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TM

Your Independent UNIX* and C Advisor

From the Editor

WOW!

What else can you say about a Uni-Forum conference with 8000 attendees that looked like a mini-Comdex? The booths, presentations, and organization of the show were extremely professional - even flashy at times. This indicates that the big money people have arrived, but we'll miss the "small-town" friendliness of past conferences, where there was always some sort of "field trip" in the evening to loosen people up. (This is not to disparage the people in charge of logistics, who ran things much better than most previous groups).

Covering a conference like Uni-Forum takes a great deal of work and editorial space. Since it just ended a few days ago, we're rearranging things so that the most important announcements get written up in this issue. Show benchmarks, new product announcements, and detailed coverage of other products will appear next month.

Possible Conflict of Interest Dept.: Vendors that have had dealings with one or another of my companies recently include Cosmos Systems (now Netcom), Data Base Consultants, Data Language Corp., and Webco Industries.

Rumors

We keep hearing rumors of various companies about to go out of business, but are able to refute them by doing a little digging. The moral? Check on whether your informant has any personal reasons for spreading such gossip.

The 68000 machine shown by **Honeywell** at UniForum was really the Corvus in disguise...The president of **Sritek** was boasting of selling "thousands" of their upgrade boards to IBM. This might be connected to the rumor that IBM will be giving Berkeley NS16032-based UNIX machines. So the students can improve the port?...The next two big OEMs for **Convergent Technologies'** MiniFrame and MegaFrame will be Four-Phase and Sperry.

In This Issue

Zintz' Rumors

What's Past is Prolog Department – Prolog buffs and inquirers soon can stop messing with those unsupported university Prolog compilers. Scientia Computer Applications in Singapore is about to release a commercial Prolog compiler, "definitely running under UNIX"...Those royalties to AT&T when you sell time on your UNIX system are now a thing of the past. So said Bill Murphy of AT&T, at the European UNIX User Group's conference in Dublin last September...Uni-Ops has scheduled its third annual conference week for UNIX and C users, the 30th of July through the 3rd of August 1984. It will be back at the Miyako Hotel in San Francisco. Major changes this year are tutorials in half-day segments and a vendor exhibition featuring applications software. -- W. Zintz

IBM Announces UNIX for Its PC

The announcement with the longest-term meaning for our industry actually happened before UniForum -- Thursday, January 12, 1984 was the day IBM revealed it would be selling **full UNIX** for its IBM PC/XT. The operating system is formally known as **PC/IX** (which stands for Personal Computer Interactive Executive), and was ported by INTERACTIVE Systems Corporation (ISC). What IBM probably does **not** want you to know is that the porting job was actually finished on Thursday, January 12, 1983 (this from a very reliable source).

It's possible that many of you didn't hear the announcement until that Friday, or maybe the first day of Uniforum. The speed of the grapevine amazed even us. We found out about it on Thursday afternoon and passed the information along to a few other people. Checking with IBM on Friday for more background, we were informed that the press releases hadn't been mailed yet!

Here's a few details about PC/IX that everyone should know. First of all, it's a **single-user** system -- unlike uNETix, Venix, Idris, and Coherent, which all support multiple simultaneous users on the PC/XT. PC/IX is based on full UNIX System III, with not only ISC's usual enhancements (bringing it up to IS/3 level) but also a few specifically geared to the PC hardware, such as the windowing screen editor. The minimum configuration needed to run PC/IX is 256 KB of RAM, one double-sided floppy disk drive, and a 10 MB hard disk.

Naturally, more performance is gained by adding more hardware, and the operating system can support up to a full complement of 640 KB of RAM, 4 floppy disk drives, one extra 10 MB hard disk, 2 serial ports (known in IBM parlance as Asynchronous Communications Adapters), and 2 graphics or text printers. The color display is supported in text mode only. In addition, the 8087 arithmetic processor is supported if it is installed, and emulated otherwise. PC-DOS may be resident on the same hard disk as PC/IX, and utilities are provided for file transfer between the systems. The 19 diskettes that make up the full release may be installed as needed (9 disks hold the kernel and utilities and are required at all times). PC/IX will be supported by IBM, and the license fee is $900.

We got an exclusive interview with Heinz Lycklama, VP of Systems Development for INTERACTIVE Systems, and formerly of Bell Labs. According to Lycklama, IBM approached ISC because of their high degree of UNIX experience. ISC developed the first UNIX emulation under VMS -- called IS/Workbench -- which remains one of their largest-selling products. As old hands in the

UNIX business know, they were also one of the first to develop a UNIX-based microcomputer: the IDEA machine, essentially an Onyx with the IS/1 operating system (INTERACTIVE-enhanced Version 7 UNIX).

Lycklama said that the main reason for keeping PC/IX a single-user system was to avoid paying extra royalties to AT&T, which charges more for multiuser software. He also told us that the f77 Fortran compiler is not included in PC/IX, but that a separate Fortran compiler will be offered. It's not clear whether this is pure marketing strategy, or whether Fortran-conscious IBM just refused to put f77 on one of its products. Perhaps it simply couldn't fit. Except for a few utilities specific to the PDP-11, only one other program was left out: the rje package. No plans were mentioned for such software, although we have little doubt that a small additional charge will eventually make it available.

What kind of market can be expected for an expensive single-user package such as this? And in light of the many applications packages available for the IBM PC under MS-DOS, to what extent will applications be available for PC/IX? Lycklama commented, "As the market moves towards UNIX, and more applications become available, that in itself will make the market." He also reminded us that MS-DOS programs written in C could easily be ported to the UNIX environment, but wouldn't comment on any possible future software offerings from IBM or ISC.

Lycklama was willing to comment on some technical details, though. ISC's experience with the PDP-11 helped with the PC/IX port because the 8088 used in the IBM PC has a similar 64 KB address limitation. However, ISC wrote their own super-efficient C compiler which allows many PC/IX programs to actually

be smaller than their counterparts on a PDP-11. He said it "took a lot of effort and tuning, but we feel it works well on the hardware". In particular, the sector skewing was optimized for better disk access. The "warm-up" problem common on other UNIX and UNIX-like ports to the IBM PC is not present, he also told us.

Bob Blake, the Manager of Program Development for the PC/IX project at IBM's facility in Irving, TX, told us that PC/IX is primarily intended for engineering and scientific uses, particularly at universities. The reasons he gave for the limitation to a single user were that the IBM PC has no memory management, and that as a personal computer, it's intended for use by one person only. When asked about applications programs, Blake admitted there were none yet, but said he "expects that [UNIX] System III programs should port easily". However, no arrangements have been made for software developers to get copies of PC/IX before the official release date, now being stated as April 1, 1984.

Despite official refusals to talk about certain details, we've managed to piece a few facts together. While IBM retains full and exclusive rights to PC/IX, ISC will be able to duplicate the port of IS/3 for other vendors with little trouble. As you might expect, ISC has been approached by manufacturers of "PC-clones" as well as by applications vendors. SCI, in Huntsville, AL, will be one of the first to get a port for their 80186-based machine. Nobody would discuss how long the project has been underway, but we have determined that INTERACTIVE has been working on PC/IX for almost two years. And why wasn't Microsoft's XENIX used? IBM was worried about putting too much of its software in the hands of one company.

Industry reaction was generally favorable. SCO's Ronald Williams felt IBM has "expanded the legitimate market", and "shown that the market-place is sufficiently elastic to absorb this giant newcomer." Clay Clatur of Unisource Software said he was "pleased that IBM has come to its UNIX senses. This will allow many people to sell applications software and tools for the PC."

A Microsoft spokesman that will remain unidentified said, "What we have to ask ourselves is, does this signify a corporate-wide move on the part of IBM towards UNIX? We [Microsoft] don't think so. We think it's primarily a move to sell to their major account base." He went on to point out that the IBM PC uses the 8088, "one of the slowest chips around", and that PC/IX is single-user. "There's been a lot of media attention surrounding this pro-duct but it won't mean a lot over the long haul", he predicted while passing a bowl of sour grapes.

The Bottom Line on PC/IX

PC/IX is full UNIX, with slightly improved documentation and a number of enhancements from INTERACTIVE. While IBM will support it, initially there are no applications available, and even the standard IBM/Epson printers won't be fully supported by nroff. The cus-tomers IBM usually sells to are interested in buying software off the shelf, not waiting a few months until people get around to porting applica-tions. Nevertheless, we predict that UNIX-based software suppliers will be the first ones with marketable pack-ages, and that the traditional vendors of PC applications will then catch up, bringing more functionality with them. This will eventually filter into the mainstream UNIX environment. The peo-ple who have written huge software packages that can only fit on 68000s

will lose some time due to the IBM PC's 64 KB address space.

While it is true that the announcement causes a tripling of the potential machine base for UNIX sys-tems, we don't feel everyone with a PC/XT will run out and buy PC/IX. Most people -- or companies -- will not be willing to sacrifice their current base of installed software just to work with UNIX (of course, software firms might offer an upgrade with the return of the original disk). Copy protection is probably sacrificed under PC/IX also, offering less incentive for PC-DOS software vendors to rewrite software for PC/IX. And of course, the price is $900. The first wave of PC/IX buyers will therefore be software developers and every college kid who's ever had to wait for time on his school's VAX.

ISC has always been a leader (they were one of the few companies around to be written up in UNIQUE Vol. 1, No. 1), and they've been pretty quiet in the marketplace since they've been working on PC/IX -- and for that reason exactly -- but suddenly they've been thrust into the spotlight again. They have the background and skills to wear it well. How well did INTERACTIVE succeed with their port? Benchmark results from UniForum will be presented next issue, but we'll spill this much now: the IBM PC running PC/IX will be no slouch when running applications. ISC's fortune is assured.

The biggest winners from this, aside from ISC, will be the UNIX indus-try. Offering UNIX on the PC will get much more attention for us than it will for IBM. While PC/IX will not replace PC-DOS, even a relatively small market share will mean a much larger market for UNIX software vendors in general.

Bad news? The vendors of other UNIX systems for the PC will have to

add lots of value or drop their prices in order to compete. Microsoft is the biggest loser; between this and all the attention being focused on DRI (see following story), they're losing prestige and possible market share. We say "possible" because there's always the chance Microsoft can still pull a winner out of its hat -- although they're facing AT&T on that score. It seems that IBM has a few more machines to announce UNIX on (such as the 4300 mainframe, and its upcoming Popcorn 286-based microcomputer) and no one is down for the count yet.

One Last Thought

So IBM has finally come around to offering UNIX on a popular machine. The idea that this somehow "legitimizes" UNIX (as some pundits have suggested), seems insulting, as if we've been bums all this time. Fooey on the pundits, but welcome to IBM.

Other UniForum Announcements

While nothing quite matches the IBM announcements, several other things did happen at UniForum. AT&T Technologies announced System V Release 2 as we leaked last issue. A few twists: there were 500 bug fixes (implicitly admitting to 500 bugs found) over Release 1; the UNIX Documentor's Workbench is nothing more than nroff and troff unbundled; and an IBM PC-compatible BASIC interpreter is now available. While the pricing changes were surely aimed at IBM (who else can sell the number of machines needed for the maximum royalty discount), Big Blue has not yet taken the bait with System V. But they will.

Digital Research Inc. (DRI), a company we know well due to our long involvement with CP/M, figured prominently (and surprisingly) in several announcements. AT&T will be publishing a series of "quality applications packages", supporting different microprocessors, in cooperation with DRI. This will be called the UNIX System V Library. Meanwhile, Motorola will be cooperating with DRI to produce and market a total of 19 development language packages for Concurrent CP/M, CP/M-68K, and UNIX System V. These will include Cobol, Pascal, CBASIC, C, Fortran, and PL/I. The goal, according to DRI President John Rowley, is "any software on any machine": remember that there are a great many CP/M-based applications that can be ported to UNIX. The key for Motorola is to move the applications software focus to the 68000 from the 8088 (IBM PC). We're still digesting much of this ourselves, but read the next story and see if you agree that DRI may be in over its head with all this work. Maybe they'll end up having to farm out the 286 port. Sorry guys: we'd help, but we have a newsletter to put out.

Microsoft Madness

Let's get the story straight about some of the hoopla you've been hearing regarding Digital Research, AT&T, and Microsoft. It seems that **EE Times** carried a story proclaiming that DRI would do the System V port for Intel on the iAPX 286 processor (rather than Microsoft as was previously announced). The story also implied that, because of DRI's involvement with UNIX, System VI would have the ability to "run CP/M files" -- which probably means that a file transfer utility and CP/M system emulator would be included -- and that DRI's GSX graphics kernel interface would also be incorporated. According to the article (which carried no byline), this indicated that DRI would "have the edge over Microsoft in the UNIX marketplace".

A spokesperson at Digital Research would only confirm that the contract

with Intel had been signed. No comments of any other kind were made by DRI, so we got some more background on the entire episode from John Ulett, XENIX Marketing Manager at Microsoft. Ulett said that what AT&T wanted Intel to do (remember, the final customer is AT&T; anybody working for Intel on this is a **subcontractor**) was provide a "vanilla" System V port: every line of code changed from the original tape for the VAX would have to be fully documented. Microsoft, of course, had already ported UNIX while changing it to XENIX, which runs on the 8086/88, 68000, Z8000, and iAPX 286. So due to AT&T's requirement, they wouldn't be able to reuse some of what they had learned while porting XENIX to the 286 (why not, John? Didn't you guys use SCCS?).

Since they didn't want to allocate the resources necessary for an entire new porting effort, Microsoft decided a few months ago "not to be a porting house", and informed Intel that they would have to find someone else to do the job, according to Ulett. This put Intel in quite a spot, since Microsoft's XENIX is Intel's major operating system. The XENIX release schedule could have been upset had Microsoft finished the System V port for Intel. After evaluating several possibilities, Intel went to DRI, whose UNIX porting experience (in spite of some past development work in C under UNIX, such as CP/M-68K) is somewhat limited.

Does the loss of such a potentially major contract bother Microsoft? Ulett noted that AT&T, Digital Research, and Intel will all be competing to sell the final product to a possible OEM. Also, DRI has to build a team and learn how to do a UNIX port, involving a great deal of time and effort. If Microsoft sticks to its plans, it should be more profitable by

passing this port up.

What will Microsoft do next? In the past, they made a great deal of noise about how MS-DOS would eventually be indistinguishable from single-user XENIX. Ulett pointed out there's not enough bandwidth on a multiuser, single-processor system (especially 8088-based) to run "interesting" (i.e. big selling) MS-DOS or CP/M graphics applications well. So they've been talking lately about networking individual PC's together in future releases of MS-DOS, and will probably enhance XENIX' capabilities in this area as well. No doubt, with IBM's interest in communications and INTERACTIVE Systems' related background, they will follow suit. (Is anyone interested in comparative reviews of these systems on the PC?)

XENIX 3.0 will be available to OEMs sometime in 1984, and will include a visual shell with a user interface similar to that of Multiplan. Watch for additional XENIX products for the 286, a chip Microsoft (and presumably Intel, and even IBM with the rumored Popcorn machine) is very excited about. Meanwhile, Microsoft has made arrangements to license UNIX System V as well.

Over the summer, much was made over Microsoft starting up a new "master distributor" for retail versions of XENIX that would run on the IBM PC, DEC Professional 350, and Apple Lisa. We've heard rumors about staffing and funding problems, but feel its demise was really due to the then-upcoming IBM PC/IX announcement. They've quietly dropped the distributor idea and instead decided to make a long-time associate, the **Santa Cruz Operation**, their exclusive retail distributor.

As far as other business arrangements, Ulett called AT&T Information Systems "an OEM who Microsoft will not

comment on". But information from a usually reliable informant indicates that AT&T went to Microsoft looking for "something like MS-DOS": a standalone operating system they could make available on their new hardware. If "something like" turns out to mean "compatible with", then AT&T will likely have an IBM PC-compatible computer at its low end, maybe running on their 32-bit processor (see last issue's /dev/rumor for more details). You can at least be sure that Microsoft, AT&T, and IBM have their futures inexorably intertwined -- whether they're working with each other or not.
-- DF

We Have Mail.

Dear Editor,

I read in the September 1983 UNIQUE that you acquired a Cadmus 9790 microcomputer. I expect you will be acquiring a relational DBMS. Please evaluate/review/benchmark a new DBMS which is currently in beta test and will be announced at COMDEX. I believe the DBMS will be named **Progress**. It was originally named "Spectrum" but the name had to be changed because of a naming conflict. The DBMS will initially be available on Wicat, Cadmus, and Fortune micros. Additional information may be obtained from Joe Alsop or Chip Ziering at Data Language Corp. (617) 663-6500. I look forward to reading your review of this DBMS in a future issue of UNIQUE.

Sincerely,
Walt Maling
U.S. Dept. of Transportation
Research and Special Programs
Kendall Square
Cambridge, MA 02142

Funny you asked, because on our initial visit to the Cadmus factory in

early September, we were treated to a sneak preview of Progress (then Spectrum, as you noted). The deceptively simple-looking demo program hid a lot of sophisticated software, but the interesting part is that it's still simple to program in Progress. We have already received a beta-test version which is in the process of being installed. The toughest part seems to be working over the termcap file to add a few new definitions. As soon as it's running, we will do a full review, and check it against /rdb and Leverage, two other data-management packages we have been working with for review.
-- DF

Dear Editor,

I have some interesting benchmark results for you from 6809 UniFLEX(tm), our 6809-based UNIX-like operating system. I realize that your survey reported in **UNIQUE** V3N1 found that "over half of you would prefer never to hear about 8-bit operating systems again", but I believe the following benchmarks will change some minds.

First is the "hello.c" benchmark:

Disk	Compile	Simultaneous	
		#1	#2
unfragmented	9.9	16.8	17.2
fragmented	11.0	17.7	18.8

The times are different because of disk fragmentation. The first time is from a system with a freshly formatted disk. The second time is from a system whose disk contained more data and fragmentation, resulting in an increase in disk seeks.

Next is the "getpid.c" benchmark:

| Compile Time | Execution Time | Average Access | Disk |
| 10 | 4 | 30 ms. | Atasi |

These times are faster than anything that has been reported to date in **UNIQUE**! Faster than any 68000 system! Of course, these benchmarks don't tell the whole story. Obviously, for pure number crunching the 68000 would surpass the 6809. However, in most multiuser environments, kernel throughput and disk I/O speed are as important as number crunching, and these are the areas where UniFLEX shines.

The times were obtained from 2-MHz 6809 systems with 256 KB of RAM and 40 MB Atasi Winchesters. Two manufacturers currently produce 6809 hardware which is compatible with UniFLEX: Southwest Technical Products Corp. of San Antonio, Texas, and Gimix of Chicago, Illinoiss.

We are looking into running the Multiuser UNIX Benchmarks given in your June issue. Because UniFLEX is not licensed UNIX, we do not have the standard UNIX sort utility. We do have our own sort/merge package which is written in assembly language. Our sort/merge is so much faster than the UNIX sort that including a sort in benchmarks of the operating systems does not yield a fair comparison of the operating systems. On the systems we tested, UniFLEX sorted the two "words" files (combined into one to get around the Unisoft UNIX sort problem) some five to ten times faster than UNIX. Since it would not be a fair comparison (except to show how much faster our sort is), we have not yet attempted the full multiuser benchmarks.

One final point. We have developed a 68000 version of our UniFLEX Operating System. We have not yet our C compiler; thus, we cannot provide benchmark results. We do have a C compiler which we use in-house, but it is kludged at this time and must go through many steps of code conversion to produce binary files that are compatible with UniFLEX. The extra steps make it quite slow (though still in line with some of the slower compile times listed in UNIQUE), so we'll wait until we finish our own C compiler to provide you with 68000 benchmarks. We did compile the "getpid.c" program and found it to execute in 3.9 seconds on an 8-MHz 68000 UniFLEX system.

Sincerely yours,
Daniel E. Vanada, Vice President
Technical Systems Consultants, Inc.
111 Providence Road
Chapel Hill, NC 27514

Thanks for the results and for throwing down the gauntlet!
-- DF

More Benchmarks

After talking to a large number of concerned people, we have decided to standardize on the following benchmark for our "quickie test". While our original benchmark (the famous "hello.c" program) was easy to type in, it didn't test much beyond the speed of running the compiler. Our new benchmark gives you this, plus a rough indication of the CPU and system call efficiency. Thanks to Martin Prowell (see **UNIQUE** Vol. 3, No. 2, p.7) for the initial suggestion. The program is as follows:

```
main()
{
int i=10000;
while (i--)
        getpid();
}
```

The results are obtained from both the compilation and execution off the above program, which we will call **getpid.c** for convenience. All three times for each run (real, user, and system) are recorded; and the compile results are given before the execution times (but

read further for the entire procedure).
As an example, these times were
obtained at Comdex or otherwise
recently:

Computer	R	U	S
Cadmus 9790, 30 ms disk	23	1.5	2.2
	4	.4	3.2
Cadmus 9790 (virtual)	24	.5	2.5
	7	.4	6.0
Codata 3300, 20 ms disk	14	3.0	4.1
	4	.1	3.2
Cyb Multibox, System V	29	4.0	4.0
	3	.1	2.4
Pixel 80, 40 ms. disk	15	2.0	3.1
	5	.1	4.7
Fortune 32:16XP (30 ms)	24	2.4	5.6
	5	1.1	2.9
Momentum 32/E	19	2.7	4.9
	5	.3	4.3

Then there's our UNIQUE Multiuser
Benchmark. We don't like the idea of
changing any standards, but feel justi-
fied in this case because of problems
when porting to non-UNIX systems such
as UniFlex or Idris that might not have
the same sort algorithm as UNIX.
Besides, we still haven't received many
benchmark results that we'd have to
invalidate. After some further conver-
sations with Paul Weinberg, we have
reconsidered our decision and have now
come up with a new CPU benchmark that
meets the original design criteria.
It's very similar to getpid.c, but uses
a larger loop. This is due partly to
the need to have it execute for around
30 seconds on most machines, and partly
as an extra test for 32-bit word han-
dling. We call it bigpid.c:

```
main()
{
long i=77777;
while (i--)
        getpid();
}
```

The selection of the constant may
have something to do with timing (it
happened right around Comdex, which you
recall was held in Las Vegas) but it is
easy to remember. You may notice a
disproportionate difference between the
user times when running this against
getpid, allowing for the change in mag-
nitude of course. The more a machine
uses true 32-bit architecture, the less
the difference. It's also a handy
thing to use on UNIX-based mainframe
class machines, although I think the
Cray 2 will need a longer loop for you
to notice any time whatsoever. Anyway,
compile and strip the output, and use
it for cpu.proc in your benchmarks when
you send them in.

Next issue, you'll see the results
of our complete "quickie" benchmark,
performed on many of the machines at
UniForum. If you want to follow our
procedure and build up the machine
database, here's how:
1. Create the source files getpid.c and
bigpid.c.
2. Do a "ps -ax" or "ps -elf" to make
sure no other jobs are running in back-
ground, which would invalidate the
results. (If you're superuser, kill
everyone else's jobs and shells --
they'll surely appreciate it.)
3. Time the compilation of getpid.c
(real, user, and system times).
4. Now get the real times for two
simultaneous compiles. We use a command
line similar to this:

```
time cc getpid.c -o getpid & \
time cc bigpid.c -o bigpid
```

5. Then record the real, user, and sys-
tem times for executing getpid and

bigpid.
6. Finally, write it all down, include the name and model number of the computer you're testing (along with any out-of-the-ordinary configuration information) as well as your name and company, and send it to Benchmarks, PO Box 849, Denville, NJ 07834.

Meanwhile, here are some results to show you what other machines can do on our UNIQUE Multiuser Benchmark:

Plexus P/35 and P/60
(using file system)

	lone	load	2*load
cpu	14.5	30.6	53.1
term	30.3	31.5	34.3
disk	12.0	32.2	54.1

Plexus P/40
(using raw disk)

	lone	load	2*load
cpu	23	41	79
term	30	32	35
disk	22	28	62

Altos 586-10, XENIX 1.0
(using raw disk)

	lone	load	2*load
cpu	28.5	62.5	115
term	47.5	69.3	124
disk	31.5	81.5	152.5

Cadmus 9790, SIII, non-virtual
(using raw disk)

	lone	load	2*load
cpu	30	77	168
term	27	46	58
disk	23	49	102

Cadmus 9790, SIII, non-virtual
(using file system)

	lone	load	2*load
cpu	30	100	211
term	27	56	136
disk	43	82	250

Notes:
1. All the above used the resident sort program, not the modification with bigpid. So they all have to be done over again (groan). While you're at it, change the **disk.proc** program (when using the file system) to use **bs=4096**. This will give fair results using any file system: V7, SIII, SV, or Berkeley. We'll shortly publish a corrected reprint of the **entire** benchmark procedure, and it will be FINAL!
2. Note the difference in performance on the same machine between using the raw disk and going through the file system.
3. Thanks to Marc Ries for the Altos times and Paul Weinberg (of Plexus) for the Plexus times.
4. I'm not sure of the other systems, but the Cadmus is using a Maxstor disk that is specified at 30 ms. access time, though I'm told it's actually faster than that.
5. All times are in seconds. Please use a similar format when sending your results in.

Call for Product Literature

Due to the voracious interest in specialized software packages (especially applications) we are putting out this call for information on any and all such software whether it is available now or scheduled for future release. Subject headings include but are not limited to:

Accounting/Financial
Communications/Networking
Compilers/Assemblers/Linkers

Graphics and CAD/CAM
Health/Medical/Dentistry
Languages other than C
Manufacturing
Office Automation
Professional Management (ex. PERT, Gantt, Critical Path Method charts)
Professional Time/Billing
Software Tools/Programming Aids
Text Editors and Word Processors

We are also interested in vertical market packages designed for use in special markets such as: non-profit organizations, advertising, real-estate, and the legal profession. We will use the information you send us (and which we collect from other sources) to create easy to use charts, organized by category, as this seems to be a popular form for rapid look-ups. Of course, by their very nature, you can't put much detail into charts, and they can rapidly become out-of-date, so look for our in-depth coverage of these products throughout the coming year. These charts will be published in subsequent issues once we have accumulated a reasonable number of products for that category. So if you want people to know about your company's products -- send us your literature and we'll have something to work with.

University of California, Berkeley
College of Engineering
Dept. of E.E. & Computer Science
Berkeley, CA 94720

Those marvelous folks who have brought you a variety of enhancements to UNIX over the past few years have recently announced their new three-year plan which includes four separate projects related to Berkeley UNIX. This work is made possible by a three-year contract from the Defense Advanced Research Projects Agency (DARPA). The **Computer Systems Research Group** (CSRG) which will perform this work as well as the ongoing refinement of 4.2BSD, is currently headed by Mike Karels.

The aim of the first project is to design "mechanisms that can provide for distributed access of files and other resources within networks of single-user workstations running under Berkeley UNIX." Their concerns will include maintaining some semblance of rapid response time, memory requirements, and preventing remote facilities from being swamped by users.

The second project will study the feasibility of creating a distributed name server. This will provide the users of the DARPA Internet with a database containing information on all the resources, users, and servers on the DARPA Internet.

Project number three considers the problems of local area networks, including both single-user workstations and multi-user machines, with special attention to maximizing the utililization of available system resources. Their goal is "to design and implement a viable load balancing scheme that can be made to fit a variety of configurations within their individual environments."

The fourth project involves designing a "debugger for distributed programs" and a measurement instrument both of which will monitor network activity. The debugger will trace network activity, and to do this, it will be created with the capacity to control, process, and monitor messages as they move through a given network. The measurement instrument will track the time necessary for each step of a given process plus the cumulative time used to complete the entire process.

The C Line Goes to the Bottom

We started **The C Line** in January 1983 as a free public access system that people interested in UNIX and C could use to compare notes, gripe about problems, ask for help, offer solutions and handy tips, seek employees, and keep in touch with each other through an electronic grapevine that is more low-key than Usenet. Over 2 MB of free public domain software was there for anyone to take and use. A number of times during the past year we found that software had been destroyed, and our hardware (mainly the floppies) abused by hours of disk access caused by a perpetual loop, and similar problems. Yet we salvaged what we could and kept The C Line going. The last straw came when someone apparently deliberately erased all the files on a UNIX system hard disc. Yes, we had security. But there are always holes that someone can creep through if they try hard enough (and we do mean creep). We have decided not to reinstitute The C Line as a pay-as-you-go system with monthly billings, as some had suggested. That's just not our area. Would-be operators of similar systems, you have been warned.

Applications

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The Counselor System is a menu-driven, integrated financial package designed for small to medium sized law firms. The package has five main menus and 60 sub-menus which allow the user to keep track of their working diary, general ledger, fees, costs and billing, and analysis reporting. The Counselor System enables you to designate your own choice of codes for clients, matters, attorneys, and type of transaction. The software allows the use of default values for the data fields, and provides extensive help information for those who need it. A special program will generate forms for gathering the necessary information for entry into this system. The entry of new transactions or disbursements will automatically cause all relevant areas to be updated, and these updates can be tracked via the system's audit trail.

The special segments of this package are: **Diary** which acts as a calendar, keeping track of future activities and appointments sorting them by attorney, client, or series of days. One of the more interesting features of I "General Ledger" is that the program allows you to compare billing/performance activities to your budget. Of course, it integrates all the information made available through the other segments of the system. A variety of reports can be generated to show your recurring entries, a chart of all accounts, a profit and loss statement for each period, and a detailed look at all journal activities during a given period of time. The **Fees, Costs and Billing** will process flat fee or hourly rates, and non-billable entries. Cash receipts can be processed through three methods: by crediting individual statements, posting monies received to a client's oldest statement, or by decrementing your retainer. You can also create an aging report with 30 day increments and a printed receipts journal. There are a series of pre-defined descriptions (narratives) which the user can add to and select. There is also an option to prevent these narratives from appearing on a printed statement. Pre-billing reports will show a statement before the hard copy is produced and can be amended at that time, if needed. Ten print options which will vary the layout of the

statement are available for each client, and explanatory material can be added. **Analysis Reporting** provides a variety of reports designed to keep detailed records of all activities and payments for every attorney and client on the system. There are over ten possible reports, including aging, client mailing list, matters, transactions, breakdown by individual client or attorney, and cash receipts.

The Counselor System was ported from high-capacity (hard disk MP/M type) multiuser microcomputer systems and so shouldn't have the problems some large applications packages sometimes do when ported "down" from minicomputers. The full package lists for $6000, with substantial dealer/OEM discounts, and currently runs on Onyx computers. As the first (to our knowledge) "legal" package for the UNIX market, The Counselor System will probably be in demand by systems houses who never had time to write something like this themselves.

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Sun has a bimonthly **Third Party Program Bulletin** which covers software products that are available to run on their Sun Workstations. Among the newly licensed products covered in the first issue are: **EMACS,** the text editor and **LEX,** the word processor from Unipress Software (see **UNIQUE** Volume 3 Number 2), **MISTRESS** an RDBMS from Rhodnius (see same issue as above), and **Data-views** a graphics package from Intelligent Software Systems (see **UNIQUE** Volume 2 Number 10). Two new languages are Telesoft's (San Diego, CA) **ADA** compiler, and **MAINSAIL** (tm) which consists of a source level debugger, a full-screen editor, a portable performance monitor, a runtime system, and of

course, the compiler, all created by XIDAK, Inc. (Menlo Park, CA). Also available are Unilogic's (Pittsburgh, PA) document preparation software product called **SCRIBE** (Registered trademark) and Lucasfilm's (San Rafael, CA) **CADroid,** a logic design system which uses the Sun optical mouse and was created as an aid for circuit designers.

Instruction and Training

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Bunker Ramo, which has been training their employees and customers for 50 years, offers a several introductory and advanced UNIX and C training courses for those who are interested. These courses are usually for five day periods and course requirements are reasonable. They provide one terminal per student, as well as course materials and documentation for the students to take home. Courses include advanced and introductory courses in C and UNIX, a management and marketing workshop, and a course on other UNIX-related subjects. The last course covers topics such as: Berkeley enhancements, **SCCS, awk, lex, yacc, uucp,** and other tools normally associated with UNIX. The one-day management course provides non-technical individuals with a feel for what the UNIX operating system is all about, using video, lecture/discussions and actual practice on a UNIX system. Prices for the five day courses are $750 each, for the marketing course the cost is $200. Discounts for groups are available.

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About InfoPro Systems

After a popular series of articles on UNIX by David Fiedler appeared in *InfoWorld*, InfoPro Systems realized the need for an authoritative periodical to cover this relatively unknown subject and so we began publication of The UNIX Software List in April 1981. Originally a quarterly, we went monthly with Volume 2, and the title was soon changed to UNIQUE: Your Independent UNIX and C Advisor. UNIQUE has now grown to have the largest circulation of any UNIX or C related newsletter. Although we incorporated Pipes and Filters, the official newsletter of Uni-Ops, in March 1983, we remain editorially independent of any user group, organization, or company.

Editorial Policy

UNIQUE regularly covers news of software, hardware, specialized services, companies and conferences that pertain to the UNIX operating system, its look-alikes, and the C programming language. Rather than just publishing names and addresses, UNIQUE evaluates vendors and their products as they relate to the marketplace, often from extensive direct experience. We also publish comparative benchmarks that we run on machines at shows, as well as those submitted to us by our readers. Occasionally we have feature articles and product reviews by a variety of people with UNIX background. Of course, opinions expressed in signed articles are not necessarily those of InfoPro Systems or UNIQUE.

Conflict of Interest Policy

As one of the few specialized sources of information about a very competitive field, we feel that it is important to be able to present information without any inherent bias. In order to maintain this stance, we have chosen not to accept advertising in UNIQUE. In a recent survey, our subscribers overwhelmingly agreed with this policy. Furthermore, we disclose, without details, any dealings with vendors so you may judge our objectivity for yourself.

About The Perchwell Corporation

The principals of InfoPro Systems are affiliated with this market research and consulting firm. The Perchwell Corporation helps firms involved with UNIX by performing services such as assisting companies in selecting and configuring UNIX systems, guiding the development of software products, evaluating promising startups for venture capitalists, and performing custom market research studies. The Perchwell Corporation also markets a mailing list of UNIX and C users. For more information, or a free brochure, contact:

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