                    Guide to Network Resource Tools

Status of this Memo

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

Table of Contents

1. 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 hardpressed 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 exploiting these resources is a server, special software
   on a computer somewhere in the network which accepts requests (or
   queries or commands) and sends a response automatically. The
   requestor does not have to be working on the same computer (or even
   in the same part of the world) in order to use the server. Many
   servers accept requests via electronic mail, so that often the
   requestor needs not even be on the same computer network as the
   server. In many cases, servers are interconnected so that once you
   have established contact with one server, you can easily communicate
   with other servers as well.

   Today, many users have powerful computers on the desktop, with
   advanced graphical, audio and storage capabilities, which are
   connected to the network. This fact has given rise to what is known
   as the client-server model. Users can have special software on their
   local computer called a client which can utilize the capabilities of
   that computer and can also communicate with a server on the network.
   These clients provide an easy-to-use, intuitive user interface, allow
   use of pointing devices such as a mouse, and exploit other local
   features. The client sends the user's requests to a server using a
   standardized format (called a protocol) and the server sends its
   response in a condensed format which the client displays to the user
   in a more readable way.

   Several of the tools described herein have several different
   functions. However they could be classified in functional areas
   according to their main purpose. Sections two and three cover two

services, Gopher and World-Wide Web, which use the client-server
model to explore the network providing a means of moving through a
wide range of network sources and resources in a uniform and
intuitive way. A tool for searching in a wide range of different
databases located throughout the network, WAIS, is documented in
section four. The problem of knowing where to find network resources
(files and programs) is addressed in section five, which deals with
archie. Three tools for finding people, computers and their network
addresses, WHOIS, X.500 and Netfind, are discussed in sections six,
seven and eight. While just about all of these network tools can be
used to get files of one sort or another, there are a few servers
available for getting files easily and efficiently from various
repositories in the network. Two of these servers, TRICKLE and
BITFTP, are covered in sections nine and ten. Sections eleven and
twelve deal with what is perhaps the most popular of all the network
resources, discussion groups on every imaginable topic. The two tools
discussed there are LISTSERV and Netnews (Usenet). Section thirteen
gives brief descriptions and pointers for a number of tools which
were not mainstream enough to get a full description. Some are still
in the developmental stage (Prospero), some are relatively unknown
outside a particular network (ASTRA and Netserv from EARN/Bitnet and
Mailbase from JANET) 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 to try out and begin using 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. The example in the BITFTP
section of this guide shows how one can use BITFTP to get guides to
these tools over the network.

2. GOPHER

2.1. What is Gopher

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

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

view, all information items presented on the menus appear to come
from the same place.

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

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

2.2. Who can use Gopher

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

2.3. How to get to Gopher

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

2.3.1. Local clients

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

2.3.2. Remote clients

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

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

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.

2.4. Using Gopher

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

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

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

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

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

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

and then by countries.

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

Here is a sample menu:

                    Internet Gopher Information Client v1.1

                        Information About Gopher

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

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

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

    An item could be:

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

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

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

display all types of files.

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

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

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

An item is processed according to its type:

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

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

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

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

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

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

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

            terminal and setting or tset

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

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

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

2.5. VERONICA

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

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

   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 that 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 2 keywords, and is
    assumed. E.g.:

        eudora and macintosh

    will give you a list of menu titles that 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.

2.6. Learning more about Gopher

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

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

Usenet newsgroup: comp.infosystems.gopher

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

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

3. WORLD-WIDE WEB

3.1. What is World-Wide Web

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

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

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

For instance, in the first document you might read:

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

Selecting hypermedia will display the following explanation for you:

                          WHAT IS HYPERTEXT
     Hypertext is text 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 can learn more about links and Nelson. Indeed, the links in
     WWW are not confined to text only, so the term hypermedia is more
     accurate. For example, the link to Nelson might point to a file
     containing a picture of Ted Nelson. The picture would be displayed on
     your screen if you have a suitable configuration.

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

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

3.2. Who can use World-Wide Web

     WWW uses the client-server model to provide access to the information
     universe. You must be on the international TCP/IP network (the
     Internet) in order to use a client on your computer to access WWW. If
     you are on the Internet, but don't have a WWW client on your
     computer, you can still enter the World-Wide Web. 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 listserv@info.cern.ch files.
     (see E-mail access section under How to get to World-Wide Web below).

3.3. How to get to World-Wide Web

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

   3.3.1. Local clients

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

      Public domain clients for accessing WWW servers are available for:
      Macintosh, MS-DOS, VMS, VM/CMS, MVS, NeXT, Unix, X-Windows. The
      clients are available for anonymous FTP from info.cern.ch in the
      directory /pub/www. All these platforms support a simple line mode
      browser. In addition, graphical clients are available for:
      Macintosh, Windows, X-Windows, NeXT and Unix. See the list of
      freely available client software in Appendix A.

   3.3.2. 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. You will immediately enter the WWW line mode browser. Some
      publicly accessible clients feature locally developed clients.
      Most remote clients are at sites with WWW servers with information
      on specific areas. After you telnet to the client site, at the
      login: prompt enter www, no password is needed. The following
      remote client sites are available:

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

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

       3.3.2.1. E-mail access

          In order to get a file, send mail to listserv@info.cern.ch with
          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
          document-addresses of the related documents.

          If the document is hypertext, its links will be marked by
          numbers in brackets, and a list of document addresses by number
          will be appended to the message. In this way, you can navigate
          through the web, more or less. 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)

3.4. Using World-Wide Web

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

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

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

   This is the subject catalogue. See also arrangement by service
   type[1]. Mail www-request@info.cern.ch to add pointers to this
   list.

   Aeronautics   Mailing list archive index[2]. See also NASA LaRC[3]

   Agriculture[4] Separate list, see also Almanac mail servers[5].

   Astronomy and Astrophysics
                   Abstract Indexes[6] at NASA, Astrophysics work at
                   FNAL[7],   Princeton's[8]   Sloane Digital   Sky
                   Survey, the STELAR   project, Space Telescope
                   Electronic Information System[9], the Southampton
                   University Astronomy   Group[10], the National
                   Solar Observatory[11], Astrophysics work at the
                   AHPCRC[12]. See also: space[13].

   Bio Sciences[14] Separate list.

   Computing[15]   Separate list.

   1-81, Back, <RETURN> for more, Quit, or Help:

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

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

Manual
   displays the on-line manual.

Quit
   exits WWW.

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

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

Back
   goes back to the document you were reading before.

HOme
   goes back to the first document you were reading.

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

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

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

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

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

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

Extra command available on Unix versions only:

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

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

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

where:

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

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

Options are:

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

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

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

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

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

   -version
      displays the version number of the software.

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

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

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

3.5. Examples

   WWW gives you access to an information universe. Let's say you want
   to know how many film versions of The Three Musketeers there have
   been. You browse the WWW Subject Catalogue and select Movies:

                                     Movie database browser (Cardiff)
   A Hypertext movie database browser

   Sep 2nd... Your help is needed..[1]

   Aug 29th.. Images, sounds, mpegs & reviews[2]

   Select the type of search you'd like to perform:-

      Movie people[3].....(multi Oscar winners)[4] or

      Movie titles[5] .....(multi Oscar winners)[6]

   Searches the "rec.arts.movies" movie database system, maintained
   by Col Needham et-al.

Here[7] is some information on list maintainers.

If you have a comment or suggestion, it can be recorded here[8]

HERE[9] is a pre-1986 movie information gopher server. (at
       Manchester UK)

1-13, Back, Up, <RETURN> for more, Quit, or Help: 5

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

                                              Movie title queries
                        MOVIE TITLE QUERY

Enter a movie title or substring.

Example, to search for movies with the word "alien" in their
title, type "alien".

This will return details on several movies, including Aliens[1]

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.

 search menu[2] Fun and Games page[3] COMMA home page[4]

FIND <keywords>, 1-5, Back, Up, <RETURN> for more,
or Help: three musketeers

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

                                                     Movie Info
     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]

       search menu[7] Fun and Games page[8] COMMA home page[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
     Here are the results from the search for "Three Musketeers, The (1921)"

                     THREE MUSKETEERS, THE (1921)

     1921

       Cast   Belcher, Charles[1] ......Bernajoux
                     De Brulier, Nigel[2] ......Cardinal Richelieu
                     De La Motte, Marguerite[3] ......Constance Bonacieux
                     Fairbanks, Douglas[4] ......D'Artagnan
                     Irwin, Boyd[5] ......Comte de Rochefort
                     MacLaren, Mary[6] ......Queen Anne of Austria
                     Menjou, Adolphe[7] ......Louis XIII
                     Pallette, Eugene[8] ......Aramis

                         Poff, Lon[9] ......Father Joseph
                         Siegmann, George[10] ......Porthos
                         Stevens, Charles[11] ......Planchet

        Directed by   Niblo, Fred[12]

        Music by   Gottschalk, Louis F.[13]

     1-21, Back, Up, <RETURN> for more, Quit, or Help: 7

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

3.6. Learning more about World-Wide Web

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

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

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

     Usenet newsgroup: comp.infosystems.www

4. WAIS

4.1. What is WAIS

     WAIS, Wide Area Information Server, is a distributed information
     retrieval system. It helps users search databases over networks using
     an easy-to-use interface. The databases (called sources) are mostly
     collections of text-based documents, but they may also contain sound,
     pictures or video as well. Databases on topics ranging from
     Agriculture to Social Science can be searched with WAIS.

     The databases may be organized in different ways, using various
     database systems, but the user isn't required to learn the query
     languages of the different databases. WAIS uses natural language
     queries to find relevant documents. The result of the query is a set
     of documents which contain the words of the query: no semantic
     information is extracted from the query.

4.2. Who can use WAIS

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

   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 e-mail interface
   is available at the address: waismail@quake.think.com which gives
   e-mail access to WAIS databases (see E-mail access section under
   Using WAIS below).

4.3. How to get to WAIS

   There are many WAIS servers throughout the network. A
   directory-of-servers database is available at several sites. You can
   address a query to it, e.g., to find out what databases are available
   on a particular subject. This database is also available via
   anonymous FTP from Think.com in the directory /wais as file
   wais-sources.tar.Z.

   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.

4.4. Using WAIS

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

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

   * Step 1: The user selects a set of databases to be searched from
     among the available databases.

   * Step 2: The user formulates a query by giving keywords to be
     searched for.

   * Step 3: When the query is run, WAIS asks for information from each
     selected database.

   * Step 4: Headlines of documents satisfying the query are displayed.
     The selected documents contain the requested words and phrases.
     Selected documents are ranked according to the number of matches.

   * Step 5: To retrieve a document, the user simply selects it from the
     resulting list.

   * Step 6: If the response is incomplete, the user can state the
     question differently or feed back to the system any one or more of
     the selected documents he finds relevant.

   * Step 7: When the search is run again, the results will be updated
     to include documents which are similar to the ones selected,
     meaning documents which share a large number of common words.

4.4.1. 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 (a vertical bar (|) indicates a choice of parameters):

   help
      to get the help file

   maxres number
      to set the maximum number of results 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'll get a list of sources.

   retrieve docid
        to retrieve a document from a database. docid is a DocID as
        returned by a search above. 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.

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

4.5. 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, for
   example, 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.

4.6. 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.

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

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

    For information on free WAIS software contact freewais@cnidr.org

    Mailing list: wais-discussion@wais.com
    To subscribe send a mail to wais-discussion-request@wais.com

    Usenet newsgroup: comp.infosystems.wais

    WAIS was developed at Thinking Machines Corporation.

5. ARCHIE

5.1. What is ARCHIE

    Archie is an information system. It offers an electronic directory
    service for locating information in the international TCP/IP network
    (the Internet).

    The best known use of archie is for scanning a database of the
    contents of more than 1000 anonymous FTP sites around the world.
    Currently, this database contains more than 2,100,000 file names from
    anonymous FTP sites. This database is known as the archie database.

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

    The archie database is automatically updated, thereby ensuring that
    the information is accurate. Using this database, users can easily
    find the the location of files they need without logging onto several
    machines.

5.2. Who can use ARCHIE

    Users on any network can access the archie database by electronic
    mail. Other means of access are available to users on the Internet
    (see the section Using ARCHIE below for details).

    You are requested to respect a few basic rules when you request
    information from an archie server:

      * avoid connecting during working hours; most of the archie
      servers are
        not dedicated machines, they have local functions as well.

      * make your queries as specific as possible; the response will be
        quicker and shorter.

      * user interfaces installed on your computer contribute to reduce
      the
        load on the server sites, please use them.

      * use the archie server closest to you and, in particularly, don't
        overload the transatlantic lines.

5.3. How to get to ARCHIE

   The archie database is maintained in the following locations:

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

5.4. Using ARCHIE

The format of the parameters is given at the end of this section.
Angle brackets (<>) indicate an optional parameter; a vertical bar
(|) indicates a choice of parameters.

Note: A new version of the archie server (3.0) is now available. Some
of the commands for interactive access and the e-mail interface are
slightly different from previous versions of the server (2.11 and
before). Command formats marked with a (+) are valid in version 3.0
only, those marked with a (*) are acceptable only in previous
versions. To find out which version is installed at the server you
wish to use, issue the version command.

5.4.1. Using a local client:

Usage of these clients is encouraged since they provide quick and
easy non-interactive access to the archie servers, and thus,
better performance of the servers and better response time for the
user.

Public domain clients for accessing archie servers are available
for: Macintosh, MS-DOS, OS/2, VMS, NeXT, Unix and X-Windows. The
clients are available for anonymous FTP from the archie sites in
the directories /pub/archie/clients or /archie/clients. All these
platforms support a simple command line client. In addition, a
graphical interface (called xarchie) is available for X-Windows.

5.4.1.1. Archie client command and parameters

When using a graphical interface, you access the archie functions
by pressing mousse buttons. The results are displayed with
selectable fields for further explorations.

The basic archie client is a command with parameters that you
enter on your local machine. With most versions of the archie
client, if you type archie with no parameters, you will get a list
of the possible parameters and a short description of each. The
format of the command is:

```
+-----------------------------------------------------------------+
|                                                                 |
|   archie     <-options> string | pattern                        |
|                                                                 |
+-----------------------------------------------------------------+
```

where the options are:

o

    specifies an output file name to store the results (not
    available with all clients).

l

    lists the result one match per line. This form is suitable for
    parsing by programs.

t

    sorts the result inverted by date

m#

    specifies maximum number of matches to return (# within the
    range 0 to 1000). The default value is 95.

h archie-server

    specifies an archie server to send the query to; if this
    parameter is not given, then the query will be sent to the
    default archie server, if one is defined.

L

    lists known servers and current default server.

The following group of options determines the kind of search
performed on the database. They are mutually exclusive.

s

    a match occurs if the file/directory name contains string. The
    search is case insensitive.

c

    as above, but the search is case sensitive.

e

    string must EXACTLY match (including case) the file/directory
    name in the database. This is the DEFAULT search method.

r

    searches the database using pattern. It contains special
    characters which must be interpreted before performing the

search.

There may be some slight differences in the options available with
different clients on different platforms.

The result is a list of FTP site addresses with files or
directories matching the argument, 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.

5.4.2. Using Telnet:

To access an archie server interactively, telnet to one of the
existing servers (see the list of servers in the section How to
get to ARCHIE above). At the login: prompt enter archie, the login
procedure ends leaving the user at a archie> prompt. The server is
ready for user requests. The following commands are available:

exit, quit, bye
   exits archie.

help <command-name>
   invokes the on-line help. If issued with commandname, the help
   request is restricted to the specified topic. Pressing the
   RETURN key exits from the on-line help.

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

        list \.de$

   will list all German sites

site(*) site-name
   lists the directories and, recursively, the subdirectories, of
   site-name in the database. The result may be very long.

whatis string
   searches the database of software package descriptions for
   string. The search is case-insensitive.

```
prog  string  |  pattern
find(+)  string  |  pattern
   searches the database for string or pattern which represents
   the name of the resource to be found in the database. Searches
   may be performed in a number of different ways specified in the
   variable search (set command) which also decides the
   interpretation of the parameter as string or pattern. The
   result is a list of FTP site addresses with matching entries,
   the size of the resource, its last modification date and the
   directory to find it. The number of hits is limited by the
   maxhits variable (set command). The result of prog can be
   sorted in different ways, depending on the value of the sortby
   variable (set command). By default, the variables search,
   maxhits and sortby are set to, respectively, exact match search
   on string, 1000 hits and unsorted resulting list. Typing the
   keyboard interrupt character during a search will abort it. The
   results up to that time are displayed. See the Examples section
   below for an example of the prog command and its results.

mail  <email>  <,email2...>
   sends the result of the last command in a mail message to the
   specified e-mail address(es). If issued with no argument, the
   result is sent to the address specified in the variable mailto
   (set command).

show  <variable>
   displays the value of the given variable name. If issued with
   no argument, it displays all variables. See the set command
   below for the possible variables.

set  variable  value
   sets one of the archie's variables. Values of these variables
   affect how archie interacts with the user.

Variables and values are:

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 mail the result of the last
    command when mail is issued with no arguments.

maxhits number
    specifies the maximum number of matches prog will generate
    (within the range 0 to 1000). The default value is 1000.

search search-value
    determines the kind of search performed on the database by the
    command: prog string | pattern. search-values are:

    sub
        a parttial 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 (including
        case) the string in the database. The fastest search method
        of all, and the default.

    regex
        pattern is interpreted before performing a search on the
        database.

sortby sort-value
    describes how to sort the result of prog. sort-values are:

    hostname
        on the FTP site address in lexical order.

    time
        by the modification date, most recent first.

    size
        by the size of the found files or directories, largest
        first.

    filename
        on file or directory name in lexical order.

```
              none
                 unsorted (default)
```

The reverse sorting orders from those described here are
obtained by prepending r to the sortby value given. (e.g.,
reverse hostname order hostname is rhostname).

```
    term  terminal-type    <number-of-rows  <number-of-columns>>
         tells  the archie  server what  type of  terminal  you are
         using, and optionally its size in rows and columns, e.g.:

              set term xterm 24 100
```

5.4.3. Using electronic mail:

Users limited to electronic mail connectivity can access the
archie servers by sending mail to the domain address of one of the
servers listed in the section How to get to ARCHIE (e.g.,
archie@archie.ac.il). The commands are sent in the body part of
the mail.

The electronic mail interface to an archie server recognizes a
subset of the commands described in Using Telnet. Most useful
commands and particularities to the e-mail interface are described
below. If an empty message, or a message containing no valid
requests is received, it will be considered to be a help request.

Command lines begin in the first column. All lines that do not
match a valid command are ignored. The Subject: line is processed
as if it were part of the message body.

```
help
     sends you the help file. The help command is exclusive, ie,
     other commands in the same message are ignored.

path  return-address
     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 ...>
     provides a list of the sites in the database that match pattern
     and the time at which they were last updated. The result is a
     list with site names, sites IP address and date of the last
     update in the database.
```

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

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

      prog pattern <pattern2 ...>
         find(+) pattern <pattern2>
         searches the database for each interpretation of pattern which
         represents the name of a resource to be found in the database.
         If multiple patterns are placed on one line, in that case, the
         results will be mailed back in one message. If multiple prog
         lines appear, then multiple messages will be returned, one for
         each prog line. Results are sorted by FTP site address in
         lexical order. If pattern contains spaces, it must be quoted
         with single (') or double (") quotes. The search is case
         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. This will produce a .Z file. You can then run
         uncompress on this 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 when a signature
         is automatically appended at the end of your mail messages.

      Description of pattern

      A pattern describes a character string including characters which
      take a special meaning. The special meaning is lost when "\" is
      put before the character. The special characters are:

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

        ^

           (caret) if "^" appears at the beginning of the pattern, then
           the searched string must start with the substring following the
           "^". If it occurs anywhere else in the pattern it is regarded
           as non-special, 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 occurring anywhere else in the pattern, it is regarded as
           non-special, e.g.:

               "efghi$" will match "efghi" or "abcdefghi" but not
               "efghijkl"

5.5. 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 eudora1.2.2.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  Eudora1.3.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
```

5.6. 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. Now archie is
supported by Bunyip Information System Inc., Canada.

6.1. WHOIS

6.1. What is WHOIS

WHOIS provides directory service to network users. This service is a
way of finding e-mail addresses, postal addresses and telephone
numbers. It may also deliver information about networks, networking
organizations, domains and sites.

The main database of networking-related names (organizations, sites,
networks, people, etc.) is maintained by the Internet Registration
Service (InterNIC). Actually, the names of the administrative and
technical contacts for registered domains are automatically entered
into the database when domain or IP number applications are processed
by the Internet coordination authority. Each entry of the database
has a handle (a unique identifier), a name, a record type, and
various other fields depending on the type of record. This database
will be used as an example in the descriptions below.

Before April 1, 1993, the Network Information Center (NIC) of the
Defense Data Network (DDN) was the Internet coordination authority
and, therefore, maintained the database (known as the NIC database).
The NIC database is now restricted to information about the .mil
domain. Many documents still refer to these names.

Many academic sites maintain their own database to offer information
about their staff members and students.

In its current implementation, WHOIS has some limitations which
prevent it from becoming an efficient directory service for 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. A new
extended protocol, WHOIS++, is being specified to improve the current

service. WHOIS++ will include local enhancements to the WHOIS
service, an improved query syntax and its architecture will allow a
real distributed directory service for the entire Internet.

This new protocol for directory services will be made available
shortly.

6.2. Who can use WHOIS

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

A WHOIS server is accessible across the network from a user program
running on local machines or via an interactive Telnet session to the
site which hosts the server.

In addition, the InterNIC offers an electronic mail interface to the
database it maintains, allowing users not on the Internet or users
with electronic mail only to access this information. This type of
access is described below in the Using WHOIS section.

In general, WHOIS servers should only be used for isolated queries
about specific information. Typically, it is not acceptable to make
an extended series of queries to obtain large sections of the
directory. Such a strategy is unfair both because of excessive
consumption of server resources, and because the directory
information belongs to individuals. In particular, extracting lists
of people for commercial purposes is strictly prohibited.

6.3. How to get to WHOIS

There are many WHOIS servers throughout the network and a
comprehensive list would be too long to be included here. A WHOIS
server offers information about the organization to which it belongs:
it doesn't share a common directory with other WHOIS servers and
doesn't know either where to find information about other
institutions.

6.4. Using WHOIS

WHOIS has become the familiar name of the user program for accessing
a WHOIS database, although NICNAME is the original name.

In the following, angle brackets (<>) indicate an optional parameter.

   6.4.1. Using a local client:

      Unix computers have a native whois command. On non-Unix machines,
      ask your system administrator whether your computer has it or not.
      This command searches the database on the specified site for entry
      which contains identifier. The format is:

      +---+
      | |
      | whois   <-h site-name> identifier |
      | |
      +---+

      where:

      site-name
         is the domain address of the site which hosts the database you
         want to query (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 2 ways:

        * a full detailed display for a single match,
        * a list of summary lines for multiple matches.

     In both cases, the handle is shown in parentheses after the name.

   6.4.2. Using Telnet:

     To access the InterNIC database interactively, telnet to the
     InterNIC site (whois.internic.net). No login is required.

     Other WHOIS databases may have a Telnet access and offer most of
     the functions below (e.g., whois.ripe.net which hosts the WHOIS
     database of the European IP Networks).

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

     WHOIS
        invokes the information retrieval program.

     ?
        displays a short on-line help.

     HElp
        accesses the full on-line help.

     Q, QUIT, RETURN key
        exits WHOIS

     <keyword> identifier
        searches the database for 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 entry that matches identifier
      only, no membership list.

   The special characters may be used together.

   Except if Full or SUMmary are specified, the results are
   displayed in one of 2 ways:

      * a full detailed display for a single match,
      * a list of summary lines for multiple matches.

   In all cases, the handle is shown in parenthesis after the name.

6.4.3. Using electronic mail:

   Users limited to electronic mail connectivity can send requests to
   the database maintained at the InterNIC by sending mail to
   mailserv@internic.net. The commands are sent in the Subject:
   field. The body part of the mail is ignored except if the Subject:
   line is empty. In that case, only the first line is interpreted.

   This electronic mail interface recognizes all commands described
   in Using Telnet. Requests should be prefixed with the word WHOIS.
   Requests are processed automatically once a day.

6.5. Examples

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

        whois \!EARN...   (remark: "\" is an escape character)

   or if you send by e-mail the command:

        whois !EARN...

   then 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

        then 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...

then 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
```

6.6. 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.

7. X.500

7.1. What is X.500

X.500 is an OSI (Open System Information) based directory services
protocol designed by the CCITT (International Telegraph and Telephone
Consultative Committee).

X.500 provides distributed directory services to network users. The
X.500 directory specifies a model for connecting directory services
to form one distributed global directory. Each directory service
holds a part of the global database and the directory information is
made available via a server (called a Directory System Agent - DSA).
The database is maintained locally. From the user point of view, the
entire directory is accessible from the local server.

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
are underway which utilize these directory capabilities (e.g., the
Internet RFCs (Request For Comments) are listed in the global
directory).

Each item (entry) in the X.500 directory describes one object (e.g.,
a person, a network resource, an organization) and has a
Distinguished Name - DN (a unique identifier). It consists of a
collection of attributes (e.g., last name, organization name, e-

mail,...- for a person). The information held in the X.500 directory
(or Directory Information Base - DIB) is arranged hierarchically.
This organization is called the Directory Information Tree (DIT). At
the top-level is the root entry (the World), then the country level,
then the organization level, and, eventually, the people, the
resources, etc., at the bottom-level of the hierarchy.

7.2. 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 on the Internet. In addition, users on any network can
access the X.500 directory by electronic mail. See the section Using
X.500 below for details.

7.3. How to get to X.500

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

In addition, other network tools (e.g., WWW and Gopher) provide
access to X.500 directory services through gateways.

Accessing a remote client is an easy way to start querying the X.500
directory. Some sites allow public access via Telnet or X.25 to a
client. Public access user interfaces are available at:

```
      +-----------------------------------------------------------------+
      |                                                                 |
      |   Telnet (login)                    Public X.25 (login)  Country|
      |                                                                 |
      +-----------------------------------------------------------------+
      |   jethro.ucc.su.oz.au (fred)                            Australia |
      |   elem4.vub.ac.be (dua)         222100611              Belgium    |
      |   login.dkuug.dk (ds)                                 Denmark    |
      |   nic.funet.fi (dua)                                   Finland    |
      |                                 20800603053201         France     |
      |                     (login: dua, password: ucom.x)    France     |
      |                                 26245050230303         Germany    |
      |   ashe.cs.tcd.ie (de)                                  Ireland    |
      |   jolly.nis.garr.it (de or fred) 22225010083212       Italy      |
      |   zoek.nic.surfnet.nl (zoek)                          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 |
      |   paradise.ulcc.ac.uk (dua)      23421920014853       Paradise   |
      |                                                                 |
      +-----------------------------------------------------------------+
```

   Paradise is a European project to encourage the use of X.500 in
   European countries.

   To connect to one of these sites, select an access method (Telnet or
   X.25) and at the login: prompt type the specified login, if required.

7.4. Using X.500

   X.500 supports data management functions (addition, modification and
   deletion of entries) and powerful lookup capabilities. The use of
   X.500 is primarily for its lookup capabilities, ie, querying a
   database for information on a person (postal address, telephone
   number, e-mail address, etc.). The basic fields for searching are the
   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 (|) indicates a choice of parameters.

   7.4.1. 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.
      For a comprehensive list of DUAs, their description and where to

find them, consult the Internet document RFC 1292 - A Catalog of
Available X.500 Implementations.

Available DUAs range from simple line commands to sophisticated
graphical user interfaces which require a pointing device.

7.4.2. Using Telnet or X.25:

3 categories of user interfaces might be available at the remote
site:

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

Capabilities of these DUAs range from basic search facilities to
full X.500 functionality.

de (directory enquiries) is recommended for novice users since it
is a very simple user-interface. It has been designed to run as a
public access DUA and is accessible from any kind of terminal. It
supports the basic X.500 functions: read, search, list. The Simple
query mode is suitable for those who are new to querying the X.500
directory.

de
    invokes the X.500 interrogation user-interface.

q
    exits de.

?<topic>
   displays the on-line help on the specified topic or general
   help.

^C
   (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.

-
   resets the default value to a blank string.

When de is invoked, the user is requested to fill in 4 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, otherwise, the search is carried
   out with the selected name. 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 on
   the organization are displayed, otherwise, the search is
   carried out with the selected name.

   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.

   7.4.3. 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.

   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.
   To receive a help file, send the word help instead of a find
   command.

7.5. Examples

   Using de, you can search for the Anthropoloy department of the
   University College of London in 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 American Institute for Foreign Study
              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 (default values come from a previous
   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
                postalAddress          UNI-C
                                       DTH
                                       Bygning 305
                                       DK-2800 Lyngby
                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
```

   ----

   and 6 other entries.

7.6. 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 electronically: send the command GET
   ITU-5233 to itudoc@itu.ch or consult the ITU document store via
   Gopher to gopher.itu.ch. This is not intended for the casual user!

8. NETFIND

8.1. What is NETFIND

   NETFIND is an Internet user directory tool. It 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.

   Netfind finds information about people through the Internet protocols
   SMTP and finger. 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 can not be found.

Due to 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.

The Netfind software can only run on Suns running SunOS 4.0 or more
recent.

8.2. Who can use NETFIND

You must be on the international TCP/IP network (the Internet) in
order to use Netfind. Moreover, Netfind can only find information on
users who are on the Internet.

There is no e-mail access to Netfind.

8.3. How to get to NETFIND

You can access Netfind through software at your site (local access),
or you can use Telnet to access it at one of the following hosts
(remote access) and log in as netfind, no password is needed.

```
+----------------------------------------------------------------+
|                                                                |
|   Host                            Country                      |
|                                                                |
+----------------------------------------------------------------+
|   archie.au                       Australia                    |
|   netfind.anu.edu.au              Australia                    |
|   netfind.ee.mcgill.ca            Canada                       |
|   malloco.ing.puc.cl              Chile                        |
|   netfind.vslib.cz                Czech Republic               |
|   monolith.cc.ic.ac.uk            England                      |
|   nic.nm.kr                       Korea                        |
|   lincoln.technet.sg              Singapore                    |
|   nic.uakom.sk                    Slovakia                     |
|   bruno.cs.colorado.edu           USA                          |
|   ds.internic.net                 USA                          |
|   mudhoney.micro.umn.edu          USA                          |
|   netfind.oc.com                  USA                          |
|   redmont.cis.uab.edu             USA                          |
|   dino.conicit.ve                 Venezuela                    |
|                                                                |
+----------------------------------------------------------------+
```

8.4. Using NETFIND

   To use Netfind, you give it the name of a person and keywords
   indicating where that person works. After you specify a search,
   Netfind looks in its seed database to find domains matching 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 the keys you specified match more than 100
   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 it completes the search (or when interrupted by <circ>C),
   Netfind summarizes the search results. The summary includes problems
   searching remote domains, information about the most promising e-mail
   address for the person being sought (if available), and information
   about when and where the person most recently/is currently logged in
   (if available). If more than one person is located by a search, the
   summary does not include information about e-mail targets and most
   recent/current logins (since only the user can decide which person
   was the correct one)

   8.4.1. Local access:

      The format of the Netfind command is:

         +--+
         | |
         | netfind   <options> name-keyword place-keywords |
         | |
         +--+

      where the options are:

      -h

         tells Netfind to skip the domain search phase, and immediately
         begin searching individual machines found in the seed database.
         This option exists for measurement purposes. It is not of much
         use to casual users.

      -s

         will disable usage of the SMTP protocol during searches. This
         option is mainly useful for measurement purposes. Without this
         protocol, searches will begin producing finger output slightly
         sooner, but will often search less useful machines, generate

more Internet load, and fail to find information for users at
sites that do not support finger (such as many companies).

-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.

-m

displays measurement information. If no filename is specified,
measurements are output to stderr. The packet count estimates
are usually exaggerated, because they make pessimistic
assumptions about the state of the Domain Naming System.

-d

allows you to turn on various classes of debugging output (all
of which are output to stderr), using a letter corresponding to
each one. Debugging output is enabled using the -d option with
a list of letters, e.g., -dslf. The following classes/letters
exist:

c:

   display control messages (check if the program has reached a
   specified point)

   f: display finger related messages

h:

   list machine names found in the seed database

l:

   display lock related messages (when entering monitors)

m:

    display messages about mail protocol (SMTP)

n:

    display messages about network failures

r:

    display hosts matched from the seed database that were
    rejected from searches because of search scope selection

s:

    display system call related messages

t:

    display thread related messages

A:

    convert the above flags to mean their complement (example
    -dAt means produce all debug output except that for
    threads).

The letters that are most likely to be of interest to the
casual user are f, m, and n. By default, these options are
enabled. Specifying any of these three flags with -d on the
command line will disable them (hence, the -d option toggles
the default behavior of each of the flags).

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

The place keywords describe where the person works, by 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 there are host names like brazil.cs.colorado.edu) you can
specify it as keys without the dots (e.g., cs colorado edu).
The host parts of domain names (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.

8.4.2. 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 a
   name keyword and place keywords.

8.5. Examples

   To find the address of 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.

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

Note that Netfind found only an Internet address on a Unix machine.

8.6. 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 e-mail message

to netfind-users-request@cs.colorado.edu with the body (not subject
line) subscribe netfind-users

9. TRICKLE

9.1. What is TRICKLE

TRICKLE is a service which will send you files on request or by
subscription. TRICKLE works with various anonymous FTP sites
(computers in the Internet network that allow public access and
retrieval of software and files). It provides a quick and easy
alternative to FTP, whether or not you have access to the Internet.

There are several TRICKLE servers throughout the world that cooperate
to distribute the files efficiently. To request files, the user
issues commands to the nearest TRICKLE server, which delivers the
software either from its local cache disk, from the cache of another
TRICKLE server, or from an FTP site that holds the software.

9.2. Who can use TRICKLE

There are currently TRICKLE servers at the following addresses:

```
+----------------------------------------------------------------+
|                                                                |
|   Location       EARN/BITNET         Internet                  |
|                                                                |
+----------------------------------------------------------------+
|   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 |
|                                                                |
+----------------------------------------------------------------+
```

When you send a command to a TRICKLE server, it either executes the
command or sends you a message with the address of the TRICKLE server
for your area.

The files which are available from TRICKLE are organized in main
directories which contain many subdirectories. The main directories

which are currently available are:

```
+----------------------------------------------------------------+
|                                                                |
|  Directory  Source FTP Site         Contents                   |
|                                                                |
+----------------------------------------------------------------+
|  MSDOS      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 arc.|
|  UNIX-C     oak.oakland.edu         Unix and C code software arc.|
|  MACINTOS   oak.oakland.edu         Apple Macintosh software arc.|
|  OS2        2tp-os2.nmsu.edu        Large archive of OS/2 sw    |
|  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/sounds) |
|  X11        export.lcs.mit.edu      X-Windows software distrib. |
|  LINUX      nic.funet.fi            Linux system software dist. |
|  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.

9.3. How to get to TRICKLE

You send commands to TRICKLE by electronic mail. The commands should
be in the body of the mail message, one command per line. Any number
of commands (up to your daily command limit) may be placed in one
message. Users on the EARN/Bitnet network may also send commands to
TRICKLE by interactive message.

9.4. Using TRICKLE

All commands begin with a slash (/). Note that the angle brackets
(<>) are part of the command, not an indication of an optional
parameter.

Use the /PDDIR command to obtain directory listings.

```
+----------------------------------------------------------------+
|                                                                |
|   /PDDIR                                                       |
|                                                                |
|   /PDDIR      <dirname>                                        |
|                                                                |
|   /PDDIR      <dirname.subdirname>pattern                      |
|                                                                |
+----------------------------------------------------------------+
```

where:

dirname
    is the name of a main directory,

subdirname
    is the name of a subdirectory,

pattern
    is part of a filename.

Use /PDDIR without any parameters to get a listing of the main
directories. With PDDIR <dirname> you will get a listing of the
subdirectories under that directory. If you specify both directory
and subdirectory, it will list the files that are available in that
subdirectory. With pattern, you will get a listing of only those
files that match or begin with that pattern. Wildcards "?" and "*"
may be imbedded 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. The default for EARN/Bitnet users is to send the
    file as-is. The default for others is UUE.

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

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

```
+--------------------------------------------------------------+
|                                                              |
|   /SUB        <dirname>                                       |
|                                                              |
|   /SUB        <dirname.subdirname>pattern                     |
|                                                              |
|   /SUB        QUERY                                           |
|                                                              |
+--------------------------------------------------------------+
```

where:

dirname
    is the name of a main directory,

subdirname
    is the name of a subdirectory,

pattern
    is part of a filename.

If you subscribe to a directory, you will get a summary of added
files about once a week, depending on how active the FTP site is.
This listing shows the names, sizes and dates of each file added. If
you subscribe to a file, as soon as TRICKLE is informed that a new

version of the file has been stored at its FTP site, a copy of the
file will be sent to you.

Note that since filenames usually reflect the version number of the
file, it is a good idea to omit the number when specifying a pattern.
For example, it is better to send 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.

Wildcards are not allowed with the /SUB command.

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.

9.5. Examples

   For a listing of the files in the VIRUS subdirectory of (the MSDOS
   directory, send the command:

        /PDDIR <MSDOS.VIRUS>

   To get the file 00-INDEX.TXT from <MSDOS.VIRUS> in EBCDIC format,
   send the command:

        /PDGET <MSDOS.VIRUS>00-INDEX.TXT (EBC80

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

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

   To subscribe to automatically get new versions of the SCANV
   software from <MSDOS.VIRUS>, send the command:

        /SUB <MSDOS.VIRUS>SCANV

   To unsubscribe from all files in the VIRUS subdirectory, send the
   command:

        /UNSUB <MSDOS.VIRUS>*

9.6. Learning more about TRICKLE

   The /HELP command may be sent to any TRICKLE server to obtain a very
   detailed help file from the server.

   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

10. BITFTP

10.1. What is BITFTP

   BITFTP, BITNET FTP Server, allows users of EARN, Bitnet and
   associated networks to access FTP sites on the Internet.

   The BITFTP server provides a mail interface between a user on the
   EARN/Bitnet network to FTP sites on the Internet. BITFTP handles this
   task by passing the commands specified in the mail message from the

user to another server that actually makes the connection to the FTP
sites. When the server finishes the interaction with the FTP site,
or fails due to an error, a transcript of the result is sent back to
the user, as well as the requested file(s), if any.

The format of the files sent to the user can be defined within the
mail message. BITFTP can deliver files in netdata and uuencode
formats.

10.2. Who can use BITFTP

BITFTP is currently available only to users on EARN, Bitnet and other
regional NJE networks. BITFTP does not support multiple file requests
via the mget command nor does it support sending files to FTP sites
(the put command).

10.3. How to get to BITFTP

There are BITFTP servers currently running at:

```
+-------------------------------------------------------------+
|                                                             |
|   BITFTP@DEARN.BITNET   or   BITFTP@VM.GMD.DE       Germany  |
|   BITFTP@PUCC.BITNET    or   BITFTP@PUCC.PRINCETON.EDU  USA  |
|                                                             |
+-------------------------------------------------------------+
```

Users on the EARN/Bitnet international network only may use the US
server. Only users from EARN member countries may use the server in
Germany. Servers at other locations are planned.

BITFTP accepts requests via electronic mail, including IBM NOTE and
PROFS-format messages, as well as by NJE file transfer.

10.4. Using BITFTP

BITFTP implements a large subset of the FTP commands of the IBM's
TCP/IP for VM, using the same syntax. This software is documented in
the IBM manual TCP/IP for VM User's Guide. In the following, angle
brackets (<>) indicate an optional parameter.

Use the ftp command to specify which host to connect to. This command
must be the first command in your mail file. You can also specify the
file format that you wish BITFTP to use to deliver files to you.

```
+----------------------------------------------------------------+
|                                                                |
|   ftp        hostname <fileformat>                             |
|                                                                |
+----------------------------------------------------------------+
```

where:

hostname
    is either the IP address or the domain name of the host to connect
    to,

fileformat
    is the format in which BITFTP should deliver files to you. It can
    be either netdata or uuencode.

Use the user command to tell the host the username and the password
to be used for the FTP connection. Note that on 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 userid.

Use the cd command to select a particular directory as current
directory.

```
+----------------------------------------------------------------+
|                                                                |
|   cd         directory-name                                    |
|                                                                |
+----------------------------------------------------------------+
```

where:

directory-name
    is the name of the directory to be selected.

Use the dir command to display a list of the files in the current, or
specified, directory. The file names, and depending on the site, the
file size, file creation date and other information will be listed.

```
+------------------------------------------------------------------+
|                                                                  |
|   dir        <pattern>                                           |
|                                                                  |
+------------------------------------------------------------------+
```

where:

pattern
    is a pattern that defines which file names should be displayed.
    Many FTP sites are case-sensitive, thus care must be used with the
    pattern. The pattern may contain any number of characters, and the
    wildcard character "*" (asterisk) may be used to represent any
    characters.

The ls command is similar to the dir command, except that with most
FTP sites, it only displays the filenames, without any other
information. The pattern specification is identical to dir.

```
+------------------------------------------------------------------+
|                                                                  |
|   ls         <pattern>                                           |
|                                                                  |
+------------------------------------------------------------------+
```

Use the get command to obtain a file from the current host.

```
+------------------------------------------------------------------+
|                                                                  |
|   get        foreignname <localname>                             |
|                                                                  |
+------------------------------------------------------------------+
```

where:

foreignname
    is the filename of the file, as stored at the FTP site. With many
    sites, the case of the filename must be respected.

localname
    is an optional local filename. If you specify a 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                                                      |
|                                                             |
+-------------------------------------------------------------+
```

10.5. 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
-rw-r--r--  1 1086     120      0 Aug 18 21:23 plane.
```

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
```

10.6. Learning more about BITFTP

A four-page instruction to the BITFTP service can be obtained by
sending a help command in the body of a mail message to either BITFTP
server.

Additional information on BITFTP may be obtained from EARN
(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.

11. LISTSERV (Version 1.7f)

11.1. What is LISTSERV

LISTSERV is a distribution list management package. It runs on IBM
VM/CMS systems in the international NJE network (EARN/ Bitnet). It
allows groups of computer users with a common interest to communicate
among themselves, while making efficient use of computer and network
resources. It makes it easy for even novice users to discover, join,
and participate in these interest group mailing lists. LISTSERV also
provides facilities for logging and archiving of mail traffic, file
server functions, and database searches of archives and files.

There are LISTSERV lists on every subject under the sun, with names
ranging from AARPUB-L (AAR Electronic Publication list) to Z3950IW
(Z39.50 Implementors Workshop). LISTSERV lists are international and
eclectic. You will find lists in every imaginable field, for every
audience, in many different countries and in many different
languages. See the description of the List command in the section
Using LISTSERV section for instructions on getting an up-to-date list
of lists.

11.2. Who can use LISTSERV

Anyone who can send electronic mail to an EARN/Bitnet address can
participate in a mailing list and access other LISTSERV facilities,
as long as the e-mail format is valid (according to the RFC822
standard), and has a usable return address. Every day, people use
LISTSERV from HEPnet, Internet, Compuserve, MCIMail and many other
networks throughout the world.

If you don't know how to send electronic mail to EARN/Bitnet, ask
your local support people for help.

11.3. How to get to LISTSERV

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

More than one command can be sent to LISTSERV in the same mail
message. Each command must be on a separate line. LISTSERV will
ignore the Subject: line of the mail header, so ensure that your
commands are in the body of the e-mail.

For EARN/Bitnet users, interactive messages are the fastest and most
convenient way to send commands to LISTSERV, but bear in mind that
interactive messages only work when the links between your computer
and LISTSERV are up; if the message fails, you can always send your
command via mail.

To facilitate communications with the LISTSERV servers on the
EARN/Bitnet network, a special LISTSERV computer node has been
defined. This means that any EARN/Bitnet user can address their
commands to the userid LISTSERV at the special node LISTSERV.

All non-EARN/Bitnet users may address their command mail to the
userid LISTSERV at the special node LISTSERV.NET. Note that if this

node is not yet defined on your network, you may also try
LISTSERV%LISTSERV.BITNET@CUNYVM.CUNY.EDU. 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 on to the
LISTSERV server hosting the 3D-L mailing list (in this case, at the
computer node ARIZVM1 or ARIZVM1.CCIT.ARIZONA.EDU).

You may also utilize the special LISTSERV address to send e-mail to
any LISTSERV mailing list if you are unsure of its 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 do so by addressing
your e-mail to BITFTP-L@LISTSERV.NET. It will automatically be
forwarded to the list's real address (in this case,
BITFTP-L@EARNCC.EARN.NET) when it reaches the LISTSERV node. Once you
know the real address of a list, it should be used for all future
mail sent to that list.

There are more than 250 sites in over 30 countries throughout the
world running LISTSERV as part of the world-wide network. Here are a
few of the LISTSERV sites:

```
+----------------------------------------------------------------+
|                                                                |
| NJE      Domain                    Site                 Country|
| Host     Address                                               |
|                                                                |
+----------------------------------------------------------------+
| EARNCC   EARNCC.EARN.NET                                       |
|                  EARN Office, Paris                      France|
| DEARN    VM.GMD.DE                                             |
|                  GMD, Bonn                              Germany|
| HEARN    HEARN.NIC.SURFNET.NL                                  |
|                  Katholieke Universiteit Nijmegen   Netherlands|
| SEARN    SEARN.SUNET.SE                                        |
|                  Kungliga Tekniska Hoegskolan, Stockholm  Sweden|
| BITNIC   BINTIC.CREN.NET                                       |
|                  BITNET Network Information Center         USA|
| PUCC     PUCC.PRINCETON.EDU                                    |
|                  Princeton University, New Jersey         USA|
+----------------------------------------------------------------+
```

11.4. Using LISTSERV

   The commands given here are available for everyone and require no
   special LISTSERV command privileges. Only the most common commands
   are described. For a complete list of non-privileged LISTSERV
   commands, retrieve the LISTSERV User Guide in the DOC FILELIST from
   LISTSERV@EARNCC.EARN.NET (or LISTSERV@EARNCC.BITNET).

   Commands are presented in a particular format: 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.

   There is a standard set of command keywords available for use in some
   LISTSERV commands. They may be used with any commands where they
   appear as optional parameters in the command description. The
   important standard keywords are:

   PW= password
      This keyword is used to specify a password in a command. If you
      have registered a personal password on a LISTSERV server, you will
      then have to validate certain commands by using the PW= command
      keyword in the command text. This feature is designed to prevent
      impostors from issuing commands while using your e-mail address.
      The use of passwords is strongly recommended for this reason. See
      the PW command for details on registering personal passwords. Once
      you have registered a personal password at a LISTSERV server, you
      will be obliged to include the PW= command keyword in all commands
      where it appears as an option.

   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, then LISTSERV will always use the default
      file format of MAIL. Otherwise, the default file format is
      dependent upon the information held in the BITEARN NODES file
      regarding your computer. The BITEARN NODES file is a special
      network definition file used in the EARN/Bitnet network. Any user
      may ask for a file format other than their default by specifying
      it in the F= command keyword in the commands where it appears as
      an option. Note that this will not permanently change your default
      file format, its effect is only for those commands where it is
      specified. Following is a list of file formats that 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

Contact your local support personnel for more information about
the file formats supported on your computer.

11.4.1. Commands for LISTS:

The primary function of LISTSERV is to operate mailing lists (also
referred to as distribution lists). Mailing lists are used to
distribute the e-mail sent to them to a list a recipients. They
provide the means for a group of users to establish an e-mail
forum on any topic or area of common interest. This service
provides an extremely convenient means for the exchange of ideas
and information between list members since LISTSERV (and not the
mail sender) manages the distribution of e-mail to all of its
final recipients. Users need only to remember one list address to
which they send their mail in order to communicate to a
potentially large number of users. Due to the efficiency with
which LISTSERV distributes e-mail to list members, discussions or
debates with a world-wide audience may be conducted.

The following commands are designed for use with LISTSERV mailing
lists. With them you may do things such as finding the names and
addresses of lists, signing on to or off lists, reviewing lists or
changing your personal options for any mailing list to which you
are subscribed.

```
+---------------------------------------------------------------+
|                                                               |
|    SUBscribe list-name  <full-name>                           |
|                                                               |
+---------------------------------------------------------------+
```

Use the SUBscribe command to join a mailing list. You can also use
this command 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. For example, the EARN User Group list located at the
node IRLEARN has a list name of EARN-UG. Do not confuse this with
the list's address (EARN-UG@IRLEARN) which should not be used. 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. If you send this command to LISTSERV via
command mail, the name for the full-name option will be taken from
the name given in the From: mail header should it be omitted from

the command text. If you send a SUBscribe command for a list to
which you already belong, then LISTSERV will interpret the command
as a request to change your full-name on the list.

A request to join a mailing list can be processed in three ways:
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 (LISTSERV will inform you to whom your
request has been forwarded). To see what kind of subscription a
list has, use the REView command.

```
+----------------------------------------------------------------+
|                                                                |
|   UNSubscribe list-name  |  *  <(NETWIDE>                      |
|                                                                |
+----------------------------------------------------------------+
```

Use the UNSubscribe command to leave a mailing list. The listname
parameter is the name of a mailing list from which you want to
remove your subscription. You can signoff all the lists to which
you are a member at any particular LISTSERV site by using the "*"
(asterisk) character in the place 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 the List command to get a listing of available mailing lists
at a LISTSERV server. The options parameter may be any of the
following:

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

Long
     The Long (or Detailed) option will send a file (called
     node-name LISTS) to you that contains 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. A file
     (called LISTSERV LISTS) will be sent to you containing the
     names, titles and e-mail addresses of these lists. This is a
     very large file, so make sure you have the necessary disk space
     to accommodate its size before you use the Global option. 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 the REView command to receive a listing of a mailing list. It
will be sent to you as a file called list-name LIST (or list-name
node-name for peered lists). A mailing list is comprised of two
parts: a control section and a subscription section. The control
section holds the definition parameters for a list which includes
information such as who is authorized to review or join a list and
whether or not it is archived. The subscription section holds the
e-mail addresses and names of all list members. The REView command
allows you to receive a listing of either or both of these
sections (the default is both) for any list, provided you are
authorized to do so. Note that at the discretion of the list
owner(s), the REView command can be restricted in use to list
members only. In this case, you will not be authorized to review a
mailing list if you are not a member of that list yourself. Also,
individual list members can restrict the appearance of their
e-mail address and name in response to a REView command if they
have set the CONCEAL mailing list option (see the SET command for
more details). The list-name parameter is the name of the LISTSERV
list you wish to review. The important options are:

Short
     This option restricts the information you receive to the
     control section of a list (giving its definition parameters)
     and does not return the subscription section of a list (giving
     the list members).

Countries
   If you use this option, the list of members will be by the
   nationality given in their e-mail.

LOCal
   If the list is peered (that is, it is linked to other mailing
   lists of the same name but on different LISTSERV servers), you
   will receive listings of all of these mailing lists in response
   to a REView command. The LOCal option can be used to suppress
   the propagation of the REView command to the LISTSERV servers
   hosting these peered mailing lists. In this case, you will
   receive a listing only from the server to which you send the
   REView command and not the others.

```
+----------------------------------------------------------------+
|                                                                |
|  Query      list-name  |  *                                    |
|                                                                |
+----------------------------------------------------------------+
```

When you join any mailing list, you will be assigned a default set
of list options that control such things as way you received mail
when it is distributed and the type of notification LISTSERV will
give you when it distributes mail you have sent to a list. These
are the personal list options that may be altered on any mailing
list to which you are subscribed to suite your circumstances. See
the SET command for a complete descriptions of these options. The
Query command can be used to review the personal list options you
have in effect at any mailing list. The listname 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. These options will remain in effect until they are
explicitly changed. The Query command can be used to display your
current optional settings for any list to which you are
subscribed. 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. After processing your SET command, LISTSERV
will send you conformation of the successful alteration of your
mailing list options via e-mail. The important options are:

Mail | DIGests | INDex | NOMail
    These options of the SET command alter the way in which you
    receive mail from a mailing list. The Mail option means that
    you wish to have list mail distributed to you as mail. This is
    the default. 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. Instead of receiving each mail
    individually as it is distributed to list members, you will
    receive all the mail in one batch for a given day, week or
    month. You may then browse through these mail messages at your
    leisure. Note that mail is not edited with the DIGests option,
    you will receive copies of all the mail messages in their
    entirety. 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.
    Both the DIGests and INDex options provide a means of listening
    in to discussions on mailing lists without having to deal with
    large quantities of incoming mail messages. The NOMail option
    means that mail sent to the list will not be distributed to
    you. This is useful when you are leaving your computer for an
    extended period of time and you do not want mail from the list
    to fill your mailbox. When you return, you can send the SET
    command with the Mail option to restore mail service.

    SHORThdr | FULLhdr | IETFhdr | DUALhdr
    All mail messages are comprised of header and body sections.
    The header section provides details such as the recipients, the
    original sender and the date and time a mail message was sent.
    The mail body section contains the text of a mail message.
    These options of the SET command indicate the type of mail
    headers you want to receive in the mail distributed from a
    mailing list. SHORThdr means that the mail header will include
    only the essential informational headers (for instance the
    Date:, To:, From:, Subject:, Sender: and Reply-to: headers).
    This is the default. You may change this to FULLhdr, which
    means that all (including non-essential) mail headers will be
    present in e-mail. The IETFhdr option means that LISTSERV will
    not change the headers of a mail message it distributes to you
    other than to add a Received: mail header (and also a
    Message-id: and Sender: headers if either of these were not
    already present). This option is designed specifically for

compatibility with SMTP exploders (as used, for instance, on
the Internet network). Lastly, DUALhdr is very similar to the
SHORThdr option except that LISTSERV will also insert mail
headers at the beginning of the mail body. Therefore, when the
mail is received and read by a recipient using this option, it
will start with this information (for instance, the first three
lines of a mail message may contain the To:, From: and Subject:
mail headers). This option is useful for users of some PC based
mail packages that will 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                                   |
   |                                                          |
   +----------------------------------------------------------+
```

   Use the CONFIRM command to renew your subscription to a
   list. Some mailing lists require subscription renewal at
   regular intervals (usually once a year). A mail message is
   automatically sent to list members indicating that they must
   send a CONFIRM command within a given number of days or they
   will be removed from the list. This command must be sent from
   the same e-mail address that received the confirmation notice.
   The list-name parameter is the name of the mailing list to
   which you are confirming your subscription. LISTSERV will
   send a message that your subscription has been confirmed.

11.4.2. Commands for FILES:

   LISTSERV also functions as a file server. That is, files can be
   stored at a LISTSERV server and made available for retrieval by
   users upon their request. These files are stored in LISTSERV under
   a hierarchical system of filelists. As the name suggests, a
   filelist is a special file that holds a list of files. Each entry
   in a filelist describes a file that is available for retrieval and
   gives details such as the file's name and size and also a file's
   access code (also known as a FAC) which describes who is
   authorized to retrieve it. These files may themselves be
   filelists, in which case they too will hold information about
   available files or further filelists. In this way, filelists are

organized in a hierarchical or tree structure.

There are two basic types of filelists on LISTSERV servers. The
first type holds files that have been specifically placed there by
file owners or LISTSERV administrators. These files may be
documents, maps or diagrams, or even programs. The second type of
filelist is associated with a LISTSERV mailing list. These are
referred to as list filelists and retain copies of all e-mail
distributed on a particular mailing list. They consist of a series
of files, each of which holds a copy of the mail messages
distributed on a list over an interval of time (usually, one
month). These files may then be retrieved to recover any list mail
distributed during a specific period. Note that e-mail distributed
on a mailing list may also be retrieved via the database functions
of LISTSERV. Not all mailing lists have an associated list
filelist; this is enabled at a list owner's discretion.

A further aspect of the file server functions of LISTSERV is the
concept of packages. A package consists of one or more files that
appear in a filelist. These may be, for example, a series of files
that go to make up a software package. A package is declared in a
LISTSERV filelist through a file that has the special name of
package-name $PACKAGE. Within it will be a list of all the files
that comprise the package. This list can be reviewed by sending a
retrieval request for that file. However, all the files that
comprise the package may also be retrieved through a request for
the file: package-name PACKAGE. Note that in this case, the "$"
(dollar) symbol is dropped from the name. The files that go to
make up the package will then automatically be sent to the
requestor. This enables users to retrieve an entire set of files
that belong to a package with only one command, instead of having
to retrieve each of these files individually through a series of
commands.

The following LISTSERV commands enable general users to manipulate
files that are stored at a server. This includes commands to
search for, retrieve and subscribe to files. When sending file
server commands to LISTSERV, you must address them to the server
and not to any mailing lists. Note that 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 at the
server to which you are sending file server commands. Otherwise,
it need not be used. The optional F= command keyword may 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 specifies the name of
the filelist you wish to get. 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, provided you are authorized to do so. 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 it is not
supplied in the command, LISTSERV will determine the filelist
through a search of its own internal filelist index.

```
+----------------------------------------------------------------+
|                                                                |
|   AFD        options                                           |
|                                                                |
+----------------------------------------------------------------+
```

AFD is an acronym for Automatic File Distribution. This command
enables you to subscribe to a file or package in a filelist. Every
time this file or package is updated in its filelist, you will
then automatically be sent of copy of it by the LISTSERV server.
You may subscribe to any number of files for packages from any
filelist with the AFD command. You may also review or delete your
subscriptions at any LISTSERV server. The options must be one of
the following:

ADD filename filetype <filelist> <text> <PW= password>
<F=format>
   The ADD option allows you to subscribe to a file or package.
   This means that a copy will henceforth be sent to you
   automatically by LISTSERV when it is updated on its filelist.
   The filename and filetype parameters identify a file or package
   to which you want to subscribe. The filelist option allows you
   to specify the name of the filelist in which it is located. If

this is not specified in the command, LISTSERV will locate the
filelist through a search of its own internal filelist index.
Also, if you wish to have an informational text message
inserted automatically at the top of the file or package when
it is sent to you, you may use the text parameter. Note that if
you omit the filelist option, the text you provide in the text
parameter must be enclosed in double quotes ("). This
parameter is most commonly used by network server applications
that subscribe to files at a LISTSERV on behalf of users. If
you are subscribing to files directly from LISTSERV yourself,
you should not need to use this option.

DELete filename filetype <filelist> <PW= password>
    Remove your subscription to a file or package for which you
    have an AFD. The filename and filetype parameters identify a
    file or package to which you wish to remove an AFD. These names
    may also include the "*" (asterisk) wildcard character so that
    multiple files or packages may be removed with one DELete
    command. The filelist option allows you to specify the name of
    the filelist in which it is located. If this is not specified
    in the command, LISTSERV will locate the filelist through a
    search of its own internal filelist index.

List <(FORMAT>
    The List option shows the files or packages to which you are
    currently subscribed at a LISTSERV. If you include the (FORMAT
    option, then the file format to be used when a file or package
    is sent to you will also be displayed.

```
+------------------------------------------------------------------+
|                                                                  |
|   FUI       options                                              |
|                                                                  |
+------------------------------------------------------------------+
```

FUI is an acronym for File Update Information. It enables you to
subscribe to a file or package in a filelist. Every time this file
for package is updated in its filelist, you will then
automatically be informed of this by the LISTSERV server. This
command is similar to the AFD command, except you will only be
sent notification of an update rather than the updated file or
package itself. You may subscribe to any number of files for
packages from any filelist with the FUI command. You may also
review or delete your subscriptions at any LISTSERV server. The
options parameter must be one of the following:

     ADD filename filetype <filelist> <PW= password>
        The ADD option allows you to subscribe to a file or package by
        adding an FUI to it. The filename and filetype parameters
        identify a file or package to which you want to add an FUI
        subscription. The filelist option allows you to specify the
        name of the filelist in which it is located. If this is not
        given in the command, LISTSERV will locate the filelist through
        a search of its own internal filelist index.

     DELete filename filetype <filelist> <PW= password>
        Remove your subscription from a file or package for which you
        have an FUI. The filename and filetype parameters identify a
        file or package to which you want to delete an FUI. The
        filelist option allows you to specify the name of the filelist
        in which it is located. If this is not specified in the
        command, LISTSERV will locate the filelist through a search of
        its own internal filelist index.

     List
        The List option shows the files or packages for which you
        currently have an FUI subscription at a LISTSERV server.

     +---+
     | |
     | Query File filename filetype <filelist> <(FLags> |
     | |
     +---+

     This command can be used to get update information on various
     files. Update information about the file or package specified in
     the filename and filetype parameters will be given. Optionally,
     you may include a filelist name in the filelist parameter. If it
     is omitted, 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 on a LISTSERV since it helps
     prevent impostors using your e-mail address. The use of personal
     passwords is strongly encouraged for this reason. Every server

will accept a password registration request from you at any time.
Passwords are comprised 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.

  11.4.3. LISTSERV DATABASE Functions

   LISTSERV provides the facility for users to retrieve old mail that
   has been distributed on mailing lists. Each mailing list has an
   associated database (called a notebook or list archive database)
   in which list mail is stored. Note that databases may not be
   maintained for every mailing list, this is done at the discretion
   of a list owner. The notebook databases are the most commonly used
   of the LISTSERV databases. However, every LISTSERV server also has
   a database of all the EARN/Bitnet computer nodes (called the
   BITEARN database). This 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 that have been created locally. To find out what
   databases are accessible at a particular LISTSERV site, send
   following command to that server:

          DATABASE LIST

   To perform a database search, you can send mail to LISTSERV
   containing a batch database job which contains 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.

11.4.4. Commands for INFORMATION:

The LISTSERV server can provide a diverse range of information to
the general user. This includes help files, release levels of the
server and important configuration files, statistics and
information pertaining to the EARN/Bitnet network. When sending
these commands to LISTSERV, they must be addressed to the server
and not to any mailing lists it may manage. For those 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 (see the section
LISTSERV Command Keywords for more information).

```
+---------------------------------------------------------------+
|                                                               |
|   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 an informational (or help) file from a
LISTSERV server. The topic option should specify the topic for
which an informational file will be sent to you. You may get a
list of valid topics by sending the Info command with no
parameters to your nearest (or any) LISTSERV.

11.5. Examples

You wish to subscribe to the EARNEWS list which is located 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 (or CEARN.CERN.FR). The
command:

        UNSUBSCRIBE INFO-MAC

should be sent to the LISTSERV server at CEARN (or CEARN.CERN.FR)
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 (or
SEARN.SUNET.SE) to which you belong. Send the following command to
the LISTSERV server at SEARN (or SEARN.SUNET.SE):

        SET * NOMAIL

You have received a message from the LISTSERV server at IRLEARN (or
IRLEARN.UCD.IE) 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 The
command:

        INDEX DOC

should be sent to the LISTSERV server at EARNCC (or EARNCC.EARN.NET)
where this filelist is located. Note that the above command is the
same as issuing a GET DOC FILELIST command.

You wish to retrieve the file PCPROG ZIP from a filelist and have it
sent to you in XXE file format. Send the following command to the
LISTSERV server that holds this file:

        GET PCPROG ZIP F=XXE

You want to retrieve all the files that make up a package called
PROGRAM (as listed in a file called PROGRAM $PACKAGE) from a filelist
called SAMPLE. Send the command:

        GET PROGRAM PACKAGE SAMPLE

You wish to subscribe to a file called BUGDET MEMO in a filelist
called EXPENSES with an AFD:

        AFD ADD BUDGET MEMO EXPENSES

To subscribe to a file called VM EMAIL in the DOC FILELIST with an
FUI, you would send the following command to LISTSERV at node EARNCC
(or EARNCC.EARN.NET):

        FUI ADD VM EMAIL DOC

11.6. 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

12. NETNEWS (USENET)

12.1. What is NETNEWS

Netnews, or Usenet as it is more commonly called, is a message
sharing system that exchanges messages electronically around the
world in a standard format. Messages exchanged on Usenet are arranged
by topic into categories called newsgroups. Netnews is, thus, a huge
collection of messages, being passed from machine to machine. The
messages may contain both plain text and encoded binary information.
The messages also contain header lines that define who the message
came from, when the message was posted, where it was posted, where it
has passed, and other administrative information.

The major, hierarchical categories of Usenet newsgroups which are
distributed throughout the world are alt, comp, misc, news, rec, sci,
soc, and talk. There are many other major categories which may be
topical (e.g., bionet, biz, vmsnet) and are usually distributed
worldwide as well, or geographical and even organizational (e.g.,
ieee) or commercial (e.g., clari). The latter categories are usually
distributed only with their area of interest. The messages of many
Bitnet LISTSERV mailing lists are also distributed in Usenet under
the major category bit.

The major categories are further broken down into more than 1200
newsgroups on different subjects which range from education for the
disabled to Star Trek and from environmental science to politics in
the former Soviet Union. The quality of the discussion in newsgroups
is not guaranteed to be high. Some newsgroups have a moderator who
scans the messages for the group before they are distributed and
decides which ones are appropriate for distribution.

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.

12.2. Who can use NETNEWS

Usenet newsgroups can be read at thousands of sites around the world.
In addition, there are several sites that provide public dial-up
service so that people who are not at a Usenet site can have access
to newsgroups as well. If you don't know if your site has Usenet
access, check with your local computer support people.

Protocols and software for the distribution of news are in use in
several networks, such as the Internet, UUCP, EARN/Bitnet and
Fidonet.

If you have e-mail service only, then you can not access Usenet.
However, 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. Moreover, many of the documents which appear
periodically in newsgroups are available by e-mail from
mail-server@rtfm.mit.edu. For instructions, send a message with the
subject: HELP.

12.3. How to get to NETNEWS

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

   Within EARN, a network of Netnews distribution has been developed,
   providing efficient distribution of Usenet traffic while minimizing
   the load on the network for the participating countries.

   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.

12.4. Using NETNEWS

   There are many software packages available for reading and
   distributing Netnews on a variety of operating systems (Unix, VMS,
   VM/CMS, MVS, Macintosh, MS-DOS and OS/2) and environments (Emacs,
   X-Windows, MS-Windows). See the list of freely available news reader
   software packages in Appendix A. Note that the number of software
   packages available to run news, especially on PCs, is increasing.

   In addition to the software packages specifically designed to be news
   readers, many other communications programs, particular mail
   interfaces, provide the possibility for Usenet access in addition to
   their main function.

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

      * Subscribing to newsgroups: This means that your news reading
        software will make these groups immediately accessible, so that
        you can choose to read the postings of groups that interest you
        quickly and easily.

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

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

  * Threads of discussion: You can follow groups of postings that
    deal with the same subject easily.

  * 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).

12.5. 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, selecting a newsgroup is done with the arrow keys. 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

   ----

tins 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. Above, you see 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. When you select an item, it appears
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)

12.6. Learning more about NETNEWS

    News programs communicate with each other according to standard
    protocols, some of which are described by Internet Request For
    Comments (RFC). Copies of RFCs are often posted to the network and
    obtainable from archive sites. Current news-related RFCs include the
    following:

        RFC 977   specifies NNTP, the Network News Transfer Protocol,

        RFC 1036   specifies the format of Usenet articles.

    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

13. OTHER TOOLS OF INTEREST

13.1. ASTRA

13.1.1. What is ASTRA

    The ASTRA service allows users to retrieve documents from databases
    known by ASTRA throughout the network. Users can send their queries
    to the ASTRA server which in turn forwards the query to the related
    database servers. This provides an easy-to-use uniform access method
    to a large number of databases.

    ASTRA provides the same user interface for all databases it can
    access, even if the database servers have different access languages,
    such as STAIRS, ISIS or SQL.

    Each database defined in ASTRA has an abstract which holds
    information about the database: title, name of the maintainers, a
    brief description of the database, the main topics of the database
    and its language. Users are advised to look at the abstracts before
    sending requests, to avoid sending requests to the wrong databases.

    Some databases actually combine several different databases that deal
    with the same topics. When a user sends a request for such a
    database, the request is forwarded to all related databases.

13.1.2. How to get to ASTRA

   Anyone who can send electronic mail to EARN/Bitnet can access ASTRA.
   Interactive user interfaces (clients) to ASTRA are available for VM
   and VMS systems on the EARN/Bitnet network. For all other users,
   there is a batch language that permits batch queries using e-mail.

   Currently there are five ASTRA servers installed at the following
   addresses:

   +---+
   | |
   | ASTRADB@ICNUCEVM.BITNET   or   ASTRADB@VM.CNUCE.CNR.IT |
   | ASTRASQL@ICNUCEVM.BITNET   or   ASTRASQL@VM.CNUCE.CNR.IT |
   | ASTRADB@IFIBDP.BITNET |
   | ASTRADB@IFIIDG.BITNET   or   ASTRADB@IDG.FI.CNR.IT |
   | ASTRADB@IRMKANT.BITNET   or   ASTRADB@IRMKANT.RM.CNR.IT |
   | |
   +---+

13.1.3. Learning more about ASTRA

   An extensive help file is available by sending the command HELP to
   ASTRADB@VM.CNUCE.CNR.IT (or ASTRADB@ICNUCEVM.BITNET).

   The LISTSERV list ASTRA-UG is used for the distribution of a
   newsletter about new databases or new versions of the current
   databases. To subscribe, send the command:

        SUB ASTRA-UG Your Name

   to LISTSERV@VM.CNUCE.CNR.IT (or LISTSERV@ICNUCEVM.BITNET).

   An ASTRA newsletter is also available by sending the command NEWS to
   ASTRADB@VM.CNUCE.CNR.IT (or ASTRADB@ICNUCEVM.BITNET).

   The developers of the ASTRA service may be contacted at:
   ASTRA@ICNUCEVM.CNUCE.CNR.IT (or ASTRA@ICNUCEVM.BITNET).

13.2. NETSERV

13.2.1 What is NETSERV

   NETSERV is a server, which allows fast access to data files and
   programs of interest to the EARN/Bitnet community. NETSERV provides a
   file repository consisting of information files and programs. It
   allows users to retrieve files, to store files and to subscribe to
   the files of their choice. The latter two functions however, require

that the user have a password for NETSERV (this is called a
privileged user).

In order to achieve a balanced load on the network and a faster
response time to users, NETSERV uses a distributed server concept:
this is achieved by the installation of a large number of servers on
the network to ensure that the user can locate a nearby server. All
servers communicate with each other to distribute updated information
and make it available from each copy of the server.

NETSERV's file server functions include retrieving any file present
in its filelists, storing new versions of a file, and subscribing to
files stored on the server. Its file directories are arranged in an
hierarchical method, with NETSERV FILELIST being on top or at the
root of the filelists. This filelist can be obtained by sending a GET
NETSERV FILELIST command to any NETSERV. Filelists contain short
descriptions of the files, and two access codes for each file. These
codes represent the get and put privileges required for that file.
These codes are explained at the beginning of the NETSERV FILELIST
file.

13.2.2 How to get to NETSERV

The server is available in almost every country. To find the closest
server for your area send a QUERY SERVICE command to a server. The
following are examples of NETSERV server addresses:

```
+------------------------------------------------------------------+
|                                                                  |
|    NETSERV@FRMOP11.BITNET    or    NETSERV@FRMOP11.CNUSC.FR       |
|    NETSERV@HEARN.BITNET      or    NETSERV@HEARN.NIC.SURFNET.NL   |
|    NETSERV@BITNIC.BITNET     or    NETSERV@BITNIC.CREN.NET        |
|                                                                  |
+------------------------------------------------------------------+
```

In EARN, there is only one NETSERV permitted for one country.
However, in some limited cases, such as when the country has a large
number of nodes, additional servers may be installed. In any case,
the user is not required to run NETSERV to be able to access and use
the server.

NETSERV accepts e-mail access from users on any network. Commands to
NETSERV should be placed in the body of the mail file, and not in the
Subject: line.

For users in the EARN/Bitnet network, NETSERV is accessible via
interactive message. Commands from privileged users requiring a
password must be sent this way.

   NETSERV does not have delivery limitations, except that a file
   ordered from NETSERV cannot be ordered again on the same day.

13.2.3. Learning more about NETSERV

   The server provides a large helpfile which can be obtained by
   sending a GET NETSERV HELPFILE command to any NETSERV.

   A list for NETSERV maintainers is available as
   NETSRV-M@HEARN.NIC.SURFNET.NL (or NETSRV-M@HEARN.BITNET).

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

13.3. MAILBASE

13.3.1. 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.

13.3.2. 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.

13.3.3 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. E.g., 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

13.4. PROSPERO

13.4.1. What is PROSPERO

   PROSPERO is a distributed file system. It differs from traditional
   distributed file systems in several ways. In traditional file
   systems, the mapping of names to files is the same for all users.
   Prospero supports user centered naming: users construct customized
   views of the files that are accessible. A virtual system defines this
   view and controls the mapping from names to files. Objects may be
   organized in multiple ways and the same object may appear in
   different virtual systems, or even with multiple names in the same
   virtual system.

   In Prospero, the global file system consists of a collection of
   virtual file systems. Virtual file systems usually start as a copy of
   a prototype. The root contains links to files or directories selected
   by the user.

   The Prospero file system provides tools that make it easier to keep
   track of and organize information in large systems. When first
   created, your virtual file system is likely to contain links to
   directories that organize information in different ways. As the
   master copy of each of these directories is updated, you will see the
   changes. You may customize these directories. The changes you make to
   a customized directory are only seen from within your own virtual
   system, but changes made to the master copy will also be visible to
   you.

   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 that contains pointers to copies of each of the papers that
   they want made available to the outside world. This virtual directory
   may appear anywhere in the user's virtual system. Once set up, a link
   may be added to the master author directory. In this manner, others
   will be able to find this directory. Once added to the master
   directory, any future changes will be immediately available to other
   users.

13.4.2. 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 right out of the box using a guest virtual system at
the USC Information Sciences Institute.

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

13.4.3. 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 a bit about the Virtual
System model, of which Prospero is a prototype implementation. It
describes what Prospero does, not how it does it.

> * 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.

13.5. IRC

13.5.1. 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
2 users to talk at once, with access throughout the global Internet.
It also provides many other useful features.

IRC is networked over much of North America, Europe, and Asia. When
you are talking in IRC, everything you type will instantly be
transmitted around the world to other users who are connected at the

time. They can then type something and respond to your messages.

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

13.5.2. How to get to IRC

Clients and servers for IRC are available via anonymous FTP from cs.bu.edu. A few sites offer public access to IRC via Telnet. Two such sites are wbrt.wb.psu.edu and irc.demon.co.uk. At both sites, you should log in as irc.

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

Fundamental to the operation of IRC is the concept of a channel. All users are on a channel while inside IRC. You enter the null channel first. You cannot 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.

13.5.3. Learning more about IRC

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

If you have problems, you can contact Christopher Davis (ckd@eff.org) or Helen Rose (hrose@eff.org) - known on IRC as ckd and Trillian, respectively. 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.

13.6. RELAY

13.6.1. What is RELAY

The RELAY server system is a set of servers in the global EARN/Bitnet network which broadcast interactive messages from one user to other users signed on to the same channel of the RELAY system. A user signed on to the closest available RELAY is 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.

Each RELAY server provides service to a specific collection of one or
more nodes designated as a service area. The functions of RELAY are
available to EARN/Bitnet users with access to interactive messages
who have not been expressly excluded from the system by RELAY
management.

RELAY is a program which allows several people to talk at the same
time. In order to start, you must sign on to a RELAY to place your
ID in the current user list. You communicate with RELAY through
messages just as you would send messages to a user. RELAY commands
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.

13.6.2. How to get to RELAY

RELAY is available at the following EARN/Bitnet addresses, and
others. The nickname of the RELAY machine is in parentheses.

```
+------------------------------------------------------------+
|                                                            |
|   RELAY@ASUACAD     (Sun_Devils)    RELAY@PURCCVM  (Purdue)    |
|   RELAY@AUVM        (Wash_DC)       RELAY@SEARN    (Stockholm)  |
|   RELAY@BEARN       (Belgium)       RELAY@TAMVM1   (Aggieland)  |
|   RELAY@BNANDP11    (Namur)         RELAY@TAUNIVM  (Israel)     |
|   RELAY@CEARN       (Geneva)        RELAY@TECMTYVM (Monterrey)  |
|   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. 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.

13.6.3. 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.

14. Security Considerations

Security issues are not discussed in this memo.

15. References

Blue Book, Volume VIII - Fascicle VIII.8, Data Communication Networks Directory, Recommendations X.500-X.521, CCITT, 1988, ISBN 92-61-03731-3

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

Kantor, B., and P. Lapsley, "Network News Transfer Protocol: A Proposed Standard for the Stream-Based Transmission of News", RFC 977, UC San Diego & UC Berkeley, February 1986.

Horton, M., and R. Adams, "Standard for interchange of USENET messages", RFC 1036, AT&T Bell Laboratories, Center for Seismic Studies, December 1987.

Lang, R., and R. Wright, "A Catalog of Available X.500 Implementations", FYI 11, RFC 1292, SRI International, Lawrence Berkeley Laboratory, January 1992.

Weider, C., and J. Reynolds, "Executive Introduction to Directory Services Using the X.500 Protocol", FYI 13, RFC 1308, ANS, ISI, March 1992.

Weider, C., Reynolds, J., and S. Heker, "Technical Overview of
Directory Services Using the X.500 Protocol", FYI 14, RFC 1309, ANS,
ISI, JvNC, March 1992.

Williamson, S., "Transition and Modernization of the Internet
Registration Service", RFC 1400, Network Solutions, Inc., March 1993.

16. Acknowledgements

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18. 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.

18.1 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

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         sunsite.unc.edu
                    /pub/micro/pc-stuff/ms-windows/winsock/apps  Gopherbook

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
```

18.2. 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/WWW/lynx             Lynx browser for vt100 terminals

                   archive.cis.ohio-state.edu
                    /pub/w3browser            tty-based browser written in perl

VMS                info.cern.ch
                    /pub/www/bin/vms          port of NCSA Mosaic for X

Macintosh          info.cern.src
                    /pub/www/bin/mac          requires MacTCP
```

```
MS-Windows      fatty.law.cornell.edu    Cello
                 /pub/LII/Cello

Emacs           moose.cs.indiana.edu
                 /pub/elisp/w3

X-Windows       info.cern.ch
                 /pub/www/src            tkWWW Browser/Editor

                info.cern.ch
                 /pub/www/src            MidasWWW Browser for X/Motif

                info.cern.ch
                 /pub/www/src            ViolaWWW Browser for X11

                ftp.ncsa.uiuc.edu
                 /Web                    NCSA Mosaic Browser for X11/Motif

NeXT            info.cern.ch
                 /pub/www/bin/next       Browser and Editor
```

18.3. WAIS clients

```
Environment     FTP site & directory     Comments

Unix            ftp.wais.com
                 /pub/freeware/unix-src  swais

VMS             ftp.wais.com
                 /pub/freeware/vms

MVS             ftp.wais.com
                 /pub/freeware/ibm-mvs

Macintosh       ftp.wais.com
                 /pub/freeware/mac

OS/2            ftp.wais.com
                 /pub/freeware/os2

MS-DOS          sunsite.unc.edu
                 /pub/wais/DOS

                hilbert.wharton.upenn.edu
                 /pub/tcpip              PCWAIS

MS-Windows      ftp.wais.com
                 /pub/freeware/windows   WNWAIS
```

```
                  ftp.cnidr.org
                   /pub/NIDR.tools/wais/pc/windows

Emacs             ftp.wais.com
                   /pub/freeware/unix-src  gwais

X-Windows         ftp.wais.com
                   /pub/freeware/unix-src  xwais

NeXT              ftp.wais.com
                   /pub/freeware/next
```

18.4. Netnews - news reader software

Environment	FTP site	Name & 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
	cc1.kuleuven.ac.be	VMNNTP
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