EUUG

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EUUG

European UNIX† Systems User Group

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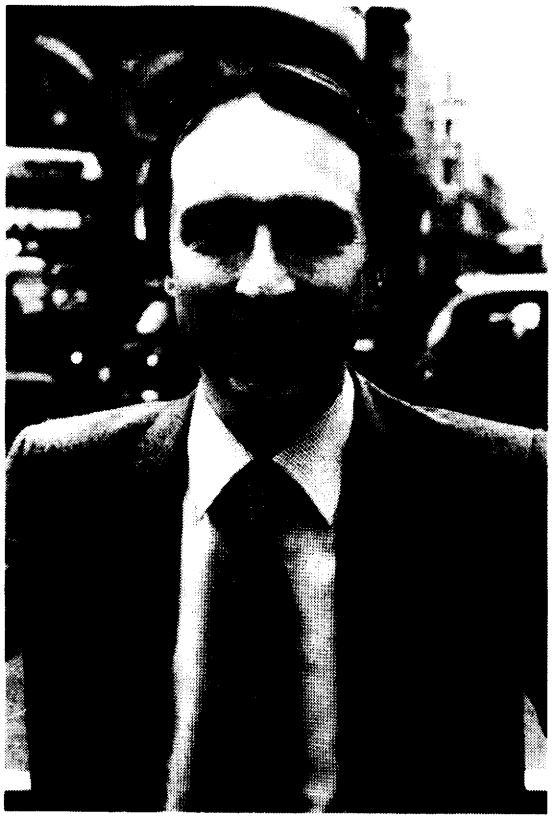
Spring 1983

† UNIX is a Trademark of Bell Laboratories.

Would you like to learn UNIX* from this man?



A hell of a lot of people already have.

UTC Ltd. has recently recruited Mike Banahan as Senior Lecturer/Consultant. With his experience at Bradford University, where he installed and maintained their UNIX System, Mike has a first class reputation as a lecturer and as a technical consultant in UNIX and C.
UTC is a sister company of Structured Methods Ltd. and a member of the Span group of computer service companies. Throughout the year, we will be holding a variety of seminars and workshops in UNIX and C, for more details please ring Mike Southon on 01-734 7394 or complete the coupon today.

UTC Ltd.

A UNIX TRAINING COMPANY | A SPAN GROUP COMPANY

43-44 GREAT WINDMILL STREET, LONDON W1V 7PA
TELEPHONE: 01-734 7394 24 HOUR ANSWERPHONE

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UNICOM Winter Conference 1983 San Diego

Teus Hagen

This conference had more attendees than ever before; the last conference in Boston had more than ever before ...

Also there were 2000 officially registered attendees and about 400 unofficial people running around. These conferences tend to become unmanageable, but due to the majority of attendees being in nice suits, the conference held to the plans of the officials.

The exhibition was filled up with about 65 booths, and all well known vendors were present, as well some newcomers e.g. IBM, Gould and National Semiconductor. Some, such as Perq, seemed to have left the battle field; anyway, there was no trace of a Perq around. The hottest war was going on between the UNIX micro vendors, most of them fighting in the 68000 field. Some of the wounds can be found in a benchmark survey (separate paper). The only European vendor came from Ireland, Software Ireland Ltd. One vendor was missing from the exhibition: AT&T. They had promised me that they would exhibit their UNIX System V; perhaps next time, with their new UNIX machine ....

The meeting had about 30 talks, most of them running in parallel. Sorry I could not fork. However, that the organisers created a fine paper with the abstracts of the talks (this time *real* abstracts). What I will do here is answer the most frequent questions I have been asked after visiting this winter show; when needed I will send a copy of the abstracts. This time the typing was not done by David Rosenthal, so do not blame him for my errors†.

Software tools

The Software Tools Users Group, 1259 el Camino Real #242, Menlo Park, Ca 94025: if you want to be a member of this group, it will cost you $15.-, commercial site $150.-. They have a newsletter and every year produce a magtape full of software, written in RATFOR or PASCAL. Newly available is an electronic mail package (Joe Sventek, Lawrence Berkeley Lab, CSAM). This package gives you a mailing system between UNIX, IBM/CMS, Harris, Cray1, DEC20, VAX/VMS and IBM/mvs. The package will be included, as promised, in the next distribution. Joe also has uucp running under Eunice (VAX/VMS).

AT&T UNIX System V announcement

System V is available now. For details of licensing, prices and what you get, see a separate overview. This overview has been sent by AT&T to everyone who has become anaemic by signing one of their licences, alive or dead. If you haven't got it, and need the details, contact the EUUG Secretary.

The main differencies with System III are as follows:

- improved interprocess communication scheme (no IPC from UCB), via process messages;
- library: special libraries for profiling and math. library enhencements;
- uucp is improved significantly;
- ex/vi from UCB is incorporated;
- accounting is better and has lots of enhancements;

†Someone else had to act as a filter this time.... Jim

- again, a better lineprinter spooler;
- init and getty are changed and should be better;
- new: more general diskdriver (includes 516Mb and 124 Mb disks).

Besides that, AT&T supplies you with lots of documentation, which is separately available for about $30.- per volume, so the AT&T Bookshop is now open! There is more documentation, and it is better. And .... AT&T will now supply as much support as you want! Day and night telephone support for nasty questions, the more you pay, the more you get. Nothing was said about the support problem in Europe, so wait and see what AT&T will say about it in Bonn.

More detailed differences:

Files: SIII already has some changes to improve pipe throughput; by changing the logical blocksize to 1Kb, the throughput is even better. Pipes are a type of FIFO file, which reflects on the creation of 'typed' files. Moreover, lots of work has been done on an enhanced filecontrol (append, no delay, etc). Reliability is improved by the means of a special condensed write (creat-link-write).

Filesystem: The filesystem now has a type. In this way AT&T will try to keep their promise to remain upwards compatible in the future. In the superblock you will find now a new entry: filesystem type.

System III already has CPIO and FSCV (conversion utility). System V has new programs to check the filesystem: fsck with a fast option, FSBA for analizing the conversion costs and a program to add a compatible filesystem type (?). DFSCK will do a dual/parallel filecheck for you. The backups go faster with the incremental tape backup utilities FF, FINC, FREC. To do an even faster backup you can use VOLCOPY. INIT does the periodic 'sync', so UPDATE is dead; the 'sync' frequency is defined at compile-time.

Speed: For a VAX780, System V is 25% faster than System III. For a PDP11/70, System V runs .9-1.0 times faster! The overhead for the context switch is decreased by about 20-25%. Inode lookup is done with a hash table, and is 175% faster. Because of the 1Kb logical block size, the bandwidth of a pipe is 175% more (see the remarks in earlier Berkeley reports).

Terminal I/O: Measurements were given for 9600Bd lines and cpu usage $<$ 100%:

11/70 with DH - raw throughput 20 Kb/sec, normal 5 Kb/sec

VAX780 with DZ - raw throughput 5 Kb/sec, normal 3 Kb/sec

with KMC - 30-40 Kb/sec (guess why).

System V is only available for the PDP11/70, VAX11/750 and 780.

AT&T also give support via electronic mail; this electronic mail is free. Use the address 'unixml!bellmail', telephone number +1-312-260-1844.

News from DEC

DEC now supports UNIX on the PDP11 - UNIXV7M. The major changes seem to be to get software support for the field engineering people, and the error messages should now be understandable for them. Of course, the system has drivers forall the different DEC peripherals.

Shortly DEC will also support UNIX on the VAX - yes, you guessed it, they will support BSD4.1 and later on BSD4.2. They did not announce when they will no longer support VMS ....

News from Berkeley

The PDP11 distribution BSD2.9 will be available in about two months. BSD2.9 will have most of the things you will find in BSD 4.1, the VAX distribution, job control, csh, termcap, ex/vi, mail, delivermail, etc. Sorry, no IPC (interprocess communication)! It is unlikely that the IPC stuff will be ported to the PDP11.

The BDS4.2 distribution for the VAX will take some time. At the moment the work is done up to BSD 4.1c, so anyone who says he is running BSD 4.1d .... These versions will be tested by a handfull of sites, and the expectation is that the final BSD4.2 will be ready in the summer, say the fall. Please DO NOT query them about the distribution date for it will only delay that date! Berkeley will send a letter to every site who is running BSD4.1 when the distribution is ready, so wait till UCB greps you!

The distribution will have IPC, network support for TCP, PUP, etc. No X25 support. Support for ethernet (Xerox one, 3Com, Interlan, DEC, Ungermann/Bass). The filesystem will be changed, inodes will be spread around the disk, the logical block size will be 4Kb, with .5Kb fill up blocks, giving much better file throughput than BSD4.1. It looks like it will be hard work to go from BSD4.1 to BSD4.2 - take some free time during Christmas!

Other details at the Bonn meeting.

Invited Talk

The opening talk was from John Mashey, and it was too good to forget, but too strange to give an overview, so I will give here his own abstract as a final remark on the San Diego meeting.

Software Army on the March - Project Strategies and Tactics.

John R. Mashey
Bell Laboratories
Whippany, NJ 07981

26 January 1983

This talk describes the work of an army building roads ('software projects') through a part of the countryside that:

- seldom has current maps.
- is plagued by earthquakes ('major environment changes'), flash floods ('temporary problems'), and fog ('inability to predict the future').
- contains villages of natives ('users') who may greet roadbuilders with anything from great interest to outright hostility, but whose cooperation is essential.
- may be overrun by enemy forces ('competitors') trying to build their own roads to the same locations.

An effective campaign has two aspects:

- Doing the right thing, i.e., fighting the right war in the right place, and choosing good routes to reach the goals.
- Doing it right, i.e., building maintainable roads with adequate capacity, at a reasonable cost, without losing too many casualties, and without offending the natives.

Most software methodologies emphasize the second part; this talk emphasizes the first by examining decision processes and methods of analyzing routes. Two different viewpoints are used. The first is the formal game theory viewpoint - making decisions in a nondeterministic, multi-stage, N-person, non-zero-sum game played with incomplete information. The second is the 'army' model described above. From this viewpoint will be discussed such issues as:

- The need for scouts on motorcycles ('fast prototypers').
- How campaigns differ, and thus affect choice of troops, ranging from commando raids through the march of the hordes.
- Special precautions for earthquake territory.
- Getting natives to buy and drive your trucks, instead of shooting your tires out as you drive through their villages.

There exist many similarities in the decision processes of formal games analysis, military planning,

and project management. The talk used the first and second to help shed light on the third. Provided with the talk was an annotated bibliography, which includes a famous treatise on 'project management' written in 500 B.C. -

Tzu, Sun. *The Art of War*. 500 B.C. Military Service Publishing Company, Harrisburg, PA 1944. [thanks to L. Bernstein].

Contains numerous pithy discussions of project management, although not expressed in the standard terminology.

"When you engage in actual fighting, if victory is long coming, then men's weapons will grow dull and their ardour will be dampened... Thus, though we have heard of stupid haste in war, cleverness has never been associated with long delays."

With thanks to the organisers of UNICOM (USENIX and /usr/group, or UNIFORM, as this group is called now.).

Impressions of San Diego

David S. H. Rosenthal

EdCAAD Studies, Dept. of Architecture,
Edinburgh University

1. Introduction

The weather was dreadful and the conference was attended by over 3000 people. Unlike earlier meetings, the overwhelming majority of the attendees were marketing and management people.

2. Software

The UNIX† world has divided into two camps; the Version 7, System III camp of *swapping* UNIX people with limited resources, and the Berkeley 4BSD *paging* camp of people with plenty of resources‡. The difference between the camps was the hot topic; people in suits like System V and people with dirty hands like 4.xBSD.

2.1. A.T. & T's System V

The announcement of System V was treated as the major event of the show. For the first time, A.T.&T. will offer source licensees support. On the other hand, they will only support the system on 11/70, VAX/750 and VAX/780 CPUs, and they will *not* offer supported binary licenses.

Technically, System V differs little from System III, and thus differs little from Version 7. The additions are largely incorporations of Berkeley developments:

- The *vi* screen editor and the *termcap* package for addressing VDUs.
- On VAXes only, a 1024-byte file system. In the interests of compatibility, both 512- and 1024-byte systems can co-exist. 1024-byte file systems are not available on PDP11s — the claim was made that they were not a performance improvement for 11s, but experience of 2BSD shows this to be false.
- Interprocess Communication extensions. These are restricted to *intra-machine* communications, and consist of *semaphores*, similar to the normal **/dev/sem** extensions to version 7, and shared-memory *messages*. They are markedly less powerful and flexible than the 4.2BSD IPC enhancements.
- 25% better performance, achieved largely by hashing the inode tables, a fix which many Version 7 systems installed years ago.
- The Common Synchronous Interface — a standard interface to intelligent communications devices such as KMC11-Bs.

In general, System V is very disappointing. The lack of paging, the feeble inter-process communication extensions, and the (un-acknowledged) ripping-off of old Berkeley performance improvements combine to make the system un-attractive. On the other hand, the marketing people need to be able to distribute binaries; this system ensures you can do it.

The licensing terms are interesting for academics. A one-time upgrade covering *all* processors that you can name is *free* from System III, and $800 from other systems.

2.2. Berkeley's 4.2BSD

The long-awaited announcement of 4.2BSD did not take place at the meeting, but the details of the system were extensively discussed.

4.2BSD's kernel, except for the memory management, is complete and being tested. Drafts exist of almost all the documentation. Most of the new utilities are complete, including the high-

† UNIX is a Trademark of Bell Laboratories.

‡ Note that small machines can have plenty of resources these days.

performance *f77*. The remaining tasks are the memory management, integration, and documentation. A release in the early summer seems realistic. The contact at Berkeley is Pauline Shwartz, but existing 4.1BSD licensees will be informed by post when release is imminent.The cost of the distribution will be about $800, as usual.

Note that 4.2BSD will require significantly more resources than 4.1, particularly as regards memory. A timesharing VAX will need 2M bytes of memory.

The new file system has been measured on month-old production file systems at 86% of the raw disk bandwidth, rather than 8% for the old (1K) file system. Eric Allman has replaced */etc/delivermail* by */etc/sendmail*. This fits the new ARPA mail standards, and provides UUCP with *addresses* rather than *routes*.

2.3. DEC's UNIX

DEC now supports UNIX for PDP11s, in the shape of the V7M system, and for VAXes, in the shape of 4.1BSD. They will support 4.2BSD. They will market supported binary licenses, but not in Europe yet (shout at your local DEC people).

2.4. Conclusion

One session, attended by about 400 people, included a paper from the University of Texas comparing System III and 4.1BSD. At the end, the question was asked "Who is running System III?". No-one raised their hands. Then the question "Who is running 4.1BSD?" was asked. Almost everybody raised their hands.

3. Hardware

3.1. MC68000-based systems

There were a vast number of MC68000-based systems on show, most running either Microsoft's Xenix, or Unisoft UNIX. Among the major manufacturers who have MC68000-based systems on the stocks are Hewlett-Packard, Gould, Tektronix, and Texas Instruments. The systems of most interest were:

1. SUN Microsystems. By the start of the show, SMI had 6 MC68010 chips (the first mask set). Despite some bugs in the chip, their system was running "4.2" with the paging turned on. The CPUs were running at 10MHz, with one wait state inserted.

   SMI have a system with most of the features of 4.2BSD running. On this basis, they have a remote file server, a "Core-compatible" graphics system, and most of a window-manager running. They are committed to providing a GKS graphics system as well. The remaining work before they have an almost 4.2BSD release is collecting the system into a distribution, documentation, and testing.

2. Apple. Both Microsoft and Unisoft showed their versions of UNIX running on the Lisa. Apple will market the Microsoft system (no price yet), but I was not able to try it for any length of time. It seemed slower than the Unisoft system, which I was able to use for some time.

   File system performance was slow, but the forthcoming DMA disk controller should improve this. Lisa's will also have a 3COM 10MHz Ethernet option, or a cheaper 1MHz Apple local-area network option. The use of a small screen, and double-buffered bitmap, give the impression of much better graphics than actually exist; it is like using the top half of a PERQ. The mouse has only a single button, but is pleasant to use. Unisoft will include the MIT window-manager in their system; the Microsoft system does not have a window-manager.

3.2. NS16032-based systems

National Semiconductor have committed to UNIX as the operating system for the NS16032 and its successors. They have built a development system with a bitmap display, and their own development team have 4.1BSD running on it with paging enabled. The architecture of the NS16032 allows for some facilities the VAX lacks:

- A configurable kernel storable in ROM.
- A pageable kernel. The NS team are working on this at present; it will be particularly important for 4.2BSD, which requires more resources.
- Improved page replacement algorithms (the NS16032 *does* have reference bits). At present, the NS 4.1BSD still uses the clock algorithm, but this will be changed.
- Hardware support for debugging.

National Semiconductor also (in parallel) hired Human Computing Resources of Toronto to port UNIX to the NS16032. This system is also running.

3.3. Hewlett-Packard

HP were making a vast effort to convince people of the sincerity of their conversion to UNIX. They had the system running on the 9000 series, and will soon release a MC68000-based system. They have committed to move most of their major software products to UNIX, including the IMAGE database system, their graphics software, and so on.

3.4. Gould

Gould showed UNIX running on the Concept 82/37. As a machine for doing arithmetic at lightning speed, the only competitor it has in the UNIX field is the Amdahl. They will also be releasing a MC68000-based system soon.

The Need for Distributions - Results of an Inquiry

Teus Hagen
Mathematical Centre
Netherlands

Number of replies

The last EUUG newsletter (Vol 2, no. 4) contained an inquiry about the need for certain software packages. Not all of these packages can be distributed by the EUUG, but it gives us some idea about your hunger for software. And perhaps we can organise some diet to still that hunger.

The inquiry contained questions asking if you were willing to be an alpha test-site, a beta test-site or did not know what the question was about. Some overview of the 25 replies we have received so far:

package	yes alpha	yes beta	yes needed	do not know
termcap	0	24%	16%	20%
news	0	12%	12%	24%
mail	0	12%	12%	20%
em	0	12%	16%	8%
vi	0	8%	20%	16%
edt	0	8%	12%	32%
EMACS	0	8%	20%	24%
UK tty	1	12%	24%	8%
PROLOG	0	8%	32%	8%
B	0	8%	24%	20%
ADA	0	24%	60%	1
MODULA	0	32%	68%	1
GKS	8%	28%	40%	20%
benchmarks	1	16%	20%	20%
BSD 2.8	-	-	16%	16%
BSD 4.2	-	1	20%	20%
software tools	-	-	36%	16%
UNIXV7M	-	-	12%	12%

88% did not reply to the inquiry, and that is not enough to make any conclusions. We do not know why some people did not reply:

- did they understand what is was about?
- did they forget to send the form?
- were they not interested?
- ...

Here are some remarks about the replies: Is it true that nobody wants to do the job of alpha-testing the software? Are people afraid to do some work? If someone needs a package, most of the time they want to be a beta test-site. If somebody really needs it, they want to do something about it - as cheaply as possible.

Of course the most urgent packages are Modula, ADA, GKS and Prolog.

What is it?

Modula:
Modula is a computer language from Wirth, in the style of Pascal, but intended to make the writing of operating systems and the like easier and safer. A Modula tape exists. We will try to organize a distribution of that tape as soon as possible. The beta test-sites will be informed.

Termcap:
Termcap is a set of routines to help you handle those nasty little characteristics that every terminal manufacturer includes in order to break your software. Together with a database which describes the characteristics of terminals (cursor movements, clearing the display, character insertion, etc.), the package gives a terminal independent interface to your program. The display editor 'vi' makes use of this package, as do many games.

Electronic Mail:
The mail package lets you send,receive and forward mail. It can know you by many aliases, keep track of what mail you have sent/received, produce a standard mail header, and can forward mail to other machines. There is a lot of ad hoc mail software around, and this package needs some (!) cleaning. Moreover, new standards are available now and these have to be incorporated in the mail system.

Electronic News:
News is an electronic bulletin board. The B version comes from Berkeley. With news you can spread rumors around the world, and you can read them again years later when they return to haunt you. It handles forwarded news and controls a database. The tested package is available from the Mathematical Centre. A new release (news 2.10) will be available within 2 months.

B:
B is a new language for novice computer users. It is intended to be the successor of Basic, but has all the important characteristics of a modern computer language. The Mathematical Centre has a lot of non-computer freaks who are fanatic about it. The implementation on a VAX is nearly ready now, although the final release still will take some time. The target machine for B is a micro, but this implementation can take some time longer.

GKS:
GKS is a graphics package. At this moment only 2D graphics are supported. It is intended to be easy to attach new graphical devices to this package. There is an official ISO book which describes this graphics standard. The Mathematical Centre implementation is almost ready now.

EMACS:
EMACS is a very powerful display editor which supports multi windows. EMACS is programmable, via a LISP-like language, so you can expand EMACS, and/or redefine any keyboard key, eventually creating the editor you used to use. Experts know that EMACS looks like TENEX. The package runs only on VAXes.

EDT:
Edt is a display editor which looks like EMACS, however not so powerful. The package is meant for PDP11's.

Software Tools:
The Software Tools tape, UNIX-like tools written in RATFOR or PASCAL, (editor, shell, mail, RATFOR, spell, runoff, etc.) is a package meant to be ported easily to non-UNIX machines. This package is in the public domain, so if you come from a UNIX machine but are going to a non-UNIX machine, this software could be of some value to you. The tape can be obtained from the Software Tools Group (US) for $50.- or via the EUUG distribution centre (Mathematical Centre, Amsterdam). The EUUG has a new tape (1982, UNIX format) available. If you must, we can make an ANSI standard tape available for you.

Benchmarks:
Well. The benchmark software is almost collected now. The SIGgroup will do the testing, and hopefully we will have a distributable version around by the end of the year.

Where can you get it?

ADA, GKS and Prolog are only available via the original sources:

ADA Only for UK sites. Give full address, VAX type, store capacity, UNIX system and magtape density. One day we hope it will be available for sites outside the UK.

ADA Compiler Distribution
Software Technology Centre
Department of Computer Science
University of York
Heslington
York YO1 5DD

GKS Different licensing for educational and commercial sites, release will be in March.

Mathematical Centre
GKS distribution
Kruislaan 413
NL-1098 SJ Amsterdam
Netherlands

Prolog CProlog, for VAXes, see last newsletter.

Fernando Pereira
Artificial Intelligence Centre
SRI International
333 Ravenswood Ave
Menlo Park, CA 94025
USA

EMACS BSD 4.1 only. Send 2400ft magtape, postage costs, give tape density.

James Gosling
Dept. of Computer Science
Carnegie-Mellon University
Pittsburgh PA 15213
USA

If you send a letter for any of this software, do not expect to get an answer right away. We will try to press these institutes to obtain a fully tested set. Comments on your experience with any of this software is welcome.

No alpha or beta test-sites are needed for the Berkeley software, most of this work is already done (with mixed results). The BSD2.9 version for PDP11's will be available at the end of this month. It will support the job control facilities from the BSD4.1 (VAX) distribution. There is also support for overlays. You can get this UNIXV7 version for PDP11's via:

Computer Science Division
BSD2.9 coordinator
EECS Dept.
University of California
Berkeley CA 94720
USA

Do not forget to include a copy of your source license agreement with AT&T (UNIXV7, UNIX SIII or SV). The cost of this distribution will be about $600.-. There are negotiations going on to enable the EUUG to distribute this, but bureaucracy takes time.

The same story goes for BSD4.1 (UNIXV7 or 32V for VAXes). Write a letter to the same address, but to the BSD4.1 coordinator. BSD4.2 (inter-process communication, network support, faster filesystem, etc.) is not yet available. Do not ask them for it, sites running BSD4.1 UNIX will be informed when BSD4.2 is available (fall 1983). So if you want to run the BSD version on your VAX, ask just now for BSD4.1, and don't forget to include a copy of your source license agreement with AT&T (UNIX32V, UNIX SIII).

BSD4.1 is easily booted on a VAX 11/7[358]0 with RM03, RM05, RP06, RP07, RK07, RM80,

RA80(1) disks, TS11, TE16, TU45 and TU77 tapes, and Unibus disk controllers with Ampex, CDC, Fujitsu, etc. disks. The disks can be on any bus, SBI, Unibus or Massbus. Any supported disk plus tape is sufficient to boot UNIX on any of the processors. For other I/O you wiill find support for DZ11, DH11, DMF32, console storage device, and various others such as printers, plotters, etc.

What is available from the EUUG Used-Software Store?

The EUUG has the following packages available for you:

EUUG D1 the UNIX V7 small systems (PDP11) tape, version 6 (EUUGD1.6). A copy of your UNIX V7 or UNIX SIII (SV) source license is needed.

EUUG D2 VU Pascal tape.

EUUG D3 the news and uucp tape. For uucp we need a copy of your UNIX source license.

EUUG D4 The Software Tools tape.

EUUG D5 The benchmark tape will be available in fall.

The address of the EUUG Used-Software Store

If you want one of the EUUG distributions, send a letter to the address below. Describe which distribution you want, send a copy of the specific UNIX license if needed and do not forget your address. The distributions are sent only on magtape (give density). No conversion to any medium will be done, that is your problem. If necessary documentation is provided. There is no advanced payment necessary (costs to much time), you will be sent a bill for tape costs and postage separately.

The address:

Mathematical Centre
EUUG Distributions
Kruislaan 413
NL-1098 SJ Amsterdam
Netherlands

Two programs, many UNIX systems

Andrew S. Tanenbaum
Vrije Universiteit, Amsterdam

Teus Hagen
Mathematical Centre, Amsterdam

UNIX meetings give a splendid opportunity to run test programs on the machines present at the exhibition. At the recent meetings in Leeds and San Diego, we have run two test programs on a wide variety of machines. Test program #1 measures CPU/memory speed; test program #2 measures I/O speed. Program #1 was tested six times, with the 'TYPE' declared in six different ways: short, register short, int, register int, long, register long. On the small machines, the test were generally made in single user mode; on the large mainframes we had the share the machine with other users.

The programs:

```
/* Test 1 - CPU/memory */
main()
{ TYPE i, j, k;
  for (i = 0; i < 1000; i++)
        for (j = 0; j < 1000; j++)
              k = i + j + 1983;
}
```

```
/* Test 2 - I/O */
main()
{ int i, j;
  char a[512];
  if ( (n=creat("foo",0755)) < 0)
        perror("error: foo");
  for (i = 0; i < 500; i++)
        write(n, a, 512);
}
```

Notes:

The times reflect a combination of several factors, among them, the CPU type, the clock rate, the speed of the memory management unit, the speed of the memory itself, the width and speed of the bus, and last, but certainly not least, the quality of the C compiler used on the machine. Also, the times were obtained using the time(I) command. There is reason to believe that not all vendors understand that 50 Hz != 60 Hz, which makes some of the times slightly suspect.

Conclusions:

None. You should take these measurements with a grain, or better yet, an imperial gallon, of salt. For example, comparing the PDP-11/70 with the SUN, we see that for test #1 and register short, the PDP-11/70 is nearly three times faster, but comparing register long for the same two machines, the SUN is twice as fast. The difference can be explained by the fact that the PDP-11/70 really is faster, but uses memory instead of registers for register longs, whereas the the SUN uses the 68000's hardware registers.

Goal:

Our goal in making these measurements is to stimulate you into making your own measurements and to make you cautious when looking at (carefully selected) comparisons thoughtfully supplied by vendors. Remember: Figures don't lie, but liars figure. If anyone wants to run the tests on other machines, we would appreciate hearing from you.

times in seconds: machine	MHz	usr short	usr short reg	usr int	usr int reg	usr long	usr long reg	real cc#1	real cc#2	run#2	rem
DEC:											
VAX 780		8.8	8.6	6.7	4.7	6.7	4.7	3	3	2	
VAX 750		18.9	19.3	13.0	8.5	11.6	8.6	4	4	2	
VAX 730		37.4	37.5	23.9	14.4	24.1	14.4	11	12	6	
11/70		7.4	2.8	7.4	2.8	14.3	14.3	11	12	14	
11/60		10.4	4.2	10.4	4.2	20.2	20.2	17	19	16	
11/44		11.2	5.7	11.2	5.7	21.8	21.8	16	16	32	
11/45		19.1	7.9	19.1	7.8	38.5	38.5	12	20	12	
11/34		22.0	10.9	22.0	10.8	44.8	44.8	18	19	14	
11/24		27.7	12.2	27.4	12.4	57.0	57.5	21	20	19	
AEDS11(/23)		34.5	14.9	34.6	14.9	72.2	72.2	28	30	8	
micro 11(/23)		36.8	16.2	36.9	16.2	76.8	76.8	29	31	24	
68000's:											
Parallel	10	11.6	7.0	13.5	6.7	13.5	6.7	17	18	8	
SUN	10	13.0	7.8	14.6	7.6	14.6	7.5	9	10	5	
Pacific	10	18.1	10.7	20.7	9.7	20.8	9.7	24	23	13	
QU68000	10	24.5	11.9	24.5		33.0	15.1	10	10	7	
Altos	8	13.9	13.9	13.9	13.9	17.8	17.8	18	25	5	
Cyb	8	15.3	9.0	15.3	8.2	17.5	8.2	27	28	12	
Codata	8	17.1	10.5	19.3	10.5	19.3	10.5	28	30	28	
Power 520	8	21.1	9.2	20.7	9.2	31.4	12.5	16	16	19	
Hawk 32/E	8	19.0	11.3	21.5	10.3	21.5	10.3	29	19	27	
Pixel 100/AP	8	18.6	11.0	21.5	9.6	22.9	9.6	44	47	10	
Corvus	8	19.8	11.6	22.5	10.1	22.6	10.1	40	42	no sp	
Fortune	8	21.7	12.8	25.0	12.4	25.0	12.3	18	20	6	
Apple Unisoft	5	22.6	13.7	25.9	12.1	25.9	12.1	41	43	28	
Apple Xenix	5	22.7	13.9	26.0	13.0	25.9	13.0	58	65	no sp	
Wicat WS150	8	24.8	14.4	28.1	13.1	28.1	13.1	19	21	12	
Cosmos Antaris	8	34.1	19.5	38.7	16.4	38.7	16.4	26	27	9	
Ch Rivers	8	28.2	15.8	31.7	15.8	31.7	15.8	28	42	14	
Unistar 200	8	28.7	16.5	32.8	14.3	32.8	14.3	36	40	28	
IBM PC Xenix	8	30.3	17.6	34.2	17.3	35.1	16.9	31	35	18	usr>real?
IBM PC Idris	8	37.9	22.7	37.9	22.7	73.3	73.3	18	26	39	
Dual	8	26.9	15.6	30.7	13.3	30.7	13.3	21	20	27	
Masscomp	did	not	permit	me							
TRS80	8	25.2	14.9	28.3	14.0	28.4	14.2	23	28	16	
Z8000's:											
Zilog	6	14.7	7.3	14.7		25.7	13.3	20	20	8	
Plexus	5	15.2	7.0	15.4	7.0	27.5	27.6	24	26	13	
ONYX	4	15.9	7.2	15.9	7.3	23.8	14.1	14	14	8	
Bleasdale	4	33.3	15.6	33.3		56.2	56.2	20	21	16	
8086's:											
Altos	10	13.7	7.2	13.7	7.2	27.8	27.7	18	20	7	
Intel	did	not	permit	me							
SBC 86/12A			68.1								
others:											
Amdahl		0.5	0.5	0.5	0.5	0.5	0.5	10	5	1	24 usrs
Concept32/87		1.9	1.9	1.7	1.2	1.7	1.1	85	16	2	16 usrs
BBN C/60		14.5	8.2	14.6	8.2	47.2	30.3	7	9	3	
PE3210		16.7	6.7	15.9		15.9	6.7	4	4	3	
Perq		44.5	15.6	22.2			15.0	25	25	7	
IBM S/1 4954		37.2	37.1	37.1	37.1	62.3	62.3	28	30	32	
NS16032	4	49.9	45.0	56.7	23.3	57.4	27.2	47	49	m flt	

The European UNIX Network

Mathematisch Centrum, Amsterdam

Recent years has seen the rise in popularity of the UNIX[1] operating system in universities, private companies and research organisations. The reasons for this are many, one primary reason is the large user community and the ease of interchange of information between them. This is accomplished by an 'ad-hoc' communications network of UNIX systems mainly using dial-up lines[2] which provide *electronic mail*[3] and *network news*[4] facilities. The network is called **USENET** in North America, and **EUNET** is the European extension.

Electronic mail and news

Electronic mail is the ability to post a message to another user, possibly on another computer, in a simple manner. There are facilities for editing messages, sending 'carbon-copies' to other recipients, etc. A user is normally informed when mail has arrived for him.

Network news is a bulletin board shared among many computer systems around the United States, Canada, and now, Europe. This is useful in a number of ways. Someone wishing to announce a new program or product can reach a wide audience. A user can ask "Does anyone have an *x*?" and will usually receive several responses within a few days. Bug reports and their fixes can be made quickly available without the usual overhead of mass mailings. Programs are freely exchanged. Discussions involving many people at different locations can take place without having to get everyone together. The news network has provisions which define the spread of news, and which groups of news are subscribed to. The software has a controlling mechanism for handling the database.

The structure of the network

All things cost money, and networking is no exception. The success of the UNIX network is partly due to it being relatively cheap to join, provided high performance is not sought. Sites, and their financial commitments, can be split up into roughly three groups, *backbone sites*, *secondary feeders*, and *terminal sites*.

A backbone site is one that bends over backwards to make delivery of mail/news as reliable and fast as possible, so it can feed mail/news to smaller sites in the same general area. Backbone sites have a great responsibility and investment in keeping the network running. The hardware required includes modems, auto-diallers, possible expensive connections to other networks, and a considerable amount of machine resource, i.e. computing cycles, disk space, etc. Manpower is needed here, probably at least one person, full time. A backbone site is the channel for all long-distance communication, and the transmission of mail/news can be lengthy and expensive here.

Feeder sites are similar to backbone sites, but only have the responsibility of passing mail/news traffic on to local sites "downstream". The investment here covers hardware in order to be called by or to call other sites, and temporary storage of data which is to be forwarded. The amount of manpower should be low (one man-month per year) as most of the work is done by the backbone site.

Terminal sites involve a minimal investment of money and manpower. Such sites are at the "end of the line", and are not involved in passing traffic on. There is very little manpower investment in a terminal site connection, apart from installation and routine maintenance. The hardware cost is that of a connection for the feeder site.

The extent of the network

At present, the network spans over 1600 sites all over the world with electronic mail, and about 800 of those also participate in the network news. In North America, almost every research institute has a connection to the network. This is the largest such network in the world.

The **Mathematisch Centrum** in Amsterdam started EUNET in early 1982, and is the backbone site for Europe. It regularly calls, by means of dial-up, two sites in North America to exchange

mail/news, then feeds this out to other European sites. Typically, 1M bytes per month are transferred across the Atlantic for mail/news, about one third mail and two thirds news. The amount of news forwarded to Europe is 20% of that which is available in the United States.

In early 1983, one year after its inception, EUNET encompassed around 30 sites; there are over 300 UNIX sites in Europe, so there is still plenty of room for growth.

A map of sites which are formally connected to the network news is included. The map dates from the end of 1982.

Connections to other networks

The UNIX network touches other networks at various points, ARPANET[5] and CSNET[6] in North America, SERC-Net and RCO-Net in Great Britain, and the Australian Computer Science Network[7] for example. Mail, and in some cases news, can be transferred across some of these boundaries. Since the network is a *logical* network which sits on top of physical networks, there is no need for the computer systems to be using UNIX at all, provided the physical networks allow the transfer of logical messages between networks, and each computer system understands the format of the logical messages. This is the case with ARPANET for example.

There are many physical ways in which the mail/news can be delivered, including dial-up lines, X25 networks, ARPANET, private networks, etc. The most popular is by means of dial-up lines, as this is cheap, easy to install, and requires no special hardware or communications media.

Costs

Installation of the network software, like it's running, is almost automatic, and should take one or two hours on a lightly-loaded system. Ideally a site has it's own auto-dialler (cost Hfl 2500.-) to phone other sites. In this way, the site pays automatically for their connection costs. A 300 baud modem costs approximately Hfl 1500.-, but requires the site to be polled.

Backbone sites, such as the Mathematisch Centrum, need more of everything. The only part of this which is currently being passed on to the other sites is their percentage of the local and long-haul communications costs; in the future it may be unavoidable to share the other recurrent costs with all sites connected.

Facilities not provided

The layering of the network, as well as the software, does not allow remote login via a path to a certain site. Of course, local-area networks may provide this, but it is not part of the mail/news network, both facilities are merely using the same transport medium.

Short-term expectations

In it's early stages, EUNET can be expected to follow the same pattern as the North American USENET, spontaneous growth mainly using dial-up lines. However, other computer networks and transport services are now becoming available, and use of these facilities must be made if the network is to remain cost effective as the volume of data increases. This is important as there is no central organisation funding the network, the users do so directly.

At present, two thirds of the European sites are in The Netherlands, where using the public telephone system is relatively cheap. There are two sites in Great Britain which are called up from the Mathematisch Centrum, and these feed other sites by means of private networks, as the public telephone system is expensive there. The public X25 service in Great Britain is relatively cheap, and this will probably play an increasing role as a transport medium there and in the rest of Europe, especially once the international X25 networks become available (end of 1983 in The Netherlands), and the amount of data increases. Some work will need to be done interfacing EUNET sites over these networks.

Future developments

Standards are now available for network protocols, hardware interfaces, and even for the format of electronic mail messages. Many networks, the UNIX network is no exception, have grown up when no such standards applied. There will soon be pressure from various factions to conform.

The present network addressing scheme is a full pathname. An attractive alternative to this would be to use an addressing scheme similar to the surface post, addresses with domains. This change is already under development, and it is interesting to note that this will provide the network with a distributed nameserver, not a central one.

A consequence of the present addressing scheme when news is spread to every subscriber is much duplication of data. If data transport becomes cheaper and faster, a network-wide database may be possible and manageable.

There is investment in existing network hardware and software. Due to

- abovementioned standards
- hardware developments
- growth of local-area networks
- cheaper connection to X25 networks
- technical backup (solving hardware and software problems)
- growth of the network.

Changes will be required in the financial structure of the network. The backbone sites are most vulnerable here, as they are committed to providing a service, the cost of much of which is not passed on to the other sites.

Conclusions

The experience of the last few years with the UNIX network has shown that the national and international communications infrastructure can be considerably improved at reasonable costs. The benefits for the research community are obvious. It is expected, however, that with the growth of the user community of the network, the diversity of this community will also increase. Currently the majority of the UNIX sites in Europe can be found in universities and research institutes, only 30% of the European sites are commercial. whereas in the United States, around 90% of UNIX sites are commercial. Of the European UNIX sites which have access to the network, only 20% are commercial, in the United States, 60% of UNIX sites with access to the network are commercial. Industry is becoming more and more interested in gaining access to the vast amount of information and expertise as embodied by the UNIX network, and the number of users from industry will rapidly increase in the years to come. In this way the UNIX network will play a major role in bridging the gap between researchers in universities and researchers in industry.

1. D. M. Ritchie and K. Thompson, "The UNIX Time-Sharing System," *Comm. Assoc. Comput. Mach.* **17**(7), pp. 365-375 (July 1974).
2. D. A. Nowitz and M. E. Lesk, "A Dial-Up Network of UNIX Systems," UNIX Programmer's Manual, Section **2**, Bell Labs, Murray Hill, New Jersey (August 1978).
3. K. Shoens, "Mail Reference Manual," UNIX Programmer's Manual, Virtual VAX-11 Version, Section **2c**, University of California, Berkeley (November 1980).
4. M. R. Horton, *How to Read the Network News.*
5. J. M. McQuillan and D. C. Walden, "The ARPA Network Design Decisions," *Computer Networks* **1**, pp. 243-289 (August 1977).
6. C. Barney, "CSNET Unites Computer Scientists," *Electronics* (October 20, 1982).
7. R. J. Kummerfeld and P. R. Lauder, "The Sydney UNIX Network," *The Australian Computer Journal* **13**(2), pp. 52-57 (May 1981).

List of European UUCP Network (EUNET) Sites
24th February, 1983

Comments: Phone numbers are in CCITT format, +country-code area-code number
Comments: Usenet and UUCP sites are collections which can differ heavily.

Name: mcvax
Organisation: Mathematical Centre
Contact: Teus Hagen
Phone: +31 20 5924127
Postal-Address: Kruislaan 413, NL-1098 SJ Amsterdam, Netherlands
Electronic-Address: mcvax!teus
Usenet: philabs diku edcaad ukc vub ztil
mcpdp45 sara70 philmds nlgvax uvapsy dutesta vu44
UUCP: decvax diku edcaad ukc vub ztil IM60 ikogsmb kunivv1 riv02 mcpdp34
mcpdp45 sara70 philmds nlgvax uvapsy dutesta vu44
Comments: mcvax is the gateway to EUNET, the European Usenet.

Name: IM60
Organisation: HIO de Maere
Contact: Theo de Ridder
Phone: +31 53 324247 x 14
Postal-Address: Postbox 1075, NL-7500 BB Enschede, Netherlands
Electronic-Address: IM60!ridder
Usenet:
UUCP: mcvax

Name: caad24
Organisation: University of Edinburgh, Computer-Aided Architectural Design
Contact: David Rosenthal
Phone: +44 31 6671011 x 4598
Postal-Address: 20 Chambers Street, Edinburgh EH1 1JZ, Scotland.
Electronic-Address: caad24!dave
Usenet:
UUCP: edcaad

Name: cern45
Organization: CERN
Contact: D. Wiegandt /DD
Phone: +41 22 834940
Postal-Address: CH-1211 Geneva 23, Switzerland
Electronic-Address: mcvax!cern45!dietrich
Usenet:
UUCP: mcvax

Name: csg
Organisation: NIKHEF-K
Contact: Marten van Gelderen
Phone: +31 20 5922030/2035
Postal-Address: Postbus 4395, NL-1009 AJ Amsterdam, Netherlands
Electronic-Address: csg!marten
Usenet:
UUCP: ikogsmb

Name: diku
Organisation: University of Copenhagen, Institute of Datology (DIKU)
Contact: Keld J. Simonsen
Phone: +45 1 836466 x 14
Postal-Address: Sigurdsgade 41, DK-2200 Copenhagen N, Denmark
Electronic-Address: diku!keld
Usenet: mcvax ibt
UUCP: mcvax ibt

Name: dutesta
Organisation: Delft University of Technology, Department of Electrical Engineering
Contact: Henk Hesselink
Phone: +31 15 783502
Postal-Address: Vakgroep Schakeltechniek, Gebouw voor Elektrotechniek, Mekelweg 4, NL-2628 CD Delft, Netherlands
Electronic-Address: dutesta!henk
Usenet: mcvax
UUCP: mcvax

Name: edai
Organisation: University of Edinburgh, Dept. of Artificial Intelligence
Contact: Irene Orr
Phone: +44 31 6671011 x 2380
Postal-Address: Forrest Hill, Edinburgh EH1 2QL, Scotland
Electronic-Address: edai!irene
Usenet:
UUCP: edee

Name: edcaad
Organisation: University of Edinburgh, Computer-Aided Architectural Design
Contact: David Rosenthal
Phone: +44 31 6671011 x 4598
Postal-Address: 20 Chambers Street, Edinburgh EH1 1JZ, Scotland.
Electronic-Address: edcaad!dave
Usenet: mcvax
UUCP: mcvax caad24 edee

Name: edee
Organisation: University of Edinburgh Dept. of Electrical Engineering
Contact: John Hannah
Phone: +44 31 6671081 x 3279
Postal-Address: Kings Buildings, Mayfield Road, Edinburgh EH9 3JL, Scotland.
Electronic-Address: edee!john
Usenet:
UUCP: edee60

Name: edee60
Organisation: University of Edinburgh Dept. of Electrical Engineering
Contact: John Hannah
Phone: +44 31 6671081 x 3279
Postal-Address: Kings Buildings, Mayfield Road, Edinburgh EH9 3JL, Scotland.
Electronic-Address: edee60!john
Usenet:
UUCP: edee

Name: edmiru
Organisation: University of Edinburgh, Machine Intelligence Research Unit
Contact: Alen Shapiro
Phone: +44 31 6671011 x 6447
Postal-Address: 2 Hope Park Sq., Edinburgh EH8 9NW, Scotland
Electronic-Address: edmiru!alen
Usenet:
UUCP: edee

Name: ibt
Organisation: University of Copenhagen, Indre By-terminal
Contact: Keld J. Simonsen
Phone: +45 1 120115
Postal-Address: Studiestraede 6 o.g., DK-1455 Copenhagen K, Denmark
Electronic-Address: ibt!keld
Usenet: diku
UUCP: diku

Name: ikogsmb
Organisation: NIKHEF-K
Contact: Wytze van de Raay
Phone: +31 20 5922030/2035
Postal-Address: Postbus 4395, NL-1009 AJ Amsterdam, Netherlands
Electronic-Address: ikogsmb!wytze
Usenet:
UUCP: mcvax

Name: kunivv1
Organisation: KU IVV Wis- en Natuurkunde fac.
Contact: Hendrik-Jan Thomassen
Phone: +31 80 558833 x 3125
Postal-Address: Toernooiveld 1, 6525 ED Nijmegen
Electronic-Address: kunivv1!hjt
Usenet:
UUCP: mcvax

Name: mcpdp34
Organisation: Mathematical Centre
Contact: Teus Hagen
Phone: +31 20 5924127
Postal-Address: Kruislaan 413, NL-1098 SJ Amsterdam, Netherlands
Electronic-Address: mcvax!teus
Usenet:
UUCP: mcvax

Name: mcpdp45
Organisation: Mathematical Centre
Contact: Teus Hagen
Phone: +31 20 5924127
Postal-Address: Kruislaan 413, NL-1098 SJ Amsterdam, Netherlands
Electronic-Address: mcvax!teus
Usenet: mcvax
UUCP: mcvax

Name: nlgvax
Organisation: Philips Natlab Geldrop
Contact: Jeroen van der Minnen
Phone: +31 40 867575
Postal-Address: Willem Alexanderlaan 7b, NL-5664 AN Geldrop, Netherlands
Electronic-Address: nlgvax!jeroen
Usenet: mcvax
UUCP: mcvax

Name: philmds
Organisation: Philips S&I/T&M/PMDS
Contact: Johan W. Stevenson
Phone: +31 40 784736
Postal-Address: Gebouw TQ V-5, Eindhoven, Netherlands
Electronic-Address: philmds!johan
Usenet: mcvax
UUCP: mcvax

Name: riv02
Organisation: Rijksinstituut voor Volksgezondheid
Contact: Paul Etty
Phone: +31 30 742963
Postal-Address: Postbus 1, NL-3720 BA Bilthoven, Netherlands
Electronic-Address: riv02!paul
Usenet:
UUCP: mcvax

Name: regi
Organisation: University of Kent Administration
Contact: Gordon Watson
Phone: +44 227 66822 ext 608
Postal-Address: The Registry, University of Kent, Canterbury CT2 7NZ, U.K.
Electronic-Address: ukc!regi:gsw
Usenet: ukc
UUCP: ukc

Name: sara70
Organisation: SARA
Contact: Joke Dorrepaal
Phone: +31 20 5923078
Postal-Address: Kruislaan 415, NL-1098 SJ Amsterdam, Netherlands
Electronic-Address: sara70!sara
Usenet: mcvax
UUCP: mcvax

Name: ukc
Organisation: University of Kent
Contact: Mike Bayliss
Phone: +44 227 66822 x 7615
Postal-Address: Computer Laboratory, Canterbury CT2 7NF, U.K.
Electronic-Address: ukc!mjb
Usenet: mcvax regi
UUCP: mcvax regi

Name: uvapsy
Organisation: Universiteit van Amsterdam, Afd. Psychologie
Contact: Anjo Anjewierden
Phone: +31 20 5253121
Postal-Address: Weesperplein 8, NL-1018 XA Amsterdam, Netherlands
Electronic-Address: uvapsy!anjo
Usenet: mcvax
UUCP: mcvax

Name: vu44
Organisation: Vrije Universiteit, Afd. Informatica
Contact: Hans van Staveren
Phone: +31 20 5484768
Postal-Address: de Boelelaan 1081, NL-1081 HV Amsterdam, Netherlands
Electronic-Address: vu44!sater
Usenet: mcvax
UUCP: vu45 vu60 mcvax

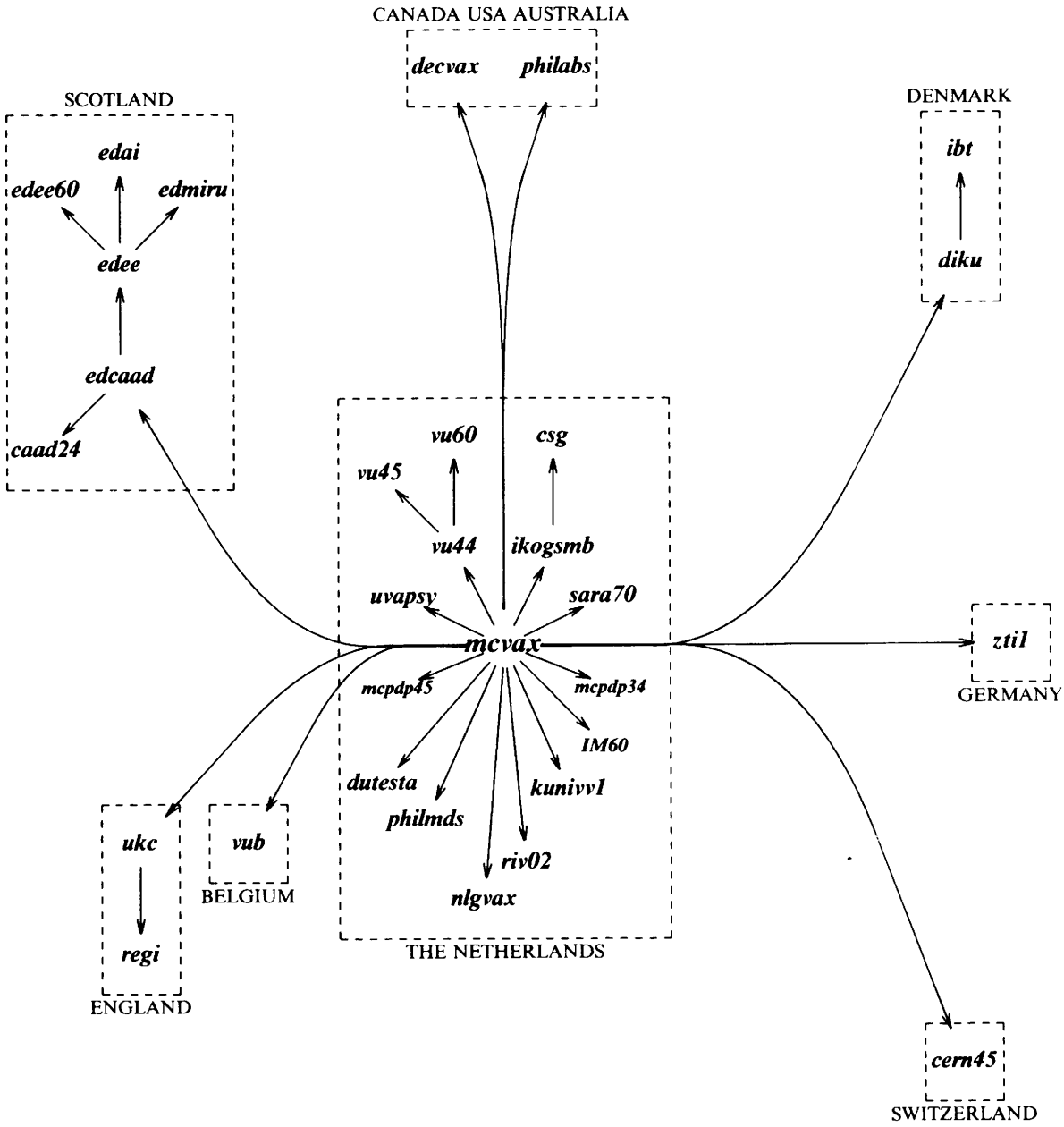
Name: vu45
Organisation: Vrije Universiteit, Afd. Informatica
Contact: Hans van Staveren
Phone: +31 20 5484768
Postal-Address: de Boelelaan 1081, NL-1081 HV Amsterdam, Netherlands
Electronic-Address: vu44!sater
Usenet:
UUCP: vu44

Name: vu60
Organisation: Vrije Universiteit, Afd. Informatica
Contact: Hans van Staveren
Phone: +31 20 5484768
Postal-Address: de Boelelaan 1081, NL-1081 HV Amsterdam, Netherlands
Electronic-Address: vu44!sater
Usenet:
UUCP: vu44

Name: vub
Organisation: Vrije Universiteit Brussel, Medische Informatica
Contact: Erik Blockeel
Phone: +32 2 4781520/1438
Postal-Address: Laarbeeklaan 103, B-1090 Brussel, Belgium
Electronic-Address: vub!erik
Usenet: mcvax
UUCP: mcvax

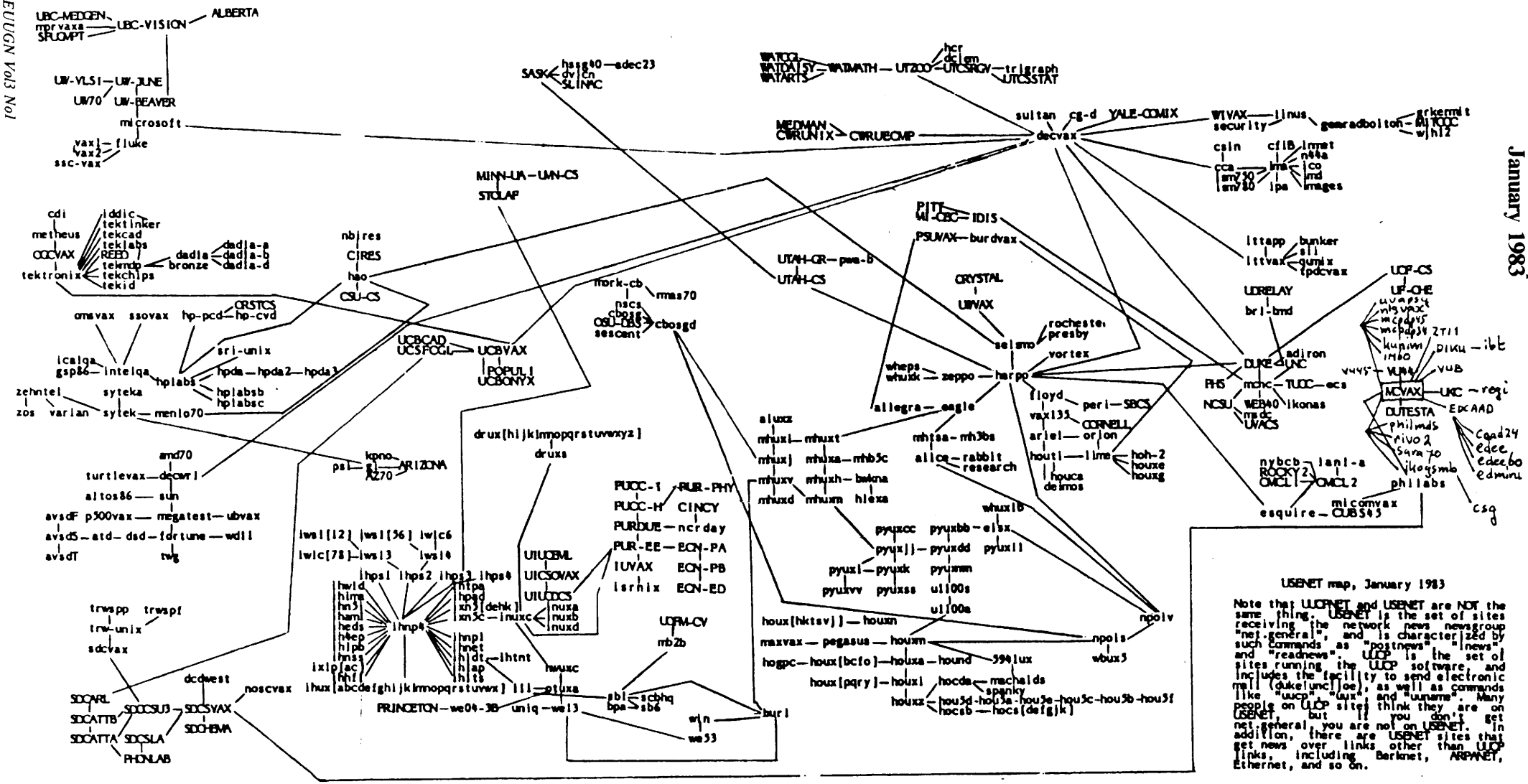
Name: zti1
Organisation: Siemens AG
Contact: Michael Uhlenberg
Phone: +49 89 63644622
Postal-Address: ZT1 INF 212, Otto Hahn Ring 6, D-8000 Muenchen 83, W. Germany
Electronic-Address: zti1!uh
Usenet: mcvax
UUCP: mcvax

European UUCP Network (EUNET) Map
24th February, 1983



THIS **PIC**TURE WAS **PIC**KED OUT BY **PIC**.

USENET Map
January 1983



USENET map, January 1983

Note that UUCPNET and USENET are NOT the same thing. USENET is the set of sites receiving the network news newsgroup "net.general", and is characterized by such commands as "postnews" "inews" and "readnews". UUCP is the set of sites running the UUCP software, and includes the facility to send electronic mail (duke!unc!joe), as well as commands like "uucp" "uux", and "uuname". Many people on UUCP sites think they are on USENET, but if you don't get net.general, you are not on USENET. In addition, there are USENET sites that get news over links other than UUCP links, including Berknet, ARPANET, Ethernet, and so on.

European backbones:

mcvax	Netherlands
ukc	England
edcaad	Scotland
diku	Denmark
zbi1	Germany
vub	Belgium

Appendix 1 - Some Major Newsgroups

This is a list of some major USENET newsgroups as of 9th February, 1983. The full list is maintained by Adam Buchsbaum (research!alb).

Newsgroup	Description
net.ai	Artificial intelligence.
net.applic	Applicative language and related architecture.
net.arch	Computer architecture.
net.bugs	General bug reports and fixes.
net.bugs.4bsd	Subgroup for UNIX version 4BSD related bugs.
net.bugs.usg	Subgroup for USG (System III, V, etc.) bugs.
net.bugs.uucp	Subgroup for UUCP related bugs.
net.chess	Chess and computer chess.
net.dcom	Data communications hardware and software.
net.followup	Followups to articles in net.general.
net.games	Games and computer games.
net.general	General queries, requests, announcements, etc.
net.graphics	Computer graphics, art, and animation.
net.jobs	Job announcements, requests, etc.
net.jokes	Jokes and the like. May be slightly offensive.
net.lan	Local area network hardware and software.
net.lang	Different computer languages.
net.lang.ada	Subgroup for ADA.
net.lang.apl	Subgroup for APL.
net.lang.c	Subgroup for C.
net.lang.lisp	Subgroup for LISP.
net.lang.pascal	Subgroup for PASCAL.
net.lang.prolog	Subgroup for PROLOG.
net.mail	Proposed new mail/network standards.
net.math	Mathematical discussions and puzzles.
net.micro	Micro computers of all kinds.
net.misc	Miscellaneous discussions too short lived for their own groups.
net.news	Discussions of USENET itself.
net.news.confi	Subgroup for posting of computer down times and network interruptions.
net.news.group	Subgroup for discussions and lists of newsgroups.
net.news.map	Subgroup for maps.
net.news.newsite	Subgroup for new site announcements.
net.periphs	Peripheral devices.
net.rumor	For the posting of rumors.
net.sources	For the posting of software packages.
net.unix-wizards	Discussions, bug reports, and fixes on and for UNIX. Not for the weak of heart.
net.usoft	Universal software packages. net.usoft.s
net.wanted	Requests for things that are needed, e.g. device drivers, pointers to people, etc.
net.works	Assorted workstations.

Appendix 2 - Net Etiquette

This article was posted on the network on Fri Nov 19 16:14:55 1982, by Jerry Schwartz.

Emily Post for Usenet

Usenet is a large, amorphous collection of machines (hundreds) and people (thousands). Readers range from casual observers who infrequently scan one or two groups to active participants who spend a significant amount of time each day reading news. Their ages, experience and interests also vary widely. Some use the network solely for professional purposes. Others use it to carry on a variety of exchanges and interactions.

The kinds of interaction that occur in Usenet are new to almost everyone. The interactions certainly aren't face to face. On the other hand, submitting an item isn't like standing up before an audience either. Nor is it like writing an article for publication. Nor, since noone moderates submissions, is it like writing a "letter to the editor." It combines aspects of formal and informal communications in a new way.

Despite (or because of) these considerations Usenet is a powerful and pleasant tool when people submitting items follow the emerging "net etiquette." Users at new sites (those at which Usenet has been available for less than three months) should be especially cautious until they have adjusted to this new form of communication.

This document is not a readnews tutorial. In some cases I tell you to do something without saying how. Ask around or consult whatever documentation is available.

The following list of suggestions is long, but you can become a responsible member of the Usenet community by reading it. Before presenting a full discussion I will boldly state the rules:

Put all items in an appropriate group.
Reply via mail.
Exhibit care in preparing items.
Read followups.
Don't be rude or abusive.
Avoid sarcasm and facetious remarks.
Use descriptive titles.
Cite references.
Summarize the original item in followups.
In posting summaries of replies, summarize.
Be as brief as possible.
Don't submit items berating violators of these rules.
Don't make people read the same thing more than once.

A more extended discussion of these points, of some important newsgroups, and of some common questions follows.

1. Put all items in an appropriate group.

   See below for a list of some important groups. A followup to an item does not always belong in the same group as the original item. In particular, followups should never go to net.general.

   Groups exist both to accommodate different interests and to limit distribution. Many geographic areas and organizations have groups that are only distributed locally. For example, on eagle where I am composing this item there are "net" groups, "btl" groups (Bell Labs), "mh" (Murray Hill) and "nj" groups (New Jersey)"

2. Use mail instead of a followup item.

   When an item asks for specific information or requests a "vote", you should reply via mail to the originator. Remember that many people will be reading the item at more or less the same time and if they all respond via a followup item, the net becomes flooded with almost identical responses that can annoy even people who were interested in the original question.

   When submitting an item that is likely to generate responses, remind people of this point by ending with "send me mail and I'll post the results to the net." Of course, you then accept the obligation of doing so.

3. Exhibit care in preparing items.

   While Usenet interactions sometimes take on the flavor of casual conversation, you should spend the time and effort to make your item readable and pertinent. Be sure you have something new to say. In particular, be sure you have understood earlier items. If you are in doubt about an author's intent, carry on a private interaction. Frequently a discussion starts with one or two carefully prepared "position papers" and then degenerates into repetitive claims.

   While proper spelling and grammar do not necessarily improve the ideas of an item, many readers feel that their absence reflects a lack of care. And that lack of attention to English usage may reflect a similar lack of attention to the ideas.

4. Read followups before reacting.

   When you read an item, followups may have already reached your machine. Before reacting to the item (either with mail or by submitting a followup) you ought to know what others have said.

   The standard readnews interface doesn't make this easy, but it should be done. (See below.)

5. Use an editor to prepare items for submission.

   If you are using the standard version of readnews or postnews

you should set the EDITOR shell environment variable to the editor you want to use. This lets you correct spelling, grammar, etc.

6. Don't be rude or abusive.

   I regret having to say this, but I have seen too many items that start "John, you idiot, ...", or contain phrases like "People who think ... should be shot." I suspect much of this rudeness is just carelessness. Modes of speech that would be reasonable in private conversation may not be reasonable in a semi-public forum such as the net.

7. Avoid sarcasm and facetious remarks.

   Without the voice inflection and body language of personal communication these are easily misinterpreted.

8. Use descriptive titles.

   Readers should be able to decide whether to read or skip items based on their titles. For example if you are having trouble with your dishwasher you might submit an item titled "need help with G.E. dishwasher" to net.wanted. Don't submit an item titled "Need Help."

   Followups should be titled "Re:" followed by the title of the original item. This is done automatically by the "f" command in standard readnews.

9. Whenever possible, cite references.

   This is especially true in discussions when you quote "facts" that are not universally known. Many such "facts" turn out on close examination to be opinions.

10. Summarize the original item in followups.

    Remember that although you may have an item in front of you when you submit a followup, others won't. Remind the reader of the point of the original item. But don't repeat a long item. That would violate the "be brief" principle.

11. In posting summaries of replies, actually summarize.

    Sometimes people just collect the items they received. The mailed replies might just as well been submitted to the net. At the least the replies should be edited to eliminate redundancy and irrelevancy.

12. Be as brief as possible.

    Some people read news over slow (300bps) terminals, and watching a 15 line "signature" that you have seen ten times before gets boring. (I hope you don't consider this item a violation. I

have tried to keep it brief, but there is a lot to say.) Even people who read news on faster terminals don't like to wade through extraneous material to get to the heart of the matter.

13. Don't publicly berate violaters of these rules.

    They probably didn't realize the anti-social nature of their behavior. Besides, if you didn't want to see the original item nobody wants to see your complaint. These complaints fall into the category of reactions that should go directly to the originator via mail.

14. Don't make people read the same thing more than once.

    When you have something to say that is of interest to more than one group, submit it as one item to the groups with one command. If you use a separate command for each group, readers who subscribe to several of these groups will see it more than once.

    If you must retract or revise an item, use the "cancel" command.

15. Here is a list of some groups that are important to the smooth functioning of the network or are frequently used improperly:

    - net.general

      This group is only for short announcements and queries that need to be read by everyone. Followups and discussions should never go here.

    - net.followup

      This is the place for continuing discussions that have started in net.general. In the standard readnews program the "f" command applied to an item in net.general will put your submission in net.followup, but you can also submit items directly to net.followup.

    - net.misc

      This is the place to carry on frivolous discussions, arbitrary chat, and rambling discussions. New groups are frequently spawned from these discussions.

    - net.wanted

      This group exists for posting queries for help. ("I know somebody must have a program to compute ...")

    - net.jokes

      Jokes go here. Jokes that might offend any readers should be encrypted. You can learn an encryption technique by decoding some encrypted jokes.

This group is often seen by people who do not regularly use computers, and there have been several instances of problems raised by offensive jokes. There have also been several extended discussions of the relation of this issue to free speech. The conclusion of these discussions has always been that because the net exists largely at the sufferance of large institutions who foot the bills we should all be very careful about offending anyone. Almost any racial, ethnic, or sexual reference will offend somebody. The safe rule is: don't submit an unencrypted joke unless you have seen similar ones in this group already.

- net.jokes.d

Discussions about humor go here, not in net.jokes

- net.news

Discussion of all aspects of Usenet itself belong here.

- net.news.group

Creating a new group affects all the machines on Usenet. Normally the need for a new group should be demonstrated by the submission, over a period of time, of items that might properly belong in a new group. If you are new to Usenet (less than 3 months) you probably shouldn't be creating new groups.

If you want to discuss a topic and can't find anywhere else, try net.misc.

In any case before you create a new group, submit an item proposing the new group to net.news.group and to specific groups that may share interests with your proposed new group. If after a week or two, you have received support for the idea, and you haven't received any strenuous objections, go ahead and create the group. You should also create an item in the new group with a distant expiration date describing what the group is about.

- net.sources

After being announced in some appropriate place useful programs and shell scripts are put here. These should be well enough commented so that even people who miss the announcement can understand what they do.

- net.test

This exists so that Usenet administrators can test the functioning of the software. It should be used only as a last resort since items will go to all machines. In most instances there will be a more limited group in which to

put tests (e.g. "mh.test").

16. Here are some queries that seem to be submitted frequently by new users. Please don't ask them out of idle curiosity.

    - "Where does 'fubar' come from?"

      In my opinion the best answer seems to be "Fouled up beyond all recognition." There are lots of versions of this acronym, in particular "Fouled" is usually replaced by a less polite word. "foobar", "foo" and "bar" are all derived from "fubar." (See discussion of net.jokes for the reason I use the polite word.)

    - "Does anybody know my freshman roommate, John Doe, who I haven't seen in years but I think works at Bell Labs?"

      If you really want to know, try calling any Bell Labs location and asking the operator. (The Murray Hill number is 201-582-3000.) They have lists and telephone numbers of all employees. The same of course applies to DEC or UCB or wherever.

    - "I can't reply via mail to some items. What can I do?"

      There are two common causes for this. One is items from ARPANET sites. (These have "@" in their names.) There are technical, administrative and organizational problems with communication between Usenet and ARPANET. The other cause is machines that are on Usenet but won't forward mail. (This includes some ARPANET sites and some uucp-only sites.) The only (admittedly difficult) way to circumvent both problems is to construct a path that avoids the trouble machines.

    - "Is being called a 'hacker' a compliment or an insult?"

      Some people think one, some think the other. If you want to be unambiguous find another word.

    - "How do I read followups to an item before I reply?"

      This depends on how you read news. If you use the standard readnews program then the easiest way is to use the "e-" command after reading an item. This will tell readnews to forget that you have read the previous item. When you have read the followups you can "q" and start readnews again.

Phew!! Don't let this long list intimidate you. The net exists to be used. It is a powerful tool and as long as people treat it as a tool rather than a toy, it will prosper.

Jerry Schwarz
eagle!jerry

Appendix 3 - Some Articles from the Network

The following articles were chosen in order to give more information about the network itself, as well as a flavour of the type of discussions which take place. Correspondingly, some of the articles here are somewhat longer than average.

From philabs!cmcl2!floyd!harpo!decvax!cwruecmp!krm
Wed Feb 9 12:02:55 1983
Subject: looking for RSX software
Newsgroups: net.general

I am looking for software sources for RSX (like to port over to DEC pro's).
specifically I would like to know if there is an emacs, a compilable lisp,
(not Pslow-code), and games. All hints and pointers will be appreciated.
Mail me, I will summarize if interrest warrants.

Rich Magill
decvax!cwruecmp!krm

From philabs!cmcl2!floyd!harpo!decvax!decwrl!sun!megatest!dre
Sat Feb 12 19:39:18 1983
Subject: Benchmarks of machines at Unicom
Newsgroups: net.general

A benchmark comparison of all machines at Unicom except the IBM PC running
Venix (they had no C compiler) has been posted to net.micro.

Dave Emberson
Megatest Corp.
ucbvax!lbl-csam!megatest!dre

From vu44!plain Mon Feb 21 13:41:36 1983
Subject: Call for papers
Newsgroups: net.general

WORKING CONFERENCE ON PROTOTYPING

October 25-28, 1983 Brussels, Belgium

This conference will focus on the user-oriented development of information
systems. Research-oriented and technical presentations, as well as working
group discussions shall address the following main issues of the conference:
- What should be understood by the term prototyping in IS development?
- Which parts of the final system can or should be covered by prototypes?
- Which methods and tools are available for prototype construction?
- What are the new opportunities and demands on developers and users?

Deadline for position papers and summaries of full papers: April 15, 1983
Deadline for full papers: July 29, 1983
For further information contact:

Martin Kersten
Department of Mathematics and Computer Science
Vrije Universiteit
de Boelelaan 1081
1081 HV Amsterdam, The Netherlands
USENET: mcvax!vu44!mk

From philabs!cmcl2!floyd!harpo!npoiv!npois!cbosgd!mark
Sat Feb 12 21:13:06 1983
Subject: backbone sites needed
Newsgroups: net.news

The net is about to undergo some major reconfiguration, and this seems like a good time to reorganize some of the major hub sites. Specifically, harpo is about to fade into the boonies of the net, so we desperately need a Bell Labs site or two to become the primary gateways into/out of BTL to replace harpo. We also need some more organization in California (especially Los Angeles, although San Diego, Silicon Valley, and San Francisco could stand some cleaning up too) and on the ARPANET.

A backbone site is one that we bend over backwards to make delivery of news as reliable and fast as possible, so it can feed news to less main sites in the same general area. Such sites currently include decvax, harpo, ucbvax, duke, and to a lesser extent seismo, teklabs, microsoft, sdcarl, and so on.

A backbone site should be a large, robust machine, that can handle connections of at least 6-10 USENET neighbors. (It helps a lot to run Berkeley 4.1BSD and have uucp subdirectories installed.) The site should have at least one reliable 1200 baud dialer, and be willing to spend some money on long distance phone calls to send news to other backbone sites (although depending on who your neighbors are, a phone budget isn't always necessary - ucbvax and duke don't have one). Backbone sites should pass along all newsgroups to their neighbors (except for a few officially blacklisted newsgroups like net.jokes.q). They should run a recent version of news software (either A or B) and the contact person there should be someone who is active on the network and who responds quickly when they receive electronic mail. These are not all absolute requirements, but show the kind of attributes that help.

Would any interested persons/sites please drop me a line?

Mark Horton

From philmds!root Wed Dec 1 21:44:57 1982
Subject: sitedir Philips, Science & Industry
Newsgroups: net.news.newsite

Site: Philips, Science & Industry
Contact userid: johan
Contact name: Johan W. Stevenson
Address: Philips, S&I, T&M, PMDS,
Address: Gebouw TQ V-5,

Address: Eindhoven,
Address: The Netherlands.
Usenet partners: mcvax
Regular uucp: mcvax
Irregular uucp:
Voice phone: (040) 784736
Dial in: (040) 784389, 1200 baud, Sematrans 1211
Subscribes to: net.all,eunet.all,nlnet.all
Willingness: anybody may dial-in, but we cannot dial-out (yet)
Location:
Comment: 11/44, Fujitsu 160Mb, RL, DZ, DH, TS, 1.25 Mb
Comment: We use UNIX to develop the Philips Microcomputer Development
Comment: System based on UNIX, using 68000. PMDS uses
Comment: In-Circuit-Emulation techniques to debug a wide range of
Comment: microprocessors, 8 and 16 bits, of various manefacturers.

From philabs!cmcl2!floyd!vax135!ariel!hou5f!npoiv!harpo!decvax!utzoo!utcsrgv!bobr
Thu Feb 3 14:28:48 1983
Subject: Proposal for Naming Conventions of European Phone Numbers
Newsgroups: net.news.newsite

Now that European sites are joining usenet, may I suggest
a standard way of expressing their phone numbers.

I suggest

"(" <country-code> "-" <area code> ")" <local phone number>
where the default value of <country-code> is "1",
standing for North America.

Thus people on this side of the ocean would not have to
change their naming convention for phone numbers and
European phone numbers would look something like

(44-1) 123-4567 in London or
(49-30) 123 45 67in Berlin.

Christoph Bobrowski Dept. of Computer Science, Toronto
still: (416) 978-6027
soon: (49-40) 299 10 22

From philabs!sdcsvax!sdccsu3!sdcvax!trw-unix!gorlick
Sun Feb 6 11:52:43 1983
Subject: CBSIZE in 4.1bsd kernel
Newsgroups: net.unix-wizards

Has anyone running 4.1bsd ever tried to increase the size of
'CBSIZE', the number of characters in a clist block? I increased
it by 50% from 28 to 42 and got trap 8's and 9's when I rebooted
the new kernel. Any advice would be much appreciated.

-Michael Gorlick-
{decvax, ucbvax}!trw-unix!gorlick

From philabs!cmcl2!floyd!harpo!decvax!ucbvax!CAD:tektronix!tekmdp!laurir
Fri Feb 11 17:42:57 1983
Subject: using YACC to generate commercial products - AT&T speaks
Newsgroups: net.unix-wizards

Long time followers of this news group may recall that last April
I queried as to the legality of using YACC to generate a compiler
which would then be sold to customers who do not necessarily have
Unix licenses. The problem is that YACC includes a 150-line file,
/usr/lib/yaccpar, in the generated compiler, and so one might construe
the result to be "derived" from Unix in the sense of the copyright
act and/or the Unix license.

I heard today from the AT&T licensing folks, and they do in fact
consider output from YACC to be part of Unix. There is at least
one company making its money by selling such a compiler; they run
the C code from yacc through a cross compiler to get a compiler
for a machine which cannot run Unix. The implication then is that
a Unix binary license must be purchased for this non-Unix
machine before the generated compiler can be run on it.

-- Andrew Klossner (decvax!tektronix!tekmdp!laurir)

From philabs!cmcl2!floyd!harpo!decvax!ittvax!swatt (Alan S. Watt)
Wed Feb 9 22:28:08 1983
Subject: Re: CBSIZE in 4.1bsd kernel
Newsgroups: net.unix-wizards

>From trw-unix!gorlick:

> Has anyone running 4.1bsd ever tried to increase the size of
> 'CBSIZE', the number of characters in a clist block? I increased
> it by 50% from 28 to 42 and got trap 8's and 9's when I rebooted
> the new kernel. Any advice would be much appreciated.

Note that (CBSIZE + sizeof (char *)) must be a power of two, so that

CBROUND = (CBSIZE + sizeof (char *) - 1)

Greg Hidley at dcdwest has tried it with CBSIZE=60, CBROUND=0x3f.
I have just built a kernel with CBSIZE=124, CBROUND=0x7f, but
haven't tested it out yet.

- Alan S. Watt

From philabs!cmcl2!edler (Jan Edler) Thu Feb 10 19:14:03 1983
Subject: Re: CBSIZE in 4.1bsd kernel
Newsgroups: net.unix-wizards

Does anyone know how much difference this makes in performance?

Jan Edler cmcl2!edler(nyu)
edler@NYU (I think)
pyuxll!jse (abi piscataway)

From philabs!cmcl2!floyd!harpo!decvax!ucbvax!CAD:tektronix!tekmdp!dadla!dadla-b!james
Wed Feb 9 23:22:56 1983
Subject: rsx-unix gateway
Newsgroups: net.unix-wizards

Some time ago, someone expressed interest in unix to rsx communications software. Who was that person and would they please get in contact with me as I have some news for them.

Jim Binkley
tektronix!tekmdp!dadla!dadla-b!james

From philabs!cmcl2!floyd!harpo!seismo!presby!aron (Aron Shtull-Trauring)
Thu Feb 10 21:25:57 1983
Subject: summary: unix license "legal" query
Newsgroups: net.unix-wizards

I recently sent out a "legal" query about unix licenses viz. what do I need to get Berkeley, and are licenses "tied" to machine types. I got several answers, all along the same lines. The following was the most complete:

****

1. A binary license for a suitable form of Unix suffices to let your binary-license vendor sell you stuff incorporating x.yBSD code. It does not suffice to get you a Berkeley distribution, since the distributions from Berkeley include sources, some of which are derived from Bell sources. Berkeley lacks the resources and the motivation to cater to binary-only sites themselves.

2. The System III license, like all Unix licenses, specifies a particular cpu by model number and serial number. There is NO form of Unix license which gives you a blanket right to use the software on any cpu you wish; all cpus must be licensed individually. Mind you, Bell doesn't care who made the cpu or whether it corresponds to the type of cpu the distribution tape is set up for (although you may need to specify, in addition, which tape you want).

****

aron shtull-trauring
harpo!seismo!presby!aron

From philabs!cmcl2!floyd!harpo!eagle!mhuxt!mhuxa!mhuxh!mhuxm!pyuxjj!martin
(M Harriss) Mon Feb 7 10:06:21 1983
Subject: Re: Proposal for Naming Convention of European Phone Numbers
Newsgroups: net.news.group

There is an international standard for the representation of telephone numbers in foreign countries; I strongly suggest that we stick to that in favour of devising a different scheme. The standard scheme uses a "+" to represent the international access code from your particular country; this is followed by the country code and the actual number.

For example:

+44 1 246 8091	in London
+32 2 123 4567	in Brussels

etc.

In those areas in the US that can dial their own international calls, the "+" is replaced by 011.

I believe this standard is proposed/supported/endorsed or whatever by the CCITT. Let's stick to it!

Martin Harriss
pyuxjj!martin

UNIX
Driver Survey Results

From ....!ittvax!swatt Wed Jan 5 19:40:40 1983
Subject: UNIX Driver Survey Results
Newsgroups: net.unix-wizards

How to Use This Listing

This catalog was assembled from information contributed in response to my requests over USENET. I have tried to leave the information alone, but make the formatting constant. To save editing chores, there are several listing groups which share some common information. Each major listing is separated by a line of '=' characters beginning at the left margin and continuing for 70 characters. Within major listings, sublistings are separated by a line of '=' characters beginning one tab stop in and continuing for 54 characters.

The order presented is pretty much the order received, except where oversights on my part necessitated moving listings to the end to avoid disturbing the numbering. Each listing is numbered, and some summary information presented under "Summary Information".

If you want to skip to some numbered listing (say 34), just search for "34$" using any editor which supports "ed"-style regular expressions; the number always appears at the end of the line. The keyword "Listing #:" can also be used to skip to the next listing.

I have also tried to catagorize devices into broad categories, such as "disk subsystems" for easy reference.

I plan to have this done more neatly and typeset for distribution at the UNICOM conference. Any additions or corrections received in time will be incorporated.

Alan S. Watt
ittvax!swatt (UUCP)
via: decvax, duke, purdue, lbl-unix, research

decvax!ittvax!swatt@Berkeley (ARPA)

ITT Programming Technology Center
1000 Oronoque Lane
Stratford, Ct. 06497
(203) 375-0200

= =

Summary Information

There are 56 listings, some for the same device.

1.1 Device names in alphabetical order:

#	Manufacturer, Name
45	4.2bsd distribution devices
21	AED-512
36	Alpha 10
26	Britton-Lee IDM 200 and IDM 500
43	Computrol Megalink 90-0018
23	DEC DQ11 and DEC DUP11
2,41,42	DEC DR11-B, DEC DR11-W
56	DEC DU-11
13	DEC DZ-11, Plessey DZ-11, Able DZ-11
18	DEC GT41
10	DEC KMC-11
30,55	DEC RK07 and DEC RK06 disk drives
14	DEC RL01 or RL02
17	DEC RM05
19	DEC RX01
51	DEC RX02 floppy disk
34	DEC TS-11 tape drive
9	DEC VS-11
12	DEC VSV01
16	DECsystem-10 asynchronous link via DEC DL-11
37	DeAnza IP 8500 image processing display system
54	Digidata look-alike for DEC TM-11/TU-10.
11	Digital Sound Corporation 200 Digital Audio Converter
3	Evans and Sutherland Multi Picture System
1	Floating Point Systems Array Processors: AP-120B and FPS-100.
35	Fujitsu 160 Mbyte Winchester
22	Genisco GCT-3000
52	Grinnell GMR-27 via DEC DR-11B (with minor mods).
8,25	Ikonas RDS-3000
33,48	Interlan N1010 ethernet board.
32	Lexidata 3400 color raster display system.
28	Megatek 7000
4,6,20	Megatek 7200-series
38	Optronics C-4500 Model 30D
29	Paper tape reader
53	Plessy PM-DC1100 controller with CDC9766 disk pack.
46	Ramtek 9200/9300 black and white graphics display
31	Ramtek RM9400 color raster display system.
50	STC 800/1600/6250bpi magtape on SI Unibus controller
39	Scientific Micro Systems FWT1127s
47	Ungermann-bass NIU via DR11-W
27	Versatec 1200, v80, or similar
15	Versatec or Varian printer/plotter
7	Xylogics Phoenix 211 Unibus Disk Controller

1.2 Modifications to standard drivers in alphabetical order

#	Name
40	DEC DZ11
44	tty (V7 UNIX)
24	Vadic 3451PA, Bizcomp Smartmodem, for UUCP

1.3 New line Disciplines

#	Name
5	Summagraphics BitPad

1.4 Not really drivers

#	Name
24	Vadic 3451PA, Bizcomp Smartmodem, changes for UUCP
49	Fast timer driver

2. Device Types (broadly speaking)

2.1 Disk subsystems:
Alpha 10, DEC RK06, DEC RK07, DEC RL01 or RL02, DEC RM05, DEC RX01, DEC RX02 floppy disk, Fujitsu 160, Plessy PM-DC1100 controller with CDC9766 disk pack, Scientific Micro Systems FWT1127s, Xylogics Phoenix 211,

2.2 Tape subsystems:
DEC TS-11, Digidata look-alike for DEC TM-11/TU-10, STC tri-density,

2.3 Graphics display devices:
AED-512, DEC GT41, DEC VS-11, DEC VSV01, DeAnza IP 8500, Evans and Sutherland Multi Picture System, Genisco GCT-3000, Grinnell GMR-27 via DEC DR-11B (with minor mods). Ikonas RDS-3000, Lexidata 3400, Megatek 7000, Megatek 7200-series, Ramtek 9200,9300, Ramtek RM9400,

2.4 Communication devices:
Able DZ-11, Computrol Megalink 90-0018, DEC DL-11, DEC DQ11, DEC DR11-B, DEC DR11-W, DEC DU-11, DEC DUP11, DEC DZ-11, DEC KMC-11, Interlan N1010 Ethernet, Plessey DZ-11, Ungermann-Bass NIU via DR11-W,

2.5 Printers:
Versatec 1200, Versatec or Varian printer/plotter, Versatec v80

2.6 Misc.:
Britton-Lee IDM 200 and IDM 500, Digital Sound Corporation 200 Digital Audio Converter, Floating Point Systems AP-120B and FPS-100 array processors. Optronics C-4500 Model 30D, Perkin-Elmer Paper tape reader

Driver Listings

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Listing #: 1
Device Name: Floating Point Systems Array Processors:
AP-120B and FPS-100.
FPS-164 and FPS-564 in development

Computer Design and Applications:
MSP-3000 in development

Device Type: High Speed Floating Point Array Processors
For CPU type: VAX 11/780 11/750 11/730, PDP-11,
Perkin Elmer (in development)
For UNIX type: 4.1 bsd, v6, v7
Availability: Anyone

Terms & Cond.: $5000, includes large program development package
(assembler, compiler, simulator, libraries, diagnostics)
+ signed copy of license agreement. Source is
distributed.

Contact: Peter H. Berens
Apunix Computer Services
1380 Garnet Ave., Suite E-292
San Diego, CA 92109
619-452-7819
decvax!ittvax!dcdwest!phb
ucbvax!sdcsvax!sdchema!phb

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Listing #: 2
Device Name: DEC DR11-B (should work for DR11-W, too)
Currently used for Grinnell Frame Buffer

Device Type: 16bit parallel DMA interface

CPU Type: VAX and PDP-11
UNIX Type: 4.1bsd, Unix V7
Availability: Anybody

Terms: For just driver, can send over net. For driver + user
level software for Grinnell FB, send tape with return
postage (can send over net on ARPANET), or pay for phone
time yourself.

Contact: harpo!utah-cs!thomas, thomas@utah-20
Spencer W. Thomas
Computer Science Dept.
University Of Utah
Salt Lake City, Utah 84112
(801)581-8800

Caveats: Has not been tested with multiple DR11s.

= =

Listing #: 3
Device Name: Evans and Sutherland Multi Picture System

Device Type: High performance line drawing display.

CPU Type: Vax and PDP-11
Unix Type: 4.1 and V7
Availability: Anybody

Terms: Send tape with return postage preferred. Can send over ARPANET, or if you pay phone.

Contact: harpo!utah-cs!thomas, thomas@utah-20
Spencer W. Thomas
Computer Science Dept.
University Of Utah
Salt Lake City, Utah 84112
(801)581-8800

Caveats: Will not support multi-user configurations. Use of signals makes running programs under debugger difficult.

= =

Listing #: 4
Device Name: Megatek 7290

Device Type: Medium performance line drawing graphics system.

CPU Type: VAX
Unix Type: 4.1bsd
Availability: Anybody

Terms: Since this is based on a driver and software package we got from Purdue, you should really get "permission" from them first. See below for contact address. However, many bugs have been fixed, and it is now impossible for the driver to hang the system. Preferably, send a tape with return postage, if you're on ARPANET, or will pay phone charges, can get over the net.

Contact: harpo!utah-cs!thomas, thomas@utah-20
Spencer W. Thomas
Computer Science Dept.
University Of Utah
Salt Lake City, Utah 84112
(801)581-8800

Address for people at Purdue to contact: (I hope this is still right)
Rick Adams or
David Anderson

Computer Aided Design and Graphics Lab

Potter Engineering Center
Purdue University
West lafayette, IN 47907
(317) 749-6578

Mail can be sent via uucp to:
pur-ee!rick
pur-ee!dave

Caveats: Still somewhat buggy, but much better. Pick module is not yet supported, but will be in near future. Will not support multiple users.

==========

Listing #: 5
Device Name: Summagraphics BitPad

Device Type: Digital data tablet
This is really just a line discipline to support the BitPad on a standard TTY line.

CPU Type: VAX (maybe PDP-11, too)
Unix Type: 4.1bsd (maybe V7)
Availability: Anybody

Terms: Can send over the net.

Contact: harpo!utah-cs!thomas, thomas@utah-20
Spencer W. Thomas
Computer Science Dept.
University Of Utah
Salt Lake City, Utah 84112
(801)581-8800

Caveats: No known bugs.

==========

Listing #: 6
Device Name: Megatek 7290

Device Type: DMA vector and raster graphics system. Replaces Unibus terminator. Driver has been written to support full functionality of Megatek-supplied WAND and Template software. Supports two workstations, one Vector display, one Raster display. Depends on ACP to handle tty-mode operations.

CPU Type: VAX
Unix Type: 4.1bsd
Availability: Anybody

Terms: Package includes driver, installation instructions, and some debugging and monitoring utilities. Available over UUCP, or send tape. Modified WAND sources available if we get letter from Megatek stating you have license

for it. WAND sources NOT distributed over UUCP.

Contact: ittvax!toolsmgr
via: decvax
duke
purdue
lbl-unix

Advanced Technology Dept.
ITT Programming Technology Center
1000 Oronoque Lane
Stratford, Ct. 06497
(203) 375-0200

Caveats: Allegedly supports multiple chassis, but this has never been tested. Only in operation on VAX780 CPU.

= =

Listing #: 7
Device Name: Xylogics Phoenix 211 Unibus Disk Controller
Device Type: CDC, Ampex 80/300 Mb SMD drives
For CPU Types: VAX, PDP11
For Unix Types: 4.1BSD, 2.8BSD
Availability: Sure

Terms & Cond: Send me a tape, or get it by net-mail

Contact: Donn Seeley or Jim McGinness
Mail Code B-014
UC San Diego Chemistry Dept.
La Jolla CA 92037
ucbvax!sdcsvax!sdchemc!{donn,jmcg}

Caveats: I think Xylogics has discontinued production because of reliability problems... but I can say that once you get a good board set (it took us 3 mo.) then it runs fine. The cute thing about the controller and drivers is that they support multi-porting of the controller. The controller is connected to as many as 4 couplers; the couplers sit in the various Unibi and the controller has its own backplane and power supply. We boot a VAX and a PDP off the same disk and controller.

Miscellaneous: By the way, the 4.1 driver was adapted by Rusty Wright of the Center for Music Experiment at UCSD from the up driver and the 2.8 driver has an odd pedigree which I don't remember just now. The 4.1 driver has fixed an apparent bug in the up driver whereby on systems with more than one drive on the same controller the "wrong" drive queue will occasionally be linked into the controller queue... sigh. Standalone boot drivers, bootblocks and even VAX 11/750 ROM code available on request. Other people at UCSD may have different versions of this driver but I have gotten the impression that ours is the only version that works (it may be that

ours are the only controllers that work(!)).

= =

Listing #: 8
Device Name: Ikonas RDS-3000
Device Type: Image Frame Buffer
For CPU type: VAX
For UNIX type: Berkeley 4.1 and 4.2
Availability: Anyone with Unix liscense

Terms & Cond.: Experimental, non-supported.
Send mail requesting driver to allegra!rdg.

Contact: allegra!rdg

[Note: "allegra" is reachable via "decvax"]

= =

NOTE: @@@ Work on this one.
Listing #: 9
Device Name: DEC VS-11
Device Type: High-resolution, bitmapped, interactive, color graphics display/workstation.
For CPU type: VAX
For UNIX type: 4.1bsd

Availability: Any licensee, but not for redistribution or resale

Terms & Cond.: I got it over the network, but we are neighbors. Free.

Contact: DEC UNIX Engineering Group (decvax)
decvax!aps

decvax!wivax!ss - but I have it untested and
with no info, or
decvax!aps - Alan - you might check with aps
before releasing his
name, even though DEC
has said they will try to
provide drivers for any
DEC hardware.

= =

Listing #: 10
Device Name: DEC KMC-11
Device Type: PDP-11 Auxiliary Processor
For CPU type: PDP-11's
For UNIX type: V6, V7, perhaps others
Availability: Anyone who wants it

Terms & Cond.: Driver source is 3K bytes long. Send UUCP address.

Contact: Michael Lecuyer

Arts Computing Office
P.A.S. Building
University of Waterloo
Waterloo, Ontario
N2L 3G1
Usenet Address: ...!decvax!watmath!watarts!spoon

Other Info: Loads an 'a.out' image (both text portion and data) into KMC-11 memory.

==========

Listing #: 11
Device Name: Digital Sound Corporation 200 Digital Audio Converter

Device Type: digital to analog and analog to digital converter
For CPU type: vax
For UNIX type: 4.1bsd

Availability: anybody with a 32/v or system III license (source or binary)

Terms & Cond.: send tape or uucp address

Contact: ucbvax!sdcarl!rusty
Rusty Wright
University of California San Diego
Computer Audio Research Laboratory
La Jolla, California 92093

==========

Listing #: 12
device name: DEC VSV01
device type: Non-DMA Bit Map Colour Television
For CPU type: PDP-11
For UNIX type: v6
Availability: everyone

Terms & Cond.: send a tape or I can mail it

Contact: Geoff Collyer
decvax!utzoo!utcsrgv!utcsstat!geoff

==========

Listing #: 13
device name: DEC DZ-11, Plessey DZ-11, Able DZ-11
device type: Non-DMA tty multiplexer
For CPU type: PDP-11
For UNIX type: v6 or v7
Availability: everyone

Terms & Cond.: send a tape or I can mail it

Contact: Geoff Collyer
decvax!utzoo!utcsrgv!utcsstat!geoff

==

Listing #: 14
device name: DEC RL01 or RL02
device type: 5 or 10 Mb removable disk
For CPU type: PDP-11
For UNIX type: v6
Availability: everyone

Terms & Cond.: send a tape or I can mail it

Contact: Geoff Collyer
decvax!utzoo!utcsrgv!utcsstat!geoff

==

Listing #: 15
device name: Versatec or Varian printer/plotter
device type: electrostatic raster plotter
For CPU type: PDP-11
For UNIX type: PWB/UNIX (essentially v6) and after Jan. 1, 1983, v7
Availability: everyone

Terms & Cond.: send a tape or I can mail it

Contact: Geoff Collyer
decvax!utzoo!utcsrgv!utcsstat!geoff

==

Listing #: 16
device name: DECsystem-10 asynchronous link via DEC DL-11
device type: 1200 or 2400 baud (approx.) link with checksum, retransmission
For CPU type: PDP-11
For UNIX type: PWB/UNIX (essentially v6) and after Jan. 1, 1983, v7
Availability: everyone

Terms & Cond.: send a tape or I can mail it

Contact: Geoff Collyer
decvax!utzoo!utcsrgv!utcsstat!geoff

Caveats: requires some DECsystem-10 programs and UNIX programs (available from me) to make a complete link

==

Listing #: 17
device name: DEC RM05
device type: 300 Mb removable disk
For CPU type: PDP-11
For UNIX type: PWB/UNIX (essentially v6) and after Jan. 1, 1983, v7
Availability: everyone

Terms & Cond.: send a tape or I can mail it

Contact: Geoff Collyer
decvax!utzoo!utcsrgv!utcsstat!geoff

Listing #: 18
device name: DEC GT41
device type: vector graphics display including display processor
For CPU type: PDP-11
For UNIX type: v6 and eventually v7
Availability: everyone

Terms & Cond.: send a tape or I can mail it

Contact: Geoff Collyer
decvax!utzoo!utcsrgv!utcsstat!geoff

Caveats: Actually I have several GT41 drivers.

Listing #: 19
Device Name: DEC RX01
Device type: Single sided single density floppy disk drive.
For CPU Type: PDP 11/40
For UNIX Type: V6.
Availability: I don't remember where I aquired it, so I can't
enforce restrictions.
ie: for any licenced UNIX system.
But don't market it.

Terms & Cond.: I don't want to spend any of my money or a lot
of my time shipping it. It is 4606 chars or 212 lines.

Contact: Charles Colbert
rm 2e222 6 Corporate Plc.
Piscataway, NJ 08854
(201) 981-2370
pyuxjj!colbert
mhuxm!pyuxjj!colbert
ucbvax!pyuxjj!colbert

bugs: The rx01 hardware does not use DMA, so it
is very slow & hoggy. It is also very low
density.

Listing #: 20
Device name: Megatek 7250
Device type: Color graphics system (vector/raster hybrid)
CPU: PDP 11/45
Unix: V7
Availability: Anyone

Terms & Conds: Not for resale or redistribution. Send magtape.

Contact: Jim Guyton (guyton@rand-unix, randvax!guyton)

Caveats: Not used very much and not very polished. A
derivation of a Megatek 7200 Unix-V6 driver

from Purdue.

==
Listing #: 21
Device name: AED-512
Device type: Color raster system
CPU: PDP 11/45
Unix V7
Availability: Anyone

Terms & Conds: Not for resale or redistribution. Send magtape.

Contact: Jim Guyton (guyton@rand-unix, randvax!guyton)

Caveats: Weird AED dma mode not supported. Still uses
PIO for all but direct video buffer loads.

==
Listing #: 22
Device name: Genisco GCT-3000
Device type: Color raster system
CPU: PDP 11/45
Unix: V7
Availability: Anyone

Terms & Conds: Not for resale or redistribution. Send magtape.

Contact: Jim Guyton (guyton@rand-unix, randvax!guyton)

Caveats: Runs with custom Rand microcode for the Genisco,
not the standard code supplied by Genisco. Also,
this is a horrible device, don't buy one!

==
Listing #: 23
Device Name: DEC DQ11 and DEC DUP11
Device Type: Synchronous line interfaces, DMA and non-DMA respectively.
Protocol: Honeywell Grts remote computer bisync; probably not too
difficult to modify for similar protocols.
For CPU type: written for VAX
For UNIX type: 4.1BSD
Availability: to anyone

Terms & Cond.: prefer to send via uucp mail.

Contact: decvax!watmath!watcgl!dmmartindale
Dave Martindale
Computer Graphics Lab
University of Waterloo
Waterloo, Ontario
Canada N2L 3G1

==
Listing #: 24
Device Name: Vadic 3451PA Autodialer/triple modem

Device Name: Bizcomp Smartmodem (300 baud only -- I haven't seen the 1200 baud version yet)
Device Type: RS 232 Autodialers for UUCP
For CPU type: any (including micros)
For UNIX type: any which supports uucp
Availability: anyone

Terms & Cond.: send electronic mail

Contact: Peter Gross
High Altitude Observatory
National Center for Atmospheric Research
PO Box 3000
Boulder CO 80307
(303)-494-5151 ext. 348
seismo!hao!pag decvax!brl-bmd!hao!pag --> uucp
ucbvax!hplabs!hao!pag /
CSVAX.pag@BERKELEY --> ARPA

Notes: There are separate versions (the only changes are in conn.c) for the VA3451PA and the Hayes Smartmodem.

===

Listing #: 25
Device Name: Ikonas RDS-3000 (IK-11B)
Device Type: Host interface to Ikonas' Raster Display System
For CPU type: "VAX", "PDP-11"
For UNIX type: "4.1bsd", "v7"
Availability: Anyone can have the V7 driver. Send for information on the 4.1bsd driver.
Terms & Cond.:
Contact: Mike Mitchell
Ikonas Graphics Systems, Inc.
531 Pylon Drive
Raleigh, NC 27606

decvax!duke!mcnc!mcm

===

Listing #: 26
Device Name: Britton-Lee IDM 200 and IDM 500, speaking to the host via a serial (RS232) port or a parallel (IEEE488) bus utilizing a National Instruments GPIB 11-2 card.
Device Type: The IDM 200 and IDM 500 are compatible Relational Database Machines. They run a complete database system (essentially a superset of INGRES) in a backend processor, thus offloading your host of the database grunt work. They communicate with your host via either an RS232 port (speaking to a standard device, e.g., a DZ11) or an IEEE488 port using the National Instruments GPIB 11-2 UNIBUS card. Multiple hosts (possibly running different operating systems or on different processors) can use the IDM simultaneously. SMD compatible disks

plug directly into the IDM. Up to sixteen disks may be plugged into a single IDM 500 (four disks for an IDM 200).

For CPU type: VAX and PDP-11.

For UNIX type: 4.1bsd, V7, 2.8234612346bsd (coming), 4.2bsd (planned). We can also put you in contact with a group doing System III support.

Availability: Available to anyone with the appropriate UNIX license.

Terms & Cond.: The driver comes on a distribution with a complete set of support software (ad hoc parser, embedded query languages, etc.) for some amount of money -- prices depend on configuration, etc.

Contact: Britton-Lee, Inc., (408) 378-7000. Ask to talk to sales.

= =

Listing #: 27
Device Name: Versatec 1200, v80, or similar
Device Type: Electrostatic printer
Comment: Software compatible with v7 and Berkeley (vtroff, etc.)

= =

Listing #: 28
Device Name: Megatek 7000
Device Type: DMA refresh vector graphics display
Comment: Software compatible with Purdue graphics package

= =

Listing #: 29
Device Name: Paper tape reader
Device Type: Any Perkin-Elmer standard paper tape reader on MUX bus

= =

They all share the following info:

CPU type: Perkin-Elmer 7/32 or 8/32 (untested on 3200, but should work)

UNIX type: Wollongong/P-E

Availability: Public domain, but I ask that my name remain in the source as original author.

Terms: Send a tape with a stamped, self-addressed return mailer, or I can send via uucp or Arpanet.

Contact: Jim Rees
Computer Science FR-35
University of Washington
Seattle, Washington 98115

Telephone: (206) 545-0912

Uucp: decvax!microsoft!uw-beaver!jim
Arpanet-NCP: Jim@Washington
Arpanet-TCP: Jim@UW-VLSI

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Listing #: 30
Device: DEC RK07 and DEC RK06 disk drives
Controller: RK-611 (unibus)
Machine: PDP-11/44
Unix: BSD 2.8
Distribution: Unlimited
Details: Send tape
Specials: Supports multi-spindle devices (as opposed to multi-device spindles), and intelligently handles configurations with only RK06's, only RK07's, or mixes of RK07 and RK06.

Contact: decvax!idis!mi-cec!dvk
or ...!tm

[Note: I assume this means "mi-cec!tm"]

Dan Klein
MI-CEC
4616 Henry St.
Pittsburgh, Pa. 15213
412/578-3382

= =

Listing #: 31
Device Name: Ramtek RM9400 color raster display system.
Device Type: High resolution color raster display system
For CPU type: pdp 11 and vax
For UNIX type: the pdp 11 is version seven and 2.8 (i think) while the vax is for 4.1bsd
Availability: Available free with proof of unix license

Contact: decvax!mcnc!swd (Stephen Daniel)

Caveats: This is a very poorly designed device.
This driver has been under development
for more than a year and works fairly well,
but you can still hang the ramtek badly enough
to have to go flip reset switches to get it back.

= =

Listing #: 32
Device Name: Lexidata 3400 color raster display system.
Lexidata says it will also work with their
8400 series devices.
Device Type: High resolution color raster display system
For CPU type: Vax
For UNIX type: 4.1bsd

Availability: Available free with proof of unix license

Contact: decvax!mcnc!swd (Stephen Daniel)

Caveats: Driver does DMA out of user memory -
a poor buffering strategy at best.
However, the 3400 is quite fast...

= =

Listing #: 33
Device Name: Interlan N1010 ethernet board.
Device Type: Ethernet controller
For CPU type: Vax
For UNIX type: 4.1bsd with the BBN TCP/IP network software

Availability: Available free with proof of unix license

Contact: decvax!mcnc!swd (Stephen Daniel)

Caveats: Still a prototype driver. It works,
but performance is poor.

= =

Listing #: 34
Device Name: DEC TS-11 tape drive
Device Type: 1600 bpi (only) 9 track tape drive.
For CPU type: PDP-11 (ours is an 11/44)
For UNIX type: 2.8 bsd
Availability: Public domain.

Terms & Cond.: We'll send it by netmail, or by tape (you supply
the tape, it will be 1600 bpi).

Contact: Mail to ...pur-ee!pur-phy:suitti, or
to ...pur-ee!pur-phy:root (there is always the
possiblity of change of command.

Caveats (bugs): I've not seen any, in 6 months of use. This
device driver was written here at Purdue Physics by
Mike Demoney. The one that comes with the bsd's is
overly buggy, tending to crash the system.

Stephen Uitti (system manager)
...pur-ee!pur-phy:suitti

= =

Listing #: 35
Device: Fujitsu 160 Mbyte Winchester
System Industries 9400 controller
CPU: 11/70
Unix type: Version 7

Availability: Anybody

Terms: Send tape.
Contact: Gary Schlickeiser
Academic Computing

Reed College
Portland, OR 97202

(503) 771-1112 x571 teklabs!reed!schlick

==========

Listing #: 36
Device: Alpha 10
Iomega Corp., Ogden Utah
Device Type: 10 Mbyte Cartridge Floppy
CPU: 11/23
Unix Type: Version 7

Availability: Anybody

Terms: Send tape.
Contact: Gary Schlickeiser
Academic Computing
Reed College
Portland, OR 97202

(503) 771-1112 x571 teklabs!reed!schlick

==========

Listing #: 37
Device: DeAnza IP 8500 image processing display system
CPU: VAX 780, 750, 11/45
UNIX: 4.1bsd, PWB1.0
Avail: Just request it
Contact: duke!adiron!bob (bob gray)

==========

Listing #: 38
Device Name: Optronics C-4500 Model 30D
Device Type: Color film scanner/writer
For CPU type: Unibus Device on a VAX 11/780
For UNIX type: 4.1bsd
Availability: An educational/research product. Commercial use to be negotiated.

Terms & Cond.: To be arranged.

Contact: Robert J. Woodham
Reachable via:
lbl-unix!uw-beaver!ubc-vision!woodham
Postal address:
Department of Computer Science
University of British Columbia
2075 Wesbrook Mall
Vancouver, B.C. V6T 1W5
Canada
Telephone:
(604) 228-4368

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Listing #: 39
Device Name: Scientific Micro Systems FWT1127s

Device Type: floppy disk drive, rx02 substitute with
"extended mode" that provides multiple
sector dma transfers, a format command,
and supports several ibm formats

For CPU type: VAX

For UNIX type: 4.0bsd

Availability: to anyone

Terms & Cond.: send tape with self addressed and STAMPED envelope
or send uucp address

Contact: Daniel R. Strick
Office of Communications Programs
University of Pittsburgh
833 LIS building
135 N. Bellefield Ave.
Pittsburgh, PA 15260

aka ...!duke!mcnc!idis!dan

Caveats: development not really finished, but works

Notes: This is a unibus device; it ought to be possible
to modifiy the driver to work on a pdp11.

= =

Listing #: 40
Device Name: DEC DZ11 (mods to standard driver)
Device Type: Tty multiplexer
For CPU type: VAX
For UNIX type: 4.1bsd

Description: Allows DZ lines (probably connected to modems) to be used
both for incomming and outgoing calls with no changes to
getty.c, login.c, init.c, cu, or uucp.

Availability: Anyone

Terms & Cond.: I'll send a diff -c to anyone on the net.

Contact: Bob Van Valzah
uiucdcs!bobvan
bobvan@DTI

= =

Listing #: 41
Device Name: DEC DR11B
Device Type: DMA General Purpose UNIBUS interface

For CPU type: VAX 11/780
For UNIX type: 4.1bsd
Availability: Call me

Terms & Cond.: Call me

Contact: Andy Tannenbaum
(floyd!trb, TRB@MIT-MC)
Bell Labs 2C-122
Whippany, NJ 07981
(201) 386-6491

Caveats: This driver was written as a quick hack to do I/O between our VAX and a piece of prototype hardware. It does DMA, but it is not interrupt driven. It's less than ten pages of commented code and may be used as an example of how to write a simple 4.1bsd driver.

= =

Listing #: 42
Device Name: Digital Equipment Corporation DR11W
Device Type: DMA Word Parallel
For CPU Type: VAX, PDP-11
For UNIX Type: USG 3.0, 4.0, 5.0
Availability: BTL, ABI, perhaps others by request

Terms & Cond.: Send tape

Contact: Richard A. Hammond
American Bell Inc.
Room 2E-108
2220 Asbury Ave
Neptune, NJ. 07701

(201) - 922 - 7275
decvax!harpo!npoiv!rah
ucbvax!npois!npoiv!rah

Caveats: This driver permits transfers between two DR11Ws connected back-to-back. In our case it is used for data transfers between an 11/34 and a VAX. It is single use - no virtual circuits or other fancy stuff. If anyone is interested in either getting it or talking about DR11W drivers feel free to contact me, I won't bother to find out our distribution policy to non-AT&T places unless someone wants the driver.

= =

Listing #: 43
Device Name: Computrol Memory Mapped Megalink 1 megabaud DMA. Model 90-0018
Device Type: Carrier Sense Multiple Access (no collision detection) two-way data transmission on coaxial cable.

For CPU type: DEC LSI-11 Q-bus.
For UNIX type: 4.1bsd.
Availability: Anyone who wants it.

Terms & Cond.: Will mail over the net or copy to tape if you send a tape and stamped return envelope.

Contact:
Russel Sandberg
1210 W. Dayton st.
Madison, WI 53706
(608) 262-7950
rusty@uwisc
uwvax!rusty

Comments: We have two versions of the driver. The plain version looks like a fairly normal device. The protocol version is intended for use with a packet switching daemon. It allows only one open, reads whenever it is not writing, and sends a signal when a read completes. The protocol version requires some simple kernal hacking.

Bugs: The megalink is a real pain to use and doesn't work very well.

= =

Listing #: 44
Device Name: Tty driver
Device Type: Replacement for V7 tty driver

We have completely rewritten the V7 terminal driver for our 11/70. The major objects of the rewrite were to improve the user interface in general and to add support for Digital Engineering's "retrographics" upgrades to Lear Siegler "ADM-3A" terminals. This software is not easily portable to other systems, but we feel that our functional modifications could easily be fitted into a traditionally structured terminal driver. (This is likely to happen locally during the next 9 months as we add a new machine to our system.)

Alan Hastings described our driver to several people at last summer's UNICOM. The following is a brief summary of current capabilities:

- several control characters have been added to improve input line editing. The "erase" algorithm is much smarter in regards to control characters and tabs, which are properly erased from the screen. CTRL/R reprints your current input line to make it easier to see what you've deleted on paper terminals.

- added CTRL/O (flush output buffer) to CTRL/S and CTRL/Q. There is an additional ioctl call to cancel the effect of this character in appropriate situations.

- all control characters may be remapped or disabled with ioctl.

- typed input can be echoed immediately (UNIX default) or held until the next read is posted (VMS default). Some users like this feature, some don't.

- mode bits (like RAW) have been extended and made considerably more flexible. In several cases, there are separate bits for input and output mappings. This makes the driver much friendlier towards peculiar terminals (and microcomputers emulating terminals). In all cases, the conventional stty/gtty calls produce the conventional effect.

And, most important:

For each terminal on the system, there is an appropriate /dev/ttyxx entry and a /dev/tgrxx entry. There is also a /dev/tgr (corresponding to /dev/tty) which refers to the user's own terminal. The tgr devices accept graphics data in a simple device-independent format and produce a correctly merged output stream which keeps track of the terminal mode. Simultaneous text and graphics use is fully supported. Interrupts and errors can not leave the terminal hung up in graphics modes. This feature is a big help in a college environment where many students without other computer background are using the machine to analyze lab data.

We do not have this software available in a prepared distribution form, but are willing to send it to anyone who's interested. Contact our system manager:

Victor Lee
Computer Center
St. Olaf College
Northfield, MN 55057
(507) 663-3097
...!harpo!stolaf!vtl

to arrange.

I hope that this will be of some interest or use to someone out there. I'll be watching the network for the final list.

Steve Tarr

= =

Listing #: 45
Device Name: DEC UDA50, IDC, DMF32, TU78, 3Com Ethernet Controller, Interlan Ethernet Controller
Device Type: 4.2bsd distribution devices

Devices Supported by 4.2BSD:

Start with all the drivers the 4.1bsd supports and add UDA50, IDC, DMF32, 3COM Ethernet, Interlan Ethernet, Ungerman Bass, and then ask Sam Leffler (ARPAVAX:sam). I think there's some new random drivers like GPIB and Picture Systems, etc., plus probably more network interfaces.

P.S. APS did 782 support, but I'm not sure if he'll get it into 4.2bsd.

Contact: The 4.2BSD distribution folks.

[Note: I was unable to make contact with Sam Leffler to find out about others.]

= =

Listing #: 46
Device Name: Ramtek 9200/9300 black and white graphics display
Device Type: Raster graphics display, color or black and white
For CPU type: Only known to work on pdp11s.
For UNIX type: Only known to work on v6, some conversion effort was made to v7,, but never completed, as the hardware died.
Availability: Anyone can have it.

Terms & Cond.: Send a tape, and I'll send what I have. It's not very pretty right now, as I never finished all the documentation.

Contact: Christopher A. Kent
Purdue University Dept. of Computer Sciences
decvax!pur-ee!purdue!cak
cak@purdue
ucbvax!purdue!cak

Caveats: There is user level code to go with this. There is some documentation. The package is not very professionally finished; unfortunately, the hardware broke during conversion to v7 and stdio, and I left the institution, and no one else has taken up the work. I have done some work remotely, and written a fair amount of documentation on the package, but it's not complete. You may be able to get something working almost immediately, but there will be work involved to bring it up cleanly.

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Listing #: 47
Device Name: Ungermann-Bass network interface unit in parallel mode, hooked up via a dr11-w
Device Type: pseudo (soon real) ethernet interface
cpu: vax, pdp11
unix: sIII
availability: whoever wants it ...
terms: send me a tape and return postage
contact:
norman wilson
caltech 356-48
pasadena ca 91125
(ucbvax | decvax!researc)!cithep!norman
notes:
this is a simple-minded driver which just passes datagrams back & forth either it or the protocol u-b use to talk to the dr11 (or more likely both) need some cleaning up

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Listing #: 48

Device Name: Interlan NI1010 Ethernet Communications Controller
Device Type: Unibus Ethernet local network interface board.
For CPU type: VAX or PDP11
For UNIX type: 4.1aBSD, 4.2BSD, SRI's PDP11 port of 4.1a
Availability: Anyone with a 2.*BSD or 4.*BSD licence.
Terms & Cond.: Send tape and copy of BSD licence.
Contact: Dan Chernikoff (dan@sri-tsc)
SRI International
333 Ravenswood Ave.
Menlo Park, CA 94025
(415) 859-4144

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Listing #: 49
Device Name: Fast timer driver
Device Type: Pseudo-device allowing timing intervals with
a resolution of 1/60th of a second. At the end
of the timed period a signal is sent to the process.
For CPU type: VAX
For UNIX type: 4.1bsd
Availability: Public Domain
Terms & Cond.: We will mail it via uucp on request.
Contact: Dean B. Krafft, Research Associate
405 Upson Hall
Dept. of Computer Science
Cornell University
Ithaca, NY 14853
(607) 256-4052
uucp: [decvax, harpo, vax135]!cornell!dean
CSNet: dean.cornell@udel-relay
ARPAnet: dean@cornell

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Listing #: 50
Device Name: Magtape driver (mt)
Device Type: STC 800/1600/6250bpi magtape drive with the
System Industries Unibus magtape controller
(psuedo-TU45 emulation)
For CPU type: VAX
For UNIX type: 4.1bsd
Availability: Requires 4.1bsd license

Terms & Cond.: We will mail it via uucp on request, or send it
on a stamped, self-addressed tape.

Caveats: Has not been tested with more than one controller or slave.
Reset has not been tested.

Contact: Dean B. Krafft, Research Associate
405 Upson Hall
Dept. of Computer Science
Cornell University
Ithaca, NY 14853
(607) 256-4052
uucp: [decvax, harpo, vax135]!cornell!dean

CSNet: dean.cornell@udel-relay
ARPAnet: dean@cornell

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Listing #: 51
Device Name: DEC RX02 floppy disk
Device Type: Dual-density RX02 floppy disk drive
For CPU type: VAX
For UNIX type: 4.1bsd
Availability: Requires 4.1bsd license
Terms & Cond.: We will mail it via uucp on request, or send it on a stamped, self-addressed tape.
Caveats: The one site we sent it to has had some problems. We use it occasionally (mostly at single density), and it works fine for us.
Contact: Dean B. Krafft, Research Associate
405 Upson Hall
Dept. of Computer Science
Cornell University
Ithaca, NY 14853
(607) 256-4052
uucp: [decvax, harpo, vax135]!cornell!dean
CSNet: dean.cornell@udel-relay
ARPAnet: dean@cornell

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Computer Vision Lab Drivers

At the Computer Vision Lab (CVL), several device drivers have been developed for use on the Lab's PDP-11/45 that has run both versions 6 and 7. Those devices that are currently supported by version 7 will also be made to run under BSD 4.1 on the VAX-11/780 that is due to be installed in January 1983. These drivers are distributed as part of the ULISP (a LISP interpreter for PDP-11s) and Computer Vision Lab image processing software tape. This tape, written in "tar" or "tp" format at 800FPI or 1600FPI, can be obtained for a $100.00 handling charge and agreement to a copyright license from the

Computer Vision Laboratory
Computer Science Center
University of Maryland
College Park, Maryland 20742.

Limited requests for single items may also be addressed to

staff.cvl.umcp-cs@UDEL-RELAY (via the ARPAnet now)
staff.cvl@MARYLAND (after the Md. ARPAnet connection arrives)
staff.cvl@UMCP-CS (via CSnet)
brl-bmd!umcp-cs!cvl!staff (via USEnet (maybe))

but satisfaction via these channels cannot be insured.

Robert (Bob) L. Kirby

(Please respond to "staff".)

Some of the available device drivers:

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Listing #: 52
Device Name: Grinnell GMR-27 via a DEC DR-11B (with minor mods).
Device Type: A 512x512 frame buffer with 13 bits/pixel:
1 overlay (white) and either 12 bits used for 4 bits each of 3 colors or 8 bits of black/white grayscale. Raster and vector read/write operations are supported along with 6-bit black/white TV camera input, 2 cursors that can be asynchronously read/written, and a lookup display table.
For UNIX type: V6 and V7 (BSD4.1 soon).
Notes: A large collection of support software is available for not only manipulating the GMR-27 but also for performing many image processing algorithms.

Terms & Cond.: See above information for Computer Vision Lab Drivers

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listing #: 53
Device Name: Plessy PM-DC1100 disk controller for a CDC9766 disk pack.
Device Type: RP03 look-alike with nonstandard capacity (256 Mbytes) done by emulating controller.
For UNIX type: V6 and V7 (soon for BSD4.1 as UNIBUS device).

Terms & Cond.: See above information for Computer Vision Lab Drivers

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listing #: 54
Device Name: Digidata look-alike for DEC TM-11/TU-10.
Device Type: 800 and 1600 BPI, 9-track, Magtape systems.
For UNIX type: V6 and V7 (soon for BSD4.1 as UNIBUS device).
Notes: Supports multiple physical drives with each drive having two logical names for the 800 and 1600 FPI densities. The handler allows file backspacing operations and restarting in the middle of tapes through a collection of support programs. A version-6-only handler is also available for DEC TE-16s providing similar support.

Terms & Cond.: See above information for Computer Vision Lab Drivers

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listing #: 55
Device Name: DEC RK06 (and untested RK07)
Device Type: 28 Mbyte, 3-platter, disk packs.
For UNIX type: V6 only.
Notes: Supports ECC (Error Correcting Code) in software. Only one UNIBUS is supported. RK07 support is untested.

Terms & Cond.: See above information for Computer Vision Lab Drivers

listing #: 56
Device Name: DEC DU-11.
Device Type: Synchronous Line Interface to a UNIVAC 1100 system used as a "remote batch site" for remote job entry.
For UNIX type: V6 only.
Notes: Uses the UNIVAC "1004" protocol to support a fictitious card reader, card punch, and printer station. Dies often under heavy PDP-11 loads. The "NTR" protocol does not work right.

Terms & Cond.: See above information for Computer Vision Lab Drivers

Letters Page

Amsterdam, 15th February, 1983

Dear Jim,

On Friday 14th January 1983, the NLUUG (Local UNIX† Systems User Group, The Netherlands) received it's official (i.e. legal) status in Holland. This brings up two subjects:

1) It's time to start national groups in Europe! What about taking over this initiative in Britain? Where in Germany, France, Italy, Denmark, Norway and Belgium. The amount of EUUG members in these countries is enough.
2) The NLUUG Board is elected by it's members. The board decides who is doing what (chairman, treasurer, etc.). Is this an idea for the EUUG? In this way we do not need to send forms around for the new treasurer. Or does the total number of replies received exceed three?

Teus Hagen
Mathematisch Centrum
Kruislaan 413
NL-1098SJ Amsterdam

Braunschweig, 2nd February, 1983.

Dear Mr. Hagen,

We are new members in the family of UNIX users. We are running UNIX Version 7 on an LSI11/23 computer with one RL01 and one RL02 disk drive (a copy of the licence is included).

We are looking for a UNIX user who has some experience in communicating with an IBM (Big brother link; protocols like 3270, 3780, HASP, etc.).

Would you please distribute this call in the UNIX network.

H.J. Brede
TU Braunschweig
Institut für Informatik
Gaussstr.12
D-3300 Braunschweig
F.R. Germany

tel. +41 531 391 x3273
telex TU BS 952526

† UNIX is a Trademark of Bell Laboratories.

Important Addresses

For **EUUG** subscriptions or questions concerning EUUG membership:

EUUG secretary
Owles Hall
Buntingford
Herts SG9 9PL
Great Britain
Tel: Royston +44 763 71209

If you have a question, and you don't know who you should contact, please use the above address.

For subscriptions to the Dutch national group **NLUUG:**

NLUUG secr.
Marten van Gelderen
Nikhef-K
Postbus 411
NL-1009 AJ Amsterdam
Netherlands
Tel: +31 20 5922030

Articles or any material which should be in the next **newsletter**:

Stichting Mathematisch Centrum
EUUG editor
Jim McKie
Kruislaan 413
NL-1098 SJ Amsterdam
the Netherlands
Tel: Amsterdam +31 20 5924127

net address: mcvax!jim

If you want to hook your system up to the network and are looking for an address, well here they are:

For **England**:

University of Kent
Mike Bayliss
Computer Laboratory
Canterbury CT2 7NF
England
Tel: +44 227 66822 x 7615

For **Scotland**:

University of Edingburgh
CAAD Studies
David Rosenthal
20 Chambers Street
Edingburgh EH1 1JZ
Scotland
Tel: +44 31 6671011 x 4598

For **The Netherlands**:

Mathematical Centre
Teus Hagen
Kruislaan 413
NL-1098 SJ Amsterdam
Netherlands
Tel: +31 20 5924127

For **Switzerland**:

CERN
D. Wiegandt /DD
CH-1211 Geneva 23
Switzerland
Tel: +41 22 834940

For **Denmark**:

University of Copenhagen
Institute of Datalogy
Keld J. Simonsen
Sigurdsgade 41
DK-2200 Copenhagen
Denmark
Tel: +45 1 836466 x 14

For **Belgium**:

Vrije Universiteit Brussel
Medische Informatica
Erik Blockeel
Laarbeeklaan 103
B-1090 Brussel
Belgium
Tel: +32 2 4781520/1438

For **Germany**:

Siemens AG
Michael Uhlenberg
ZT1 INF 212
Otto Hahn Ring 6
D-8000 München 83
W. Germany
Tel: +49 89 63644622

For **France**:

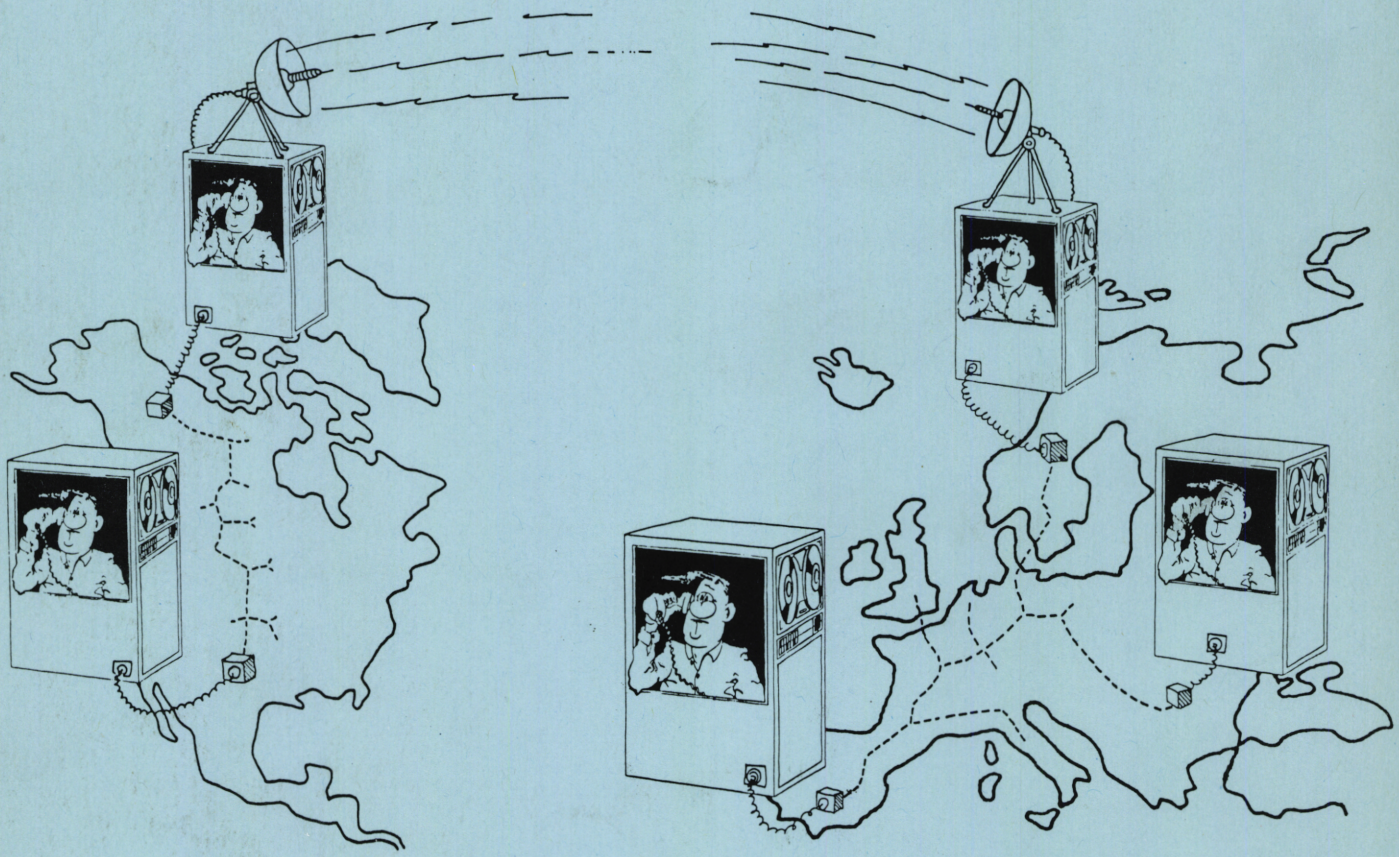
CNAM
Lab. d'Informatique
H.C. Lucas
292 Rue Saint Martin
F-75141 Paris Cedex 07
France
Tel: +33 1 2712414

If you are outwith the above countries, you will be asked to be a central site for your country, and you are invited to hook up your system to the Mathematical Centre.

If you have any trouble connecting up to your local site, please contact:

Mathematical Centre
Teus Hagen
Kruislaan 413
NL-1098 SJ Amsterdam
Netherlands
Tel: +31 20 5924127

net address: mcvax!teus



The Secretary
European Unix User Group
Owles Hall
Buntingford, Herts.
SG9 9PL.
Tel: Royston (0763) 73039.