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FIRST INTERNATIONAL SCHOOL ON COMPUTER NETWORK ANALYSIS AND MANAGEMENT

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END-USER SERVICES

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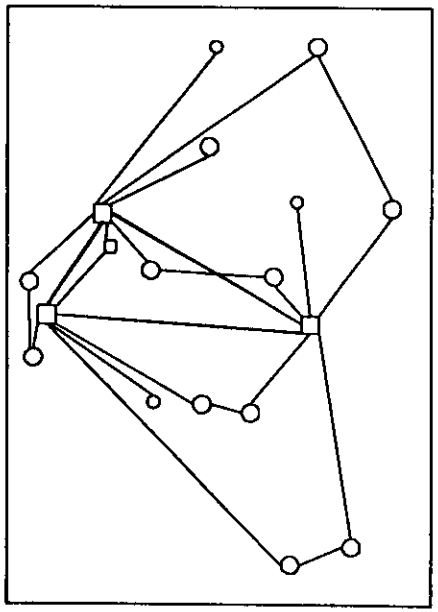
End-user services: they are many and diverse

In this third lecture, a number of network services will be dealt with. That is, the complete track, from initial transfer up to the user (which service for which type of transfer).
You'll find Chapter 5 from the SURFnet Guide attached; it is the chapter about network services available to SURFnet users. It was written before IP services became available in SURFnet.

The basis for the services

Good network services are based on two pillars:
- A stable national infrastructure
- Good international communications

The national infrastructure is an X.25 network which is organized as shown here:



The transfer facility has the following features:
- Built with NT switching equipment
- Multiple backbone with 64 Kb/s links
- Each university site has one 64 Kb/s link
- For each university site a back-up line is available through another university
- Multi-protocol

This transfer infrastructure has been made internationally available in the following way:
- Link with Montplellier for EARN facility
- Two 64 Kb/s gateways to public datanat (which means to every foreign PSDN)
- 64 Kb/s link to IXI, European X.25 infrastructure
- Use of IP link to SURAnet (U.S)
- Link to CERN 256 Kb/s (soon) (from CERN 2 Mb/s to the Internet)

This X.25 network with its international connections is the heart of the organization, enabling the following facilities:
- IP network with transparant connection to Internet
- DECnet, national (talks in progress for linking to SPAN)
- NJE network with EARN services
- Access, based on Triple-X

These protocol stacks are in turn the building blocks for a number of end-user services:

Service	*Name/protocol*	*Based on*	*Future*
Mail	RFC822	X.25 (XSMTP) DECnet (DSMTP) NJE (BSMTP) TCP/IP (SMTP)	X.400
Access	Triple-X TELNET SET HOST	X.25 (X.3/X.28/X.29) TCP/IP DECnet	VT
File transfer	SENDFILE FTP COPY	NJE TCP/IP DECnet	FTAM

Running on top of these end-user services are applications such as file-servers, distribution list servers, et cetera (but not all in our own network). The annex contains an elaborate description of these services. I will discuss some of them here.

Distribution list server (MAIL application)

Distribution lists contain users with common interests. Mail sent to the list (which has a network address), will be forwarded by the server to all the people on the list.
Presuming that X.400 (1988), which contains a distribution list concept, will still not be available for some time, we can dispose of several other possibilities to set up distribution lists.

The first is Mailserv, an application of the multi-channel mailer program PMDF (VAX/VMS only). Mailserv kan automatically put users on a list and take them off again. To achieve this, a message containing a standard text is sent to the MAILSERV@"network address". Mailserv is a stand alone application, unaware of the existence of other Mailservs. This can be troublesome for the user, because different lists are to be used for different Mailservs, and the addresses have to be written down.

Listserv is a similar product, running on 230 BITNET/EARN nodes (NJE not required, but a VM system is).
As with Mailserv, a large number of operations (subscribing and delisting, for example) are executed automatically. Listserv has many extra features for list management and keeps contact with other Listservs on the network. This enables the user to enquire at any Listserv (though preferably at the nearest) which lists are available. The nearest Listserv can also be used for adding a subscription to a list. Listserv then forwards the subscription data to the node where the list runs.

Information about Listserv can be acquired at:

ERIC@SEARN.BITNET	Eric Thomas, the author
TURGUT@TREARN.BITNET	Turgut Kalfaoglu

You can order user documentation by sending a mail message to Listserv@NIC.SURFnet.nl the first line of which should read
GET INFO FILELIST

For information about PMDF and Mailserv, contact ....

Innosoft International, Inc.
250 West First Street, Suite 240
Claremont, CA 91711
(714) 624-7907

File-servers

a. Mail-based
Through the network, a lot of public domain software can be procured. Sometimes the quality of these products is excellent, sometimes it is abonimable.

MACSERVE@IRLEARN.BITNET	for Macintosh software
TRICKLE@TREARN.BITNET	mainly DOS
BITFT@PUCC.BITNET	varied (mail-FTP gateway)
KERMSERV@CUVMA.BITNET	Kermit for a variety of systems

b. Based on file transfer
Anonymous FTP to a multitude of Internet sites. It is possible to order an overview at LISTSERV@NIC.SURFNET.NL with the command (first mail line)
GET BITNET FTPLIST
Renowned for its vast reservoir of information and notorious because of the heavy traffic is WSMR-SIMTEL20.ARMY.MIL, which contains about one Gigabyte public domain software.

Information servers (ACCESS-based)

The network contains a number of information servers which are accessible for everyone. Your protocols determine which servers on your network are public servers.
X.25 (triple X) gives access to:

ECHO: European *Commission* Host Organisation; supplies information about information, such as the databases to be consulted for water pollution.
DFN: information server
Janet: information server

A number of university libraries can also be accessed along this way.

If your network speaks TCP/IP, a wide range of university libraries in the Internet is available via Telnet. Anonymous FTP to NIC.CERF.NET will get you a survey.

You can also send a mail message to LISTSERV@NIC.SURFNET.NL, the first line reading:
GET INTERLIB CATALOG

Which completes this brief overview. There's much more, actually.

For end-users, collecting this information is rather troublesome. For a user support team in a network organization it is much simpler, owing to the international contacts and because usually some time is available to make a simple study of these services. Therefore, from an information point of

view, it is necessary to issue publications about these services on a regular basis.

Attached you find an excerpt from the SURFnet network guide. You can order the complete guide by sending a message to LISTSERV@NIC.SURFNET.NL, the first line of which should read GET GUIDE90 GENERAL.

Some final remarks:

- you can always contact me and my organisation for help or information on networking: Stals@SURFnet.nl
- I had to leave a lot of things out, for example the international work on directory and information services in RARE working group 3, International X25 Infrastructure, X400-service, X500-service,
- there is a funded (by the E.C) position for one member of every country in RARE working group 3. Information can be obtained from Erik Huizer, chairman of this working group;

Huizer@SURFnet.nl
or
SURFnet (Erik Huizer)
P.O BOX 19035
NL 3501 DA Utrecht
The Netherlands

Annex A: Chapter 5 of GUIDE through SURFnet

5.1 Introduction

A computer network is not a goal on its own, but a medium to exchange information. One of the ways in which this may happen is by addressing information services, that make data and/or computer applications reachable by means of the network. Thus this can imply: consulting a data base, working with a supercomputer situated somewhere else and turning in homework at an education institute by way of the network. The interactive use of central mainframe facilities, or taking part in international discussions by means of mailing lists, also belong to the area of information services. Due to the application of telecommunication the information need not be local anymore, but it is as if the world has become your work spot.

By lack of standardization there exist many kinds of information services, that all have their own set of commands. Therefore it can't be done to supply a short and concise user guide for addressing information services. A distinction can be made into some kinds of information services, that each require the same method of approach. Besides that, it is necessary that the user knows certain characteristics of the service, before he or she proceeds to address the information service.

In this chapter, those services shall be dealt with that are offered by way of the (international) network, like file servers, mailing lists and name servers, while at the same time examples of these services shall be given. Further the national supply of library catalogs that can be consulted and the expertise centers of various disciplines shall be dealt with. Finally an overview shall be given of the network organizations within and outside of Europe.

5.2 Network information services

Network information services are facilities that are made available by way of the (international) networks, to those who are connected to those networks. In most cases it concerns services that deliver ready-made programs, where you can request files or that deliver literature services on various disciplines; usually have sarted somewhere at a university and have gradually grown into professional organizations. And still most of them still offer their services free of charge.

We distinguish the following kinds of services:
- file servers;
- mailing lists;
- interactive servers;
- name servers.

File servers
A file server is an electronic delivery service for, as the name says, files and software. You can order a file, and it will be sent to you. To do so, you supply the file server with instructions. The file server reacts by

sending the requested file.
You can approach file servers in two ways:
- file servers that respond to mail messages;
- file servers, where you have to log on to a computer where the file server software is installed.

In general, the files and software that you order from a file server are 'Public Domain': the term 'Public Domain' means as much as that the software is public and often can be received free of costs. The public Domain software may, roughly, be divided into two sorts (all kinds of refinements are possible):

- Freeware: software that is not meant to be paid for, not even if you use it intensively;
- Shareware: software where the maker asks for a compensation, if the program suits you. However, you have to decide yourself whether you do that, but you often profit by doing so, as you get registered as a user. In that case you also receive extensive user manuals and notices about updates.

Not a single word can be said about the quality of Public Domain software: sometime it's more than perfect (take Kermit and Procomm for example), sometimes it's rubbish.
It is of uttermost importance only to use software from a reliable source in view of the spreading of viruses.

Examples of a number of file servers can be found in 5.3.

Mailing lists
A mailing list is a service where the users can put themselves on a distribution list, where they can receive information a specific subject. The information is usually sent to the users as a MAIL message (but sometimes as file too). The regularity in which this occurs and who supplies the information varies a lot.

Examples of mailing lists are:
- Discussion lists: all the network users can send information directly to the distribution list, only those that have subscribed to the list will receive the information. For example, on the list INFONETS, information is exchanged about problems regarding the use of international networks. This varies from the efficient use of gateways to finding the address of a university in Argentina.
- Digest lists: all network users can send information to the editor of the list, who collects suitable messages and sends them out at regular intervals; the list INFO-IBMPC is an example of such a list.
- Electronic magazines: one or more editors put together a publication where, at forehand, the users have no influence in; at regular intervals an issue of the magazine is sent around. MEDnews (Health Info-Com Network Newsletter), Judiac Studies newsletter, Optics newsletter, Psychology Newsletter, Tunisian Scientific Society News and International Intercultural newsletter: its a small grasp from a large number of this kind of magazines.

In 5.3 you can read how to go about with mailing lists.

Interactive servers
An interactive server is a service where the user asks for the necessary information by way of a query. This may happen by sending interactive messages over the network, or it may be that the user has to log on to the computer where the service is installed and subsequently can ask questions.

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Under this last category all the commercial and non-commercial data bases reside.
Contrary to file servers, mailing lists and electronic magazines, it is usually necessary that the user is validated to work on the computer (and one often has to pay for it).
A (limited) list of suppliers and interactive servers is to be found in the paragraphs 5.3 and 5.6.

Name servers
A name server is a service that you can call on in order to get electronic addresses of other network users.

The conventional way to do so is to contact the user by telephone or letter, or look it up in collected lists of meetings or in technical literature.
Now, a more up to date way is to use the computers in the network to find out the address of the other user.

You may find examples of name servers in 5.3.

5.3 Examples of network information services

Every country taking part in EARN has a central computer that is also called the national node. In The Netherlands this computer is called HEARN. These national nodes fulfill an important function in EARN, they see to it that the national branch, as well as the connections to other national nodes keep on functioning properly. Furthermore there is the software for the network information services: Netserv and Listserv.

These services can be viewed as virtual computer users on the national node. Netserv and Listserv guard over an amount of information that is stored there.
Every SURFnet user can reach these services by way of electronic mail: you compose an electronic letter in the usual manner and put the command on the first line of the message, for example:

```
GET BITNET SERVERS
```

Some systems offer two other ways to make use of this service, namely:
1. by sending interactive commands to it
2. by file transfer, where the file contains all kinds of commands. Consult the system dependant part for this, or inform at your ICP/IC.

The servers respond to your commands by either sending interactive messages back, or files or by way of electronic mail.

General syntax of commands for Netserv and Listserv
First of all you have to tell your own computer to send a command. How to do this is dependant of the computer system. For VM/CMS and VAX/VMS we shall give the information here. If you are working on another kind of system, ask your local support.

For VM/CMS you have to use the following command structure:

```
TELL NETSERV AT HEARN GET file_name
```

and for VAX/VMS (Beware: with Jnet software!)

$ SEND NETSERV @HEARN GET file_name

In the following text we shall introduce you to a number of interesting files in both services. The names of the files are mentioned in capitals in the following description. In general you can request for them by way of the command structure given above.

NETSERV
The information that Netserv possesses is often technically-inclined, for example the topology of the network, but other information is also stored there.

- information about all the files is to be requested for with the name:
NETSERV FILELIST
In the file sent to you all the files are mentioned that Netserv guards. You can't request for them all, a part is reserved for people with privileges, such as, for example, the system managers of EARN nodes. Have a look at the file to get an view of the information that is available.
Some of the files mentioned, contain lists of files themselves and are recognizable by the second part of the name, e.g. FILELIST.

- information about servers.
In order to know which servers can be approached, the user can ask for the file BITNET SERVERS.
Here you can find a summary of the file servers, list servers and name servers, all over BITNET and EARN.
For example, you can find the Macintosh server (MACSERV), but also a summary of the electronic magazines. And what to say of a poetry server. From this server you can request the poem of the day, or browse through a poem library.

- information about other networks.
Somebody might also be interested in networks that he or she can reach from EARN. The file NETWORKS FILELIST contains information about other networks, that are reachable from EARN/BITNET.

- name/address information
If you are looking for the electronic address of another computer user, for example a colleague at another Dutch university, you can use the User Directory Service, that is available by means of Netserv. An extensive description of this is to be found later on in this chapter.

However there are also other ways to receive address information by means of Netserv. If, for example, you do know the country and the institute of a colleague, but not his computer, then you must request the NODELIST of that country; this contains all the EARN nodes in that country and the institutes that correspond to them.
An interesting file is also BITEARN NODES, the base file with all the nodes in EARN and BITNET. If you want information about one of the nodes you enter the file name:

NODENTRY node_name

You will receive an abstract of the file BITEARN NODES that, amongst other things, contains the names of contact persons. You may then send an electronic mail to the user POSTMASTER at that node with the kind request if he or she can and wants to look up the electronic address of the colleague. Actually, there is a real person behind this address.

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LISTSERV
Listserv produces all kinds of mailing lists and maintains them also. At this moment there are about 800 mailing lists in EARN/BITNET that are managed by Listserv.

Listserv is installed on a large number of central nodes and each of these manages a number of the mailing lists.
A list can also be present on more than one Listserv. Actually Listserv has two important advantages:
- there is just one distribution list (possibly spread out over several nodes) and consequently updates involve less work, and:
- by spreading the list efficiently the amount of traffic on the network is limited. This last point needs further explanation. Many mailing lists are spread out over several nodes, that is to say every one of these nodes contains only a part of the list of all the subscribers. When, for example, a list is on an American and a European node, only one copy of the message crosses the Atlantic Ocean. In Europe and The United States the message is distributed further.
Such a distribution list often confines itself to a certain subject (usually recognizable by its name, for example VAXTOOLS, AIDSNEWS or FUSION) and regularly there are discussions on the list, hence the name distribution list.

Of course, for you as a user, not all the lists are interesting, but it could be very useful to subscribe to some mailing lists, that are a suitable discussion forum for you.
Mailing lists can also function as an oracle. If you have a problem, then you just send your question to the suitable list (usually you don't even have to be subscribed to it) and most likely you will receive a satisfactory answer to it. Request to send the answer directly to you (necessary if aren't on the list, because usually the answer is sent to the list); afterwards, if desirable, you can send a summary of the answers to the list in order to inform the other people. In this way everybody gets the best of it.

With emphasis we wish to indicate the possibility to set up and manage a mailing list of your own. If, for example, if you wish to discuss a certain subject with colleagues in The Netherlands or abroad, contact the national support address INFO@HEARN (INFO AT HEARN) for your application or further information.

Approaching Listserv
See the earlier mentioned text beneath the heading "General syntax of commands for Netserv and Listserv" for the way how to apply Listserv commands. With the command:

GET LISTSERV REFCARD

you will receive a file with instructions for use.
This command, just like all the other commands can be sent to every Listserv, not only the one at HEARN.
Of course you are primarily interested in the mailing lists that are present on the national node HEARN. You enter the command

LIST

(the command LIST and the following command LIST GLOBAL are entered without the command GET) and shortly afterwards several messages appear on your screen, with the lists and a short description of the subjects.
You can ask for a complete catalog of all the lists with the command:

LIST GLOBAL

Furthermore you can ask for a summary by key word, by adding text to the command above, for example:

```
LIST GLOBAL EDUCATION
```

results in a file with all the distribution lists that contain the text 'education' in the description. If you want to know more about a certain list, then you enter the following command:

REVIEW list_name

For list_name you enter the name of the distribution list. Listserv will then send you a file with more information. You can't subscribe to some mailing lists, this is mentioned in the file.
To subscribe to the list you enter:

SUBSCRIBE list_name your full name

So, for example, if you want to subscribe to the list BITNEWS (news from Bitnet) from a VAX/VMS computer you enter the following command:

$SEND LISTSERV@HEARN SUBSCRIBE BITNEWS John the Foreigner

To discontinue a subscription you enter:

UNSUBSCRIBE list_name

You don't have to supply your name here.

To send a contribution to the list you proceed as follows: you compose an electronic message in the normal way and then address it to the list, for example I-KERMIT@HEARN.

Browsing through the archives of Listserv
Messages, circulated by way of these distribution lists, are usually kept in archives. In the following, a distinct message in such an archive shall be called an 'item' or 'entry'. In the mean time, some of these archives have developed into bulky volumes and it isn't feasible anymore to request for these archives and examine them in search of useful information. Therefore, there is a need to be able to search directly through the archives and request for specific information.

Listserv provides a search facility for this that can be used by every SURFnet user. The search facility only functions when certain software has been installed on your own system. So, consult your local software support if this is the case at your site. A little further along you will find a paragraph explaining how you can achieve these programs.

Sending commands
With the search facility you can send your commands to a Listserv node in two ways:

- Interactively
On a VM/CMS system you use the command

LDBASE node_name

On VAX/VMS systems you enter the command:

$@LDB

(it is possible that this command has been replaced by a synonym, for example LDBASE). In order to stop you don't enter a command, instead you have to preform a number of actions. This proceeds as follows:

1. enter CTRL/Z

```
db>CTRL/Z
```

2. you be will requested whether you want to stop, answer confirming (RETURN):

```
cancel?[Y]
```

3. a message will appear (in the case you are working with LISTSERV@HEARN):

```
Server> LISTSERV@HEARN
```

and you remove the text after 'Server>' with CTRL/U and enter CTRL/Z.

An advantage of the message 'Server>' is that at that moment you may choose for another Listserv and make a connection to it. So you don't have to leave LDBASE in order to initiate another connection.

- Not interactively
Here you send a set of commands as a file (batch job) to the Listserv concerned. You may also send the commands as electronic mail. The Listserv address for users who aren't directly connected to EARN is:

LISTSERV@node_name.BITNET

The set of commands is to be put in the message part of the electronic letter. These commands look like:

```
// JOB Echo=No
Database Search DD=Rules
//Rules DD*
command 1
command 2
.....
/*
```

After the first three mandatory lines you enter the commands. You have to conclude your commands with '/*'. If necessary, you may change the maximum number of output lines or change the number of CPU seconds for the whole job, by indicating this in the DATABASE SEARCH command, for example:

```
DATABASE SEARCH DD=RULES OUTLIM=4000
```

Search commands
Search operations in the Listserv archives usually consist of the following commands:

SEARCH	Looks for the search text provided by you in one or more archives (a synonym for the Search command is SELect)
Index	Provides a catalogue of the items found (on your screen or in the output file DATABASE OUTPUT)
Print	Displays all the items (on your screen or in the output file)

SENDback Sends the result to your electronic EARN address

The smallest abbreviation allowed has been put in capitals, so instead of SEARCH you may use 'S'. The complete direction for use of the Listserv search facility can be requested from LISTSERV@HEARN. The file is called LISTDB MEMO, consists of 36 pages and is, as usual, written in English.

Appropriate distribution lists
In some cases you will already know which archives you want to consult, however if you don't know, you will first have to look for one or more appropriate archives of distribution lists. To do this, you will have to use the command of the Listserv search facility to look in the LISTS archive, for example by keyword or part of one. This LISTS archive consists of the descriptions of all the distribution lists in EARN and BITNET. Distribution lists that only have a local circulation aren't included.

In the description of the distribution lists keywords are defined, for example the keyword 'Notebook'. If 'Yes' has been written after it, there exists an archive of the distribution list on the node in question. Usually a code has been added for the access, for example 'Public', 'Private' or 'Service'. If the code mentions 'Public' then you can certainly consult the archive. 'Private' means that only people who are subscribed to the list may do that. 'Service' refers to another keyword of the list, namely 'Service'. Persons who belong to the group or groups who are defined by this keyword are allowed to consult the archive, others are not.

For example, in order to look for information regarding ATARI you enter the SEARCH command (interactively or by way of a batch job), including a restriction concerning the note book:

```
SEARCH ATARI IN LISTS WHERE NOTEBOOK CONTAINS (YES AND PUBLIC)
```

After that , with the command INDEX you will receive a view of the distribution lists about ATARI with a short description of the list.

Where to look?
If the previous search command has resulted in one or more distribution lists, you can use the PRINT command to request a complete description. Have the index sent as well, this is necessary because the description of the distribution list does not clearly state the electronic address of the list.

A complete set of commands of the LISTSERV facility in a batch job then becomes (with ATARI as example):

```
// JOB Echo=No
database Search DD=Rules
//Rules DD*
search atari in lists where notebook contains (yes and public)
index
print
/*
```

With the aid of the detailed description of the distribution list(s), and in some cases with the information of the INDEX command, you determine the name of the node. After that your search operation in the archive is to be sent to the LISTSERV at the node concerned (NOT to the distribution list). In this way there is a distribution list INFO-A16 (about ATARI ST) with, amongst other things, an archive at LISTSERV@FINHUTC.BITNET. Don't send your search operation to INFO-A16@FINHUTC.BITNET, the message will then be

sent to all the subscribers to the list!

Access to a specific node
If you want to know which archives are accessible for you at a specific node, you enter the command:

```
DATABASE LIST
```

to the LISTSERV at that node. You can't wrap this command up in a batch job and send it away, you may enter it interactively or send it by mail.

Examples of an answer from LISTSERV@HEARN

```
 * Database  Description
 * --------  -----------
 * BIOMCH-L  Archives of "Biomechanics and Movement Science listserver"
 * BITEARN   Information on all the BITNET/EARN/NetNorth nodes
 * EARN-BC   Archives of "EARN-BegeleidingsCommissie NL"
 * EARNTECH  Archives of "EARN Technical Group"
 * LISTS     Information on all the network-wide LISTSERV lists
 * PEERS     Information on all the LISTSERV servers in the network
 * POLYMERP  Archives of "Polymer Physics discussions"
 * TEST-L    Archives of "TEST-L at HEARN"
 * 9370-L    Archives of "IBM 9370 and VM/IS specific topics list"
```

It is possible that this list looks different if you request it. For example if you are a member of a closed distribution list at that node, LISTSERV shall then show the archive in question to you. Somebody else, who isn't a member of this closed list, doesn't get the archive in his or her catalog. So, LISTSERV checks if somebody is authorized to search through a certain archive.

Limitations of use
If you are working the following limitations are applicable:

per command - 30 lines of output (can not be changed upwards)
- 20 CPU seconds (to be increased with CPULIM=<mm:>ss at the end of the command)

per session: - no limit of the size of the output file that is sent back
- no CPU limit (except of course the 20 seconds per command)

If you are working by means of a batch job the following is applicable:

per command: - the number of lines is equal to the limit for the whole job, if desirable it can be decreased with OUTLIM=nnnn
- the number of CPU seconds is equal to the limit for the whole job

per job: - 2000 lines of output, if desirable it can be changed with OUTLIM=nnnn at the end of the DATABASE SEARCH command
- 60 CPU seconds, if desirable it can be changed with CPULIM=<mm:>ss at the end of the DATABASE SEARCH command.

When you are working interactively with the search facility of Listserv, you will have to exercise the necessary practice. Usually the whole query is very slow, perhaps much slower than you are used to when searching in an on-line database. The reason for this lies mainly with the computer where you are consulting the Listserv-archives. These computers usually have other things to do as well, and consequently search operations in the

archives don't have a high priority. Although it doesn't function perfectly yet, the search facility of Listserv can be seen as a gain that makes the large amount of stored information more accessible to you.

Getting hold of LDBASE
The information about getting hold of and installing LDBASE packets is primarily intended for system managers. Users can better first inform at the local user support whether the programs are installed on their local computer system. This saves users the trouble of having to install the programs themselves.
At LISTSERV@HEARN a version for VM/CMS systems and a version for VAX/VMS systems is available. For VM/CMS systems you enter the two following commands:

TELL LISTSERV AT HEARN GET LDBASE EXEC
TELL LISTSERV AT HEARN GET LSVIUCV MODULE

Once you have received the two files, you can directly enter the command LDBASE. For VAX/VMS systems (only if JNET software is present):

$SEND LISTSERV@HEARN GET LDBASE COM

In order to install the software on a VAX/VMS system you have to execute LDBASE.COM (with the command @LDBASE) to unpack it. Next you enter the command @BUILD to make executable files.

NAME SERVERS

EARN
At every national EARN node UDS is available within NETSERV; for The Netherlands NETSERV resides at HEARN in Nijmegen.
With the command NETNAMES you can consult UDS in a simple way. Your requests for information will be presented to NETSERV@HEARN or to a Netserv in another country if you want to consult the UDS there, and you will receive the requested information in a form you choose yourself, on your screen or in your mailbox (or reader).
Furthermore you can have yourself registered, or have your registration removed from the user directory in your own country. You can also change your entry. An entry in UDS contains the usual things: name, electronic address, postal address, telephone number, institute, interests, etc.
Beware: you are not obliged to register yourself, but it is rather considerate for other users, and with your registration you may decide for yourself which information you want to have mentioned. For more information you may enter the command HELP NETNAMES to Netserv.
At this moment the number of registrations is more than 1500. However the number of persons that regularly make use of EARN, more than twice a month, is more than 4000. The number of persons in The Netherlands that you can reach is even larger still, namely all the persons that work on a computer that is connected to EARN. You can therefore well imagine that a search operation at UDS will often end in a negative result, and for the time being a telephone call to the person concerned or to the institute will provide the desired information quicker.

Bitnet
In the file BITNET SERVERS (see under Netserv also) the user directory services within Bitnet/EARN are summed up, with reference to whether the service is approachable interactively or by way of electronic mail.
There you can also find a list of all the Listserv services, all over the

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world, where you can look for someone by means of the command /WHOIS. Listservers can always be approached by way of electronic mail and interactively. LISTSERV@MARIST takes an important position here, as every subscriber to a mailing list is automatically registered in the name server.

ARPA/Internet
This network also has a large name server at its disposal, approachable by way of the Network Information Center (NIC). NIC too supplies information by way of the command WHOIS. This is especially the place where you can receive information concerning the domains within Internet. See further on for information regarding calling on this service.

Finally there is the Listserv list 'INFONETS', where every user can subscribe to (from The Netherlands you send the command SUB INFONETS to HEARN) and where one can ask questions regarding addressing.

View of a number of specific services on several networks.
Network help desks (see paragraph 5.7 for a description of the networks)

- Bitnet
Bitnet has a support center: Bitnet Network Information Center (BITNIC). At LISTSERV@BITNIC you can request the NETINFO INDEX, interactively from VM/CMS and VAX/VMS systems, or by way of mail from other systems.

From a VM/CMS surroundings:
TELL LISTSERV AT BITNIC SENDME NETINFO INDEX

From VAX/VMS surroundings:
SEND LISTSERV@BITNIC SENDME NETINFO INDEX

This index contains a summary of all the information that is available at the center. The file Bitnet Userhelp provides useful information concerning the access to BITNIC.

- CSNET
CSNET has an Info Server that is reachable by way of mail:

info-server@sh.cs.net

A request has to contain a number a mandatory lines:

REQUEST:INFO
TOPIC:HELP
REQUEST:END

- ARPA/Internet
The Network Information Center, located at the Stanford research Institute (SRI), functions as a help desk for the whole of the Internet. From SURFnet it is reachable by way of electronic mail with the address:

NIC@SRI-NIC.ARPA or NIC@NIC.DDN.MIL

The server at NIC plays a very important information role.
Send a mail message to:

SERVICE@SRI-NIC.ARPA or SERVICE@NIC.DDN.MIL

with as Subject: HELP and you will receive, by way of mail, a help file with information about the services that are available from this server. A request (in the Subject field) for NETINFO INDEX results in information about all the mailing lists ('interest groups') on this network. Finally, by means of the name server at SERVICE@SRI-NIC.ARPA many addresses may be requested and here you can also receive domain information: who belongs to a particular domain in Internet. Put WHOIS HELP in the Subject and you will receive a help file stating how you can ask for names in the database in the most efficient way.

- NSFnet
Information concerning NSFnet can be requested by way of mail at:

INFO@NSF

Enter the following text lines in the body of a mail message:

REQUEST:INFO
TOPIC:HELP
REQUEST:END

There exists still another information service about NSFnet, managed by Merit:NIS-INFO@merit (from EARN/Bitnet) or NIS-INFO@nis.nsf.net, accepts mail messages. For example, ask for more information by way of a message with only HELP in the first line.

- DFN
Main field of interest is the network information within West Germany.

Network user Address: 026245300043042

This service is accessible free of costs, however one does have to pay the datanet costs to get to the service.

File servers by way of Bitnet/EARN
If you want to make use of a particular server, which, for example, you have found in the file BITNET SERVERS, the problem arises that not all servers know the same commands. It is therefore wise to first send the command HELP to the server in question; you will be informed of which commands are accepted. In the following a description is given of a number of these servers.

COMSERVE: a service in the area of human communication, with a file with bibliographies, conferences, but also with address information. Reachable at COMSERVE@RPIECS.
For example, send the following command, by way of mail or interactively:

SEND comserve helpfile

ISERVE@UWAEE: a clearing house for information about IBM computers and compatible software. Before you can approach ISERVE, you have to subscribe (free of costs) to ISAAC@UWAEE (ISAAC stands for Information System for Advanced Academic Computing).

TRICKLE@HEARN: for EARN users from The Netherlands, an intermediate for the software archives of an ARPANET Public Domain software server: SIMTEL20

Send the message HELP (by way of mail or interactively).

VMSSERV@UBVMSD: files for the users of DEC equipment. You will receive a catalog with the command DIR, that can be sent by way of mail or interactively.

Mailing lists and electronic magazines by way of Bitnet/EARN

INFONETS: any user may subscribe to it (from The Netherlands with the command "SUB INFONETS your full name" to HEARN: one may ask questions here concerning addressing, gateways and connections between networks.

CCNEWS: The article index of CCNEWS (Campus Computing NEWSletter) is an electronic abstract magazine, where you may subscribe to. The articles themselves can be received from a file server, that is reachable from all EARN nodes. The file server is managed by BITNIC, the central node of Bitnet. There are articles about all kinds of subjects, like viruses, network use, but also matters such as copyright, library automatization, desk top publishing, etc. To request a catalog of the articles present, you send the following command to BITNIC (by way of mail or interactively):

GET ARTICLES INDEX

The articles may be used freely in ones own publications, given that the author, the original title and the publication date are mentioned. New articles are announced in the electronic magazine of CCNEWS.

NETMONTH: an electronic magazine that is composed by employees of the Bitnet support center in the United States. NETMONTH can only be received by users at EARN nodes. In NETMONTH all kinds of information can be found about Bitnet related matters, like new mailing lists, stories about network experiences and organizational matters, such as the merge between Bitnet and CSnet (CREN will be the new name). In order to subscribe to NETMONTH one has to act according to the way that was explained above at LISTSERV@HEARN.

EUnet/Netnews: EUnet offers users the facility Netnews: a provision that can be seen as a combination of an electronic conferencing system annex bulletin board system, electronic magazine and electronic newspaper. For the contracted institutes SURFnet has a joint subscription to Netnews.

5.4 Library catalogs in The Netherlands

Local and national availability
At this moment a large number of libraries are at the point where they have set up an on-line catalog, but don't have enough facilities to allow access in great numbers. Consequently the following situations can be distinguished:
- searching in the catalog is only allowed by way of the local facilities, for example the local network;
- especially for access to the catalog, a connection is set up by means of a modem;
- access to the catalog is allowed by way of the local network; and if this network is connected to SURFnet every participant of SURFnet may also look in the catalog.

Restricted access
Naturally, simultaneously searching, by means of a large number of terminals, in such a catalog puts the necessary demands on the available

computer and network capacity. Therefore most libraries have the process take place in two phases: access to the catalog is only allowed from the local facilities, and after that, only if it appears to function satisfactory, access by way of SURFnet is allowed.
In order to keep the load on the system within bounds, access from outside is usually limited to a number of ports.
So, this can mean that access is denied when all the ports are busy. Most systems indicate this, but sometimes it means that you receive no response to what you enter. In this case, there is nothing else to do than try again later.

Reachable by way of SURFnet
A brief summary of the library catalogs, that are reachable by way of SURFnet follows. For all these catalogs it applies that the access is primarily meant to provide local users with extra facilities. In this way, for example, one can also consult the catalog if one isn't at the work spot, but wishes to work from home. That the access by way of SURFnet means that one can also look into the catalog from all over the country, wasn't always realized. This means that the number of ports that have been made accessible is rather limited, with the consequences as stated above.

How to get where
The following library catalogs are reachable by way of SURFnet (where mnemonics are mentioned the list in appendix 3 has been used):

1. The library of the "Rijksuniversiteit Utrecht", by way of the terminal network of the "Rijksuniversiteit Utrecht" that is reachable in the following ways:
- by way of the PAD with the mnemonic 'RUUT' (RijksUniversitieit Utrecht Terminal network)
- for VAX users with the command 'SET HOST/X29 RUUT'
- by way of the SURFNET numbers 13401480200/12911028099

After a carriage-return, RUUnet announces itself with the question: "Request:" and if you then enter BRUNET, you will be connected to the library network and, if an access is available, placed directly in the on-line catalog.

By way of the command STP, that may be entered from any point in the system, you are automatically logged out.

2. The library of the "Universiteit van Amsterdam" by way of the terminal network of SARA: reachable by way of the mnemonic SART (SARa Terminal network) in the same way as was described under 1., or by way of the SURFnet numbers 12903210200 / 12911000099.

On the first screen of the network, after the prompt "Destination:", you have to enter UBA (Universiteits Bibliotheek (=library) Amsterdam); next a choice can be made for a special terminal emulator, such as VT100, after which the connection to the catalog is made. If one has the correct terminal emulation, the connection with the catalog is interrupted by pressing the ESCAPE key three times. A screen appears with several choices and the prompt USER>; here you choose the option QUIT.
Finally, one has returned to the initial screen of the terminal network SART. The connection is interrupted as described under 1. above, or one can wait until the timeout gets activated after entering nothing for a certain period.

3. The library of the "Rijksuniversiteit Limburg" in Maastricht, by way of the terminal network of the university, reachable with the mnemonic RLMT

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(Rijksuniversiteit Limburg Maastricht terminal network) as described under 1., or by way of the SURFnet number 14400420200 / 18802021099.

4. The library of the 'Katholieke Universiteit Nijmegen" (KUN):
The procedure requires some directions and it is very important to know that the terminal setting has to be VT52 compatible. The procedure is as follows:
- make a connection with the terminal network of the KUN by way of the SURFnet number 18800110200 / 18802007099;
- if you are working by way of the PAD you may use the mnemonic KUNT;
- if your VAX has a connection to the X.25 network, then probably the command "SET HOST/X29 KUNT" will work;
- enter, after the connection has been established, a <CR>;
- after the prompt 'Local>' you type: c KUNOPC <CR>;
- after the message 'Session to KUNOPC ... established' you enter an 'H' and a <CR>. Then an initial screen appears with general information. In some cases you have to enter another 'h', 'a' or <CR>, whatever the screen mentions. Now you may consult the catalog.

After you have completed your search, the session is terminateddown as follows:

- enter an 'A'. A screen will then appear called "BESTANDSKEUZE" (meaning "File Choice");
- interrupt the connection: with <CTRL/P> followed by CLR or CLEAR the (Tele)PAD connection interrupted.

Beware that your terminal will presumably still be in VT52 mode after the session is closed.
A nice option is the following: the OPC provides a comment screen: you can ask for information here, but you may also place remarks (- like: does the system "talk" English?, the translator -). You enter the option screen by typing a 'W' in the "BESTANDKEUZE" screen.

5. The library system of the "Landbouw Universiteit Wageningen" (AGRALIN) is directly reachable by way of the SURFnet number 1837002.

AGRALIN isn't freely accessible for everybody. One has to address an application to the department "Automatisering" - Jan Kopshuis, Wageningen (08370 - 83602/82006) in order to be considered suitable for access to AGRALIN.

6. The possessions of the library of the "Open University" are integrated in the catalog of the library of the "Rijksuniversiteit Utrecht" and, consequently, are accessible by means of the way mentioned under 1.

5.5 Expertise centers

A expertise center is a national center where scientific knowledge about a particular, clearly defined, area is collected, kept up to date and made available. So, it primarily concerns a central collection of discipline oriented knowledge. The purpose of an expertise center is to support research in a particular research area. The collected knowledge is electronically (by way of SURFnet) disclosed for interested parties, researchers and the private sector. Unfortunately, at the time this Guide through SURFnet went to press, we didn't have information at our disposal about all the expertise centers. For example, in the following descriptions, to our regret, information concerning the expertise center CADANS (Cardiology) is missing.

ARCHIS

The purpose of the expertise center ARCHIS is the realization and preservation of an Archeological Information System of relevant archeological deposits in The Netherlands. Alpha-numeric as well as cartographical information shall be stored and disclosed by and in ARCHIS. As anticipated, the expertise center to be, shall be accessible by way of SURFnet during the first half of 1990.

Address : Kerkstraat 1
3811 CV Amersfoort
Contact person : Drs. R.W. Brandt
Telephone : 033-634233
E-mail : info@archis.nl

Astronomische Beeldverwerkingsfaciliteit
(Astronomical Image Processing Facility)

Astronomical observation techniques are going through an enormous development. The increase of quality and quantity of the data sets that the astronomers use daily, ask for ever more professional processing facilities. Developments at an international level put the establishment of this expertise center at a timely moment. The expertise center ABF shall provide the following:

- development and maintenance of own, respectively imported, software for astronomical image processing, that at the same time helps to create a software environment for, still to be developed, processing algorithms;
- improvement and expansion of the computer hardware that is necessary for image processing;
- interactive access by means of SURFnet to nationally administrated data sets, that can be stored in digital or analog form.

Address : Sterrewacht Leiden
Postbus 9513
2300 RA Leiden
Contact person : Prof. dr. W.B. Burton
Telephone : 071 - 27.58.32

Expertisecentrum Beenmergdonoren
(Expertise Center Bone Marrow Donors)

Within the present West European and North American family structure, only one third of the patients, who are candidates for an allogene bone marrow transplantation, can find a donor within ones own family, who is suitable, that is to say is identical with reference to the tissue or HLA antigens.

As the result of the present knowledge of the HLA system and the progress in the area of bone marrow transplantation, HLA identical donors, that are not kin, can also be used for transplantations with these patients. A problem is created by the large number of possible ways of tissue typification.

The expertise center "Beenmergdonoren" has set itself as purpose:

- construct a joint data base of 20,000 donors in The Netherlands, with retainment of the independence of the eligible specialized blood banks and/or institutes for tissue typification;

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- realize a quick, on line, tissue typification match by way of SURFnet for every participant;
- execute follow up registrations and analysis;
- use the same facilities for suitable donors for the purposes of cytoferase (matched thrombocytes).

Address : Rijnsburgerweg 10
2333 AA Leiden
Contact person : ir. H.G.M. van der Zanden
Telephone : 071 - 262565/263240

CAN

On the 1st of August 1989 the expertise center "Computer Algebra Nederland" (Computer Algebra in The Netherlands), shortened as CAN, started. This expertise center is housed at the "Centrum voor Wiskunde en Informatica" in Amsterdam and has as goal the support of scientific researchers that make use of computer algebra in their research. In order to accomplish this goal the following activities are programmed:

- Provide access to a central computer that is specially equipped for working with computer algebra software.
- Put work stations and software at the disposal of groups that want to use computer algebra in their research work. The communication between the local equipment and the central machine goes by way of SURFnet.
- Collect and distribute information regarding computer algebra software.
- Inform and advise researchers about the use of software.
- Organize meetings, workshops and courses on the terrain of computer algebra.

In Nijmegen a SUN4/280 computer is already available for those who want to work in CAN context. This computer goes by the name of "cana" and is directly reachable by way of SURFnet with the mnemonic "cana". Reputable computer algebra systems as MAPLE, MATHEMATICA, REDUCE, LIE and MACAULAY have already been installed on this system.

This computing facility is, at low charges, at the disposal of researchers who want to use one of the mentioned computer programs; an application form can be requested at the expertise center. There one may also submit applications for the installation of a local work station.

Address : Postbus 4079
1009 AB Amsterdam
Contact person : E. Willems
Telephone : 020-5926050
E-mail : wilmz@cwi.nl

CAOS/CAM
Dutch National center for Computer Assisted Chemistry

CAOS/CAMM is the national center for computer assisted chemistry. The center provides expertise and supports research on the terrain of chemical design by means of a number of dedicated on-line services, that are extensively used by researchers at all of the Dutch universities.

State of the art equipment and software for 'Computer Assisted Organic Synthesis' (CAOS) and 'Computer Assisted Molecular Modelling' (CAMM) are reachable by means of user friendly graphical menus (amongst other ways by

EARN and SURFnet).

CAOS/CAMM has a large number of software tools available, amongst other things for the design of organic syntheses and research of molecule structures. Several data bases are available on-line, with regard to chemical reactions, crystal structures, proteins and nucleotides, amongst other things.

CAOS/CAMM is located at the University of Nijmegen and has a VAX 11/785 with 8 Mbyte central memory and approximately 1.3 Gbyte external memory. At CAOS/CAMM advanced graphical facilities are available for all academic users. A large number of graphical work stations have been installed at the chemical faculty groups and academic libraries.

Address : Faculteit Wiskunde en Natuurwetenschappen
Katholieke Universiteit Nijmegen
Toernooiveld
6525 ED Nijmegen
Telephone : 080-613386
Contact person : dr. J. Noordik
E-mail : caos::noordik

CELEX
Center for Lexical Information

Ever since the beginning of 1989, as a national expertise center, CELEX has been involved in all kinds of projects at Dutch and foreign universities and research institutes. The Dutch and English lexical databases, that are available at CELEX, can be put to use in research of language and speech in the broadest sense and in the development of all kinds of linguistic and speech oriented software. Besides that, from the beginning of 1990 a German lexical data base, now in development, shall provide even more application possibilities. Also, the first results of the proceeding structural enrichment of the databases - syntactical subcategories, semantical characteristics, translation equivalents, etc. - will come available during that year.
CELEX is available by way of SURFnet for on-line performance of search commands and for the construction of derived word lists for off-line applications.
Those interested may directly get acquainted to CELEX by way of SURFnet, as CELEX has made an info account available (username: INFO),

Address : Katholieke Universiteit Nijmegen
Wundtlaan 1
6525 XD Nijmegen
Telephone : 080-512117
Contact person : drs. H. Kerkman
E-mail : celex@hnympi52.bitnet

ProGAMMA

The inter-university expertise center "iec ProGAMMA" is a co-operation between the Dutch universities, that has been established for the promotion of computer applications for behoof of the behavioral and social sciences.

ProGAMMA provides information about various computer applications, amongst other things about possible software environments, development systems and forms of standardization.
With the development of software the expertise center strives after

professional, user friendly software that can easily be adapted to several computer systems. Everybody who has concrete plans to develop software or to modify it, may ask for support by submitting a project proposal at ProGAMMA

ProGAMMA distributes software that has been developed by the expertise center as well as software that has been developed somewhere else. At the same time ProGAMMA takes care of the import, export and joint acquisition of software within the social sciences.

Address : Kraneweg 8
9718 JP Groningen
Contact person : mw. G. de Vries
Telephone : 050-636900
E-mail : GAMMA@HGRRUG5
GAMMA::GAMPOST

Bureau NexpRI

The "Nederlands Expertise centrum voor Ruimtelijke Informatieverwerking" (Dutch Expertise Center for Geographical Information Processing" directs its aims at the support of advanced applications for geographical information systems (GIS) in research areas as geography, geodesy, planology, environmental studies and landscape architecture. For this goal a number of information banks and documentation systems are being set up, that will be interactively available for consultation by way of SURFnet from the beginning of 1990. The NexpRI information bank shall contain data about institutes and companies that are occupied with GIS in The Netherlands and about available and operational GIS systems. Besides that, information is being collected about: applications, education, research and development projects, data bases, consult services, GIS experts and GIS documentation.

Address : Postbus 80.115
3508 TC Utrecht
Contact person : Mw. drs. D.A. Ondaatje (bureau coordinator)
Telephone : 030-534261

PREX

The expertise center PREX is primarily meant for those who, within the biomedical research, are involved with conducting animal experiments.
The purpose of the expertise center is to offer support with the preparation, design and performance of vivisection. The aim of this is to contribute to the responsible use of animals for experiments and to the the quality of research with experiment animals.

In biomedical research yearly more than one million vertebrate animals are used. For an efficient and responsible use of animals in experiments it is often necessary that, prior to the experiment, a number of specific vivisectional questions are answered. These questions can refer to the choice of the animal for the experiment, norm values, the availability of the animals, the demands the animals have regarding housing and attendance, the protection of health and treatment of diseases, anaesthesia, analgesia and experiment techniques; and also to availability of alternatives and to ethical and academic aspects.

Address : Postbus 80.166
3508 TD Utrecht

Contact person : Prof. dr. L.F.M. van Zutphen
Telephone : 030-532033

SPEX

The "Speech Processing EXpertise center" (SPEX) has as objective to render services to researchers who work in the field of speech, in the broadest sense of the word. So besides phonetics, also those who are occupied with dialects, speech defects, social variations in languages, as well as researchers in the area of the coding of speech, speech recognition and speech synthesis.
The services of SPEX consists of the development and distribution of aids for the collecting, describing, management, distribution and consultation of a large data base with speech data.
SPEX is an initiative of the "Stichting Spraaktechnology" (the Foundation for Speech Technology, a co-operation between speech institutes) and is housed at the PTT Research Neher laboratory.
SPEX shall be reachable by way of SURFnet from the middle of 1990.

Address : Postbus 421
2260 AK Leidschendam
Telephone : 070-436522
Contact person : B. van Heugten
E-mail : hlsdnl::vanheugten
vanheugten@hlsdnl5.bitnet

The SRM Documentation Center

The SRM Documentation Center, established since 1990 at the Erasmus University in Rotterdam, is occupied with the registration and documentation of recent literature regarding methods and techniques for the academic social research.

In order to make a meaningful documentation of literature possible, a very specialized classification scheme was designed and recorded in the "Thesaurus of Social Research Terminology". With the aid of this Thesaurus new "methods and techniques" literature is detected and the contents are written down in abstracts, disclosed by descriptors in the Thesaurus.
The data base, that has been constructed in this way, consists of literature references starting from 1970.
The present database consists of about 35,000 titles, nearly half of which are provided with an abstract that has been made by SRM specialists. The yearly input is 2,000 new references, of which half have an abstract.
For more information about the SRM Documentation Center, ordering subscriptions to the SRM bulletins and for applications for searches and for information about the on line retrieval you may contact the secretariat.

Address : Burgemeester Oudlaan 50, BT-11
3000 DR Rotterdam
Contact person : mw. drs. G.W. Kantebeen
Telephone: : 010 - 4082195/4082155

5.6 Some host organizations and suppliers of information services

Excerpta Informatica
Fields of interest : applied computer science for the behavourial,

literature and philosophy sciences
Location : Tilburg/Bibliotheek Katholieke Universiteit Brabant
Network User Address: 14200610200/18802026099
Access code : obtainable on request
Costs : subscription and search costs
Information : 013-662637

NIMF (PTT Online Network Information and Maintenance Facility)
Fields of interest : Datanet1: news, host list, tariffs, reachable countries, telepad accesses
Location : Den Haag
Network User Address: 12900090
Access code : not necessary
Costs : none
Information : 070-3438611

PAD HELP
Fields of interest : information regarding PAD usage
Location : Delft
Network User Address: 11730170611/12911004111
Access code : not necessary
Costs : none
Information : SURFnet Helpdesk: 030-367676

PICA Online Retrieval System
Fields of interest : bibliographic files, amongst others: TACO, GLIN, AVM, Nestor, BNTL, Swidoc
Location : Leiden
Network User Address: 117117301/12911033001
Access code : obtainable on request
Costs : tariff per data base
Information : 071-257257

RCC-Rijks computer centrum
Fields of interest : literature databases, amongst other things: laws, questions and documents of the House of Parliament, press documentation, ADION
Location : Apeldoorn
Network User Address: 1576056
Access code : obtainable on request
Costs : subscription and costs for the connection
Information : 055-778822

U14/Shopnet
Fields of interest : product information for PC hardware and software
Location : Hoofddorp
Network User Address: 1250234
Access code : not necessary
Costs : none
Information : 02503-32033

Outside of The Netherlands

Datastar
Fields of interest : Scientific literature, industrial and business information
Location : Switzerland
Network User Address: 0228464110115
Access code : obtainable on request

Costs : search costs per database, a demo account is possible
Information : 06-0220804 (in The Netherlands)

ECHO (European Commission Host Organization)
Fields of interest : Data base of databases, available in Europe
Location : Luxembourg
Network User Address: 0270448112
Access code : DIANENL
Costs : only connection costs
Information : +352 488041

5.7 Summary of foreign networks

For the development of education and research it is of the uttermost importance that the exchange of knowledge and experience proceeds with the same advanced possibilities as within The Netherlands. At this moment the existing possibilities already offer the ability to make contact with users in the largest part of the rest of the world.

European networks

COSINE
In order to exploit the possibilities at a European scale, in 1986 the association RARE (Reseaux Associes pour la Recherche Europeene) was established. The national research networks of 22 European countries are a member of RARE (a list of a large number of these networks follows below). This association is the supervisor of the specification phase of an EUREKA project, COSINE (Cooperation for Open Systems Interconnection Networking in Europe), that is meant to connect the national research networks on the basis of common specifications. One of the goals of this project is the realization of a European X.25 network, the IXI network. These specifications, in their turn, are attuned to the so called ISO/OSI standards. In The Netherlands, SURFnet is the supervisor of these arrangements.
The execution of the COSINE project is at a point that, in the mean while, a start has been made with actually connecting the national networks in Europe (implementation phase).

In this manner, on short term all the computer services that are offered in Europe, will be accessible for all the users in Europe. It is also anticipated that the communication possibilities with networks outside of Europe will be improved.

EARN
EARN (European Academic and Research Network) is a computer network that connects the academic institutes within Europe. EARN is the European part of a larger network that spans the United States, Japan, Canada and West-Europe. In the U.S. the network is called BITNET, in Canada NETNORTH. As of June 1989, in total the network consisted of approximately 2300 computers, that are called nodes. Every participating country in EARN has an international node. The whole of these international nodes and the connections between them form the backbone of EARN.

From EARN/Bitnet, by way of gateways, communication can take place with other networks, such as UUCP, ARPANET and JANET. Presently a lot of universities and research institutes are connected: in total it concerns

400 institutes with 750 nodes. The central node HEARN (stands for Holland EARN) in Nijmegen is the international node, as well as the node through which most of the national communication goes.

EUnet
The European Unix network (EUnet) has been in operation since 1982, and therefore is the oldest computer network for education and research in Europe. EUnet is a rapidly growing pan-European network of Unix systems with more than 1300 nodes in approximately 20 countries (one node usually spans several systems). Within The Netherlands EUnet and institutes connected to SURFnet partially overlap, but presently EUnet is reachable with SURFmail by the whole SURFnet community. In any case the EUnet traffic within The Netherlands from and to an institute connected to SURFnet, goes by way of SURFnet. Contrary to EARN, EUnet forms no part of SURFnet, neither in the organizational nor in any other meaning.
EUnet has a decentral organization, that's managed by the national central nodes. EUnet as a whole is represented by the European Unix User Group (EUUG), where all the national Unix user groups are united. Users in The Netherlands are united in the NLUUG, what stands for: National Unix systems Group - The Netherlands. EUnet has gateways to a number of other networks, such as ARPA Internet, EARN/Bitnet, JANET, and so on. And naturally with USENET, the Unix network in the United States (furthermore there is JUNET in Japan). The network protocol that is the basis of Unix networks is called Unix-to-Unix-CoPy, UUCP. The central European node for the connection of the European EUnet with USENET and other networks is situated in The Netherlands at the "Centrum voor Wiskunde en Informatica" (CWI, Center for Mathematics and Informatics) in Amsterdam. The contact address for E-mail is: postmaster@cwi.nl.

Summary of European research networks
In nearly all of the European countries activities are displayed to set up research networks. In alphabetical order, by country, in the following the various research networks, that have been set up to the advantage of higher education and research, shall be summed up.
Beware!, this summary does not strive to be complete, as the network situation in Europe changes with the month. It is only meant to get the reader acquainted to names and situations in other countries, as was known to SURFnet at the time of this edition of the Guide. If known, e-mail contact addresses are mentioned.

Austria:
ACONET (Akademisches Computer Netz): coordinates network activities of most of the institutes for higher education and research.

UNA (Universitats-Netz Austria): a network based on DECNET

Denmark:
DUNET: the Danish part of NORDUNET, a co-operation of the Scandinavian countries, aimed to apply the international standards, such as X.400.

UNI-C: a computer center that supports research institutes and plays an active part in the coordination of network activities for researchers.

East European countries:
IASnet: a network for socialist countries; central host at the Institute for Automated Systems (IAS) in Moscow.

X.25 connections to computer science institutes in: Bulgaria, Hungary, East Germany, Poland, Tsjechoslowakia, Cuba, Mongolia and Vietnam.

Finland:
FUNET (Finnzatish university and research network): coordinates network activities within the academic world and is the Finish part of NORDUNET, a co-operation of the Scandinavian countries, aimed to apply the international standards, such as X.400.
E-mail contact address: sadeniemi@funet.fi or sadeniemi@finfun.bitnet

France:
ARISTOTE: set up as an initiative of research organizations such as CEA (Commissariat a l' Energie Atomique) and INRIA (Institut national de Researche et Informatique et Automatique) in order to define and implement mutual applications for the connected research centers. OSI has been chosen as basis.

REUNIR (Reseau des Universites et la Recherche): a network for higher education and research, aimed at the basis network requirements of computer centers and laboratories.
E-mail contact address: UCIRO83@FRORS42.bitnet

OFRIR (Organisation Francaise des Reseaux Informatiques de la Recherche): set up in order to coordinate the activities of ARISTOTE and REUNIR.

Greece:
ARIADNE: a project, set up in order to connect all the institutes for higher education and research.
E-mail contact address: kostas@ariadne.uucp

Iceland:
SURIS (National Organization for research Networking in Iceland): an organization where all the large institutes, about 20, for higher education and research participate. Part of NORDUNET, a co-operation of the Scandinavian countries, aimed to apply the international standards, such as X.400.
E-mail contact address: gunnar@hafro.is

Ireland:
HEANET (Higher Education Authority Network): a network for institutes for higher education. Seven institutes are connected.
E-mail contact address: jhayden@lbvax1.tcd.ie

Italy:
In Italy several organizations are, at their own free will, co-operating with each other. For example: CNR (Consiglio Nazionale delle Ricere), ENEA (Ente Nazionale Energie Alternative) and INFNet (Institute Nazionale Fiscia Nucleare). And besides that, existing consortiums are going to co-operate:
CINECA: a consortium of 13 universities
CILEA: a large computer center for researchers
CSATA: the largest computer center in South Italy

Recently the GARR (Gruppo Armonizzazione Reti per la Ricera) was established in order to coordinate all the activities.

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Norway:
UNINETT: a network for institutes for higher education and research, a close collaboration with NORDUNET, a co-operation of the Scandinavian countries, aimed to apply the international standards, such as X.400. There are 24 institutes on the network.
E-mail contact address: postmaster@nodename

Portugal:
RIUP (Rede de Investigacao e Universitaria Portugese): a network for research institutes.

Spain:
IRIS: coordinates the existing networks in Spain.:
FAENET: High Energy Physica
RICA: network for research departments of the University of Andalusia
EARN
E-mail contact address: martinez@iris-dcp.es

Sweden:
SUNET (Swedish University Network): part of NORDUNET, a co-operation of the Scandinavian countries, aimed to apply the international standards, such as X.400.
E-mail contact address: roland@umu.se or rhg@seumdc51.bitnet

Switzerland:
CHADNET: the Swish part of HEPNET
CHUNET: pilot network for EAN/X.400
SWITCH (Swiss Telecommunications for Higher Education and Research): a project that is to provide new telematic technology to the universities, based on experiences from amongst others CHUNET and EARN.
E-mail contact address: postmaster@switch.ch

Turkey:
TUVAKA: Turkish national network for research institutes, with 11 connected institutes.
E-mail contact address: postmaster@trearn

United Kingdom:
JANET: Joint Academic Network
Established in 1984 in order to provide network connections for universities and research institutes. JANET is the counterpart of EARN in the United Kingdom, but does participate in the EARN organization. The network is, however, based on a different protocol than the one used in EARN, so that a gateway is necessary between the two networks. This gateway is presently located at the Rutherford Laboratory (node UKACRL on EARN). A SURFnet user can only establish contact with JANET by way of the mail facility. About 200 institutes are connected.
E-mail contact address: NE@gec-b.rutherford.ac.uk

West Germany:
DFN: Deutsches Forschungs Netz
Approximately 134 institutes are connected to the network; E-mail is completely based on X.400. An information service that is managed by the

DFN and contains useful information about the institutes connected to the network is worth mentioning. It is freely accessible with NUA:
026245200043042
E-mail contact address: infosys@zpl.dfn.dbp.de

Research networks outside of Europe
Only the best known/used research networks outside of Europe are mentioned in this summary. It is nearly impossible to provide an exhaustive list of all the existing networks.
You may always ask your ICP for information about networks and whether they are reachable from SURFnet.

United States:
A lot of networks in the US are reachable from SURFnet. A distinction can be made:
1. Networks that were set up by the government: ARPAnet, ARPA Internet, NSFnet, HEPnet, ESnet
2. Networks that were set up by users: Bitnet, CSNET, UUCP

In 5.3 the help desks of the various networks are listed.

1. Networks that were set up by the government:

-ARPAnet/ARPA Internet
ARPAnet stands for 'Advanced Research Projects Agency Network'. It is the oldest network (started in 1969) of the networks in ARPA Internet. ARPA Internet is the internetwork of several, distinct, networks that all use the same communication protocol (TCP/IP). There are more than 5600 nodes connected to the ARPA Internet. Both networks are named after DARPA ('Defence Advanced Research projects Agency'), the network that is part of the Ministry of Defence of the United States.
So, actually ARPAnet is part of ARPA Internet, but the two names are often used next to each other. The day to day coordination of the whole of ARPA Internet is managed by the Network Information Center (NIC). Often one also encounters the name Internet (with a capital I), meaning the ARPA Internet. ARPAnet and MILnet, that together are part of the Defence Data Network (DDN), are the two most important networks of ARPA Internet. CSNET and NSFNET are also a part of the Internet.

Of the services that are offered by ARPA Internet, a SURFnet user only encounters the mail service. In ARPA Internet there are mailing lists and so called digests. A SURFnet user may subscribe him/herself directly in ARPA Internet at the owner of such a mailing list or digest; however some of these distribution lists are also circulated in EARN/Bitnet by way of Listserv, so that it is better that you subscribe at Listserv. For the users of EUnet it is worth mentioning that most of these mailing lists are also sent to a netnews news group, so that one doesn't have to subscribe individually. Naturally, this diminishes the trans-Atlantic traffic.
E-mail contact address: see 5.3

- HEPnet and MFEnet
HEPnet (High Energy Physics network) is a world wide, DECNET based, network that, during the last ten years, has been developed by the United States High Energy Physics Program. Besides large laboratories in the United States, a number of European organizations are also connected, like CERN in Switzerland.
MFEnet (Magnetic Fusion Energy network) was set up in 1976 in order to gain

access to the National MFE Computer Center.

- ESnet
HEPnet and MFEnet shall be replaced by ESnet (Energy Science network), that forms the new back bone for all the projects of the United States Department of Energy.

- NSFnet
Started in 1986 as a communication network that provided access to national supercomputer centers that were sponsored by the NSF (National Science Foundation).
E-mail contact address: see 5.3

The backbone of NSFnet is formed by the following networks that consist of supercomputer centers with the local network that is connected to it:

AFSCC-K	Air Force Supercomputer Center at Kirtland AFB, New Mexico
JVNCNET	John von Neumann National Supercomputer Center, Princeton, New Jersey
NCAR	National Center for Atmospheric Research, Boulder, Colorado
NCSANET	National Center for Supercomputing Applications, University of Illinois, Urbana
NPAC	Northeast Parallel Architectures Center
Nysernet	Cornell National Supercomputer Facility, Cornell University
OSC	Ohio Supercomputer Center
PSCNET	Pittsburgh Supercomputer Center
SDSCNET	San Diego Supercomputer Center, University of California

Next to these the following regional networks are directly connected to the backbone:

BARRNET	Bay Area Regional Research Network, California
CERFNET	California Education and Research Federation
CICNET	Midwestern States Network
MERIT	Michigan Educational Research Network
MIDNET	Midwestern States Network
NEARNET	New England Academic Research Network
NORTHWESTNET	Northwestern States Network
SESQUINET	Texas Sesquicentennial Network
SURANET	Southeastern Universities Reseach Association Network
THENET	Texas Higher Education Network
USAN	University Satellite Network
WESTNET	Western States Network

In total about 350 networks are connected to NSFnet.

- SPAN
Space Physics Analysis Network is sponsored by the NASA and consists of a network based on DECNET.
It has been operational since 1981 and has more than 2000 nodes in the United States, Europe, Canada and Japan.
SPAN has an interactive information service, reachable by institutes that are connected to SPAN (userid SPAN-NIC on the node NSSDCA).

2. Networks that were set up by users:

- Bitnet

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Bitnet (Because It's Time Network) started in 1981 as a small network of IBM computers at the City University of New York (CUNY).
At present it consists of approximately 2400 computers over the whole world, in the United States, Europe, Canada, Japan, Central and South America, Israel, Taiwan and Singapore.
Bitnet is aimed to accomplish the non-commercial exchange of information between institutes with a scientific nature.

EARN is the European part of Bitnet (see above) and NETNORTH is the Canadian part.
Technically the participating networks form one network, based on the IBM RSCS protocols.
At this moment, Bitnet and CSNET are engaged in a merge process and shall co-operate together starting 1 January 1990 under the name CREN.
E-mail contact address: see 5.3

- CSNET
CSNET (Computer Science network) functions since 1981, is financially supported by the National Science Foundation (NSF), with participants in the United States, Europe, Canada, Korea, Japan and New Sealand.
At this moment, Bitnet and CSNET are engaged in a merge process and shall co-operate together starting 1 January 1990 under the name CREN.
E-mail contact address: see 5.3

- UUCP
Unix-to-Unix CoPy (UUCP) is a collection of programs that were designed to make communication between Unix systems possible, with the use of dial-up or fixed connections. It is primarily a mail network, without central management.

- USENET
USEnet spans a number of networks; UUCP (Unix to Unix Copy), X.25 and Internet. It consists of a set of programs that provide access to NETNEWS and that transports contributions within NETNEWS from one machine to the other (also see 5.3).

CANADA:
- CDNnet: renders services to the Canadian scientific community. The first X.400 network in the world (1983).
E-mail contact address: postmaster@rekay.ubc.ca

- Netnorth (1983): Canadian branch of Bitnet.