

Berkeley Software for UNIX† on the VAX‡

(The Third Berkeley Software Distribution)

A new package of software for UNIX will be available from the Computer Science Division of the University of California at Berkeley in early December, 1979. This is a package of software for UNIX/32V† licensees, and includes a paged version of the kernel for the VAX, as well as a large number of other programs. The tape includes:

New Languages for the VAX

Interpreters for APL, LISP and Pascal. The APL interpreter is the PDP-11 version, moved to the VAX. The LISP system, known as “Franz Lisp”, is written in C and LISP, includes both an interpreter and a compiler, and is compatible with a large subset of MACLISP. The Pascal system is the instructional system which has been distributed previously for PDP-11’s‡. The language implemented is very close to standard Pascal, and features excellent diagnostics, and a source level execution profiling facility.

New System Facilities

The system is now fully and transparently demand paged. As distributed it will support individual process sizes up to 8M of data and 4M of program. These numbers can be increased to 16M bytes of data and stack and 16M bytes of program easily given the availability of a reasonable amount of disk space to which to page. Description is given of steps necessary to further increase these limits.

A new load-on-demand format allows large processes to start quickly. A *vfork* system call allows a large process to execute other processes without copying its data space. Virtual versions of the *read* and *write* system calls known as *vread* and *vwrite* permit fast random access to large files, fetching data pages as needed, and rewriting only changed pages. The system supports UNIBUS disk drives, and can access and update files on the console’s floppy disk drive.

A display editor

The tape includes the display editor, *vi*, (vee-eye) which runs on a large number of intelligent and unintelligent display terminals. This editor uses a terminal description data base and a library of routines for writing terminal independent programs which is also supplied. The editor has a mnemonic command set which is easy to learn and remember, and deals with the hierarchical structure of documents in a natural way. Editor users are protected against loss of work if the system crashes, and against casual mistakes by a general *undo* facility as well as visual feedback. The editor is quite usable even on low speed lines and dumb terminals.

Command and mail processing programs

The tape also includes a new command processor *csh* which caters to interactive users by providing a history mechanism so that recently given commands can be easily repeated. The shell also has a powerful macro-like aliasing facility which can be used to tailor a friendly, personalized, command environment. A new interactive mail processing command supports items such as subject and carbon copy fields, and distribution lists, and makes it convenient to deal with large volumes of mail.

Better debugger support

A version of the symbolic debugger *sdb* is provided which now can be used to debug FORTRAN 77 programs. The assembler has been rewritten and the C compiler modified to reduce greatly the overhead of using the symbolic debugger.

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‡VAX and PDP are trademarks of Digital Equipment Corporation.

Other software

Also included are a number of other useful packages including the circuit analysis program SPICE, programs to simulate the phototypesetter on 200 bpi dot-matrix plotters (these programs were moved from the PDP-11 to the VAX and a large number of fonts available on the ARPANET have been converted to the required format), a bulletin board program, routines for data compression, a modified version of the standard I/O library permitting simultaneous reads and writes, a slow-speed network for connecting heterogeneous UNIX systems at low cost (1 tty port per connection per machine and no system changes), and a new, flexible macro package for *nroff* and *troff* called *-me*.

Source code, binaries and machine readable versions of all documentation are included with the tape. We supply the magnetic tape on which the software is written.

To receive the tape make two additional copies of the the attached agreement, sign and return 2 of the 3 copies with a **check** for \$200 U.S. payable to "Regents, University of California," and a copy of your UNIX/32V license agreement to:

Berkeley Software Distribution for UNIX
c/o Keith Sklower
Computer Science Division, Department of EECS
Evans Hall
University of California, Berkeley
Berkeley, California 94720

We will return a fully executed copy of the agreement to you with the distribution.

Included with the tape will be two volumes of documentation. The first is a programmers manual (similar to UNIX/32V Volume 1) modified and updated to correspond accurately to the distributed system. The second is a volume of documents (Volume 2C) similar to the two standard volumes (2A and 2B) describing the major packages on the tape.

If you have questions about this tape they can be directed to Keith Sklower at the address above or at (415) 642-4972 or leave messages for Keith at 642-1024.