes, designated as a *service area*. Users *sign on* to the closest available RELAY and are then also virtually signed on to all RELAYs which are linked to it. Most RELAYs are closed during peak hours; only some RELAYs are up 24 hours a day.

RELAY is available to EARN/Bitnet users with access to interactive messages who have not been expressly excluded from the system by RELAY management.

How to get to RELAY

RELAY is available at the following EARN/Bitnet addresses (and other sites). The nickname of each RELAY machine is given in parentheses.

RELAY@ASUACAD	(Sun_Devils)	RELAY@PURCCVM	(Purdue)
RELAY@AUVM	(Wash_DC)	RELAY@SEARN	(Stockholm)
RELAY@BEARN	(Belgium)	RELAY@TAMVM1	(Aggieland)
RELAY@CEARN	(Geneva)	RELAY@TAUNIVM	(Israel)
RLY@CORNELLC	(Ithaca_NY)	RELAY@TREARN	(EgeRelay)
RELAY@CZHRZU1A	(Zurich)	MASRELAY@UBVM	(Buffalo)
RELAY@DEARN	(Germany)	RELAY@UFRJ	(RioJaneiro)
RELAY@DKTC11	(Copenhagen)	RELAY@UIUCVMD	(Urbana_IL)
RELAY@FINHUTC	(Finland)	RELAY@USCVM	(LosAngeles)
RELAY@GITVM1	(Atlanta)	RELAY@UTCVM	(Tennessee)
RELAY@GREARN	(Hellas)	RELAY@UWAVM	(Seattle)
RELAY@HEARN	(Holland)	RELAY@VILLVM	(Philadelph)
RELAY@ITESMVF1	(Mexico)	RELAY@VMTECQRO	(Queretaro)
RELAY@JPNSUT00	(Tokyo)	RELAY@VTBIT	(Va_Tech)
RELAY@NDSUVM1	(No_Dakota)	RELAY@WATDCS	(Waterloo)
RELAY@NYUCCVM	(NYU)	RELAY@YALEVM	(Yale)

RELAY is available to users on the EARN/Bitnet network via interactive message (e.g. the **TELL** command of VM or the **SEND** command of VMS/JNET). All RELAY server machines are on IBM VM/CMS systems, but you do not have to be a VM user in order to use RELAY. However, if you are not in the EARN/Bitnet network, you can not use RELAY.

CHAT, a full-screen interface to send and receive TELL messages for VM systems, is particularly useful for users of RELAY. CHAT is available from any **NETSERV**.

Learning more about RELAY

Upon registration, the files RELAY INFO and RELAY USERGUIDE are sent to the user. These two files give a comprehensive description of RELAY.

A brief guide to RELAY is available from the EARN documentation filelist. Send mail to **LISTSERV@EARNCC.EARN.NET** (or **LISTSERV@EARNCC.BITNET**). In the body of the message, write: **GET RELAY MEMO**.

Appendix A
Freely available networking software

Below you will find the location of client software for several of the tools described in this guide (Gopher, WWW, WAIS and Netnews). This is not a complete listing of available software for any of these tools.

Gopher clients

Environment	FTP site & directory	Comments
Unix	boombox.micro.umn.edu /pub/gopher/Unix	
VMS	boombox.micro.umn.edu /pub/gopher/VMS	
	job.acs.ohio-state.edu XGOPHER_CLIENT.SHARE	for Wollongong or UCX
VM/CMS	boombox.micro.umn.edu /pub/gopher/Rice_CMS	
	boombox.micro.umn.edu /pub/gopher/VieGOPHER	
MVS	boombox.micro.umn.edu /pub/gopher/mvs	
Macintosh	boombox.micro.umn.edu /pub/gopher/Macintosh-TurboGopher	
	ftp.cc.utah.edu /pub/gopher/Macintosh	requires MacTCP
	ftp.bio.indiana.edu /util/gopher/gopherapp	requires MacTCP
OS/2	boombox.micro.umn.edu /pub/gopher/os2	OS/2 Gopher Client
MS-DOS	boombox.micro.umn.edu /pub/gopher/PC_client	requires packet driver
	oac.hsc.uth.tmc.edu /public/dos/misc	dosgopher, for PC/TCP
	bcm.tmc.edu /nfs/gopher.exe	for PC-NFS

	lennon.itn.med.umich.edu /dos/gopher	for LAN Workplace for DOS
MS-Windows	tis.inel.gov /pub/wsgopher	wsgopher
	lister.cc.ic.ac.uk /pub/wingopher	HGopher
	sunsite.unc.edu /pub/micro/pc-stuff/ms-windows/winsock/apps	Gopher Book
	bcinfo.bc.info (password: guest) pub.bcgopher	BCGopher (beta version)
X-Windows	boombox.micro.umn.edu /pub/gopher/Unix	xgopher (Athena widgets)
	boombox.micro.umn.edu /pub/gopher/Unix	moog (Motif)
	boombox.micro.umn.edu /pub/gopher/Unix/xvgopher	or Xview
Next	boombox.micro.umn.edu /pub/gopher/NeXT	

World-Wide Web clients

Environment	FTP site & directory	Comments
Unix	info.cern.ch /pub/www/src	WWW line-mode browser
	ftp2.cc.ukans.edu /pub/lynx	Lynx browser for vt100 terminals
	archive.cis.ohio-state.edu /pub/w3browser	tty-based browser written in perl
VM	gopher.nerdc.ufl.edu /pub/vm/www	
VMS	info.cern.ch /pub/www/bin/vms	port of NCSA Mosaic
	vms.huji.ac.il /www/vms_client	WWW line-mode browser
	ftp2.cc.ukans.edu /pub/lynx	Lynx browser for vt100 terminals

Macintosh	info.cern.ch /pub/www/bin/mac	Samba - requires MacTCP
	ftp.NCSA.uiuc.edu /Mac/Mosaic	Mosaic
MS-Windows	ftp.law.cornell.edu /pub/LII/Cello	Cello
	ftp.NCSA.uiuc.edu /PC/Mosaic	Mosaic
Emacs	moose.cs.indiana.edu /pub/elisp/w3	
X-Windows	info.cern.ch /pub/www/src	tkWWW Browser and Editor
	info.cern.ch /pub/www/src	MidasWWW Browser for X/Motif
	info.cern.ch /pub/www/src	ViolaWWW Browser
	ftp.ncsa.uiuc.edu /Web	Mosaic
Next	info.cern.ch /pub/www/bin/next	Browser and Editor

Wais clients

Environment	**FTP site & directory**	**Comments**
Unix	ftp.wais.com /pub/freeware/unix-src	swais - wais distribution
VMS	sunsite.unc.edu /pub/wais/clients/vms	
MVS	ftp.wais.com /pub/freeware/ibm-mvs	dinowais
Macintosh	ftp.wais.com /pub/freeware/mac	
OS/2	ftp.wais.com /pub/freeware/os2	
MS-DOS	sunsite.unc.edu /pub/wais/clients/ms-dos	

	ftp.wais.com /pub/wais/DOS	PCWAIS
MS-Windows	ridgisd.er.usgs.gov /software/wais	WinWAIS
	ftp.einet.net /einet/pc	EWAIS
	ftp.cnidr.org /pub/NIDR.tools/wais/pc/windows	
	sunsite.unc.edu /pub/wais/clients/ms-windows	
Emacs	ftp.wais.com /pub/freeware/unix-src	wais-gmacs - wais distribution
X-Windows	ftp.wais.com /pub/freeware/unix-src	xwais - wais distribution
Next	ftp.wais.com /pub/freeware/next	

Usenet - news reader software

Environment	**FTP site**	**Names & Comments**
Unix	lib.tmc.edu	rn also available via e-mail to: archive-server@bcn.tmc.edu
	ftp.coe.montana.edu	trn
	dkuug.dk	nn
	ftp.germany.eu.net	tin
VMS	kuhub.cc.ukans.edu	ANU-NEWS
	arizona.edu	VMS/VNEWS
VM/CMS	psuvm.psu.edu	NetNews also available from LISTSERV@PSUVM
	ftp.uni-stuttgart.de	NNR
MVS	ftp.uni-stuttgart.de	NNMVS
Macintosh	ftp.apple.com	News
MS-DOS	ftp.utas.edu.au	Trumpet

MS-Windows	ftp.utas.edu.au	WTrumpet
X-Windows	many FTP sites	xrn
	export.lcs.mit.edu	xvnews
Emacs	most GNU sites	GNUS for use with GNU Emacs editor
	most GNU sites	Gnews for use with GNU Emacs editor

Appendix B
Online information

Unless otherwise indicated, the left hand column contains an address for anonymous FTP, followed by a directory on the line below. Comments about the contents of the reference are in the right hand column.

General references

sluaxa.slu.edu /pub/millesjg/newusers.faq	Useful list of books, with comments
LISTSERV@UBVM.cc.buffalo.edu get newusers faq nettrain f=mail	email address for same list as above body of message
nic.merit.edu /introducing.the.internet/info-sources	various useful files
rtfm.mit.edu /pub/usenet/news.answers/communication-net-resources/part1, part2, part3	Information compiled by John December
ftp.rpi.edu /pub/communications/internet-tools	John December's Internet Tools summary
is.internic.net /infosource/getting-started/tools/babel-txt	long list of abbreviations and acronyms

References for individual tools

Gopher:

boombox.micro.umn.edu /pub/gopher/docs/GopherGuide_Jan12-94.ps	user guide text versions also available
rtfm.mit.edu /pub/usenet/comp.infosystems.gopher/G_(c.i.g)_F_A_Q_(F)	FAQ
comp.infosystems.gopher	Usenet newsgroup
ftp.cso.uiuc.edu /doc/net/iuicnet/vol6no1.txt	articles on gopher and veronica
veronica.scs.unr.edu /veronica-docs/veronica-faq	veronica FAQ

World-Wide Web:

http://info.cern.ch/	access to WWW information via WWW
info.cern.ch /pub/www/doc	ftp archive of WWW information
rtfm.mit.edu /pub/usenet/comp.infosystems.www/W_W_W_F_A_Q_(F)	

WAIS:

quake.think.com /pub/wais/bibliography.txt	excellent bibliography
sunsite.unc.edu /pub/docs/about-the-net/libsoft/wais.txt	
wais-discussion-request@wais.com	email list
comp.infosystems.wais	Usenet WAIS newsgroup

Archie:

archie.ans.net /pub/archie/doc/whatis.archie	
sunsite.unc.edu /pub/docs/about-the-net/libsoft/archie_guide.txt	
archie.ans.net /pub/archie/doc/archie.man.txt	Unix online manual page

WHOIS:

nic.merit.edu /documents/rfc/rfc0954.txt	contains whois specification, explains sources of names for the database
rtfm.mit.edu /pub/whois/whois-servers.list	
gopher.ucdavis.edu /pub/archive/wnils/Discussion.Paper	

X.500:

nic.merit.edu /documents/rfc/rfc1308.txt	
nic.merit.edu /documents/fyi/fyi_11.txt	contains very long catalogue of applications which use X.500

Netfind:

ftp.cs.colorado.edu
/pub/cs/distribs/netfind/README

ftp.cd.colorado.edu
/pub/cs/techreports/schwartz/ASCII/Netfind.Gathering.txt.Z

listserv@brownvm.brown.edu	email address
"get netfind help"	body of message

TRICKLE:

LISTSERV@EARNCC.BITNET	email address for EARN documentation
get trickle memo	body of message

FTP:

nic.merit.edu
/documents/rfc/rfc0959.txt

rtfm.mit.edu FAQ
/pub/usenet/news.answers/communication-net-resources

ftp.sura.net
/pub/nic/network.service.guides/how.to.ftp.guide

BITFTP:

BITFTP@BITFTP.BITNET	email address
help	body of message

LISTSERV:

listserv@listserv.net	generic email address for LISTSERV
send listserv memo	body of message
listserv@bitnic.bitnet	email address for LISTSERV tips
get listserv tips	body of message
listserv@earncc.earn.net	email address for LISTSERV guide
get lsvguide memo	body of message

cs.bu.edu
/pub/listserv/FAQ.Z

Usenet:

rtfm.mit.edu	many documents about various aspects of
/pub/usenet/news.announce.newusers/	Usenet, including 'What_is_Usenet?'

Hytelnet:

ftp.usask.ca
/pub/hytelnet/README

LISTSERV@UHUPVM1.UH.EDU	email address; article about Hytelnet
get scott prv3n4 f=mail	body of message

NETSERV:

netserv@frmop11.bitnet	email address
get netserv helpfile	message body

Mailbase:

mailbase@mailbase.ac.uk	email address
help	body of message for help information
index mailbase	body of message for list of online documents
send mailbase user-faq	body of message for FAQ listing

Prospero:

prospero.isi.edu
/pub/papers/prospero/README-prospero-documents

prospero-request@isi.edu	email address of prospero mailing list

archie.ans.net
/pub/archie/doc/archie-interface-to-prospero

IRC:

ftp.kei.com
/pub/irc/mailing-lists/Index

cs.bu.edu
/irc/support/tutorial.1, tutorial.2, tutorial.3
/irc/README

RELAY:

"RELAY INFO" and "RELAY USERGUIDE" sent at registration

listserv@earncc.bitnet	email address for brief guide
get relay memo	body of message

Ftpmail:

ftpmail@decwrl.dec.com	email address
help	body of message

src.doc.ic.ac.uk
/packages/ftpmail/README