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DOS programs meet Unix

Software and add-in boards make PC applications at home with Unix

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SPECIAL TO CW

You can have your cake and eat it, too.

The IBM Personal Computer and the DOS operating system revolutionized the world of low-cost computing. However, when 10 or more people are working together, it is often more cost-effective to invest in a single high-performance minicomputer than in a network of personal computers. And for users who want features such as electronic mail, security, remote access and shared peripherals, a minicomputer running the Unix operating system does by design what many PC-based networks do only with difficulty and at great expense.

However, many organizations need to run DOS applications. They are generally cheaper, easier to use and frequently more powerful than anything in the Unix world. Many have no Unix counterpart; few software publishers are willing — or even able — to port their DOS applications to a Unix platform.

Many users moving from DOS to Unix would like to continue taking advantage of investments in DOS software, as well as the time their people have in-

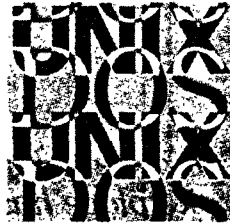
vested in learning DOS. With more than 40 million DOS-based PCs worldwide, more prospective employees know DOS than any other operating system.

That's why plug-in boards and software packages that allow Unix computers to run DOS programs have been growing in popularity. The boards, such as Sun Microsystems, Inc.'s SunIPC, replicate an IBM PC-compatible, using the host computer for the screen, keyboard, disk and printer. Unfortunately, like real PCs, the boards cannot be shared by more than one user at a time.

Another approach is to simulate the instruction set of Intel Corp.'s 8086 or 80286 PC microprocessors. Simulators, such as SoftPC from Insignia Solutions, Inc., let computers such as the Apple Computer, Inc. Macintosh or Sun workstations run DOS software. A simulator requires no additional hardware, but the "simulated PC" runs slowly: A DOS program running under SoftPC on a workstation will run only about as fast as it would run on an IBM XT or — on the fastest workstations — at

the pace of an IBM AT.

For people running Unix on Intel's 80386 and I486 chips, there is a third choice: Merge and VP/IX, two programs that can create "virtual PCs" using the "virtual 8086" mode of these advanced chips.



Each Merge or VP/IX process simulates an IBM PC, complete with a copy of MS-DOS. Running on top of DOS is a program called a redirector that intercepts all file I/O calls and maps them to the appropriate Unix calls, so the DOS application has full access to all of the files stored under Unix. This makes it easy to share files between DOS and Unix, as well as between DOS users on the same machine or over the network.

Both Merge and VP/IX let several DOS applications run simultaneously in windows or on a single terminal, using appropriate multiscreen software. DOS applications can even run on a serial terminal or over a modem.

Merge is also available for the Intel 80286. Because the 80286 does not have a virtual 8086 mode, Merge 286 must run the DOS application in "real" mode.

Thus, only one DOS program can be run at a time, and an ill-behaved one can crash the entire system.

Both Merge and VP/IX allow Unix programs to be run from DOS and vice versa. Accounts can be set up so that the user logs into DOS, bypassing Unix.

I've been using VP/IX on a 20-MHz 80386 computer since late last year. On the PC's keyboard and display, DOS applications run only a little more slowly than they would if I were running DOS instead of Unix — still faster than they would run on an 80286. The biggest benefit, however, is the ability to quickly swap from DOS application to DOS application and back into Unix without rebooting.

Unfortunately, Merge and VP/IX do not work with every DOS application. One problem is the complexity of DOS, which is littered with different ways of performing similar functions. Each function must be emulated perfectly by the redirector. Bugs in a redirector will prevent the running of some, but not all, applications. The Santa Cruz Operation supplies VP/IX with a list of programs that work with it; people interested in buying the product should consult that list first.

A second problem arises from the fact that a virtual PC isn't really a PC. Many communications packages, time-sensitive applications and programs that attempt to directly read and

write disk sectors will not always run as expected. Most copy protection schemes won't work either. DOS programs that require special plug-in boards, such as laboratory acquisition software, will generally not run.

Merge was written by Santa Monica, Calif.-based Locus Computing Corp. VP/IX was written by Interactive Systems, also in Santa Monica. Companies such as AT&T and The Santa Cruz Operation resell the programs for their own Unix offerings.

For an in-depth discussion of Merge and VP/IX, I recommend the book *DOS meets Unix*, published by O'Reilly & Associates, Inc. in Cambridge, Mass., and available in most computer book stores.

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