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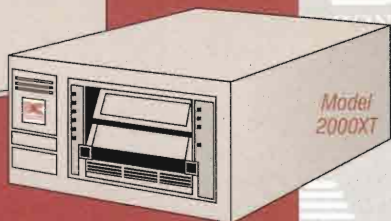
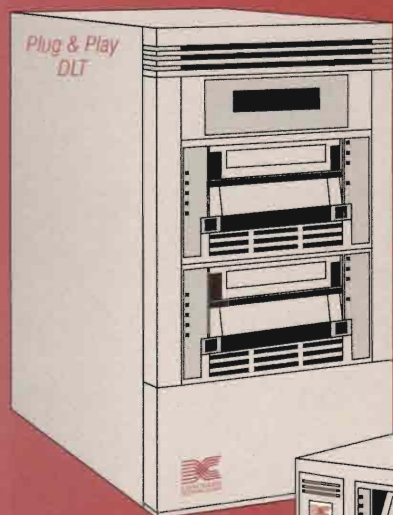
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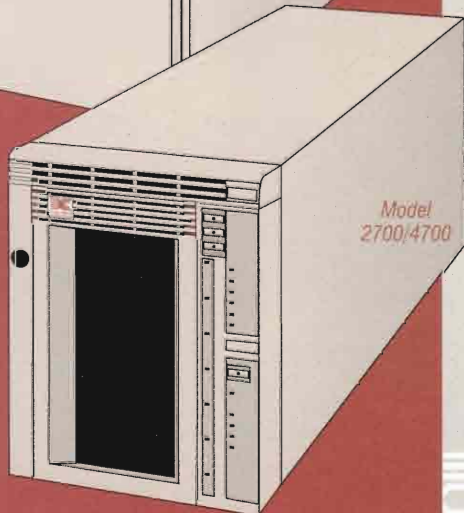
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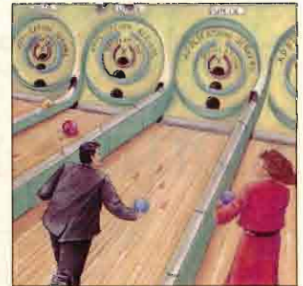
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Cover illustration by Ken Debrauski

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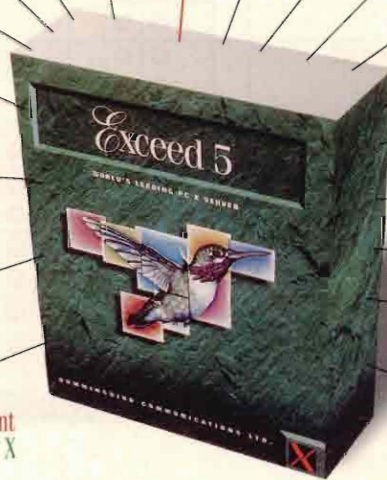
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Middle Of The Road?

Last month, President Clinton signed the Telecommunications Bill into law. Unfortunately, it seems that vague language like “indecent” and “sexual or excretory activities” included in the Communications Decency Act (CDA) portion of the bill could easily allow prosecutors to censor any literature from *Tartuffe* to *Fear and Loathing in Las Vegas*, as well as health and public safety information. Luckily, a federal judge in Philadelphia banned the government from enforcing the CDA law, which forbids the transfer of “indecent” material to minors over the network. The temporary restraining order is a byproduct of the lawsuit filed by the ACLU. The ruling is important because it challenges the use of the word “indecent.” Items deemed “obscene,” however, can still be cited as illegal. But the definition of obscene must go beyond pornography. Personally, I find a recipe for a pipe bomb extremely obscene.

The reaction on the Net to the CDA ranged from “black-outs” to name calling — a lot of name calling. Very righteous. Very radical. Very useless. It’s disappointing when freedom of speech to so many translates into the right to offend others with your words — just because you can. I know — you’re making a point. But I think it’s already made. I suppose I could tell you: If you don’t like this magazine, don’t read it. But that would defeat the purpose of this publication — to communicate information and ideas — which I thought was also the purpose of the information superhighway.

Perhaps it’s time to rename the information superhighway, uh, superhighway. Maybe the “Opinion Autobahn” or the “Ego Expressway” would be more appropriate. Yes, there is information out there, but rantings, ravings and misinformation have become the norm not the exception. And, they remain hidden behind a gossamer veil of truth simply because they are “published” on the net.

Ultimately, it is up to individuals to control their own behavior. However, I believe the burden should fall on the Internet community, and not outside agencies, to self-police the Internet. The Internet, by design, is uncontrollable; but, it doesn’t have to mean that chaos is its future.

The concerns of parents over what their children may access are genuine. After all, a gun manufacturer wouldn’t sell a 12-year-old child a pistol and then claim that the parents should have been there to make sure the child didn’t buy it. An extreme example, but parents have a right to expect help — from the information producers and fellow consumers — in controlling what’s out there. That having been said, there should be an equal concern by parents about what their children may *not* be able to access under the CDA provisions.

So what’s the answer? I don’t know. If I did, I’d be raking in the royalties from the solution. However, I propose that the answer lies somewhere in between government censorship and online anarchy. The so-called community of Internet users should provide the means of enforcement. Many possibilities now exist that are worth exploring: better filtering products; rating systems; or an agreed upon policy that establishes some clear-cut rules.

As the debate over the CDA progresses over the next few months, it will be interesting to see who takes what side. Truly the Internet makes strange bedfellows.

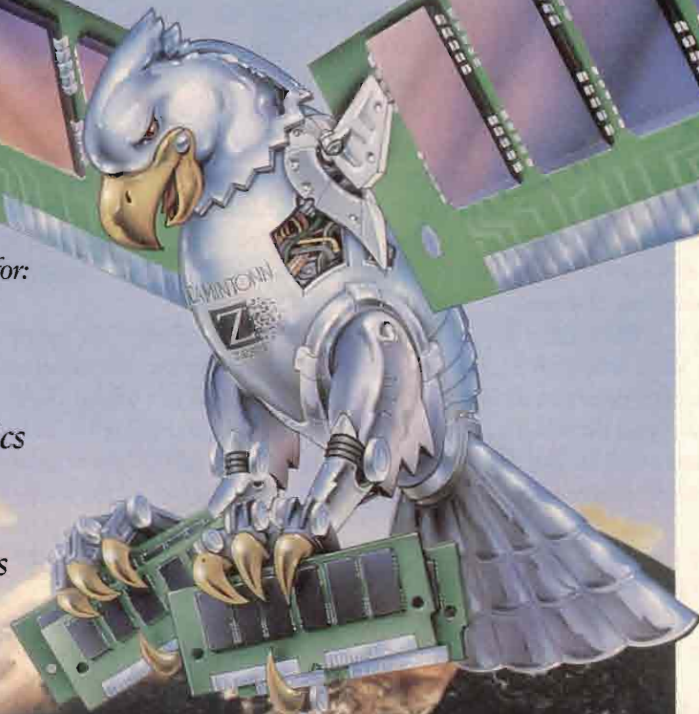


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INDUSTRY WATCH

George A. Thompson

HP-UX 10.10 ACHIEVES UNIX 95 BRANDING

Early last month with the announcement of enhancements to HP-UX 10.0, HP became one of an increasing number of vendors now promoting UNIX 95 branding for its operating system. Sounding suspiciously like Windows 95, the UNIX 95 brand is X/Open's Single UNIX Specification, providing a common API for UNIX (you may remember it better as SPEC 1170 or even as the Common Operating System Environment [COSE]).

"Applications written to the UNIX 95 API can now be portable across other branded UNIXes," according to David Valenta, HP product manager for HP-UX in HP's workstation system division. While certainly not the first vendor to claim UNIX 95 branding, HP has laid claim to the honor of being the first to deliver a UNIX 95-branded OS when HP-UX 10.10 began shipping to customers on February 20.

HP-UX 10.10 is binary compatible with all prior HP-UX releases and supports all of HP's current hardware. A two-user license is bundled with all HP 9000 workstations and servers.

Additional enhancements in HP-UX 10.10 include:

- ◆ Common Desktop Environment (CDE) compliance
- ◆ Dynamic Host Configuration Protocol (DHCP)
- ◆ OpenGL Support (with Portable Graphics Inc.)
- ◆ Upgrade path from HP Diskless to NFS Diskless
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- ◆ 3.75 GB Addressable RAM (previously 2 GB)
- ◆ 1.9 GB process data space (previously 0.9 GB)

- ◆ Shared Logical Volume Manager
- ◆ 60,000 file descriptors (previously 2,000)
- ◆ 48 LAN Card Support
- ◆ SMP support for HP's Visualize Graphics subsystems
- ◆ 4-byte Extended UNIX Code
- ◆ Network Information Services (NIS) Links within SAM ●

WEAVING A WEB TO BLOCK OUT THE SUN

HP so desperately wants to get a piece of the Internet action — it can taste it. So after announcing only its strategic intentions this past September, HP finally delivered the first product — the HP 9000 Web Server. The HP 9000 Web Server is bundled with HP-UX 10.10 and Netscape's Commerce Server software or Open Market's (Cambridge, Mass.) WebServer preinstalled. If the hardware seems familiar, it's because HP's Web Server is based on the recently introduced HP 9000 D-class SMP server (see Industry Watch, February

1996). Now available, prices begin at \$10,380 for an entry level D-class system with Netscape Commerce Server installed.

With its aggressively priced D-class systems and increasing interest in indirect channel selling, HP is swinging at the market sweet spot in the red hot World Wide Web server business. "The focus is volume to meet the demand for Web servers," says James Zepp, HP Internet product marketing manager. According to HP's figures, an HP 9000 Web Server Model D200 running Netscape's Commerce Server software delivers twice the price/performance of Sun Microsystems' comparably configured Netra Model i600 server running Netscape Communications Server software. Sun has been bundling the Netscape software on its Netra Servers for some time now.

As an added incentive, HP also is using a comprehensive program of products and services to convince Sun customers to migrate to HP 9000 Web Servers. As part of HP's TradeUp



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incentive program, customers could receive up to a 20 percent credit before purchase when they trade in Sun or Sun-compatible workstations or servers and purchase HP workstations or servers. "HP's solution is quite comprehensive and scalable. And it has priced the UNIX Internet box very attractively," says Angela Hey, client-server program manager for INPUT (Mountain View, Calif.), a market research firm.

With the Commerce Server and OpenServer software (both include encryption technologies), HP's concentrating more on the opportunities in the emerging *Intranet* or intracompany connections which depend more on reliable firewalls and secure encryption methods. "The intranet is eventually going to be cost-effective for distributing internal information. And probably lead to improved corporate communications," predicts Hey. She suggests there is a natural fit for the HP Internet servers in the telecom industry where HP is well established. "With a good services orga-

nization, HP knows how to deploy systems in a networked environment." HP, however, doesn't have the mind space that Sun has managed to achieved with Java, Hey notes. ●

WEB SLINGING WITH THE HP 3000

HP 3000 users, take heart. HP hasn't left you out of its assault on the Internet. No foolin', on April 1, HP's OpenMarket's WebServer, already bundled with HP's new 9000 D-class server, will be supported on every HP 3000 running MPE/iX 5.0 and higher. OpenMarket's Secure WebServer, which includes SSL and S-HTTP encryption will be available in the second half of the year 1996. The price of the Web Server software starts at \$1,650.

Although TCP/IP is already bundled with MPE/iX 5.0, firewall solutions will require you to purchase an Intel Pentium-based server or HP-UX workstation as an application (firewall) server,

which would add another \$5,000 to the hardware cost. Currently, Raptor (Waltham, Mass.) and Checkpoint (Lexington, Mass.) are the leading HP firewall vendors for both the HP 3000 and HP 9000 platforms. For the HP 3000, the Raptor solution is available from HP starting at \$12,500.

For more information, see the HP 3000 home page at <http://jazz.external.hp.com>. ●

NEW HP 3000 MIDRANGE SERVERS

Taking a page from HP's new K-class servers introduced last month, HP continues to update and upgrade the HP 3000 with new processors and technology. Four new HP 3000 Series 9x9KS servers — the 9x9KS 120, 220, 320 and 420 — were introduced earlier this month. Using HP's 120 MHz PA-RISC 7200 CPU with four times the data and instruction cache sizes (1,024 KB for each) as the previous 9x9KS models, the new HP 3000 SMP servers provide up to 20 percent more overall performance in one-, two-, three- or four-way configurations. "Our focus is on the midrange because that's the area most of our customers are interested in," says David Snow, HP's midrange product manager. "But all other HP 3000 systems in the 9x9KS product line are still available."

Upgrades to the 9x9KS series cost \$19,000 for each additional 120 MHz CPU (with 4x cache), but by getting return credits on the 80 MHz (\$8,000), 100 MHz (\$10,000) and 120 MHz (\$13,000) 9x9KS CPUs it becomes cost-effective for the HP 3000 to move up to the new systems. With the credits, you can move from an 9x9KS 400 (four-way with 256/256 cache) to a four-way 9x9KS 420 (four-way with 1,024/1,024 cache) for \$24,000, points out Snow. .

All upgrades are available immediately.

The 9x9KS systems are all eventually upgradeable to HP's forthcoming PA-8000 CPU which is expected to be available before the end of this year. ●

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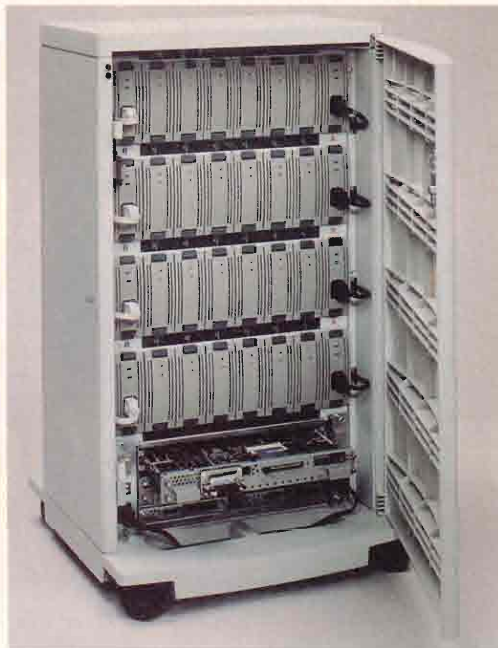
services such as on-site consulting, implementation assistance, and 24-hour hotline support are a key factor in Unison's consistently high customer satisfaction ratings.

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CIRCLE 139 ON READER CARD



Crime RAID Successful

that have been added.

TRW (Fairfax, Va.), a systems integrator, evaluated several options before deciding on the RAID Array 410. According to Ken Felmly, network administrator at TRW, the decision to go with the RAID Array 410 was primarily based on capacity. "The rackmount HP system has 2 GB disk modules that plug into the main enclosure with a maximum capacity of 10 GB," says Felmly. "With the RAID Array 410, we get 50 GB."

Because the production line handles as many as 1,000 fingerprint cards a day, it must store the fingerprint images and the data that comes off the cards for quick retrieval. Users are able to process new information and keep current transactions in the RAID storage. Then, at the end of the day, the system stores data offline to HP optical jukeboxes. Currently, the RAID Array 410 system is installed and running in Ohio, but TRW maintains control of the system. But, Felmly estimates giving the Bureau full control in the next three to four months.

With support for RAID 0, 3 and 5, you can survive the loss of a disk without any loss of data. Automatic monitoring, failover detection and

recovery and event notification allows for lights-out operation and real-time disaster recovery without operator intervention. The dual environment monitoring units constantly track the operating environment to enable early problem detection and recovery.

It has a performance of 2,600 I/Os per second. The RAID Array 410 can be configured with up to 24 drives per cabinet for up to 50 GB of capacity in a single enclosure. With enhanced firmware, the RAID Array 410 performance has been increased to 4,350 I/Os with a single controller configuration.

RAID Array 410 Subsystem is priced at \$23,052 for a 12.9 GB configuration, which consists of a six-channel SCSI controller with 32 MB read- and write-back cache, RAID software and an office expansion enclosure with redundant fans and optimized power supplies. Dual-controller configurations of the RAID Array 410 start at \$29,821.

The RAID Array 410 works with HP-UX, IBM AIX, Sun Solaris and SunOS. Support for Windows NT is planned for early this year.

— Deborah Schwartz,
Associate Editor

RAID ARRAY 410

- Works with HP-UX, IBM AIX, Sun Solaris and SunOS
- Configured with up to 24 drives per cabinet for up to 50 GB
- Price starts at \$23,052

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CIRCLE 352 ON READER CARD

Seems like a normal headline, right? But this isn't referring to your everyday police crack-down, this is talking about storage. And, if you work at the Ohio Bureau of Criminal Identification and Investigation (London, Ohio), it's the storage solution that prevents important information from being lost.

The AFIS project, an automated fingerprint identification system for the state of Ohio, uses Digital StorageWorks' (Shrewsbury, Mass.) RAID Array 410 with HP 715 and 735 workstations and an HP 800/I50 server running HP-UX 9.04. The technology is based on image processing and analysis, allowing customers who have databases of fingerprints to digitize them and rapidly search for fingerprint cards



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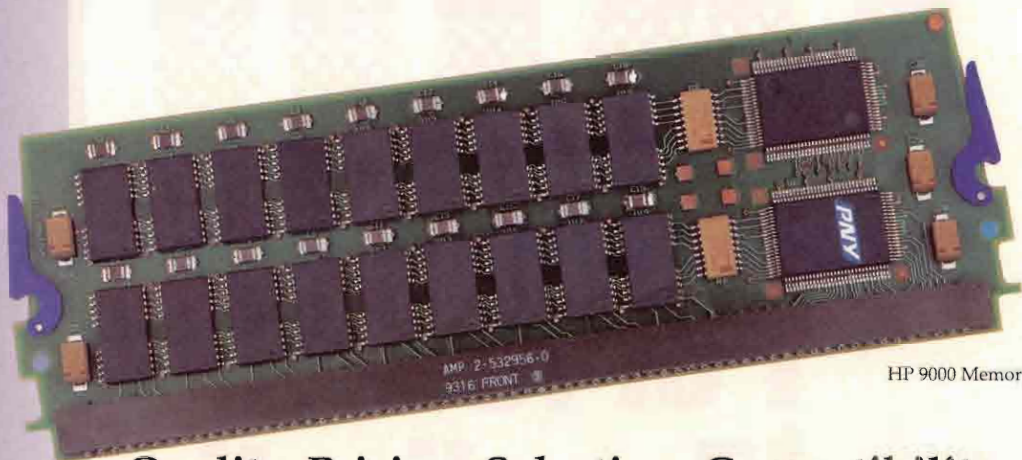
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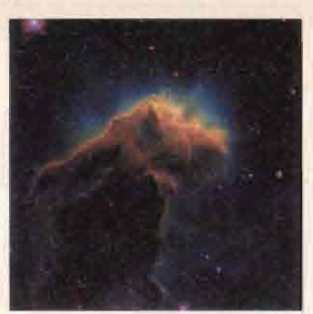
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As technology evolves and its applications grow more complex, so too does the data generated by today's scientists, engineers and researchers. This fact, above all others, is the reason behind the widespread use of data visualization technology as an essential element of desktop computing.

Perfect Visualization

The fundamental challenge shared by all technical professionals is managing and analyzing big datasets — often tens of gigabytes or larger. With continual advances in hardware technology, the challenge becomes more acute. Each new simulation technique generates larger datasets and each new measuring device captures ever bigger data, continually stressing the capabilities of the most powerful computers. With the aid of advanced operating systems and a new generation of desktop computers — for example, HP 9000 workstations — engineers and scientists have become quite proficient at generating data.

Where people have stumbled is in their ability to quickly analyze the data,

for it is the analysis that results in the actual creation or transfer of knowledge. Desktop visualization tools, such as Research Systems' (Boulder, Colo.) IDL, help solve that problem — they allow people to gain meaning and understanding from their large, complex datasets.

For example, Amir Najmi, Ph.D., uses an HP 735 workstation at the Johns Hopkins Applied Physics Laboratory. He and his colleagues are developing optimal processing methods for electromagnetic and acoustic data. According to Najmi, visualization tools that allow him to import and process large datasets and visualize the results give him confidence that his efforts will not be hampered by software limitations.

■ D a v i d S t e r n ■

Hubble Space Telescope image, processed using IDL, reveals newborn stars emerging from evaporating gaseous globules 7,000 light-years away.

Credit: Jeff Hester and Paul Scowen (Arizona State University), and NASA.

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CIRCLE 247 ON READER CARD

VISUALIZATION

The most successful desktop visualization systems allow technical end-users to be self-sufficient by providing functionality that lets them build their own custom applications, without requiring the support of dwindling software development resources. Today's

desktop visualization tools combine programming flexibility with powerful GUI building widgets. The resulting applications are GUI-driven, easy-to-use and tailored to specific user needs.

Ben Penaflor, an engineer at General Atomics (San Diego, Calif.), is building

a GUI-based application that controls plasma produced by an experimental fusion reactor. The ability to easily change over 500 operating parameters was a primary system design requirement. In addition, the plasma control system required an interface that could

HEAVENLY GRAPHICS

We live in a world of numbers. Phone numbers, fax numbers, PINs for automatic teller machines and calling cards, social security numbers ... the list goes on and on. And that's just in our personal lives.

Businesses are inundated by numbers; reports, analyses and projections, which result in avalanches of paper in storerooms and warehouses, and in ever larger computer storage mediums.

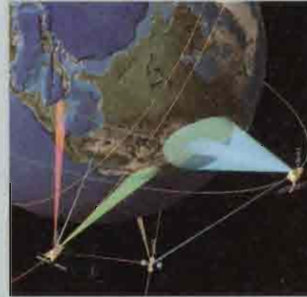
This would be reason enough to look for a better way to deal with all these numbers — with all this data — but there's a more important one. In many situations in which the numbers represent complex variables, planning, analysis and problem solving can be extremely difficult if not impossible.

Nowhere is this more true than in the space industry where a revolution is taking place in the approach to mission planning and analysis. Off-the-shelf graphical analysis software tools are gaining acceptance in the space industry, and not a moment too soon. With numerous plans for private constellations of communications satellites in various stages of planning and implementation, many satellite builders and operators have turned to graphical tools like Analytical Graphics' Satellite Tool Kit (STK) and Satellite Tool Kit/Visualization Option (STK/VO) to understand and display their mission data in a four dimensional format (4D; the usual three spatial dimensions plus time), and to increase the cost effectiveness of their operations.

Take the case of Bob Cenker, for example. Cenker is a former astronaut who flew aboard the Space Shuttle Columbia in 1986. An aerospace and electrical engineer, he is now a private consultant to companies entering the commercial space business. Currently, Cenker is analyzing a planned low earth orbit (LEO) satellite constellation involving six satellites circling the earth in three orbit planes.

While this may sound complicated to the non-rocket scientist, Cenker explains that it is really one of the most straightforward of the various possible satellite constellations. "The way the system works," he says, "requires that you have contact between your customer, a satellite and a control center. That sounds like a simple problem, but in reality, when you combine it with orbital motion, it just turns into a nightmare." Cenker's current project involves a data communications satellite constellation, which he is evaluating in order to determine what level of service the operator can offer its customers — for example, how frequently data can be provided or what level of service can be delivered if one of the six satellites malfunctions.

He explains, "Imagine you own a gas line and that there's a pump on the gas line for which you need to know the bearing temperature on a regular basis to make sure it isn't going bad. The current way of measuring this might be to send a technician out to that pump once a week to check on the temperature. By equipping the pump with a transmitter that can send that infor-



mation via a satellite to your operation center, you can check the condition of the bearing on a daily or even more frequent basis." The importance of this is that if the pump begins to fail, you will know about it much sooner and may, in fact, catch it before it fails completely, enabling you to dispatch a crew to do preventive maintenance.

This sounds like a great system, but customers have many questions which need to be answered before they contract for the service. They want to know what percentage of the time the transmitter — such as the bearing transmitter in the previous example — will be in communication with their receive station. Or, how long a wait there will be between communication windows?

The satellite operator also has questions that need to be answered before firing these six satellites into orbit. How much will each satellite be used? What percentage of the time will the transmitter on each satellite need to be powered up? How much battery and solar array will be required to provide the power needed for the transmitter? Where will the sun (which powers the solar panels) be in relation to each of the satellites?

These are exactly the types of questions graphical tools help mission analysts answer, providing analysts like Cenker with the ability to gain a clear and accurate understanding of complex geometries changing over time. It provides users with a set of generic tools which enables them to access satellite data, determine sensor coverage and swath, establish ground station coverage, study lighting conditions, calculate satellite position and attitude, and propagate orbits.

Analysts then create instant visual representations detailing the complex inter-relationships between satellites, ground stations and other targets, and by making it easier to see the big picture, shorten project time lines and reduce costs. —Paul Graziani is president and chief executive officer of Analytical Graphics Inc. (King of Prussia, Pa.). STK and STK/VO run on HP's 9000 workstations with Evans and Sutherland (E&S) Freedom Series graphics accelerators.



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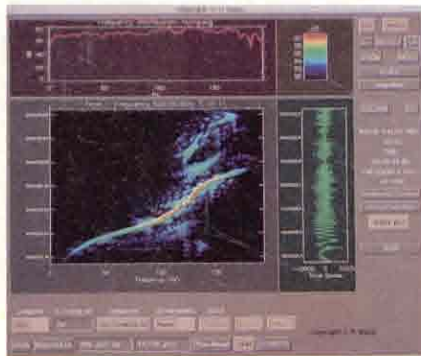
VISUALIZATION

simultaneously interact with a number of concurrent processes, enabling Penaflor to send and receive information from various working routines.

Clearly more people would employ visualization technology if the difficulty decreased. With modern tools, ease-of-use is no longer a major hurdle. Whether the tool of choice is a high-level programming language or a pre-built point-and-click application, today's ease-of-use greatly exceeds the "good old days" of programming in C or FORTRAN.

Users of a high-level 4GL get the added benefit of interactive development. Because concepts and changes can be seen immediately — without the tedious edit-compile-link cycle required by traditional languages — applications built with 4GLs that include visualization routines, numerical analysis routines and interface development tools require far less coding and are completed in less time. This interactive nature of an efficient 4GL supports rapid prototyping, a critical element of software development. "Once I have an idea, I can quickly prototype that idea and see the results almost instantly," said Johns Hopkins' Najmi.

Najmi found programming in FORTRAN and C unsuitable to the work of a researcher who is thinking of new methods that require rapid



Display of time-series data and its Wigner distribution showing a visual representation of a whale-song using an HP 735 and IDL.

implementation, testing and evaluation. "I had basically given up on programming and left it to the professionals, because it just was not practical in my work. It took weeks or months to try out new methods, implement the winners, debug the program and see results," Najmi said. "That all changed once I discovered the power and flexibility of a 4GL. In the past three years, I have written and tested more than 100,000 lines of IDL code. That is a task I simply would not have been able to complete using FORTRAN or C."

Widely embraced desktop visualization tools must also be *useable* systems, meaning they must be useful in many types of applications, work with data from any data source, and run on many types of computers. This last point is especially critical because of the work-

place network of the '90s. Today's work environments contain a heterogeneous mix of UNIX workstations, PCs running Microsoft Windows or Windows NT, and Apple Macintoshes. The freedom to choose appropriate hardware requires platform-independent code.

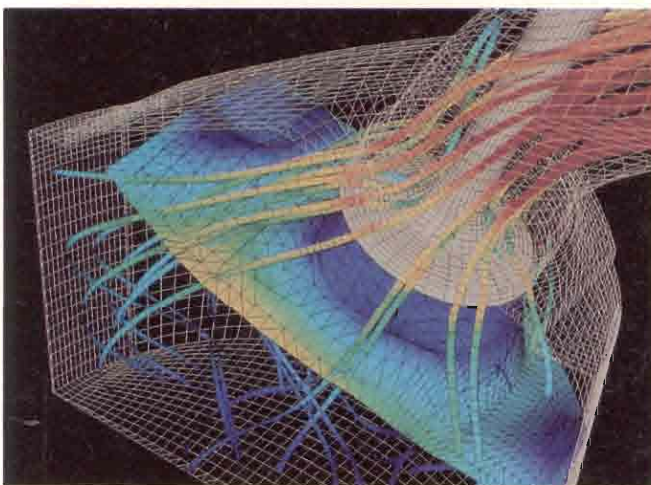
Andy McIlroy, an engineer at The Aerospace Corp. (Los Angeles), tests

new ignition methods for satellite propulsion systems and develops combustion formulas that are less damaging to the environment. For the past three years, McIlroy has used visualization tools on a variety of platforms including Power Macintoshes, IBM RISC workstations, and Intel-based PCs running Windows 3.1 to manipulate and display data.

An emerging trend is the intuitive nature of desktop visualization systems — users can focus on the "what," not the "how." The new breed of visualization tools provide pre-coded building blocks for commonly-needed procedures. These components are in-place and can be used as is, or they can be modified to the user's specification. The intriguing aspect is not that the components are customizable — although this is invaluable for solving the many disparate problems for which data visualization is used — it is the fact that the software contains such "thinking aids" in the first place.

The final issue driving desktop data visualization holds true for all desktop software: affordability. Thanks to advances in microprocessor technology, chip power roughly doubles every 18 months. According to Moore's Law, this doubling has occurred for two decades and will continue for another couple of decades.

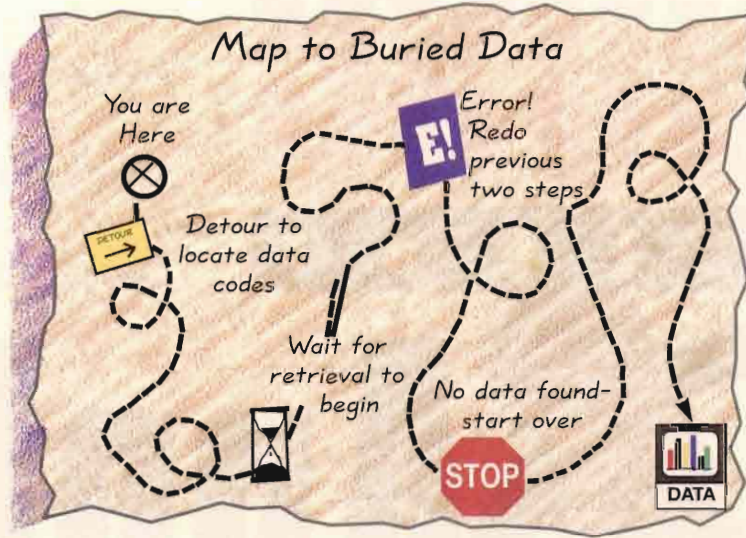
Today's Pentium-based PCs and Power Macs can perform typical visualization chores that previously were reserved for high-end workstations and servers. Likewise, today's workstations mirror the performance of older supercomputers. As a result, users expect to pay lower prices for desktop hardware and the software they intend to run on their new machine. Successful vendors of visualization software have acknowledged this trend and are continuing to develop useful products at affordable prices. —David Stern is founder and president of Research Systems Inc. (Boulder, Colo.), a developer of IDL, ENVI and the Visible Human CD graphic visualization products.



Another example of data visualization is EnSight, an advanced CFD/FEA postprocessor from Computational Engineering International, Inc. (Research Triangle Park, N.C.) which is used to visualize unsteady air flow in an engine intake valve.

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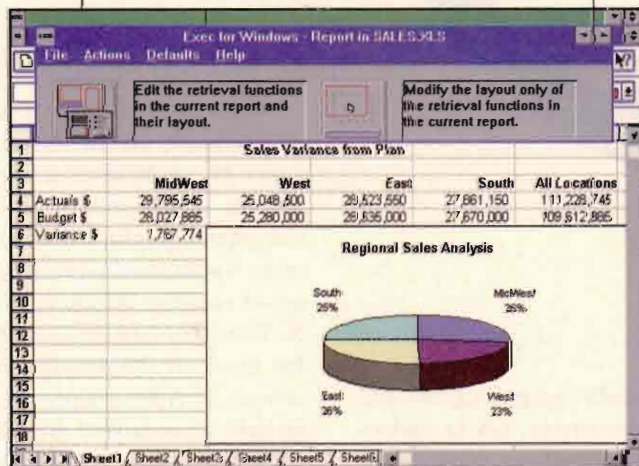
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CIRCLE 154 ON READER CARD

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J I M E S C H

The art of successfully integrating the PC with UNIX environments lies in understanding your technology options. If you've already invested in X terminals or if you're upgrading more than a few aging PCs, you can think about taking advantage of an application server dishing out Windows applications to your desktop clients. If you already have PCs on many of your desks, you've probably already thought about or implemented PC X Servers. On the other hand, workstation users, united by a historical disdain for PCs, can opt for

good old fashioned software-only DOS/Windows emulation.

Windows application servers, a new technology category, are the latest rage for delivering native PC applications to the desktop. Like PC X Servers, which provide an X Windows System-compliant graphics display for networked PC users, application servers (usually an Intel-based server running Windows NT Server) provide an X Windows System-compliant graphics display for any TCP/IP networked workstation and X terminal. Advantages of application servers include: an improved display when working from an X terminal or workstation, so users can operate their Windows/DOS tools on much larger monitors with higher screen resolutions; and can have cut, copy and paste capabilities among and between their PC and UNIX applications. For IS managers, application servers centralized within a three-tier client-server architecture are easier to manage. And with the application running on the PC server, there is less maintenance per desktop client. Overall, application servers are less costly

than other alternatives.

The available application server solutions include:

- HP's 500 Windows Application Server (WAS)
- Insignia Software's (Mountain View, Calif.) NTrigue
- Tektronix's (Wilsonville, Ore.) Windows Distributed Desktop (WinDD)

UNIX ON THE PC

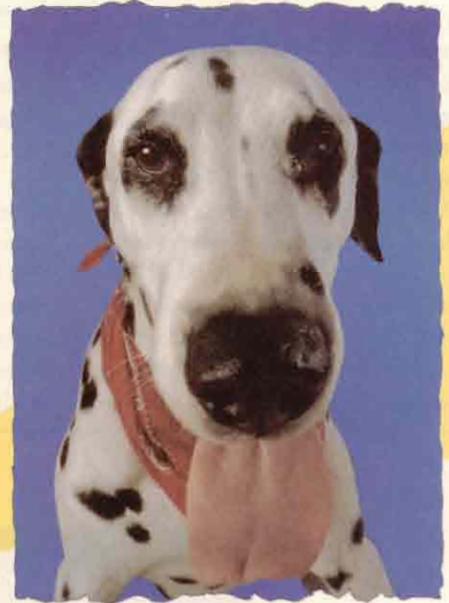
Some organizations have opted to move to UNIX on the PC. For instance, in 1994, Dr. Pepper Bottling Co. of Texas was in the process of replacing its IBM 4381 mainframe with SCO's Business Critical Servers. The full system, to be finished by late 1996, will include seven SCO-based servers. They will support application development, the vending maintenance database, route accounting and accounts receivable, the sales database, payroll, general ledger and fixed assets, purchasing and accounts payable. The SCO servers are integrated with two NetWare servers that support personal productivity DOS and Windows applications and file-and-print services. From Lotus SmartSuite or any Dr. Pepper custom report writer, users can use Visionware SQL-Retriever to connect to any external Informix database running on the SCO servers. One hundred of Dr. Pepper's 300 users work with X terminals. The other 200 use Windows PCs.

SCO's OpenServer Release 5 includes TCP/IP, IPX/SPX and POP network protocols; NetWare and LAN Manager gateway services; Wintif services; and Windows client backup and restore. The following add-on products are also available: Microsoft LAN Manager for SCO Systems, an advanced LANserver for client-server Windows environments; SCO WABI for SCO OpenServer; SCO Merge, for running DOS and Windows applications on SCO OpenServer systems; and Visionware's XVision, SQL-Retriever and PC-Connect products. —JE

Unlike Insignia's and Tektronix's products which use Windows NT Server, the HP 500 WAS uses a Pentium-based HP NetServer running SCO (Santa Cruz, Calif.) OpenServer Release 5. A "Xifier" (from Locus' Merge) runs on top of the operating system providing an X Window System display driver to any X-capable device on the network. According to

HP's estimates, the HP 500 WAS provides multiuser access to Windows/DOS personal productivity tools at speeds faster than a 33 MHz 486DX PC. Although the server software is available to run on any Pentium-based desktop with a configuration equivalent to the HP 500, it is sold as a pre-configured and pre-installed software/hardware combination with a 15 or 30

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user license. The HP 500 WAS 1.1 provides support for Windows 16-bit applications and Windows 3.x GUI. Windows enhanced mode also is supported. Windows 95 compatibility and 32-bit applications, however, have yet to be supported.

Like HP's 500 WAS, Insignia's NTrigue and Tektronix's WinDD can work on any Intel-based PC server. But by taking advantage of NT's multiuser capability (rather than SCO UNIX) they provide simultaneous access to PC applications running on any Intel 486- or Pentium-based server. Like the HP 500 WAS, the server manages remote user windows and performs all processing.

There are two parts to Tektronix's WinDD: the WinDD Server running Windows NT and the Tektronix's Xpress, residing on the local client. Display characteristics are handled by the local client, using Citrix's ICA protocol (as does NTrigue) reducing the load on the server. The ICA pro-

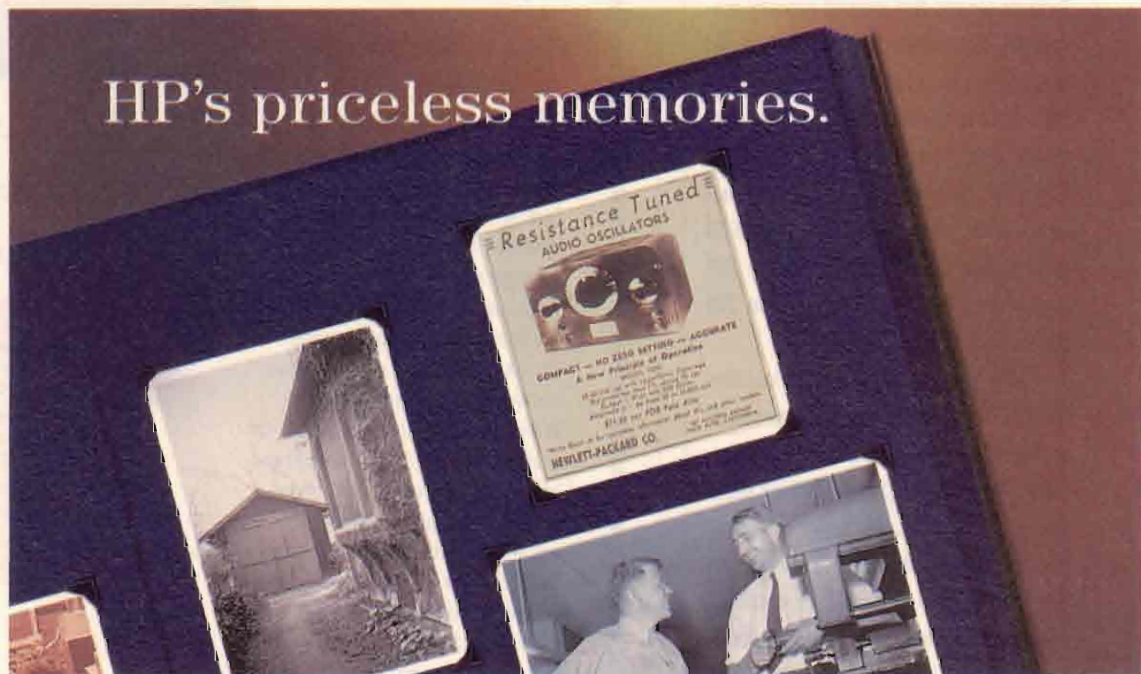
WABI 2.1 CERTIFIED APPLICATIONS

- Aldus PageMaker 5.0a and 4.0
- CorelDRAW 4.0 and 3.0
- Harvard Graphics 3.0 and 2.0
- Lotus 1-2-3 for Windows 5.0 and 4.0
- Lotus Ami Pro 3.1 and 3.01
- Lotus Approach 3.02 and 2.1
- Lotus cc:Mail 2.03 and 2.0
- Lotus Freelance 2.1 and 2.01
- Lotus Organizer 2.01
- Lotus Notes 3.3 and 3.0c
- Lotus SmartSuite 3.1 and 2.0
- Microsoft Access 2.0
- Microsoft Excel 5.0c and 4.0
- Microsoft Mail 3.2a and 3.2
- Microsoft Office 4.3c+
- Microsoft PowerPoint 4.0c and 3.0
- Microsoft Project 4.0 and 3.0
- Microsoft Windows 3.11 and 3.1
- Microsoft Windows for Workgroups 3.11
- Microsoft Word for Windows 6.0c and 2.0
- Paradox for Windows 5.0 and 4.5
- ProComm Plus 1.02 and 1.0
- Quattro Pro for Windows 6.0 and 5.0
- Quicken 4.0 and 3.0
- WordPerfect for Windows 6.1 and 6.0a

ocol compresses keyboard and mouse events sending them the data field of a TCP/IP packet. The server then decompresses the packet, executes the command and returns compressed screen updates, keeping network bandwidth usage low. The HP 500 WAS

uses more network overhead because it doesn't use a compression scheme. Although not widely accepted yet, ICA may yet become a standard for remote access.

NTrigue and WinDD both support 16- and 32-bit Windows applications



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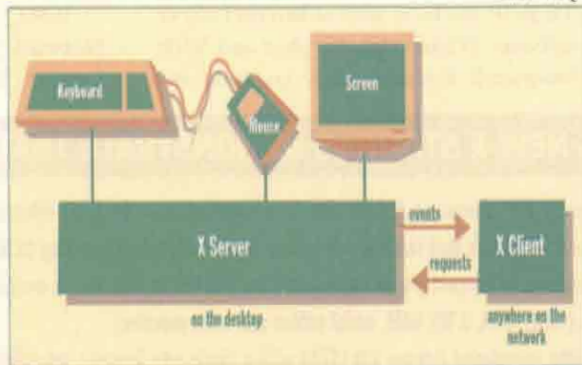
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and Windows NT applications. Each WinDD server comes with 10 floating licenses. Unlike the 15 or 30 user increments of the HP 500 WAS, license pooling limits software costs to the number of users using the software at any given time. WinDD 2.0 is compatible with Windows 95. WinDD for PCs provides dial-in access, as does NTrigue.

The philosophy behind application servers is simple: Instead of distributing PC computing power to each user and having that costly investment sit idle for much of the time, why not centralize the processing power on a server and distribute the information access to all users? Theoretically this reduces the cost of ownership, but how does it really add up?

According to Forrester Research (Cambridge, Mass.), large companies

Source: WRQ



spend about \$3,800 each year per PC for maintenance, technicians and downtime. Contrast that to the X Business Group's (Fremont, Calif.) estimate that X terminal network administration time is about one hour per month vs. five hours for a PC in a LAN environment. Another Achilles heel for PCs is obsolescence. Before you can say "Intel Inside," a new and improved PC is on the market. That means more upgrade costs.

Some analysts, however, claim that X terminal vendors exaggerate costs

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for PC hardware, software and maintenance. And they omit parameters like initial application cost, application training cost, X terminal software licensing and RAM cost. Another disadvantage is service and support. When an X terminal goes down, you may be locked into service by a single manufacturer. The servicing of PCs is cost-effective, much more flexible and, in some cases, can be done in-house.

X SERVERS LEAVE THEIR MARK

PROTECTING A large economic investment in PC desktops is the issue when it comes to PC X Servers. PC X Servers display UNIX applications via an X Window on desktop PCs, generally letting you cut and paste data between different systems. Because X Servers usually reside on the PC and the application resides on what is typically thought of as a server, X Servers seem to reverse the common meanings of client and server. However, despite the confusion it causes, where the application resides is beside the point (see figure on previous page).

A typical X terminal local client suite consists of the following:

- 32-bit High performance TCP/IP stack
- Telnet and Digital's Local Area Transport (LAT) protocol
- Serial X, SLIP, PPP and optimized remote X protocols
- Audio and Video Clients (extensions to the X Server)
- Multimedia MPEG local video
- Multiple Local Window Managers
- TN3270, TN5250 and VT320 terminal emulators
- SNMP Agent
- XIE Imaging and proprietary imaging extensions
- 3D PEX Extension

To compete with Microsoft's Windows 95, which now includes a TCP/IP stack of its own, PC X Server solutions are evolving into one-stop connectivity suites, which include

TCP/IP stacks as well as Internet client software (Telnet, ftp, Gopher and Web browsers). Because many corporations

WRQ's (Seattle, Wash.) Reflection Network Series 5.0, licensed from Age Logic (San Diego, Calif.) which

HP'S NEW X STATIONS DEMONSTRATE THAT THIN IS IN

In February, HP's Panacom Automation Division (Waterloo, Ontario) introduced **Entria Plus**, a new series of entry-level X stations that replaces all former Entria products. According to HP estimates, the **Entria Plus X** stations deliver a 30 percent performance increase. The **Entria Plus** also is available as an **HP 9000** graphics server console (Flash ROM, 8 MB RAM, serial cables and color monitor).

HP also introduced **Enware 7.0** (\$745 with a single site license), an enhanced version of its X station software, which now includes improved multimedia capabilities, better system management features, a new **CDE** local window manager and new local clients like Sun's **Open Look**. In a related announcement, HP also introduced an preconfigured "advanced multimedia" bundle (14 MB RAM, MPEG video expansion card) for its high-end **Envizex "p" Series X** terminals.

The **Entria Plus** is an example of a "thin client" (desktop systems with only the minimal software provided for local processing; most of processing is done on networked servers) which are being promoted as **@@lthe desktop solution@@SR** in client-server environments. In fact, X station vendor **Tektronix** (Beaverton, Ore.) has suggested the term "Netstation" be adopted industrywide to accurately reflect the nature of the new role for such desktops. — *George A. Thompson, Senior Editor*

still connect to mission-critical applications via character-based terminals, VT, ANSI and 3270 terminal emulators are also usually included. According to Eileen O'Brien, director at IDC (Framingham, Mass.), "products with VxD [Virtual Device Drivers] TCP/IP stacks have the greatest potential." IDC statistics also show that the compounded annual growth rate for PC and Macintosh computers using X Servers is 41 percent a year. Zona Research (Redwood City, Calif.) expects the PC X Server market to reach \$289.5 million by 1998.

Hummingbird Communications Ltd. (North York, Ontario) provides **eXceed**, a PC X Server with integrated TCP/IP and NFS applications. It was recently upgraded to version 5, and became available for Windows 95 and NT as well as the PC.

Network Computing Devices' (NCD; Mountain View, Calif.) **PC Xware 3.0** for Windows now includes an integrated TCP/IP suite. The **VxD** TCP/IP stack supports a new NFS client that integrates remote UNIX file systems into the Microsoft file manager and is compatible with the Microsoft TCP/IP stack. The TCP/IP facilities are available as a standalone product, called **Marathon**.

recently acquired by **NetManage Inc** (Cupertino, Calif.), includes not only TCP/IP, but also UDP/IP, LAT, NS/VT, IPX/SPX, ICMP, ARP and SLIP/CSLIP protocols. An NFS client with OLE compatibility lets users share OLE-compatible files from UNIX drives. An NFS Administrator is also included to ease NFS administration, including file permissions and translation options. Internet access programs include **Enhanced Mosaic**, a mail client, a newsreader, ftp, TFTP and LPR/LPD, along with application interfaces such as **NetBIOS** and **WinSock**. WRQ also has announced **Reflection X** for Windows NT, which supports the enhanced features of the **Win32 API** (Microsoft's 32-bit API). New features include shared memory support, enhanced security, inter-process communications (IPCs), network and Internet applications and mobile/wireless connectivity.

THE SINCEREST FORM OF FLATTERY

IF YOU WANT TO run a few PC applications directly on your UNIX workstation, then PC emulation (software-only replication) is the way to

go. The best known emulation options for running DOS/Windows applications on UNIX are Insignia Software's SoftWindows and SunSoft's (Mountain View, Calif.) Windows Application Binary Interface (WABI).

SoftWindows maximizes performance via device drivers that take advantage of UNIX-specific features. For example, the SoftWindows display driver maps Windows operations directly to X Windows and uses the host system mouse instead.

SoftWindows 2.0 now emulates the Intel 486 CPU instruction set and runs Windows in enhanced mode and includes a WinSock interface. Besides support for Novell NetWare, LAN Manager/Windows NT and Banyan VINES, SoftWindows 2.0 now supports Token Ring networks.

Companies Mentioned In This Article

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SunSoft's WABI 2.1 is able to run certain Windows applications on Solaris-based systems. Instead of interpreting each x86 binary instruction by instruction, WABI maps Windows function calls directly to native X services. Windows API calls are translated into Xlib calls, and Intel processor instructions found in Windows applications are converted to optimized native SPARC instruction sequences.

WABI 2.1 supports popular Microsoft Windows applications (see "WABI 2.1 Certified Applications" sidebar) like Microsoft Office and Lotus SmartSuite — on Solaris. You can cut-and-paste and drag-and-drop information between Solaris and Microsoft Windows applications, share files with other users and access printers from within Windows applications. WABI also can be run in a client-server configuration, which supports multiple remote users, including X terminals. WABI 2.1 takes advantage of the multimedia capa-

bilities provided by certified applications, and you can access databases residing on outside servers using open database connectivity (ODBC).

SunSoft's new WABIServer, like the application servers described above, salvages low-end SPARC systems and X terminals by configuring them as WABIServer clients. It manages Windows applications from one server to easily add new users and upgrade software, thereby reducing support overhead. WABIServer supports up to 16 simultaneous users per CPU. Clients also get remote (i.e., client-side) floppy disk access, allowing users to share files between computers. All WABIServer clients can access network files and printers. —*Jim Esch is a freelance writer, based in St. Louis, Missouri.*

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HP's Software DISTRIBUTOR

If software management is important to you, you're going to want to take a close look at HP's Software Distributor. Using Software Distributor, you'll be able to "push" software out to systems from a central location, "pull" software in from a central location and perform a variety of software management functions. The best part of Software Distributor is that it is based on a POSIX standard which means the commands you use for software management on different platforms will be consistent. This functionality is particularly useful in a highly distributed workstation environment.

Software Distributor as referred to in this article is two different products on HP-UX. The first is Software Distributor-HP-UX (commonly called SD-UX) that is used for software management on HP-UX 10.x systems. SD-UX comes with every HP-UX 10.x system. The second is Software Distributor OpenView (commonly called SD-OV), an add-on product which supplies some of the advanced software management functionality such as the "push" capability and support for managing software for non-HP-UX platforms such as AIX, Solaris and PCs running LAN Manager and Novell.

Software Distributor can be invoked using the commands described in this article, by using SAM which has a Software Management area or by installing software for the first time on a system.

FOUR PHASES

THE FOLLOWING are the phases of software installation performed with Software Distributor:

- **Selection** — You can select the source and software you wish to load during this phase. In the upcoming example the GUI of Software Distributor is used and you'll see how easy it is to select these. With SD-OV, you also could select the target on which you wish to load software

— remember the SD-OV "push" capability? You select the software you wish to load from a depot. Some examples of depots are a CD-ROM, magnetic tape or a "depot" directory from which software can be distributed.

- **Analysis** — All kinds of checks are performed for you including: free disk space, dependencies, compatibility, mounted volumes and others. Among the very useful outputs of this phase is the amount of space the software you wish to load will consume on each logical volume. This will be shown in the example.
- **Load** — After you are satisfied with the analysis you may proceed with loading the software.
- **Configuration** — It is possible the software you load requires kernel rebuilding and a system reboot. Startup and shutdown scripts may also need to be modified.

SOFTWARE MANAGEMENT

THE FOLLOWING is a list of some of the common software management related tasks you can perform with Software Distributor. In addition to implementing these commands, as per the POSIX specification, HP has also developed a GUI for some of these commands:

Installing and Updating Software. The **swinstall** command is used to install and update software. The source of the software you are loading can come from a variety of places including CD-ROM, magnetic tape or a "depot" directory from which software can be distributed. Using the depot, you can load software into a directory and then install and update software on other nodes from this directory. Software loaded from CD-ROM with Software Distributor must be loaded onto the local system; this technique is used in the upcoming example. You have a lot of flexibility with SD-OV only when selecting the target system onto which you

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want to load software and the source from which you will load the software. For instance, you can load software from a depot which is on another system on your network. This command can be run at the command line or with the GUI.

Copying Software To A Depot. The **swcopy** command is used to copy software from one depot to another. By setting up depots, you can quickly install or update software to other nodes simultaneously with SD-OV only. This command can be run at the command line or with the GUI.

Removing Software From A System. The **swremove** command is used to remove software from a system that has had software loaded with Software Distributor. This includes removing installed and configured software from a system or removing software from a depot. This command can be run at the command line or with the GUI.

List Information About Installation Software. The **swlist** command provides information about the depots that exist on a system, the contents of a depot or information about installed software.

Configure Installed Software. The **swconfig** command configures or unconfigures installed software. Configuration of software normally takes place as part of **swinstall** but configuration can be deferred until a later time.

Verify Software. The **swverify** command confirms the integrity of installed software or software stored in a depot.

Package Software That Can Later Be Installed (local system only). You may want to produce "packages" of software that can later put on tape or in a depot with the **swpackage** command. This packaged software can then be used as a source for **swinstall** and be managed by other Software Distributor commands.

Control Access To Software Distributor Objects. You may want to apply restricted access to Software Distributor objects such as packaged software. Using the **swacl** command you can view and change the Access Control List (ACL) for objects.

Modify Information About Loaded Software (local system only). The Installed Products Database (IPD) and associated files are used to maintain information about software products you have loaded. **swmodify** can be run at the command line to modify these files.

Register Or Unregister A Depot. A software depot can be registered or unregistered with **swreg**. This means you don't have to remove a depot if you temporarily don't want it used, you can unregister it.

Manage Jobs (SD-OV only). Software Distributor jobs can be viewed and removed with **swjob**. The GUI version of this command can be invoked with **sd** or **swjob -i**.

LOADING SOFTWARE FROM CD-ROM

THE FOLLOWING example shows, using Software Distributor, how to load software from CD-ROM to the local system. You can load software from a variety of media as well as across the network. The GUI used in this example makes the process of dealing with software easy. You don't, however, have to use this GUI. You can use the **swinstall** command from the command line specifying source, options and target.

Figure 1 shows the software selection window. To identify software bundles you wish to load on your system, you can highlight these and Mark For Install from the Actions menu as in the following example for The C/ANSI C Developers Bundle.

A bundle, such as the one selected, may be comprised of products, subproducts and filesets. You can select Open Item from the Actions menu if you want to drop down one level to see the subproducts or filesets. Figure 2 (page 30) shows Open Item for C/ANSI C Developers Bundle.

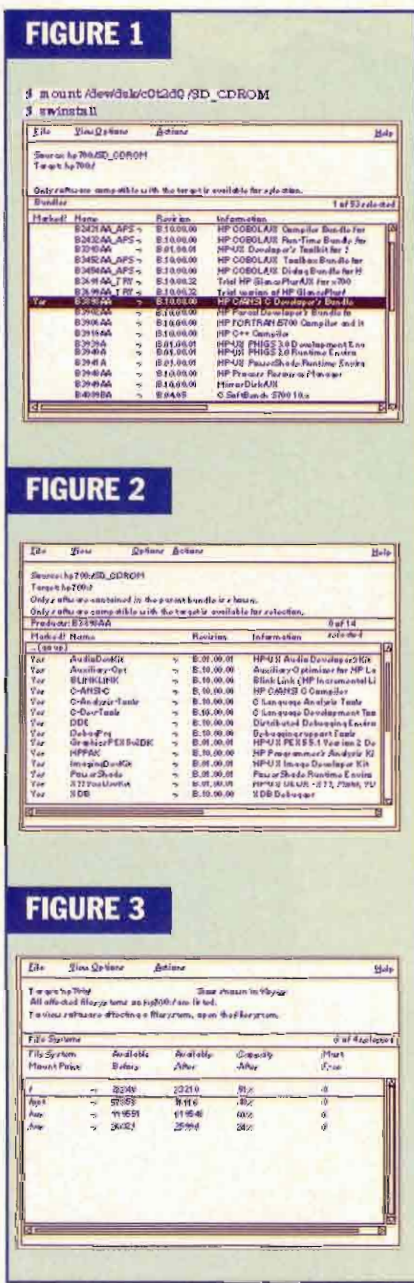
Figure 3 shows the Disk Space window which includes the amount of disk space available on the affected Logical Volumes before and after the software load takes place.

This window is a dream come true for system administrators who haven't traditionally had accurate information about the amount of space consumed by the software they are loading or the destination of the software they are loading. You also have menus here that allow you to further investigate the software you're about to load on your system.

After you are satisfied with the analysis information, you may proceed with loading the software.

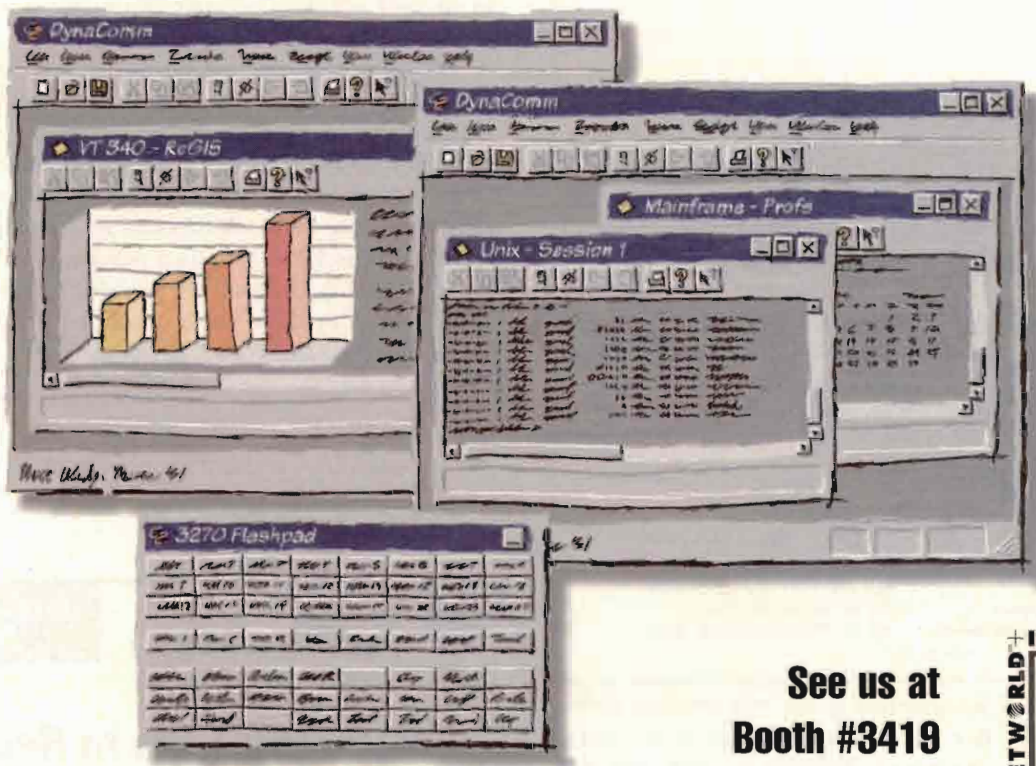
LISTING SOFTWARE

YOU CAN ALSO issue Software Distributor commands at the command line. One example is the **swlist** command. The **swlist** command is useful for viewing the software you have loaded on



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your system, the software you have loaded in a depot or producing a list of depots. A GUI to the **swlist** command is available in SAM. Example 1 shows listing software at the bundle level. The hierarchy of software in Software Distributor is as follows: bundle, product, subproduct (optional), fileset and files:

EXAMPLE 1

```
$ swlist - bundle
# various header information
# .
# .
# .
B3691AA_T      B.10.00.32   Trail HP GlancePlus/UX for s700
B3782CA        B.10.00.00   HP-UX Media Kit (Ref Only)
B3910AA        B.10.00.00   HP C++ Compiler
HPUXEngRT700  B.10.00.00   English HP-UX Run-time Environment
```

This system has the HP-UX runtime environment, GlancePlus/UX trial software, HP-UX Media Kit and C++ compiler.

If we run **swlist** to the product level, the following is produced (Example 2) for the GlancePlus/UX trial software, REV appears in place of the revision level:

EXAMPLE 2

```
$ swlist -l product B3691AA_TRY
# various header information
# .
# .
# .
# B3691AA_TRY          REV Trail HP GlancePlus/UX
B3691AA_TRY.Glance    REV HP GlancePlus/UX
B3691AA_TRY.MeasurementInt  REV HP-UX Measurement Intfc
(bundle)              (product)
```

GlancePlus/UX is comprised of the two products shown in this example. Are there any subproducts of which GlancePlus/UX is comprised? Example 3 below will help determine this:

EXAMPLE 3

```
$ swlist -l subproduct B3691AA_TRY
# various header information
# .
# .
# .
# B3691AA_TRY          REV Trail HP GlancePlus/UX
B3691AA_TRY.Glance    REV HP GlancePlus/UX
B3691AA_TRY.MeasurementInt  REV HP-UX Measurement Intfc
(bundle)              (product)
```

The output of the products and subproducts levels are the same; therefore, there are no subproducts in GlancePlus/UX. We can take this one step further and take this to the fileset level as shown in the following Example 4:

EXAMPLE 4

```
$ swlist -l fileset B3691AA_TRY
# various header information
# .
# .
# .
# B3691AA_TRY          REV Trail HP GlancePlus/UX
# B3691AA_TRY.Glance    REV HP GlancePlus/UX
B3691AA_TRY.Glance.GLANCE  REV HP GlancePlus files
B3691AA_TRY.Glance.GPM     REV HP GlancePlus Motif
# B3691AA_TRY.MeasurementInt  REV HP-UX Measurement Intfc
B3691AA_TRY.MeasurementInt.MI  REV HP-UX Measurement Intfc
(bundle)              (product)      (fileset)
```

With the **swlist** command and the **-l** option, we have worked our way down the hierarchy of HP GlancePlus/UX. Going down to the file level with the **-l** file option produces a long list of files associated with this product.

The other Software Distributor commands listed earlier also can be issued at the command line. You may want to look at the manual pages for these commands as you prepare to do more advanced Software Distributor work than loading software from CD-ROM or tape.

To system administrators familiar with HP-UX 9.x, this is a different organization of software, but the GUI of **swinstall** combined with the better organization of Software Distributor make this one at the advantages of HP-UX 10.x. —Marty Poniatowski is a technical consultant in computer-aided engineering for Hewlett-Packard in Stamford, Conn. He is author of "The HP-UX System Administrator's 'HOW TO' Book" (ISBN 0-13-099821-4) published by Prentice Hall PTR and distributed by CBM Books, a division of Cardinal Business Media, Inc. For ordering, call CBM Books at (215) 643-8105.

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A vi-able Alternative

Recently, I found myself talking to an upset colleague — upset at receiving 99 points on a test. At

first, it seemed a bit retentive to me. But the issue was not about getting a perfect score of 100, but of not being given credit for a correct answer. It's the same way I feel about **vi**. So this column is dedicated to **vi** lovers who can get into **vi**, edit files and get out again.

FIRST AID FOR **vi** ACHES

Why doesn't **vi** show you what file you're editing? Hit [CTRL]-G. The following appears in the status line (the last line of your screen) showing you the file, the line number and the percentage of the file depending on your location.

```
"March-vi" line 17 of 18 -94%
```

A simple fix for a common pain in the **vi** is the **:e** command. If you botch an edit, use **:e!** to reload your current file, discarding any changes made since the last save. Although the result is the same, don't use **:wq!** to get out of **vi** without saving. You then have to re-invoke **vi** and try again.

There are plenty of useful but *undocumented* command combinations; seemingly obvious once someone

points them out to you (but technically they are not commands — just combinations). Take the **dG** command combination: **G** means move to the end of this file (that is, delete from the cursor position to the end of the file). It often comes in handy; so does **d1G**, which deletes to the beginning of the file, or **d12G**, which deletes to line 12 ... you get the idea.

If you use **/**, **?** or **G** to move to a new location, you can quickly return to the previous line with two quotes: **”**. You also can return to the exact cursor location on that line with two ticks: **``**. In fact, these commands can quickly move you back and forth between two different locations in a file for comparison purposes.

Everyone knows you can use **5j** to jump five lines down in a file. Often overlooked, however, is using the numeric modifier with other commands. For example, **5i<tab><esc>** inserts five tabs. To add an indent level to the next 10 lines, use **9>j**. The **>** command does the indent, and **9j** means do it 9 more times going down. A combination that I use often is **>20G**. It means indent lines from here to line 20. The **<** command removes indents (it's easier to see with the line numbers turned on).

query global replace is helpful. While editing in **vi**, issuing the command **:%s/dogs/frogs/g** will replace every occurrence of **dogs** with **frogs** in the entire file. But, what if there was

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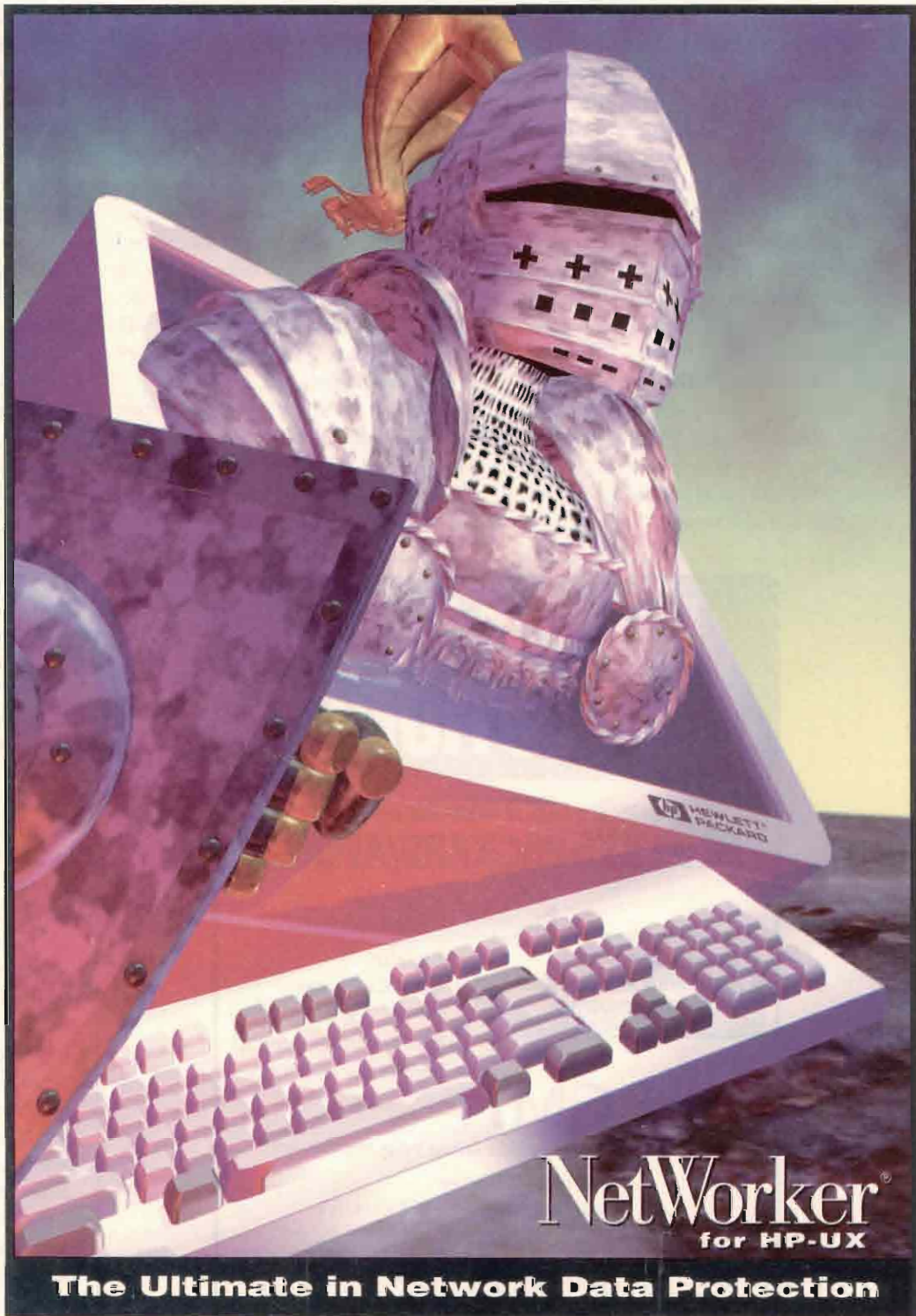
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one dog that you did not want to turn into a frog? Or several, for that matter.

I'm so glad you asked. Enter **query global replace**. Now issue **:%s/dogs/frogs/gc. vi (ex** actually, because all commands that start with **:** are handled by **ex**, the underlying editor of **vi**) will then print each line that contains **dogs** at the bottom of the screen, put **^** characters under the word **dog**, and wait for input on whether to change that occurrence or not. The responses are: **y** for yes, **n** for no or **return**, which means don't do it. You can limit the extent of searches by supplying a line number range to the substitute command: **:3,/BEGIN/-1s/x/X/g**. This means do the substitution from line 3 to the line above the next line that has **BEGIN** on it.

One of my pet peeves is hearing about what a pain it is going in and out of command mode to make small typo corrections in a small area of a file. Not true. Not true. Not true.

If you are in an **hpterm** or **xterm** and turn on the right option you can go into insert mode, move around using the cursor keys on the keyboard, and edit at will typing in characters, using the **Delete char**, and **delete line** keys. *Be careful* noting that **hpterm** sometimes gets confused and starts drawing the cursor one character to the right of where it really is.

The option to turn on this feature is: **keyboardedit!** Note the **!**. This means that we are turning on **keyboardedit** for use in insert mode. Without the **!** it turns on the named keys on the keyboard (like **home** or **delete line**) during command mode. By default this **ex** setting is turned off, so if you execute: **:set all** you will see **nokeyboardedit!**.

To turn this option on, enter: **:set keyboardedit!** while in **vi**, or, put **set keyboardedit!** in your **.exrc** file. Make sure, however, that you do not put the **:** in **.exrc**.

The **:map** command, used for assigning commands to keys, also has a **:map!** version. **:map!** allows the mapping of keys while in insert mode. For example, when the backspace key doesn't work in insert mode when **keyboardedit!** is turned on, assign it to the **x** command to enable the backspace. Remember the following when mapping keys:

- Don't assign anything to the alphanumeric keys (unless you want to render your keyboard useless)
- Assign the key to escape back to command mode before executing a command, and then return to insert mode.

Here's an example of assigning the backspace key to work on any character in the file while in insert mode with **keyboardedit!** enabled, and not just what has been inserted during this insert.

The list of keys to type are shown. What appears on the screen will be very different. The caret (^) symbol means press the control key (^v = [ctrl]-v; <spc> = the space bar):

```
<esc>:map!<spc>^v<backspace>  
<spc>^v<esc>xi<return>
```

:map! assigns a command to a key while in insert mode. The **^v < backspace>** inserts the keyname of the backspace key. The final sequence is the command that the backspace should execute: escape (to command mode), delete character (**x**), and return to insert mode (**i**).

This is what will appear on the screen after typing in the sequence above: **:map! ^H ^[xi**

You can assign all kinds of keys (function keys, named keys and control sequences) to perform many editing functions. And you only need to get out of command mode when you need an unmapped command. It's like customizing **vi** to act like **emacs**. Hmmm ...

If you want good stuff like multiple windows and multiple undos, **vim**, an extended version of **vi**, is where it's at. OK, I can hear you panting; so, I'll look at **vim** next month. —*What other UNIX topics are you vi-ing to hear about? Let Fred know, drop him a line at fredern@aol.com.*

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Macs And UNIX Living In Harmony

At this point in Apple's turbulent history, even its most loyal corporate customers must be wonder-

ing whether Apple and the Macintosh can remain a dependable computing resource. With the departure of numerous high-level executives, sales of Macintoshes considerably below projections and what appears to be an inability to deliver its next-generation operating system (code named Copeland) on time, Apple faces many "challenges," which usually translates to "problems" in Silicon Valley-speak.

Not the least of which is Apple's continuing task of convincing independent software vendors (ISVs) to develop business applications for the MacOS. With Macs making up less than 10 percent of the PCs sold nationally, ISVs find considerably more economic incentive to develop software for Intel-based PCs than for Macs. This issue is most vexing for those seeking a Macintosh-to-UNIX solution. If you're a Mac "zealot," your choices for linking into UNIX hosts are extremely limited.

That's why IS personnel who need to give Mac users access to data on UNIX hosts will find only a few connectivity packages available for that purpose. These include:

- EtherShare 2.2 from Helios Software GmbH (Hanover, Germany)
- uShare 4 from Information Presentation Technologies Inc. (San Luis Obispo, Calif.)
- K-AShare AFP from Xinet Inc. (Berkeley, Calif.)
- NFSShare from Intercon Systems Inc. (Herndon, Va.) which connects Macs to systems running Sun Microsystems Inc.'s (Mountain View, Calif.) Network File System (NFS).

In addition, this past February, Apple was expected to release its own Mac-to-UNIX product — a PowerPC-based server running IBM AIX (IBM's RS/6000 operating system). When available, this server will allow system administrators to run the AIX version of UNIX on a Mac, thus taking advantage of its user-friendly features and interface, while also providing UNIX connectivity to standard Mac clients.

UNIX AS AN APPLESARE SERVER

The Mac-to-UNIX products noted above (with the exception of Intercon's NFSShare) all use standard Mac client software to communicate with the UNIX host, but require installing software that turns the UNIX computer into an AppleShare server, where organizations can store key MacOS data. Intercon's NFSShare, on the other hand, requires running special software on the Mac client. The UNIX-as-AppleShare server approach



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has several ramifications, both for administrators and users which reside on a Macintosh client.

First, it centralizes data storage, allowing MIS managers to ensure that their organization's mission-critical MacOS-based data resides in a truly reliable environment on the UNIX host. This level of reliability is especially critical in the publishing environments in which Mac-to-UNIX connectivity most often proliferates, says Jim Davison, vice president of sales for European MikgroGraph (Scotts Valley, Calif.), the company that distributes Helios' EtherShare in the United States.

Putting the AppleShare server on a UNIX machine also supercharges network file transfer performance, Davison says. "The AppleTalk file transfer rate using our software on HP-UX 8, 9 or 10 is at least three times faster than on an Apple server. Standard AppleTalk and Novell-type networks don't cut it — they're not fast enough or dependable enough [in publishing] environments. In general, all UNIX machines will beat the pants off an Intel-based Pentium server." Speed and reliability are especially important in publishing companies, which push networks way beyond what everyone else does "because of the large image files they deal with and the fact that they also require highly reliable systems — the newspaper or magazine can't be late."

For network managers, the UNIX-as-AppleShare server method also reduces administrative overhead — only the UNIX server requires new software, not each Mac. And end users don't have to learn a new login process — they attach to the UNIX machine exactly as they do any other AppleShare server. IPT, Helios and Xinet all also support the Open Pre-Press Interface (OPI), the industry standard for pre-press color-control functions. Among other things, OPI provides conventions for handling color tinting, separations and spot colors. Print-spooling options available with all three products also minimizes the use of PostScript printers in mixed Mac-UNIX networks, and Macs and

UNIX hosts can share printers anywhere on the network.

WEB SPINNING

Xinet has also teamed up with hardware vendor Sonic Solutions Inc. (Novato, Calif.) to deliver a 100 Mbps Fiber Distributed Data Interface (FDDI) solution for Mac-to-UNIX links. Using a Sonic Solutions' MediaNet FDDI network interface card (NIC) inside a Mac operating under a proprietary operating system, Xinet has observed a five to 10 times improvement in throughput versus

The AppleShare server on a UNIX machine supercharges network file transfer performance

standard AppleShare. Versions of this system are available for UNIX on HP, Sun and Silicon Graphics computers. Tony Rotondo, a Xinet spokesman, says that K-AShare, "people can easily move files stored either on the Macintosh or UNIX side onto a UNIX host acting as the Web server. It clears up so much disk space on the Mac, and you can back up Macintoshes each night on the UNIX side"

With the exception of the hardware and maintenance costs related to operating a UNIX host, Mac-to-UNIX solutions remain relatively inexpensive. For example, IPT's uShare 4.1 costs \$1,395 for unlimited users. But Steve Rade, the company's vice president of national sales, says most customers opt for the combined uShare-uPrint product at \$2,190. EtherShare 2.2 sells for \$3,900 for 20 users, says Davison, while the Xinet-Sonic Solutions FDDI combo goes for \$4,000 per Macintosh. —*Jim Carr is a Saratoga, Calif.-based freelance business and technology writer who uses a Macintosh computer only when forced to. Contact him via CompuServe at 73561.1577@compuserve.com.*

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Not-So-Secret Agent Wars

Among all of the management products targeting open systems, HP OpenView is certainly the

most well-known and well-entrenched — and perhaps even the most widely used. HP has successfully positioned OpenView as a “framework” upon which corporations can build plug-and-play network and systems management solutions.

But when you get down to it, that framework is nothing more than a loose collection of UNIX processes, highly dependent upon inefficient TCP/IP-based data collection mechanisms. HP OpenView Network Node Manager is the epitome of the classic SNMP paradigm: a centralized manager (OpenView console) polling attached devices (routers, hubs, bridges, computers) every five minutes or so asking questions like “are you up? Are you OK? Has anything changed since I polled you last?”

The advantage of this master/agent architecture is that the agent — the management software inside the routers, bridges, hubs and other managed devices — can be compact. In other words, the agent is dumb, and the manager (OpenView) has all the smarts.

But when you try to extend this model to the management of powerful

servers, databases and even applications, it doesn't make a lot of sense. Why waste bandwidth sending “are you up” questions over the WAN every few minutes just to save a few hundred bytes of space on a big server? Why not put a smart agent on every remote server, and let it do its own polling and thresholding — communicating with the central management system only in those rare instances when something is drastically wrong like, “Help me, I'm about to run out of disk space,” or “CPU utilization is really high, can another server take over this job?”

Well, HP figured out this problem a few years ago, and began developing intelligent agents for these purposes. OperationsCenter, AdminCenter and PerfView/MeasureWare each have their own set of smart agents that perform these types of tasks locally. It makes sense, but it also casts a new light on the meaning of the word “framework.”

Now, the framework is being turned upside down. It's not the management station (a la OpenView) that's important — it's all those agents out there doing thousands of network and systems management jobs. Suddenly, a network management architecture is defined not by a console showing pretty pictures of network layout, but by all of these invisible little software agent programs that collect, sort and spit out status information autonomously.

Although smart agents have been proliferating at a rapid clip for about 18 months, MIS folks are just starting to realize that agent proliferation is becoming a big problem. HP's agents don't communicate with anybody else's management systems except HP's. In fact, OperationsCenter agents can't even communicate with AdminCenter agents — although that may change in time. And HP's agents certainly won't communicate with non-HP agents.

You may be familiar with a group called the Desktop Management Task Force (DMTF; see Standards column, October 1995). This consortium of vendors, including HP, IBM, Sun, Novell and Intel, are pushing an open, standardized interface for computer agents called the Desktop Management Interface (DMI). Problem is, DMI-compliant agents can't communicate with SNMP management systems. You have to have a mapping scheme. And, guess what? Each vendor has

their own mapping scheme — creating a very confusing and very proprietary management landscape.

Now, IBM is proposing a “common agent” that will map DMI agents into an SNMP world. The IBM common agent is based on two rarely-used IETF standards, the Distributed Programming Interface (DPI) and the SNMP Multiplexor (SMUX). Both standards compete with a more robust but proprietary, SNMP-based scheme called Emanate, developed by SNMP Research Inc. (Knoxville, Tenn.). HP has licensed Emanate, and plans to roll out several important products using Emanate in the near future.

I have a hunch that IBM's DMTF/DPI/SMUX “common agent” may not be commonly accepted in the long run — because HP is building its own agent framework around the Emanate technology, and Microsoft keeps playing cat-and-mouse with the DMTF.

And even though HP, IBM and every other vendor in the world claims

to support standards, the customers' management systems still can't interoperate. So now we are facing the start of the Agent Wars. For the customer's sake, a round at the negotiating table would be preferable to an all-out media blitz, in which the IBM crowd tries to discredit HP as “too proprietary,” and Microsoft waits for IBM and HP to annihilate themselves before descending to claim the spoils of war.

The best solution would be for HP to encourage SNMP Research to publish its interfaces and put that technology forward as an “open” standard. If that doesn't happen, a very messy and confusing battle will undoubtedly ensue — and the customer is sure to lose. — Is your system a casualty of the secret agent wars? If so, tell Jill at huntinja@mcgraw-hill.com

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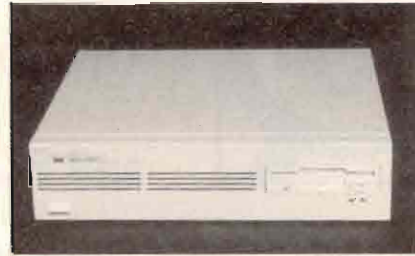
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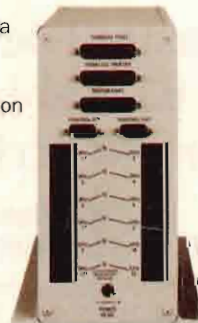
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new Products

SOFTWARE

TriTeal Offers TEDserver

TriTeal announces its new enterprise server product, TEDserver, which fully incorporates the Spyglass open server technology.

TriTeal also announced a suite of Internet products for commercial and government markets, including powerful browser, TEDVISION, with drag-and-drop integration to other applications.

TEDserver will include a variety of enhancements to the Spyglass server code, including system administration features such as configuration management, and personal publishing features. TEDserver and TriTeal's personal server also will include data-level security capabilities in future releases.

Price per server is \$199, which includes one year of technical support.

Contact TriTeal, 2011 Palomar Airport Rd., Ste. 200, Carlsbad, CA 92009; (800) 755-8325.

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Adobe Systems Ships FrameMaker+SGML

Adobe Systems Inc. announced Adobe FrameMaker+SGML software, an integrated authoring and publishing software that enables users to create, edit and publish SGML documents in an intuitive WYSIWYG environment.

Adobe FrameMaker+SGML is a combination of page composition, text editing, graphics, interactive structure validation and visual support for native SGML in one easy-to-use environment. A fully documented API enables application developers to extend and customize the product.

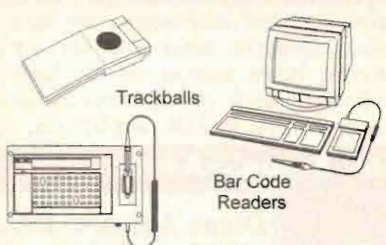
Adobe FrameMaker+SGML is available for HP-UX, SunOS/Solaris, IBM AIX, Microsoft Windows, and Apple Macintosh and Power Macintosh platforms. Price for HP and Sun is \$1,995 for a personal license and \$3,995 for a shared license. On Windows and Macintosh, the price is \$1,495 for a personal license.

Contact Adobe Systems Inc., 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039; (800) 833-6687.

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The Promise Of Process Configuration Management



Tani Haque,
CEO of SQL
Software

Enterprises of all sizes are spending substantial money and effort in managing their hardware, data and people. And to do that, they spend money purchasing application development tools. What is not done, by in large, is to institute repeatable automated software development processes for development on one or multiple platforms. Consequently, software engineers are driven to reinvent the life cycle each time they develop software.

Some vendors call for the integration of change management software and configuration management (CM) software over the next two to three years. But this functionality has already been available for quite some time. We ought to be integrating the *process* with configuration management.

Making the process a vital part of configuration management means managing code as a business critical asset. In other words, you should be able to adapt the development tools to the way you do things, not the other way around. Therefore, using an object-oriented CM tool that does not impose a strict methodology, but provides instead the flexibility you need in creating and implementing your organizational processes can influence the success of your application development efforts.

It is important to note that the emphasis on process throughout the life cycle is not the only sharp contrast between process configuration management and traditional configuration management, which focuses mainly on version control. Process configuration management not only encompasses change management, defect tracking, version control, automatic building, software distribution, process workflow, events and integration, and help desk, but it threads the underlying processes through each of these functions. These processes provide a closed loop over the entire development project; and across all its phases — from cradle to grave. As you can see, with process CM, you can do a lot more than traditional CM and comply with SEI, ISO 9000 and DOD2167A standards.

A well-implemented process CM solution should

enable the development organization to define — within the tools — the roles, responsibilities and interaction of those involved in the project. At the organizational level, such an approach vastly facilitates the deployment of staff and resources while at the project level, it also clearly reduces the risk of conflicts and enhances the accountability of staff and managers. As a result, managers can quickly identify and remove bottlenecks. Such a capability is important when several teams are developing software in parallel, and especially when more than one target platform is involved.

With process configuration management, parallel development efforts don't have to be a nightmare. Managed transparently, software developers can work effectively without any communication breakdowns. Parallel development efforts are often plagued by problems stemming from little to no communication between the development teams as well as the lack of automation to collect, manage and merge changes.

Process configuration management lets the software engineers know what parallel changes other developers are working on. As a result, coordination on the building of an application is facilitated. And it becomes easier to maintain prior releases via patches while ensuring that a bug fixed in a previous release does not reappear in the latest version. Many automated process CM tools provide a complete audit trail of pending and already implemented changes. Developers can go about their work creatively without having to worry about filling out and keeping track of countless forms.

When making decisions, we must always consider the opportunity cost. In software development, can we really afford to navigate without a guiding process? Furthermore, can we effectively curb the risk and costs of software projects which are never completed or those which require hefty maintenance? —*Tani Haque is CEO of SQL Software (Vienna, Va.), a process configuration management vendor. He can be reached at info@sql.com.*

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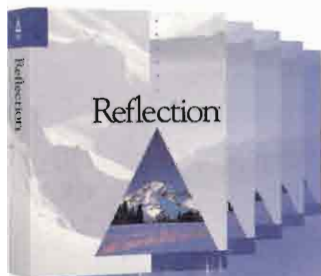
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