The Magazine for Hewlett-Packard Enterprise Computing

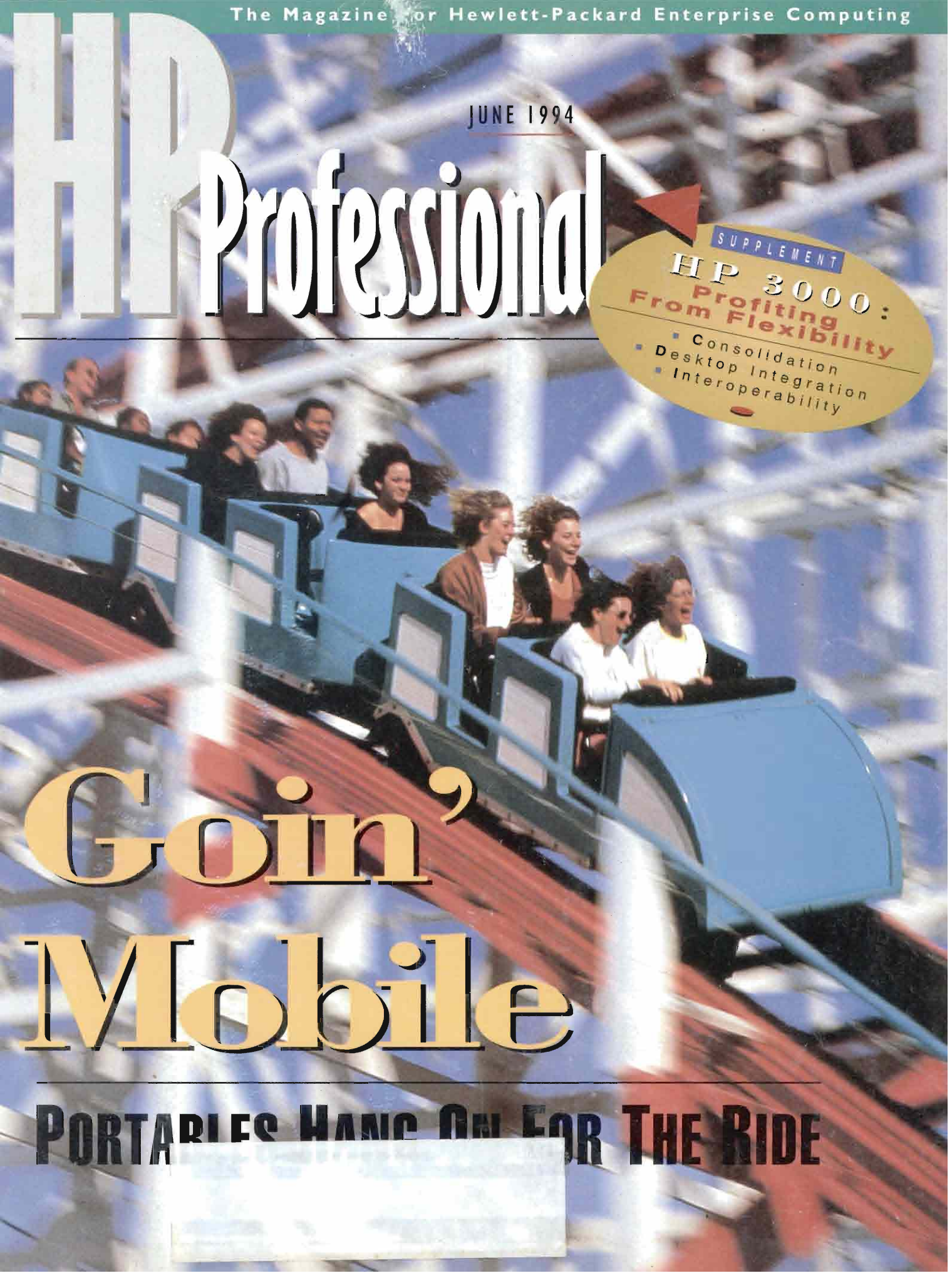
HP Professional

JUNE 1994

SUPPLEMENT

HP 3000: Profiting From Flexibility

- Consolidation
- Desktop Integration
- Interoperability



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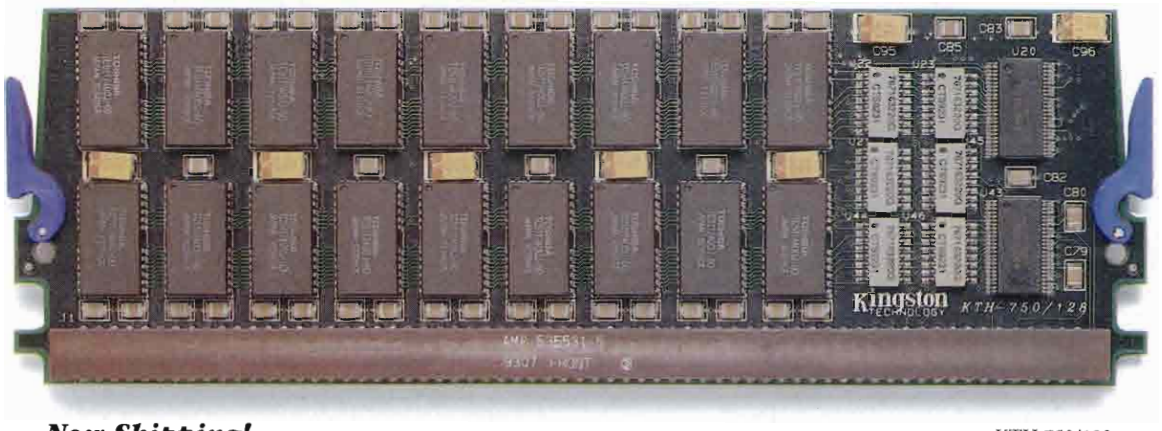

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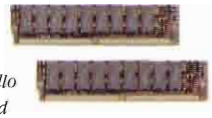

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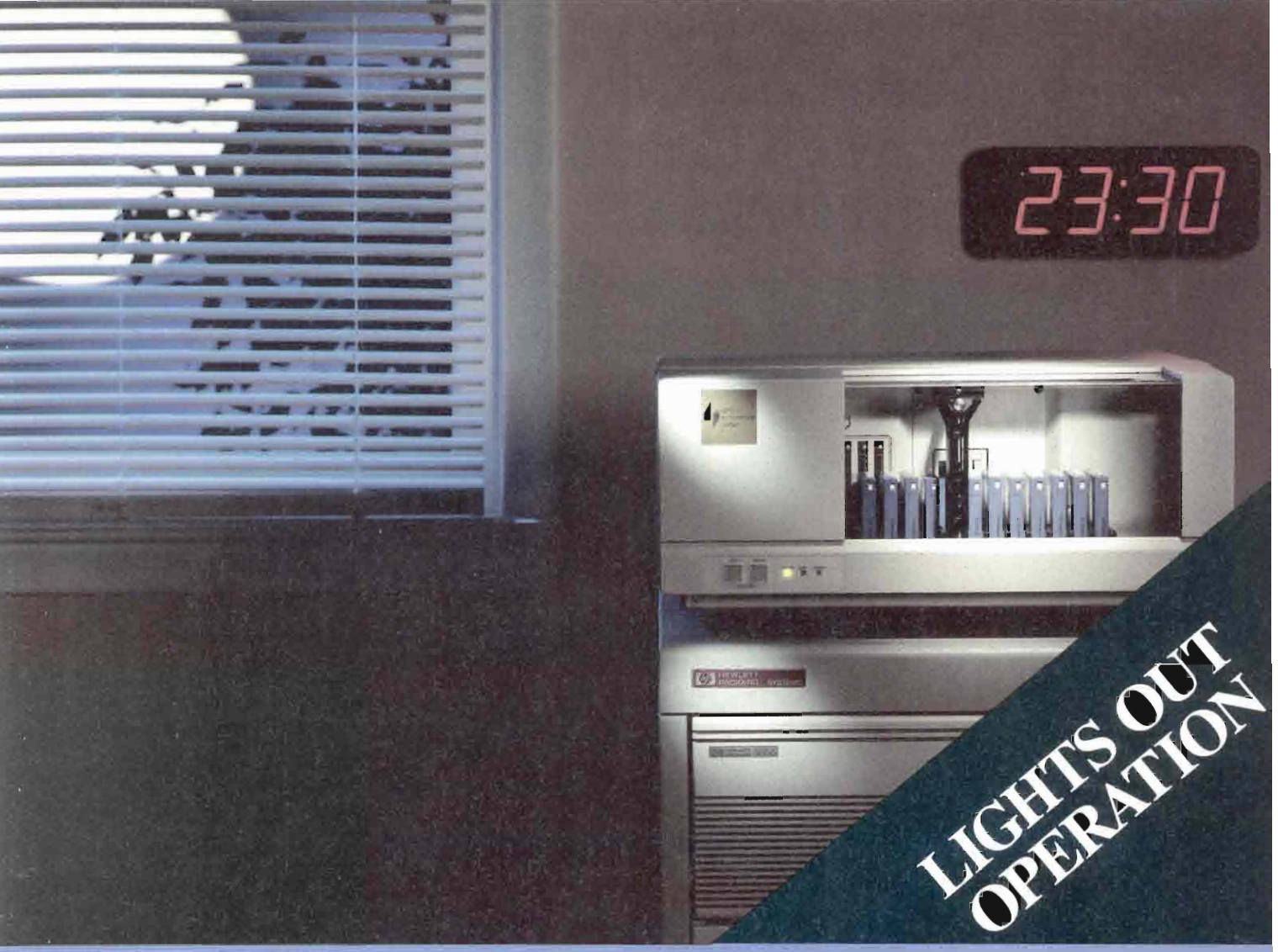

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CIRCLE 294 ON READER CARD

Wanted Dead Or Alive

The HP 3000: A Garrison Finish Or Out Of The Race?

By Charlie Simpson

The HP 3000 is dead. Long live the HP 3000! That's the cry heard around the world. Sometimes we hear the entire cry, while other times we only hear one half or the other. This mistaken case of doublethink seems to have put HP in a precarious situation with its customers. It is attempting to convince corporate customers around the globe, that the HP 3000 is still the system of choice — unless of course you choose the HP 9000.

In my first year as editor of *HP Professional,* I've heard it all: from the HP 3000 is a dead box, to the HP 3000 is the integral part of the future of computing.

In the United States, the now "number two computer vendor" sees the HP 3000 as *the* contender in the downsizing battle currently waged in IS departments. In Europe, the HP 3000 is attempting a rebirth. HP is trying to backpedal against a year of neglect of its once favorite child. By paying a bit more attention to its latest addition — the HP 9000 and HP-UX — HP inadvertently sent the message to many vendors and users that the HP 3000 was orphaned on the continent. Apparently, despite its maturity, the HP 3000 isn't ready to be left alone on a Saturday night in Paris, London or Munich.

For some vendors and customers, not only has the HP 3000 grown-up, left the home and retired it's dead and buried as well. Of course, these aren't necessarily the HP 3000 product makers or system supporters, so look closely at who's hammering in those nails.

Then there are the many loyal HP 3000 vendors who are porting to UNIX platforms. But the fact they are expanding their options, shouldn't necessarily be construed as abandonment, at least not yet anyway. After all, when you put a new addition on your house, you don't move the family into it and shut down the rest of the house.

Also many former true blue companies such as Synon, Lawson and Rochester Software are now porting to HP-UX. Unfortunately, few are making the leap to MPE. I know, this is a lot to consider when planning your computing strategy.

And if you're anything like the typical user, you're confused over where the HP 3000 fits into your business schema. However, despite the new programs in the United States and the spin doctors in Europe, ultimately it is you the user, who decides if the HP 3000 lives or dies.

IT'S YOUR MOVE

So what are users doing? Or more importantly, planning on doing about their computing environments? Are you changing because someone says you have to change? Or, are you maintaining your current systems because there's no reason to change and you refused to be bullied into a purchase?

For the past year, you've read about the future of computing options going from closed to client-server, client-server to open and now from open back to somewhat closed, including the consolidation strategy. It reminds me of when my parents were younger. They used to wash out the milk bottles for the milkman to take back. Then with the introduction of cardboard and plastics, our lives got easier. Well, at least until landfills started to overflow. Now, we have to steam off labels and sort by colors, contents and materials.

Now that you know my opinion on the state of the HP 3000, I want to know how you apprize the situation. Fax, Internet or mail me your responses. What are you planning on doing in your IS department? Where do you see the HP 3000? Is it a viable solution for your future computing needs? Are you doing anything? Are you caught up in the change for change sake craze or are you holding strong for principle?

Charlie Simpson

The Mass Storage Q & A Game

Imagine you are a contestant on Techno Jeopardy. It's Final Jeopardy and you're presented with the following clue: You are buying a client-server computer system in the '90s, and this is fast becoming the single greatest hardware cost. Remember to phrase your answer in the form of a question. Now place your bets.

You answer "What is mass storage?" Congratulations, you're the grand prize winner. The other two contestants who answered with "What is the CPU?" can't believe you knew it and they didn't. Maybe they should have listened to Peripherals Strategies (Santa Barbara, Calif.) who state that:

- Storage in the midrange market now can make up 30 percent to 35 percent of the total hardware cost.
- For high-end systems with 500 GB to 1 terrabyte of storage, the cost of storage can exceed CPU cost for the initial purchase.
- Today's typical LAN includes 7.2 GB of storage, projected to grow to 41 GB by 1997.
- On a system of any size, for every dollar spent on storage hardware, you will likely spend $8 for storage management software.

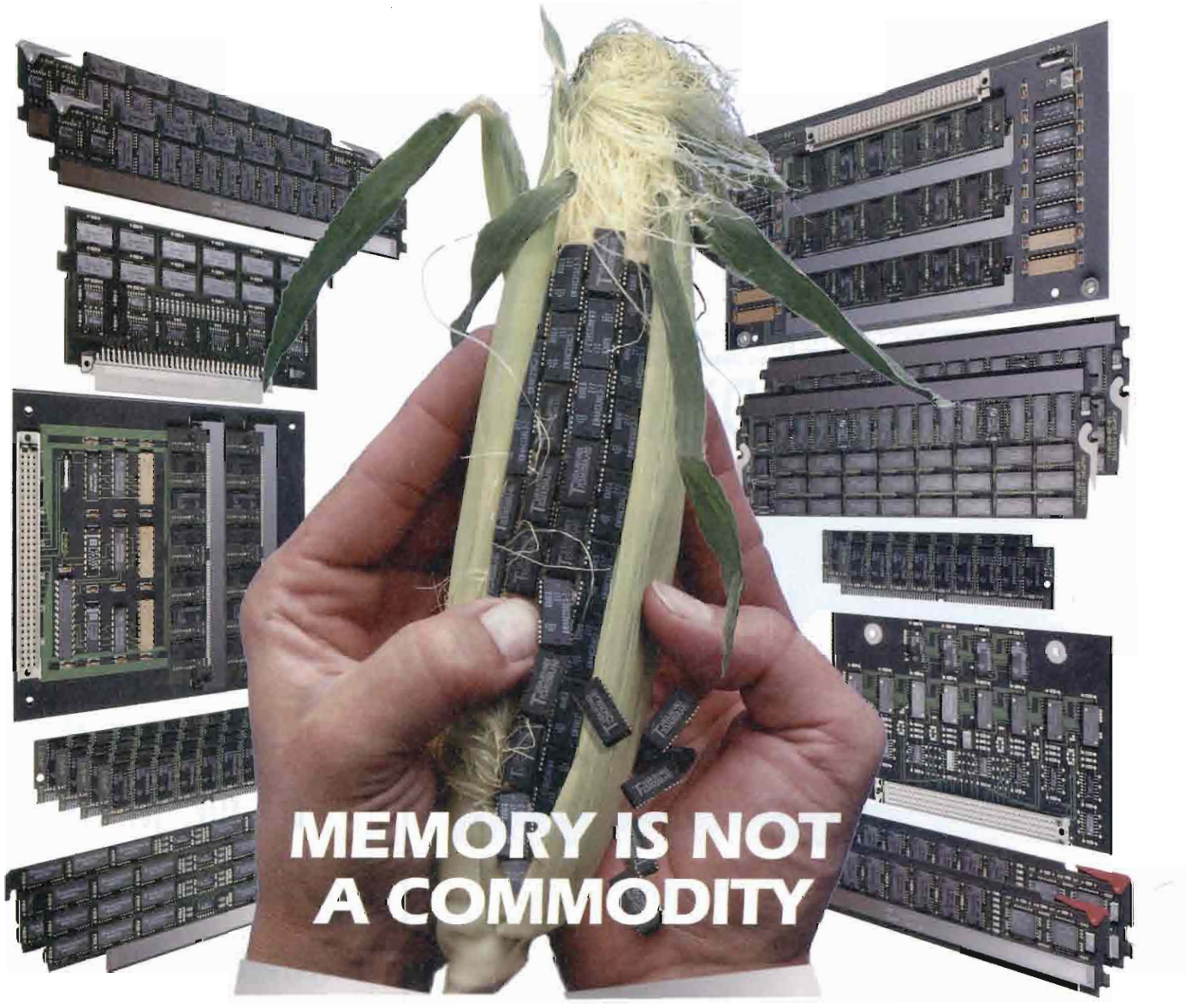
Not one to be caught without the right answer in Final Jeopardy is HP's Storage Systems Division (SSD). In yet another example of the way HP has been sneaking up on its markets lately, Tex Schenkkan, marketing manager of HP's SSD, says HP is now "one of the world's biggest manufacturers of large disk drives."

He also says as of last year, HP is the number one vendor of DAT drives, having displaced Conner Peripherals (San Jose, Calif.), the former holder of that honor. HP also claims the number 1 spot in the 5 1/4 magneto-optical drive market and the number 4 slot in the RAID market.

While just five years ago the vast majority of HP's storage products went out the door to work alongside HP computers, HP's storage market today is much larger. "Now, 80 percent of our storage products are not connected to HP systems," says Schenkkan. HP storage products now sell extensively to after-market and OEM customers. "You'd have to dig pretty hard to find a large systems vendor that is not an HP OEM," he says.

HP is concentrating on high-end storage needs, where stored objects and files are larger and storage needs are longer-term. Document imaging, manufacturing and CAD are all examples of this kind of storage. Computer output to laser disk (COLD) markets are another focus for these systems, which includes, financial systems, records keeping and quick response systems where data must be called up for rapid reference.

As part of its increased storage effort, HP announced the HP Disk System/Disk Array, a modular product configurable for



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economical storage or for hardware- or software-based RAID. The system can include up to 10 GB of storage per cabinet. One cabinet can house up to five drive modules. The modules come in 510 MB, 1 GB and 2 GB capacities.

HP has also begun providing HP optical jukeboxes as storage solutions for some critical path information retrieval systems, thanks to AMASS software from Advanced Archival Products Inc. (Greenwood Village, Colo.).

The HP/AMASS solution places a hard disk cache between the jukebox and the network server to hold file index information and to temporarily store frequently used data. This makes the use of jukeboxes transparent to users, who perceive only the central disk drive.

The system is compatible with HP jukeboxes ranging from 20 to 200 GB. At the time of its announcement, HP was prepared to ship the product for use with HP 9000 Series 700 workstations and Sun 4 systems.

Lastly, HP is working with other storage vendors to develop a useful subset of the Network Storage Requirements (NSR) standard. As networking connections between systems grow ever more pervasive, users are demanding standards that will keep their storage systems useful for many years into the future. Some disk drives are still in service 30 years after they were first linked to a large system. HP and other leading vendors seek to agree on network storage standards that will protect the long-term usefulness of their products.

On a system of any size, for every dollar you spend on storage hardware, you will likely spend $8 for storage management software.

The bottom line to all this is that in spite of falling storage costs per megabyte or gigabyte, storage as a portion of your information technology expenditures is rising because you are buying more of it. So remember this Techo Jepoardy fans: although that new CPU will cost you a bunch, storage may add new meaning to Double Jeopardy

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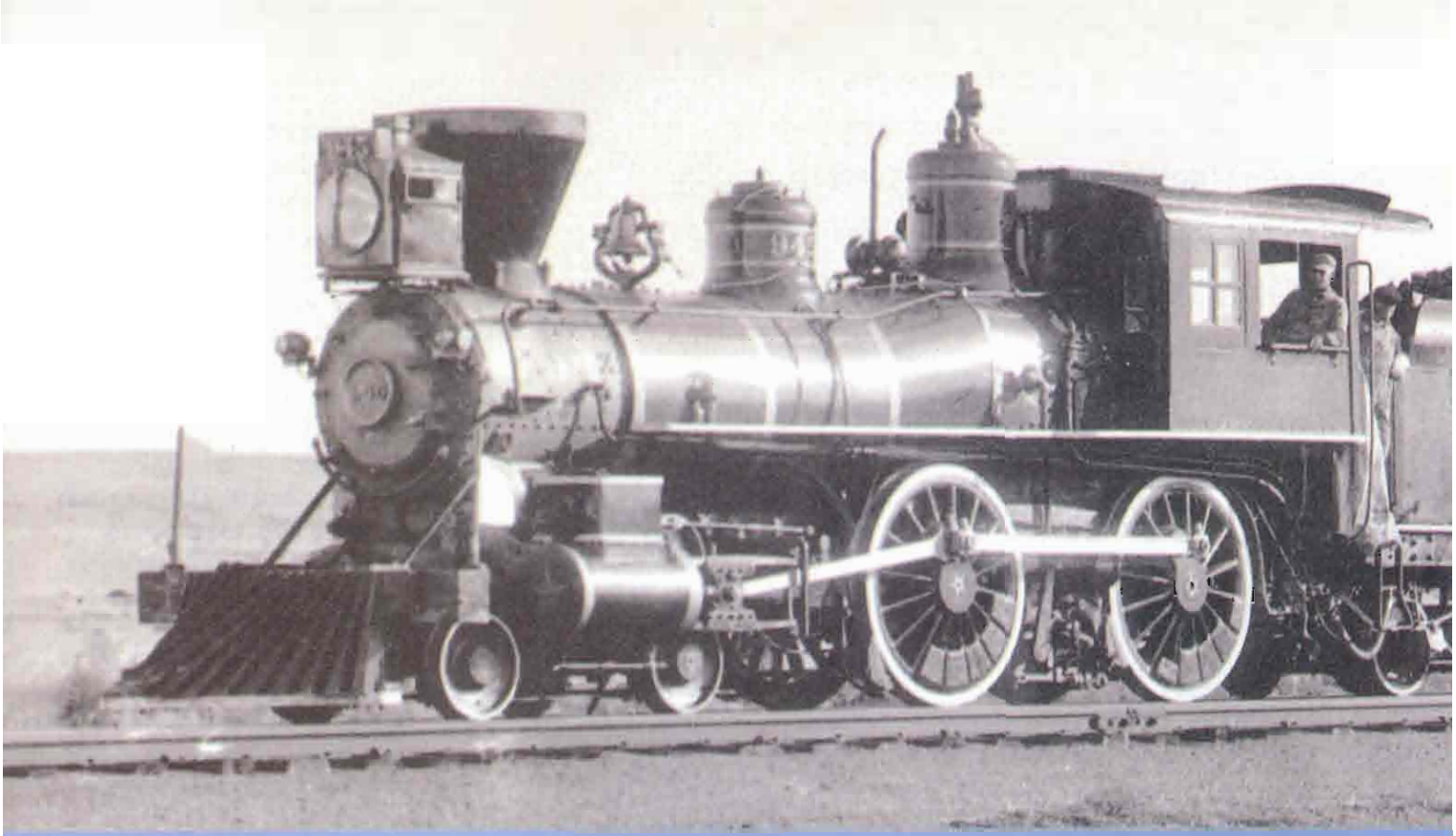

Putting Technology

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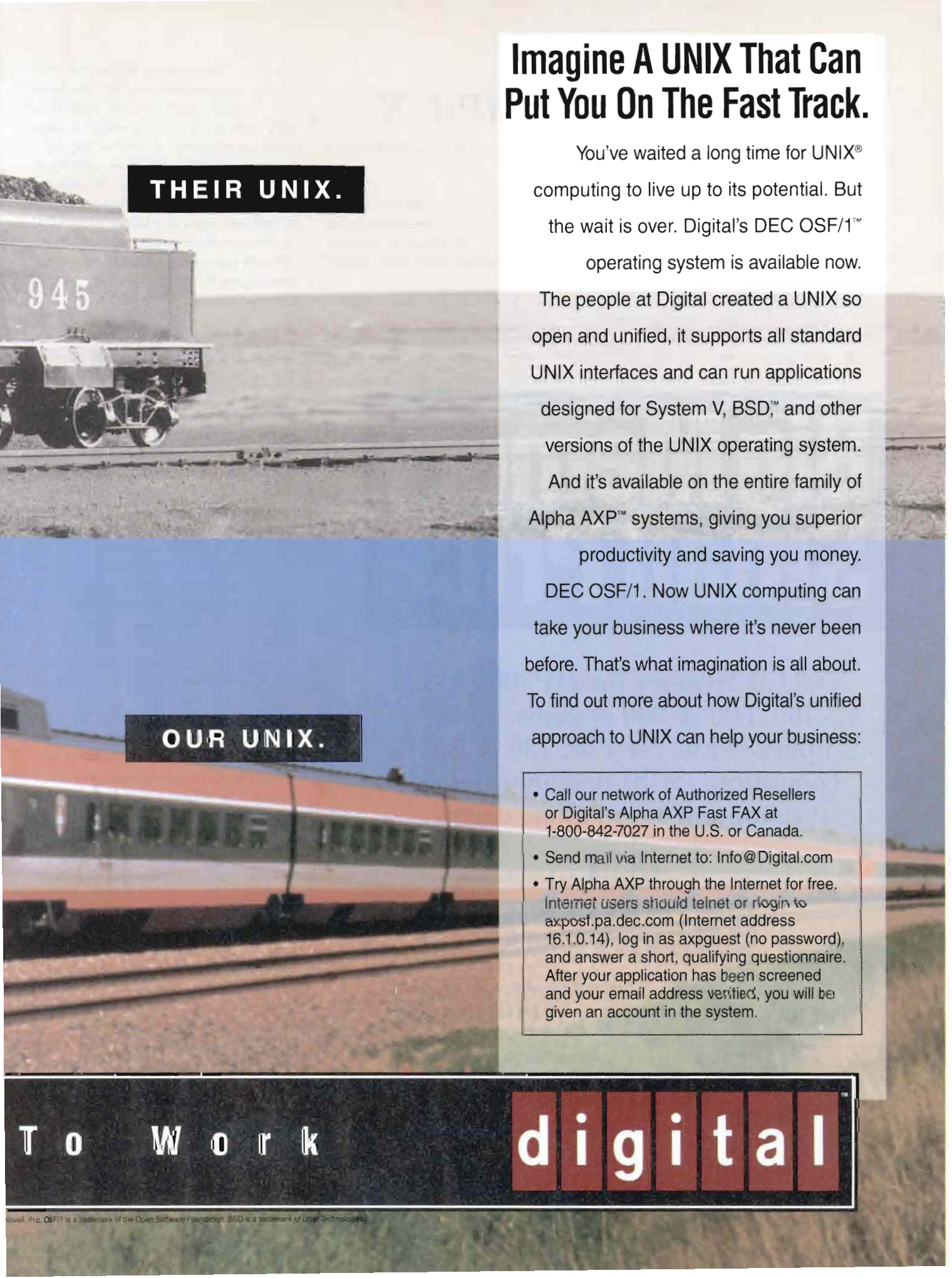

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Bespoken Advice On HP-UX

I read [Tim Cahoon's] article "Two Schools of Thought" [in the February 1994 issue], I'd like to see more about [Cahoon's] experience learning HP-UX. I am also learning it. We are using HP-UX on an HP 9000/827. Is HP VUE (Visual User Environment) working in [Cahoon's] environment? Does he have any experience setting up for HP VUE? I don't know if it is worth it to set it up.

Sheau-Yen Chen
Programmer/Analyst
Department of Radiology
University of Michigan Hospital

Setting up X terminals using XDM or HP VUE is not the easiest thing in the world for new users. This is especially true for the HP 9000 Series 800s which have a dumb terminal for a system console. Installation instructions are usually geared toward the HP 9000 Series 7xx workstations which have a graphical console. Whether you install VUE or XDM should be based on your environment. If you currently are using XDM elsewhere you should probably stick with it. But HP VUE is great because of its very complete user environment. HP VUE is probably your best choice. —TC

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Software Configuration Management

The article in the April 1994 issue of *HP Professional*, "The Road Not Taken," by Richard Riehle made several important points regarding Software Configuration Management (SCM). The lack of an effective SCM process is certainly responsible for all the problems documented in the article. However, the article could be interpreted as saying that by purchasing an automated SCM tool, the problems associated with not having a capable SCM process in operation can be avoided. Tools are no substitute for software configuration management. The process of software configuration management must be well understood by all software developers and their managers. The software configuration manager or change control board must have an appropriate level of authority to ensure that the SCM process will not be short cutted as soon as it's considered expedient. The SCM process must be flexible and comprehensive enough to handle all situations including emergencies and still perform its function of tracking all software changes in an accounting fashion.

SCM tools can help immeasurably by automating many time consuming, tedious tasks. SCM tools cannot create a SCM process where one does not exist. SCM tools are no substitute for a well-documented software configuration management plan, followed by committed software developers, administered by a dedicated software configuration manager with authority matching the responsibility.

Randy Dabbs
Senior Member of Technical Staff
Sandia National Labs

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CIRCLE 353 ON READER CARD

Magnetic rotating disk drives are smaller, more reliable, and have a higher capacity and throughput than ever before. But, magnetic rotating disks have not kept pace with the enormous strides made in CPU power nor with the increase in application demand for faster and higher I/O rate data storage access.

Disk Emulation Systems Inc. (DES; Santa Clara, Calif.) is a manufacturer of solid-state disk emulators, which bridge the gap between fast but costly, and usually limited capacity, central memory and relatively low-cost, but slow, magnetic rotating disk drives.

Solid-state disks (SSDs) are Dynamic Random Access Memory (DRAM)-based storage devices that appear to the host to be magnetic rotating disks.

SSDs are well-suited for transaction processing and query or decision support applications that use relational databases. In these computing environments, a small portion of the system's data is involved in a large percentage of I/O requests. Moving these active files to SSD emulators eliminates I/O bottlenecks, improves performance, decreases user wait time and improves productivity.

RDBMS packages, such as Sybase, Informix, Oracle and Ingres, can take advantage of the super fast access times SSDs offer for work files and indexes. The emerging imaging and video server markets also are prime candidates for DES' high-throughput SSD technology.

In moving to client-server, RDBMS-based systems, IS is discovering that I/O throughput on the server is a "gotcha" that can cripple even a well-designed system. A California retailer's planned move to a client-server system employing an HP 9000/755 server was nearly derailed by an I/O bottleneck at the server. A SSD from DES became "the difference between success and failure."

DES' SSDs are designed with an integrated backup system to achieve the speed and reliability of solid-state electronics with the safety of magnetic media. Each DES SSD contains an online UPS with at least a 2 1/2-hour battery life and an internal hard disk that provides automatic backup before the battery is exhausted. When power returns, data is automatically restored from the internal hard drive.

DES' FW-Series of SSDs support the fast/wide SCSI-2 interface. Using DES' high-speed circuit design technology, these SSDs are capable of processing over 17,000 I/O requests per second, compared to a maximum of perhaps 50 I/O requests per second for magnetic rotating disks. The FW-series can achieve 20 microsecond access times with a sustained throughput measuring up to 20 MB per second.

DES' SSDs are plug-and-play. They attach to industry standard SCSI, SCSI-2 and fast/wide SCSI-2 interfaces, and emulate standard magnetic rotating disks. No special drivers or operating system patches are required.

DES SSD products support most host systems including the HP 9000. Industry standard I/O interfaces supported include HP's HP-PB Fast/Wide High Performance SCSI Adapter. They are available in standalone cabinet models and rack mountable versions.

—John P. Burke, HP 3000 Editor

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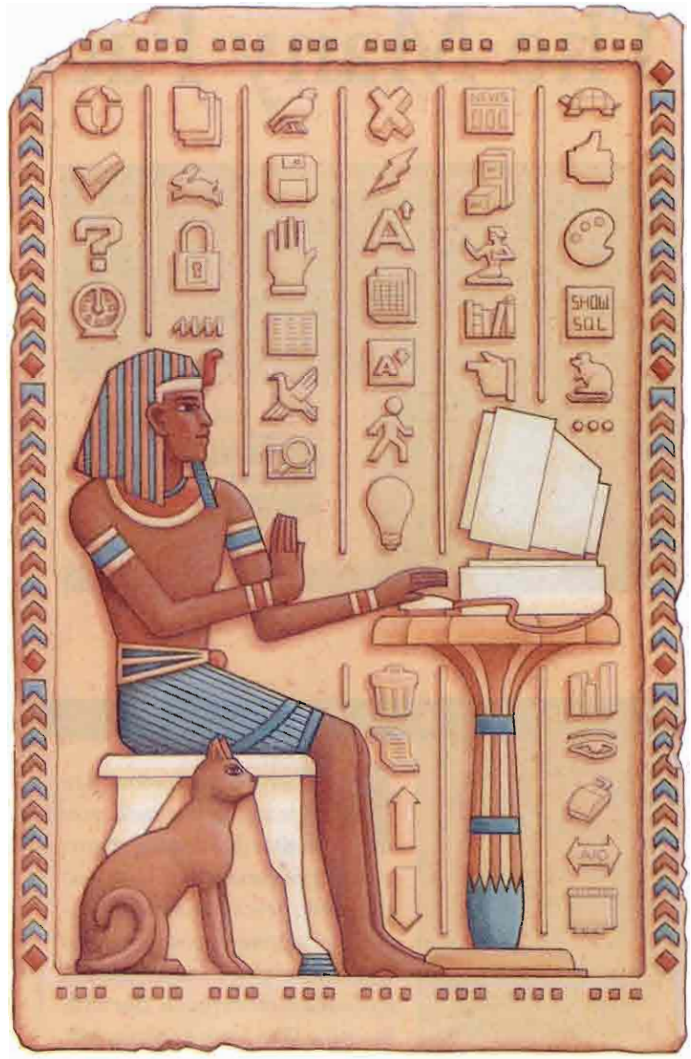

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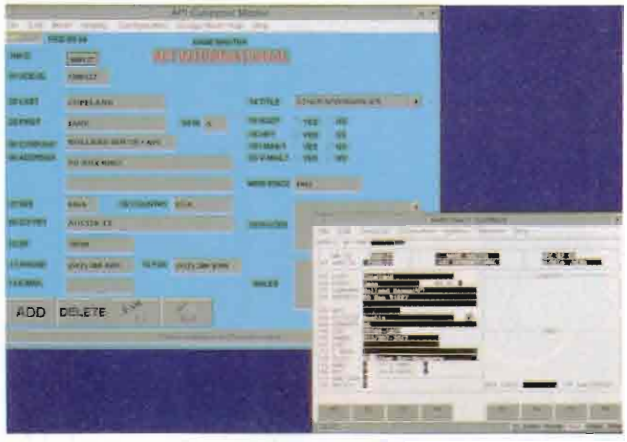
The Many Faces Of API



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CIRCLE 351 ON READER CARD

Many organizations are learning the hard way that developing client-server applications is a long and expensive process and usually involves scrapping application code that was developed and validated at considerable expense. But with Faces for Windows 4.0 from API International (Austin, Texas) you can put a new face on your existing MPE and HP-UX applications.

Without changing any application code, Faces can create a Microsoft Windows interface for existing host-based systems and link those systems to data in ODBC-compatible databases. Faces transforms character-based (or HP VPLUS-based) screens into a GUI, facilitating migration to the client-server model.

Allied with API International, Zebra Software (Austin, Texas) is responsible for the design and development of Faces. Steve Chappell, the developer of Faces at Zebra stresses that "you do not have to change anything in your legacy systems to put on a GUI front end," so you can leverage your existing software investment when moving to a client-server environment.

Faces gives you several ways to add a Windows interface to an application. In creating a screen, the user can choose to manually develop it or let Faces' Screen Builder automatically generate it. All that is necessary is for the individual fields to be delimited in a consistent manner.

If the application uses V-PLUS, Faces will read the V-PLUS FORMSPEC file to create the Windows interface. Screen controls, graphics and other objects can then be added. Objects include entry fields, text boxes, buttons and list boxes. Each screen object has a set of configurable parameters associated with it.

In addition to serving as a GUI front end, Faces also automatically builds screens for IMAGE datasets and SQL tables. Screens come complete with the appropriate buttons already set: add, modify, delete, next, previous, first and last record. For example, the designer can add buttons to initiate a record search. This allows the addition of extra functionality to existing applications, or prototyping or developing of applications, without writing additional code on the HP 3000 or HP 9000.

Faces can update multiple data sources from a single data entry screen. A scripting language supports function calls and creates hot-links between host applications and Windows programs. Faces also can link host data with local or remote PC databases.

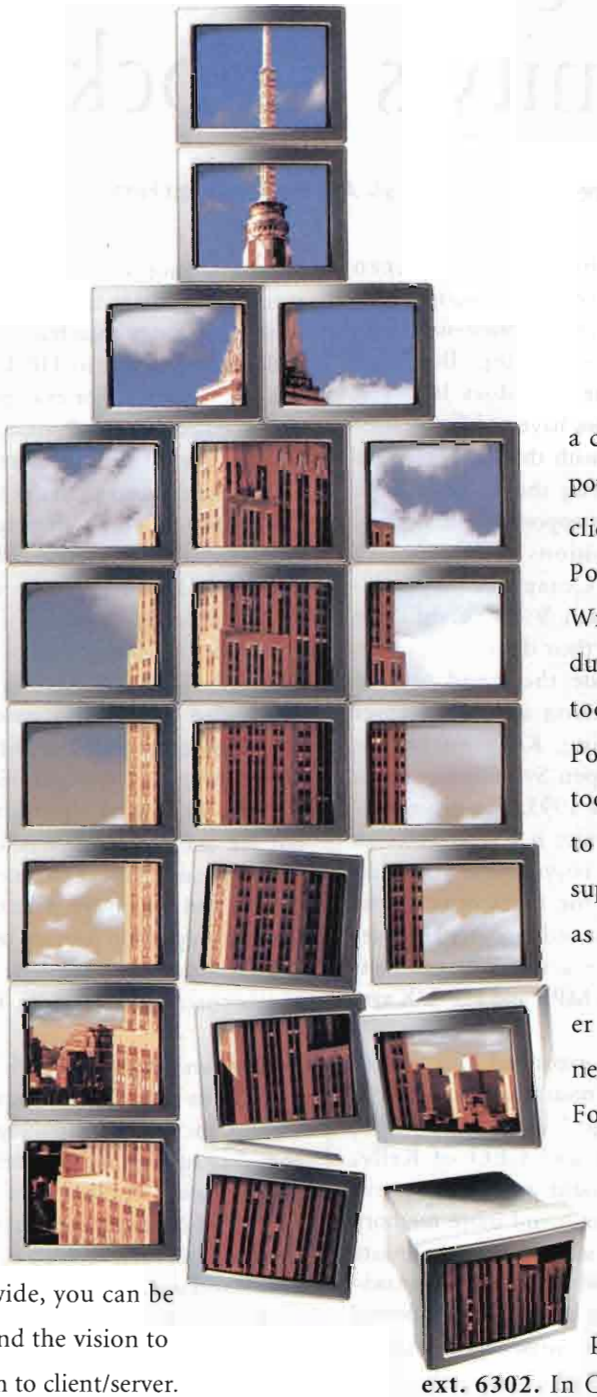
Faces does not directly communicate with the host system, but uses a terminal emulator which communicates with the host. Because Faces uses WRQ's Reflection for Windows as the host interface, Faces operates across any link supported by Reflection.

In particular, with Faces you can have the same speed, ease of use and functionality of a GUI on a PC connected to the host via low-speed, dial-up communications and a PC connected via a high-speed LAN.

Faces 4.0 requires a PC with Microsoft Windows 3.1, a mouse and WRQ's Reflection for Windows 4.0 or later. A developers version of Faces costs $995 and run-time client modules cost approximately $130.

—John P. Burke, HP 3000 Editor

Moving To Client/Server Can Have A Dramatic Impact On Your Business. Even More So If You Choose The Wrong Software Company.



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Answering Opportunity's Knock

Kelly Computer Provides Just-In-Time Solutions For Small- And Medium-Sized Firms

"In addition to network design and implementation, we offer migration from legacy applications in a mainframe or MPE environment to HP-UX and open systems."

Larry Kelly
Founder and CEO
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CIRCLE 352 ON READER CARD

The interest in "open systems" among small- and medium-sized businesses is growing. But large computer vendors like HP sometimes have a difficult time dealing with the needs of firms not among the Fortune 500. That's an opportunity knocking, and solutions providers like Kelly Computer Systems (Mountain View, Calif.) are opening their doors.

Astride the trend toward open systems and client-server computing, Kelly opened its Kelly Open Systems Center in the fall of 1993. The Open Systems Center is a new direction for the 10-year-old company known for electronic forms products, and memory and performance accelerator products for HP's MPE and HP-UX systems.

"We expanded into performance consulting two or three years ago," says Larry Kelly, founder and CEO of Kelly. "We would analyze a system and recommend more memory or solid state RAM to alleviate I/O problems. We then broadened our performance offering to include network consulting and network design, which led us to become a reseller of HP systems."

In addition to network design and implementation, Kelly offers migration services to help a company move from legacy applications in a mainframe or MPE environment to HP-UX and open systems. For example, Fritz Companies (San Francisco, Calif.) is one of the biggest custom brokerage companies in the United States. Three years ago, Fritz expanded its business, adding freight logistics services for its custom ustomers.

When it came time to choose the hardware platform to be installed — system by system — as business required in Fritz's branch offices, "We identified the HP 9000 as the platform, but we decided to go through Kelly because they were more flexible and responsive with the services they could provide us," says George Mazza, manager of communications services for Fritz.

The services provided by Kelly at its new Open Systems Center include configuring a complete base system, or "template system," consisting of an HP 9000 E35, modems, routers, terminal servers, a UPS and Fritz's software, and having it ready to be shipped in one piece to a Fritz site when Fritz is ready to install it.

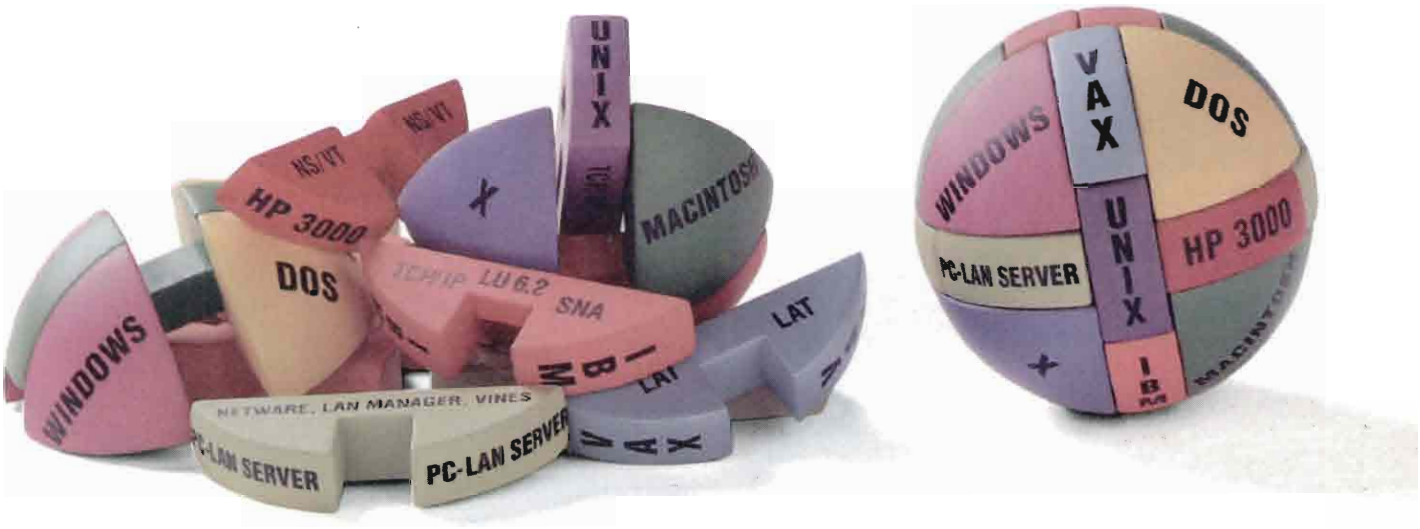
The benefit for Fritz, Mazza says, is a reduction in time and costs. "We are able to reduce the time from order to delivery, and the installation fees are greatly reduced. If we sent everything piece by piece, it would take technicians five days to install it, and cost $4,000 or $5,000. We've been able to bring the installation down to a day and a half, and cut the cost by half."

According to Richard Plough, Kelly's vice president of sales, "the traditional manufacturers like HP or IBM have a difficult time dealing with these customers in an open systems environment." But he says, "these customers still need somebody to come out, install the machine, and deal with the networking and other issues. If a customer is buying under $1 million worth of equipment a year, it's a good match."

It has been a good match for Fritz Companies. "They've been a big asset for us," Mazza says. "A lot of vendors will be glad to install 30 or 40 computers at once. But when we said we wanted to put them out there when we get the customers or the business for them, Kelly was the only company willing to say, 'Fine. We'll have them for you when you need them.' And they are still faster delivering equipment than HP."

—Sam Dickey,
Contributing Editor

PC connectivity?



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The Shapes

EDITOR's NOTE: In this two-part feature, George A. Thompson explores the portable and wireless computing options for the growing subculture of mobile executives.

Of Mobile Computing

Portable PCs Prove That It's The Little Things That Count

Much, too much ado has been made about the exotic locales the "information superhighway" is going to be able to take us. But some of us still like to, or must, visit people and places in-person rather than screen-to-screen. Unfortunately, that often requires leaving the information you'll need to conduct a successful business meeting — notes, appointments, product specs, client data — back at the office held hostage by your desktop PC or workstation.

However, it's now possible to liberate your files and take desktop processing power with you when you're on the road. Thanks to widespread technological advances and the ingenuity of some computer engineers, more than 1.5 million wandering workers define the information superhighway as any road they happen to be traveling on with their portable computer.

The fastest 486-based CPUs, color screens and pointing devices are now de rigueur features on some the smallest and least expensive portable systems. And with a minimum of 4 MB to 8 MB of RAM available on most systems (often expandable to 20 MB or more) and hard drive capacities ranging from 100 MB to more than 200 MB, portable computers are more than capable of running DOS/Windows as well as UNIX applications.

For example, Dell Computer's (Austin, Texas) new Latitude and Toshiba America Information Systems' (Irvine, Calif.) new Portege sub-notebooks include 4 MB RAM (expandable to 120 MB), one 3 1/2-inch disk drive, one PCMCIA slot and integrated pointing device. Other competitive DOS/Windows notebook and subnotebook systems include those from Apple Computer (Cupertino, Calif.), AST Research (Irvine, Calif.), Compaq Computer (Houston, Texas), Gateway 2000 (Sioux City, S.D.), IBM (Somers, N.Y.) and NEC Technologies (Boxborough, Mass.) and Zenith Data Systems (Buffalo Grove, Ill.). Although not as well-known in the note-

GEORGE A. THOMPSON

book market as some of their more dominant competitors, Texas Instruments (TI; Dallas, Texas) offers the TravelMate series of 486-based notebooks fine-tuned for running Windows.

HP, on the other hand, eschews the ultra competitive notebook market, to concentrate on providing what Kent Henscheid, HP's product marketing manager for portables, calls "unconscious portability." Therefore, HP's portable products reflect shrewd compromises between size, weight and battery life.

HP's 3-pound 386SX-based OmniBook 300 and 486SLC-based OmniBook 425 stand out from the clone pack with their ROM-based software, full-size keyboard, "pop-up" mouse and serial infrared (SIR) communications port. And although the OmniBooks include a NiMH battery, it can also run on four lithium or common alkaline AA size batteries.

According to Henscheid, when it comes to portability, HP thinks small. "It's part of our corporate heritage," he says, referring to HP's legendary calculator business. That's why the OmniBook is promoted as a "SuperPortable" by HP — it falls between the definitions of a standard notebook portable and hand-held electronic organizer. The HP Omnibooks compete with similar systems like Compaq Computer's Aero, Gateway 2000's Handbook, and Zeos International's (Minneapolis, Minn.) Contenda sub-notebooks.

Like many sub-notebooks, the OmniBook does not include a 3 1/2-inch disk drive, however, a 1.4 MB disk drive with a parallel-port connection can be obtained from Pacific Rim Systems Inc. (Hayward, Calif). The LapLink Remote Access software can be used with the JetEye PC ESI-9610A from Extended Systems (Boise, Idaho) which provides a wireless point-and-shoot connection between the OmniBook and any DOS-compatible desktop or portable computer so you can have local access to disk, hard drives and printers.

Variations On A Theme

BESIDES THE HP OMNIBOOK, there are other interesting and unique variations on the notebook computer theme. For example, Olivetti's (Bridgewater, N.J.) Quaderno 33, about the length of a standard sheet of paper folded in half, includes an integrated fax/modem and an analog mode for voice messages; it also can be used as an answering machine. For the I-wish-I-had-a-printer-at-30,000-feet crowd, the Canon NoteJet 486 from Canon (Lake Success, N.Y.) includes a built-in printer underneath the LCD screen.

For multimedia mavens, Toshiba offers the T4800 CT ($6,499), a multimedia-ready notebook with a 75 MHz Intel DX4 SL Enhanced CPU, 16 KB internal cache 8 MB RAM (expandable to 24 MB), one Type II PCMCIA slot, 500 MB hard drive and VL local bus graphics with a 9 1/2-inch, 256 color, active matrix color LCD (640 x 480 pixel resolution).

With its centrally located, two-button trackball and overall intelligent design, Apple's Macintosh PowerBooks immediately set an ergonomic standard, that has since been widely emulated, when they were first introduced in October 1991. Like its desktop Mac relatives, the PowerBooks include System 7, integrated ADB ports, LocalTalk networking, SCSI support and stereo sound input/output.

Apple's new PowerBook 520 and PowerBook 540 use clock doubled 50/25 MHz and 66/33 MHz Motorola 68LC040 CPUs, respectively. Interfaces now include Ethernet as well as an optional PCMCIA Expansion Module. But the PowerBooks are again breaking new ground by replacing the popular trackball configuration with a single-button trackpad for fingertip cursor control. Color versions using a dual-scan, passive matrix display (520c) and active matrix display (540c) also are available.

Influenced by their diminutive MS-DOS and Macintosh OS counterparts, even heavy-duty, desktop-bound operating systems like UNIX are seeing the light of day. With an overall SPECmark of 26, the SparcBook 3 ($10,950) from Tadpole Technology (Austin, Texas) uses a 50 MHz TI microSPARC CPU, 16 MB RAM, removable 340 or 520 MB hard drives, one Type III PCMCIA (2.0) slot, 84-key keyboard with integrated pointing stick, integrated data/fax modem, 9 1/2-inch color 640 x 480 TFT LCD (256 colors), Weitek P9000 graphics accelerator, stereo audio ports and built-in ISDN interface.

The 6 1/2 pound, SparcBook 3 also comes preloaded with Solaris 1 or 2 OS and version 2.0 of the Nomadic Computing Environment (NCE) 2.0. NCE provides power management, remote access communications and file synchronization facilities for the mobile users.

Tadpole, in an alliance with IBM, is also designing, developing and manufacturing IBM's RS/6000 Model N40, a 50 MHz PowerPC-based notebook. Running IBM's AIX, the seven pound N40 has a performance rating SPECint92 of 41.7 and SPECfp of 51. Not to be outdone, a DEC Alpha-based portable was demonstrated at Uniforum '94 and low-power versions of the PowerPC CPU also are heading for use in Macintosh portables to be introduced in the first half of 1995. The new PowerBooks — the 520, 540 and Duo 280 — also are PowerPC-upgradeable.

Let's Get Small

WHAT DO YOU GET WHEN you cross an 11 oz. HP calculator with MS-DOS 5.0? For HP, the answer is its LX series of DOS-based palmtops. The original HP 95LX has been succeeded by the 100LX ($749). Marketed as a personal information appliance (PIA) by HP, the 100LX also includes information management capabilities like an HP-inspired appointment and address book and of course an HP financial calculator. In fact, the 100LX is manufactured by the HP calculator division (Corvallis, Ore.).

Like its predecessor, the 100LX includes MS-DOS 5.0 and Lotus' 1-2-3, Release 2.4 in ROM, as well as cc:Mail Remote software embedded in ROM. Other improvements include one PCMCIA Type I (2.0) slot and better screen

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resolution. Using cc:Mail Remote, you can compose messages off-line and then call and upload them to your networked cc:Mail server.

If your life and livelihood revolves around Lotus spreadsheets, then the HP LX ought to be a good choice for you. But for general purpose MS-DOS computing, you may want to consider the Poquet PC Plus from Fujitsu (Santa Clara, Calif.). The Poquet PC Plus uses a 16 MHz NEC V30 CPU and includes an 80 x 25 monchrome LCD, two PCMCIA Type II slots and MS-DOS (but not Windows) in ROM.

Because of its calendaring and scheduling features, the 100LX competes with non-DOS hand-held electronic organizers like Atari's Portfolio, Casio B.O.S.S. and Sharp's. Wizard. The Series 3a, another non-DOS palmtop from the British manufacturer Psion PLC (Concord, Mass.) also competes with the 100LX. The Series 3a includes a Lotus-compatible spreadsheet, a word processor and a database, as well as agenda and time management. In addition, the 3a includes a built-in microphone for voice annotation. According to Frost & Sullivan, electronic organizers will see their strongest growth in consumer-oriented low-end units that offer basic PIM functions.

Sole Of A New Machine

THE ADVANCES IN PORTABLE computing technology combined with evolving client-server IS architectures, that include wired and wireless LANs, are correctly emphasizing the often neglected and sometimes forgotten in-the-field worker. Sales force automation in particular is a top-priority for some large companies, says Joyce Gavenda, market analyst for Summit Strategies. "For too long, companies have focused on re-engineering office and manufacturing functions, but have ignored the noble road warriors," she says.

But a portable computer-toting salesperson armed with word processing, contact management, PIM and E-mail software is nothing new. Some techno-savvy peripatetic professionals have already been using presentation and multimedia software in business and sales meetings. And that's fine for individual personal productivity, as long as salespeople are properly trained and computer literate; but there's still a far more strategic business advantage being exploited by a few leading-edge companies.

Gavenda says that the power of mobile computing gives salespeople just-in-time access to product specs, pricing and

Portable Peripherals: Don't Leave Home Without Them

P-C-M-C-I-A. It's the most unloved acronymn in the acronym-loving computer industry. But every mobile computer user loves what PCMCIA technology does for them. With the emergence and nearly universal acceptance of PCMCIA technology, once bulky computer system peripherals — fax/modems, LAN adapaters, SCSI interfaces, and now hard disk storage — have been reduced to easy-to-pack and pocket PCMCIA or PC Cards making portable computing a pleasure, rather than a pain.

PCMCIA stands for the Personal Computer Memory Card International Association, a non-profit trade group founded in June 1989 to establish, educate and promote the PCMCIA or PC Card standard. There are three kinds of PCMCIA cards (all are backward compatible):

- Type I cards are 33mm thick and consist mostly of flash memory cards. Flash memory cards are expensive compared to their hard disk counterparts.

Sun Disk (Santa Clara, Calif.) offers 1.8 MB, 2.5 MB, 10 MB, 20 MB and 40 MB capacities. Sun Disk's flash memory cards comply with the PCMCIA-ATA standard (which preserves IDE interface compatibility). Telequip Corp. (Hollis, N.H.) offers Crypta Plus, a solid-state flash memory card (up to 20 MB) with high-level embedded security functions.

- Type II cards are 5mm thick and make up the majority of existing PC Cards.

Magic Ram (Los Angeles, Calif.) provides a fax/modem/voice PCMCIA card for voice annotation with multimedia, E-mail, word processing and spreadsheet documents. Magic RAM also produces Ethernet, 10BaseT, 10Base2, Token Ring and 3270 emulation adapter PCMCIA cards.

Megahertz (Salt Lake City, Utah) offers data and data/fax modems inlcuding a cellular fax modem all in PCMCIA format. Megahertz is well-known for the innovative XJACK (extendable connector) which includes a retractable RJ-11 jack integrated on the PCMICA card. Megahertz also offers portable pocket modems, as does Zypcom Inc. (Hayward, Calif.).

Data Race (San Antonio, Texas), Proxim (Mountain View, Calif.) and Xircom (Calabasas, Calif.) all offer wireless solutions in PCMCIA format. Wireless Access Inc. (San Jose, Calif.) offers the AccessCard, a one-way PCMCIA Type II messaging receiver with an integrated attentena. Bell South's MobileComm and SkyTel are the intial services available. The AccessCard can work with the HP 100LX palmtop.

Even HP 3000 users can be "mobilized" with the Reflection-To-Go PCMCIA card available from Walker, Richer & Quinn (WRQ; Seattle, Wash.) available for the HP LX Series palmtops. In addition to supplying terminal emulation for HP 3000 applications, Reflection-To-Go offers enhanced modem dialing and screen handling.

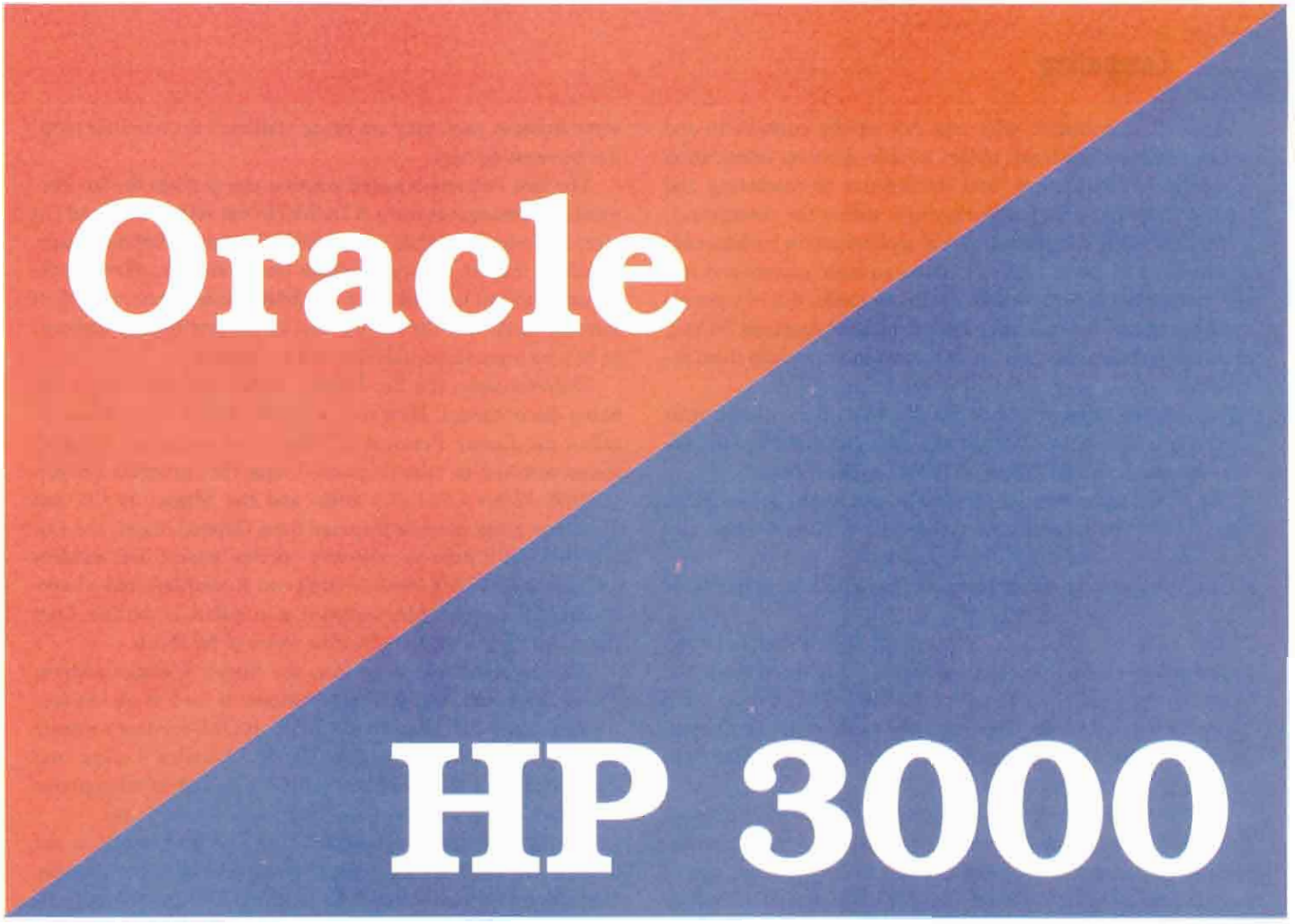
- Type III cards are 10.5mm thick and are small hard disk drives (rotating storage).

MiniStor (San Jose, Calif.) as well as Integral Peripherals (Boulder, Co.) are among the vendors offering 105 MB PCMCIA Type III hard drives. Other vendors include Western Digital Corp. (Irvine, Calif.), Maxtor Corp. (San Jose, Calif.) and Seagate Technology (Scotts Valley, Calif.).

A Type IV (sometimes referred to as Type III+) card is being promoted by Toshiba, but not recognized by the PCMCIA. Although Version 1.0 of the PCMCIA specification was not well supported, Version 2.0 (which defined the Type III slot) and the current Version 2.1 have attracted overwhelming industry support. With over 220 members, the PCMCIA has worked closely with the Japanese Electronic Industry Development Association (JEIDA) and is now working with over 100 members in Europe to establish the specification as a worldwide standard.

Unfortunately, PCMCIA cards are not universally compatible. However, the problem is being worked on by all the system vendors and tradtional BIOS vendors to make it a plug-and-play solution. Until then, make sure the PCMCIA card you buy will work with your machine.

Even desktop PCs now include PCMCIA slots for an easier transition between on the road and in the office information. For example, HP's Vectra PCs support mobile computing with PCMCIA support and SIR interfaces. By 1997, according to International Data Corp., about 30 percent of all desktop PCs are expected to include PCMCIA slots. If you need to retro-fit your PC, the DockItSocket from MiniStor Peripherals allows you to add PCMCIA slots to your system.



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availability; in addition, sales reps can rapidly connect to and update customer databases, obtain trouble-shooting information and provide competitive field intelligence to marketing and other colleagues in related workgroups within the enterprise.

By developing customized vertical applications for business tasks involving forms-based data collection, signature capture and image annotation, doctors, nurses, inventory clerks, delivery people and stock traders now are using Personal Digital Assistants (PDAs), personal communicators and mobile companions to help them reduce costs and to gain competitive advantages.

- The Specialty Division of Best Foods Canada is automating their retail sales operations. Diaries, route cards and customer sales histories now reside on Fujitsu's 325Point tablet system.
- The U.S. Department of Defense is giving physicians PDAs to allow them access to medical histories, lab test results and patient records via a wireless network.
- Traders on the American Stock Exchange are using handheld units to execute trades faster.

But no matter what you call them, all these devices and applications have one thing in common — they are tapping the power of the pen. No, not with a flick of a BIC, but by using "gestures" (proofreading-like symbols) made with an electromagnetic stylus that acts like a "pen" on a notepad-like digitizer that behaves like "paper."

Although a more clever classification might be to call them pen-assisted devices (PADs), they are without a doubt bringing the advantages of computerization to disparate groups of mobile professionals. Currently, Apple's Newton MessagePad, Sharp's ExpertPad and Tandy/Casio's Zoomer are the best examples of PDAs. However, although these devices will have some business uses, they are being marketed as consumer tools, not business devices.

The first business-oriented solution was perhaps the Eo Personal Communicator using AT&T's Hobbit RISC CPU and Go Corp.'s (Foster City, Calif.) PenPoint OS. With its clipboard shape, a built-in modem, optional cellular phone module, allowing the internal modem to work over a cellular phone system, and all its software in ROM, the Eo was one of the first systems designed to be a communications device, not a computer.

Unfortunately, the Eo devices — the 440 and 880 — are being discontinued. However, a similar device from Motorola called the Envoy Personal Wireless Communicator ($1,500) seems destined to take its place. Using the Motorola Dragon (68349) 32-bit CPU (3.3 volts) and the MagicCap OS and Telescript programming language from General Magic, the Envoy includes a built-in two-way wireless packet data modem (offered with AT&T Personal Link and RadioMail) and a built-in data/fax modem. Also included is an infrared interface. Data input can be accomplished with a stylus or by touch.

Like an electronic organizer, the Envoy includes address, phone book and scheduler applications, as well as an expense tracker, a calculator and world clock. ROM-resident software includes fax, Official Airlines Guide, America Online and PenWare's PenCell spreadsheet program. A built-in microphone and a speaker provide for voice and musical annotation.

Still more fictive hand-held visions will be hatched in the form of the "Mobile Companion" being developed by Compaq, Intel, Motorola and Toshiba. An IBM and Bell South joint venture gave birth to Simon, a pen-driven device focusing on the telephone. And HP's plans with Novell Inc. (Provo, Utah) and

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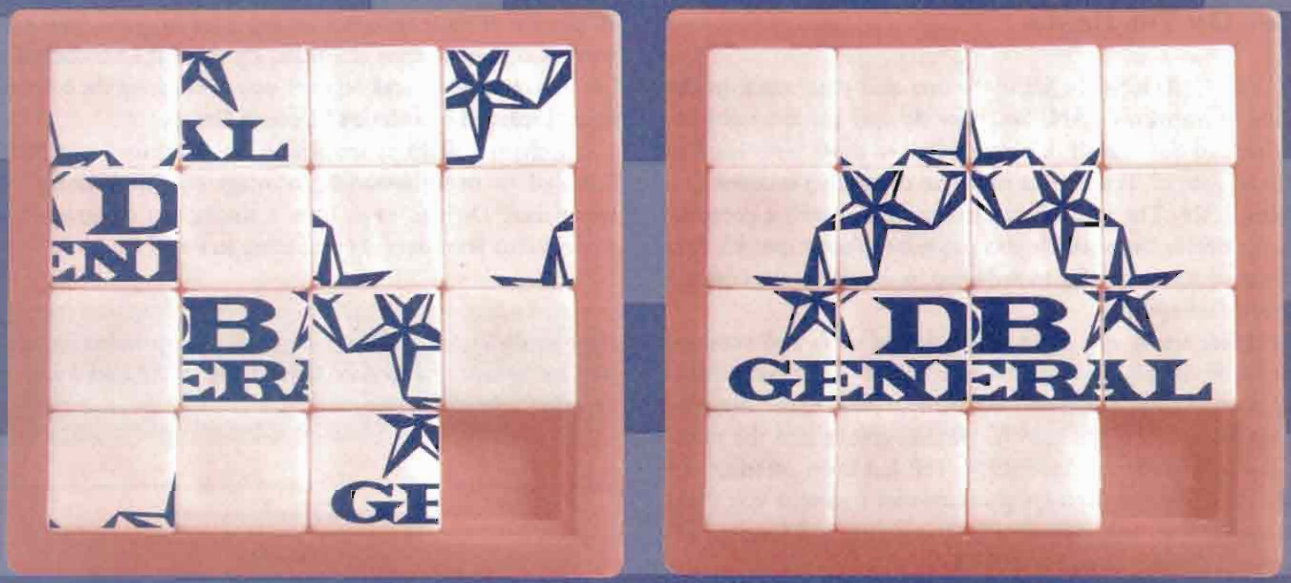

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GEOS from GeoWorks (Berkeley, Calif.) for a handheld, pen-driven HP system remain a mystery.

Home On The Range

OK, YOU'RE KNEE-DEEP IN data and your stuck in the middle of no man's LAN. So how do you get the information back to the branch or home office to those who need to use or update it? The answer for some companies is access to a wireless LAN. The idea of wandering around with a communication device from which you can nonchalantly query a host database or transmit a fax to the office is crucial to the concept of mobile computing.

Wireless access also is on the minds of users and vendors. Because of complaints about its lack of two way communications features, Apple introduced an upgraded Apple Newton MessagePad — the 110 ($599). HP has gotten into the wireless act as well. Since April 1994, HP has been offering HP StarLink, a wireless messaging service that transmits voice and data messages as well as the latest news, sports and financial information directly to an HP 100LX.

Some analysts, in fact, believe that in the virtual office of the future, all corporate LANs, MANs and WANs will be remotely linked via a wireless infrastructure. Wireless LAN revenues will reach $237 million by 1996, according to the Yankee Group — 70 percent of those revenues are expected to come from sales of wireless communication solutions. By then, the number of mobile workers will be well on their way to reaching the 6.8 million figure predicted by Business Research Group.

So, the implications are clear. Can you gain a competitive, financial or organizational advantage by "mobilizing" your workforce? Do you even have a strategy to integrate mobile devices into your overall computing strategy?

Next month Technical Editor George A. Thompson explores the impact and options of ***Wireless Computing*** *in the second part of his* ***Mobile Computing*** *feature.*

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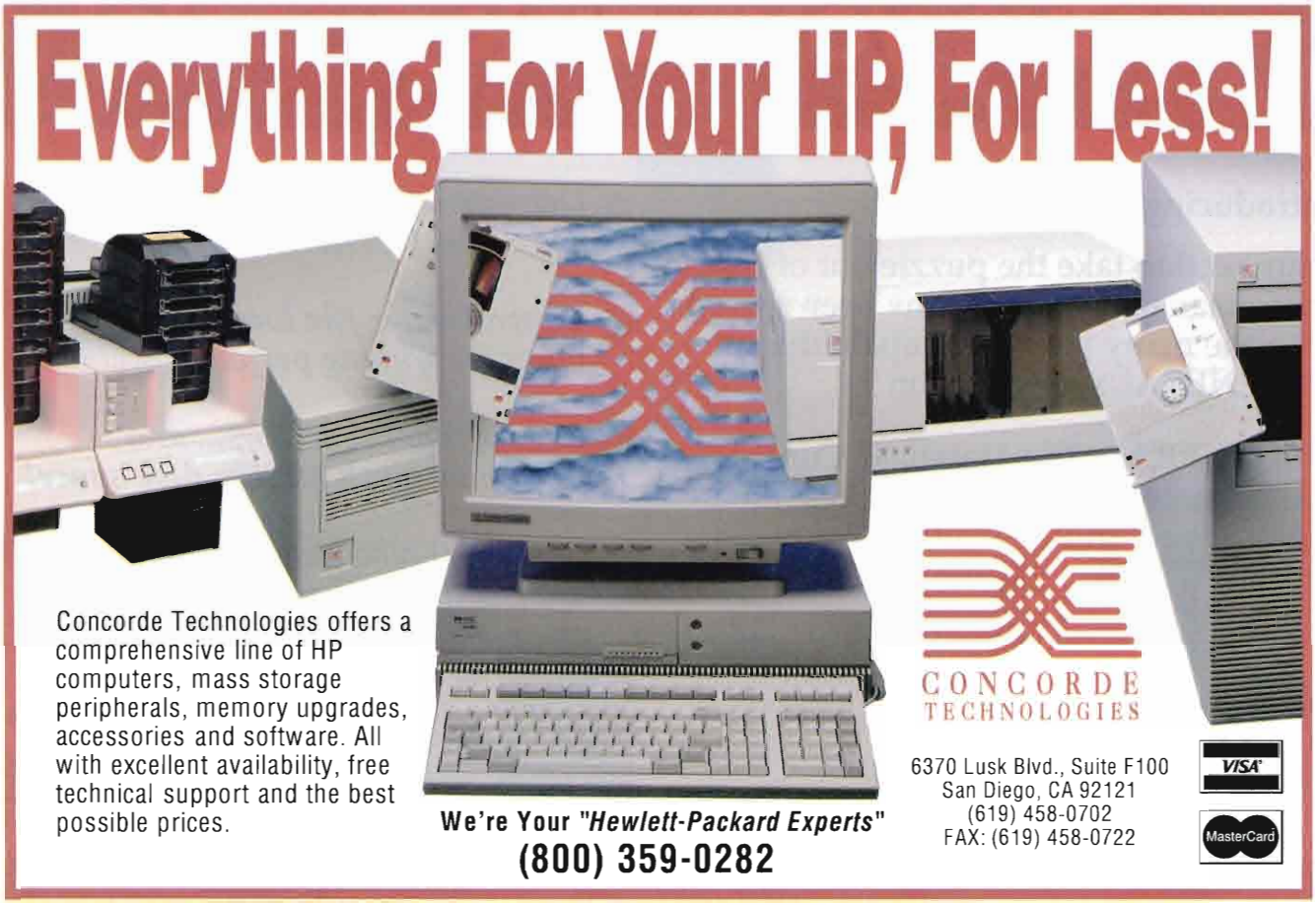

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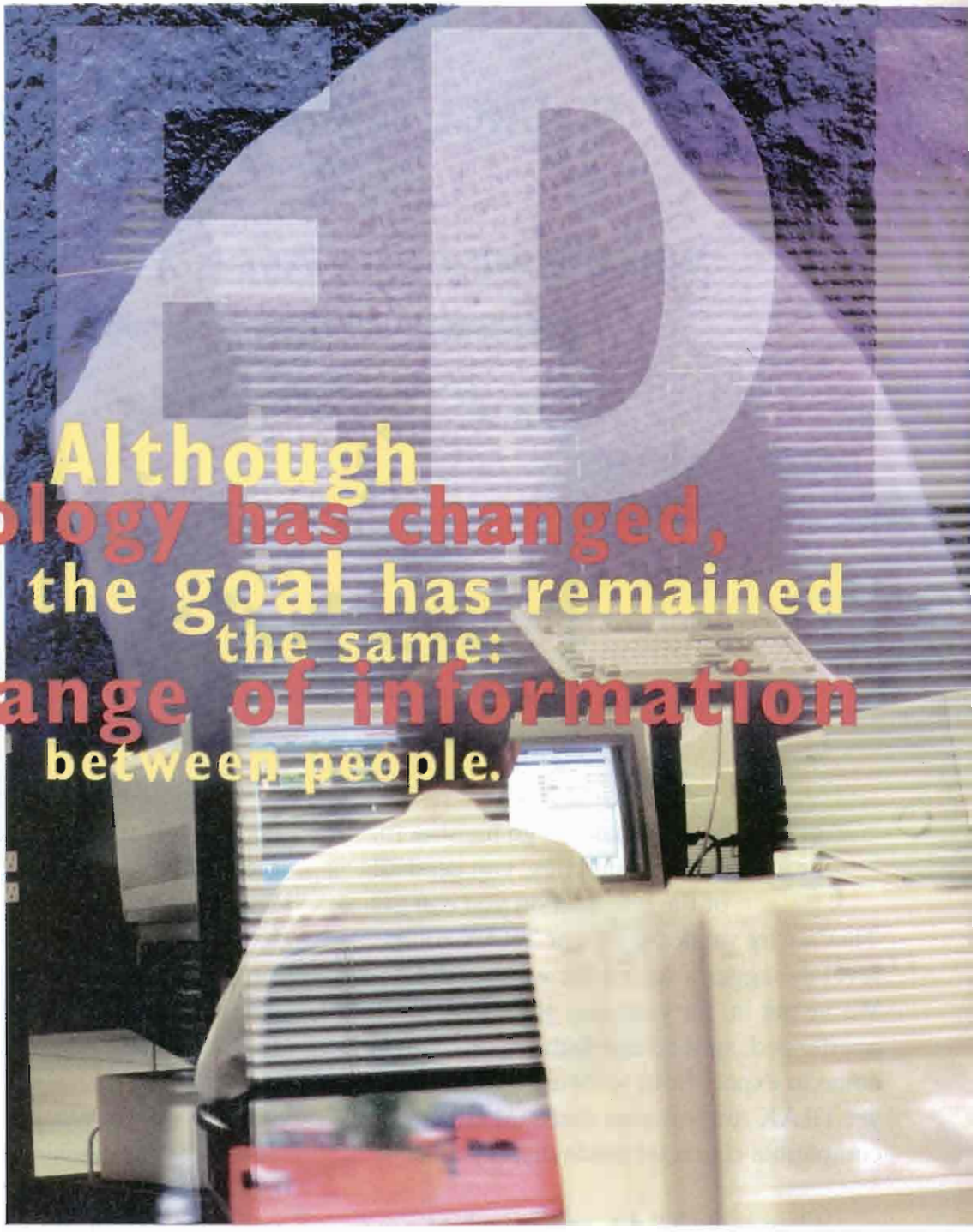

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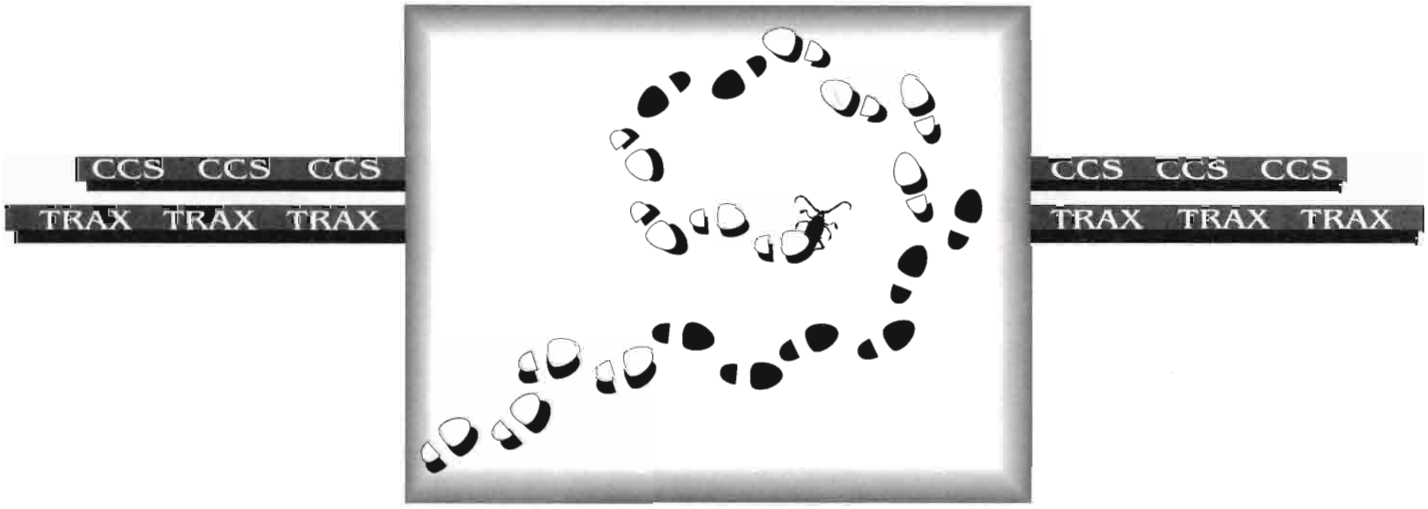

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Going To Xtremes

Installing X Stations Doesn't Have To Be An Act Of Desperation

Enterprise computing means, among other things, that you have many options when crafting your computing environment. In the past, it was simple to select a hardware platform for a particular use. The hardware platform wasn't always ideal for its planned use, but it was what everyone else used for that purpose, so that was what you got.

Mixing and matching platforms was limited by price, because business systems were relatively expensive, and functionality — Microsoft Windows was about as far as you would go on the desktop and X Windows didn't support many of the applications you needed.

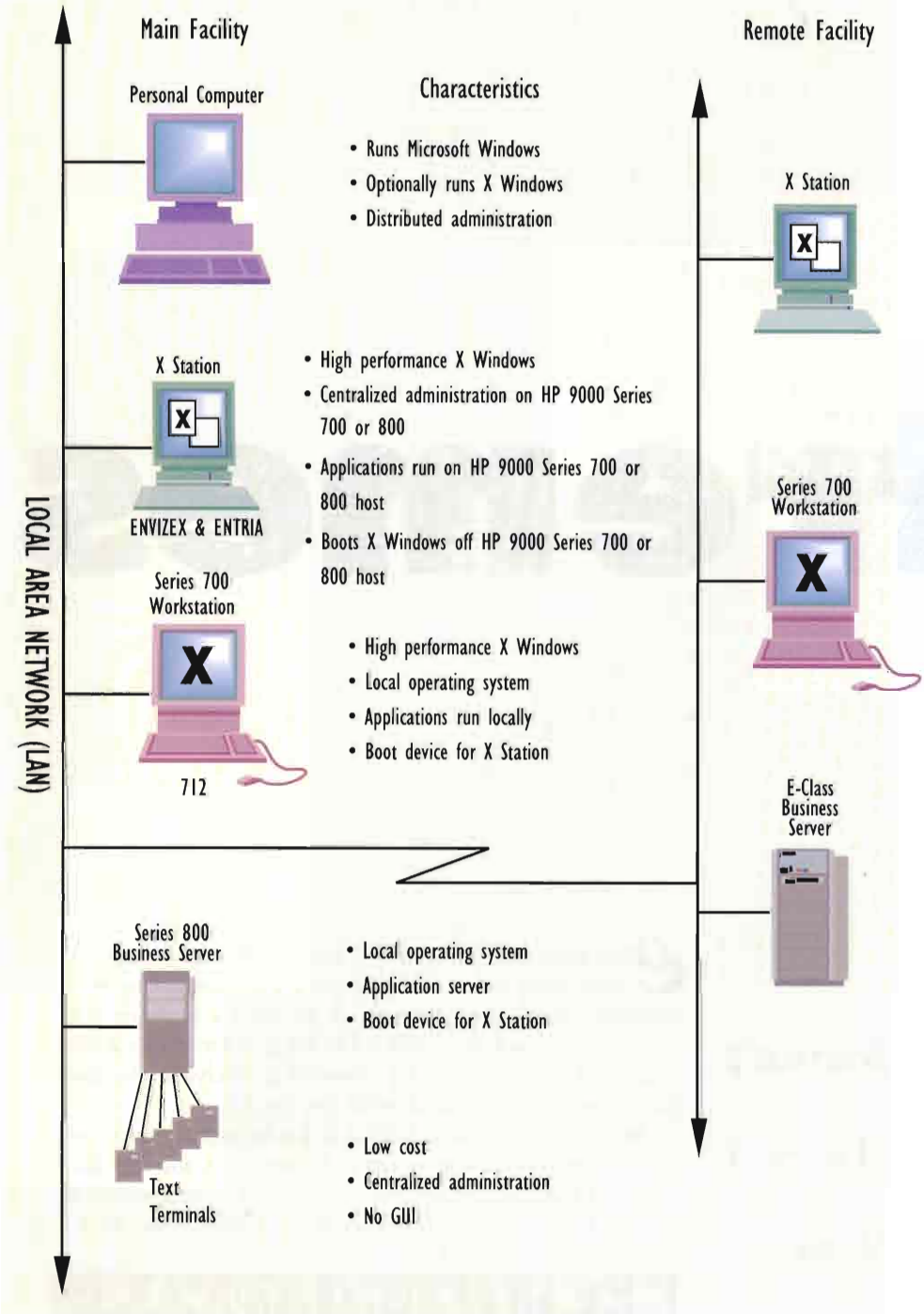
MARTY PONIATOWSKI

Because X Windows has been showing up in installations that traditionally haven't been considered mainstream X Windows environments, mostly because they are non-technical, awareness has been raised and interest increased in X Windows.

Although we'll be focusing on X Windows devices, this is not to say that there isn't a place in many environments for all of the devices shown in *Figure 1* . But in an environment where users need to access primarily X Windows-based applications, the most predominant X Windows devices are X stations and workstations. PCs also have been growing in popularity as X Windows devices; however, because of performance limitations, some more advanced applications such as the HP Visual User Environment (HP VUE) are not widely used on PCs.

From an end user's point of view, in a properly configured environment, there is no difference between an X Station and workstation. *Figure 1* shows an interesting characteristic under the X Station — it boots X Windows from an HP 9000 Series 700 or 800 host (other non-HP hosts also are supported by HP X Stations).

FIGURE 1



This is because there is no local operating system present on the X Station. It gets its X server, fons, and configuration files from an HP 9000 Series 700 or 800 host. This means no files are locally stored on the X Station to manage. In many environments, this is all someone needs to hear in order to make a decision about whether or not to buy X Stations.

If no local files are present then it is easy to manage, so this is the best choice for some installations. But just because there are no files stored on the X Station doesn't mean that processing doesn't take place on it. The HP ENVIZEX and ENTRIA families have an internal Intel i960 processor for graphics processing. The speed at which local graphics processing takes place is of as much importance to overall performance as the speed at which the application runs on the host.

Fortunately there is a performance measure for X Stations called "Xstones" that is universally used by X Station manufacturers to gauge performance. Xstones is the composite single number of approximately 40 weighted tests. Xstones is the generally accepted benchmark to quote for X Stations. The higher the Xstones the better, but the local graphics performance is only part of the equation. X Stations consume resources on the host as well.

The host runs applications that are displayed on the X Station. This means that the host CPU must support the applications running on the X Station, the network must support communication between the X Station and host, the host disk has adequate swap space. It also means that additional RAM is required

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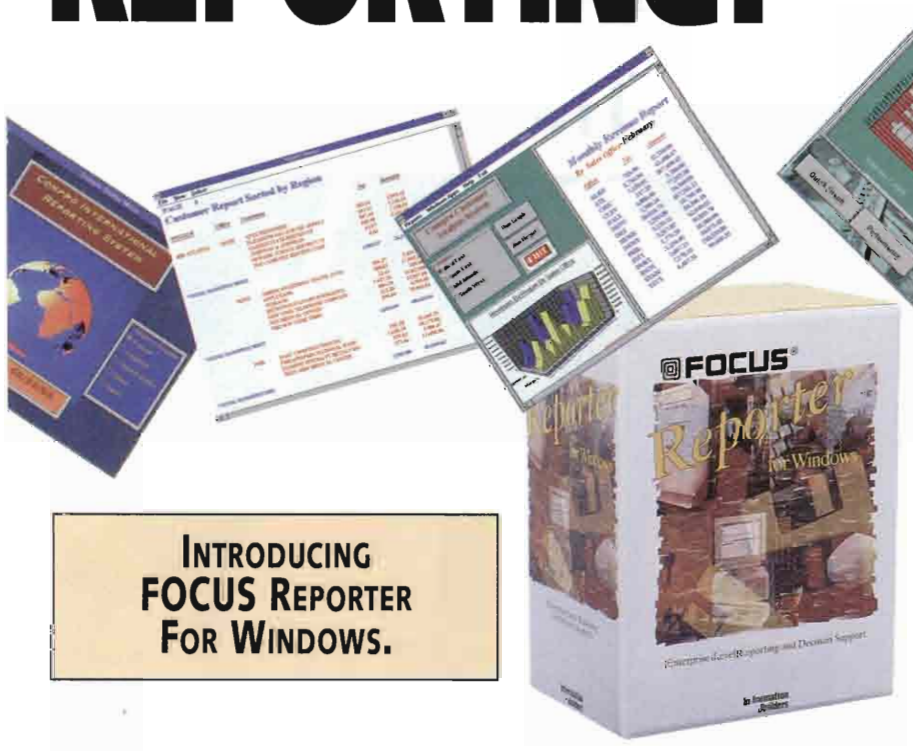

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on the host for each X Station. *Figure 2* summarizes some application test results compiled by HP for X Stations and an HP 9000 Series 700 host.

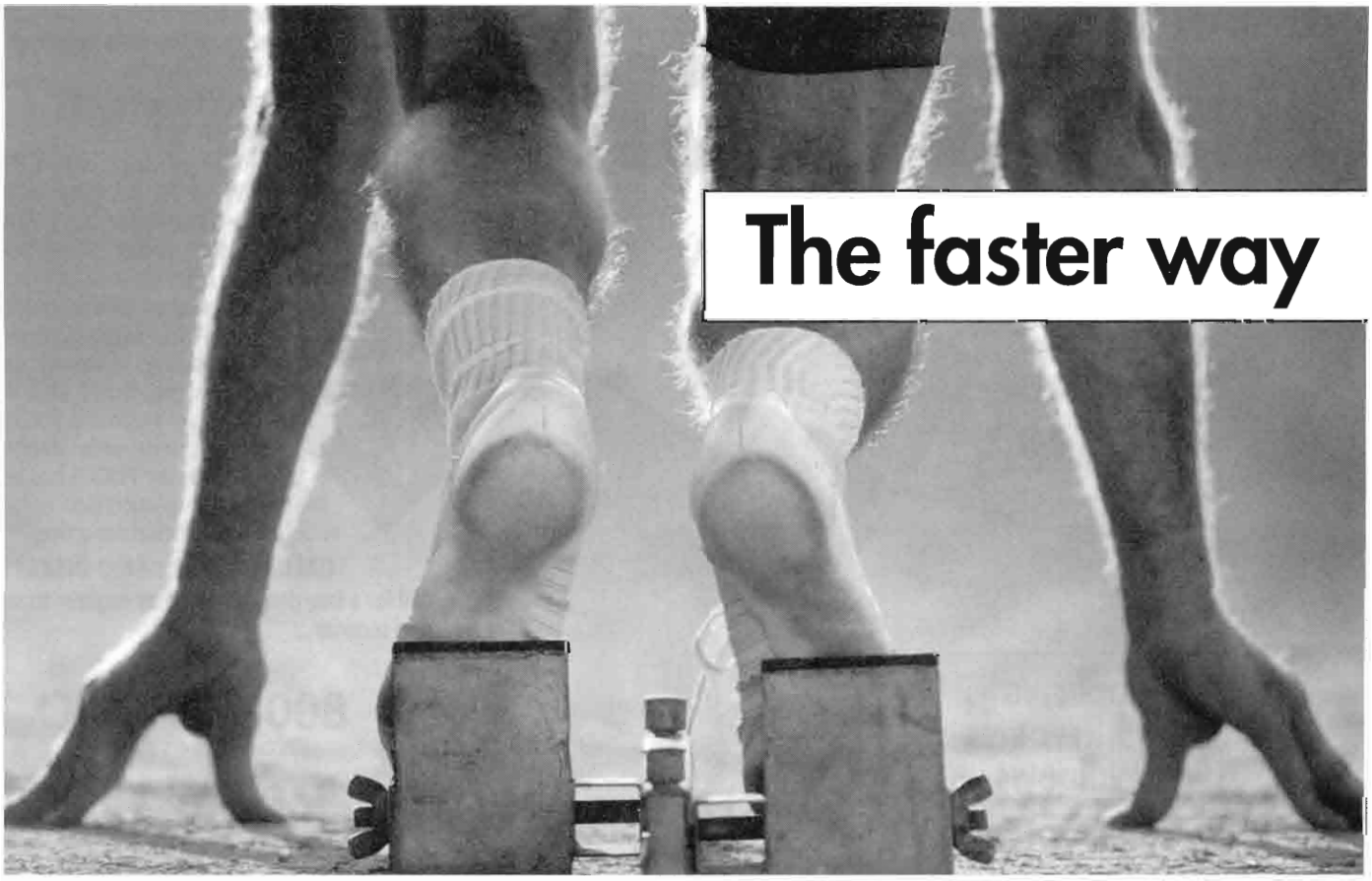
Figure 2 is broken up into six parts. The first column lists five typical applications for which X Stations are well suited. The second column is the number of X Stations supported by the application for very active users (the lower number) and less active users (the higher number). The third column is the amount of RAM recommended for the X Station, not the host. The fourth column is the amount of RAM required on the host for each X Station. The fifth column shows the amount of swap space required on the host for each X Station. The last column is the total LAN use for the number of X Stations specified for each application.

FIGURE 2 Application Test Results For Series 700

Application	HP ENVIZEX Stations Supported	HP ENVIZEX RAM Usage (MB)	HP 9000 Model 755 RAM Usage Per HP ENVIZEX User (MB)	HP 9000 Model 755 Swap Space Per HP ENVIZEX User (MB)	Total LAN Utilization (% of total)
BBN RS Series	20 to 30	4 to 6	1.8 to 3.2	3.2 to 5.1	6 to 8%
FrameMaker	18 to 24	4 to 6	3.5 to 4.0	4.5 to 6.0	9 to 12%
Island Graphics	20 to 25	6 to 8	2.6 to 5.1	4.0 to 6.0	6 to 9%
SoftBench	8 to 15	4 to 6	4.7 to 7.7	20.0	8 to 10%
Informix Wingz	25 to 30	4 to 6	1.2 to 2.5	2.5	6 to 9%

Insuring you have sufficient resources for all of these categories is important to achieving the desired performance with X Stations. An ideal way to determine what resources are required is to test your application with one X Station and determine how much of these resources are required in your environment.

The one category that is most often overlooked when configuring X Stations is LAN utilization. In many computing envi-



ronments, especially those with client-server applications, LAN utilization is already high, and introducing X Stations causes additional LAN utilization. Under these circumstances you may want to segment the LAN to keep utilization below 25 percent which is the point at which HP's testing showed that users may begin to notice degradation in interactive response times.

What About Workstations?

WITH ALL THIS TALK about X Stations, what about workstations? Where do they fit in? Because workstations do their computing locally, any applications that require a lot of desktop processing power are good candidates to run on a workstation. Because workstations have a local processor they can perform processing which, with an X Station, would have to take place on a host. You can take the local processing of workstations one step further by using a tool like HP Task Broker that can identify the system on your network that is best suited to perform processing at a particular time. With HP Task Broker you can do the following:

- Distribute computational tasks between HP-UX workstations as well as other UNIX workstations.
- "Load Balance" a group of UNIX systems by transparently finding the most available server for a computational task.
- Form a "computational cluster" which can distribute computing among several systems less expensively than a mainframe or supercomputer.
- Receive the results on your computer regardless of where computing has taken place on the network.
- Set-up the Task Broker systems on the LAN by updating the central Task Broker file on one system.

To use your network of UNIX systems with Task Broker you don't have to recompile application programs.

Narrowing Down The Options

WITH SO MANY OPTIONS available for application servers and desktop systems, it can be difficult to determine which ones will work best in your environment. At the server level, you may want to consider having not only a larger system in a central location, but smaller systems such as the E-Class server in remote locations. This will enhance the responsiveness of your applications for these remote users.

If you have a very demanding application that requires local

to faster code.

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operation, you'll want to examine dedicated workstations for users. If centralized administration is the most important factor for desktop systems then the X Stations, which have no local operating system, may be the best choice.

With so many computing options make sure you carefully compile your system requirements so you can select the platforms that are ideal for your computing environment. —*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 information, contact CBM Books at (215) 957-4265.*

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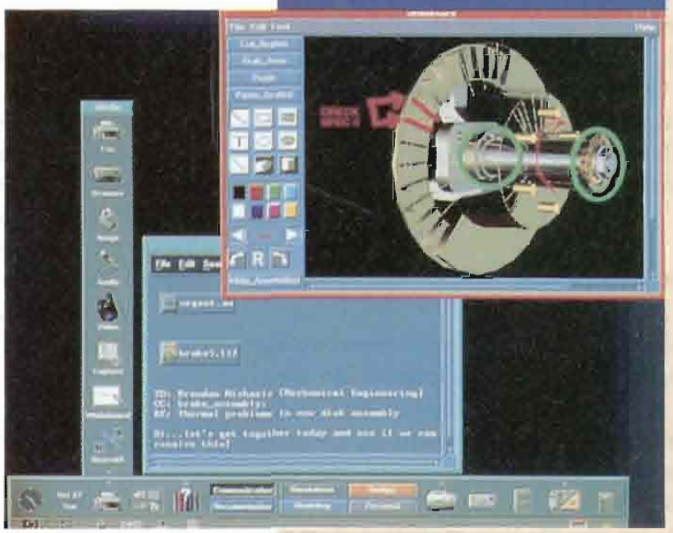
How's The VUE



An HP VUE screen shot with a sub-panel showing additional options.

With HP VUE, X Station and workstation users have an environment with many advanced features:

Login Manager — Allows you to start a work session by logging in through a graphical screen.

File Manager — Provides a graphical means of navigating through your local HP-UX file system as well as remote file systems. Files and directories can be moved, copied, deleted and added. These functions are performed by selecting an icon and then selecting the desired function from the menu.

Workspace Manager — A workspace is an organization of the user environment comprised of windows and icons. Six workspaces are shown: 1) Communications, 2) Simulations, 3) Design, 4) Documentation, 5) Modeling and 6) Personal. You can switch between these six workspaces by clicking the mouse on the workspace.

Style Manager — You can customize most aspects of your user environment with options such as colors, fonts, backdrop, keyboard, mouse, audio, etc.

Session Manager — Allows you to save your customization so you can restore to the same state when you next login.

Icon Editor — Allows you to create your own icons including text and audio.

MPower — The slide-up sub-panel shows the components of MPower, HP's multimedia product. The HP VUE screen shot shown also includes a slide-up sub-panel of SharedX, Whiteboard, Video, Audio, Imaging, Scanner and Fax. Here is a description of how you might use some of these MPower components:

Sharing Information — With MPower's SharedX and whiteboard (these are being used in the screen shot to share the design shown), you can simultaneously view information on several systems. The mechanical design shown is being viewed on more than one system so users can collaborate on work in real time without having to print information and mail it.

Messages With Meaning — You can send E-mail messages with MPower that include audio, graphics and video. This means that if you are working on a document that includes graphics you can send a mail message to a co-worker that includes the graphics as well as an audio message that you record.

For users accustomed to running applications on their PC or Macintosh, the following emulation products run in this environment:

HP WABI — Supports 13 popular Windows applications. This application translates Microsoft Windows calls to X Windows calls for high performance of graphics applications. Check to see that the applications you use most often are on the list of 13 supported by HP WABI.

Insignia SoftWindows — Use SoftWindows if your applications are not supported by HP WABI, if you need MS-DOS applications, or if you use PC networking extensively. Windows 3.1 runs natively under HP-UX.

Apple SoftMac - This emulates the Macintosh environment in X Windows.

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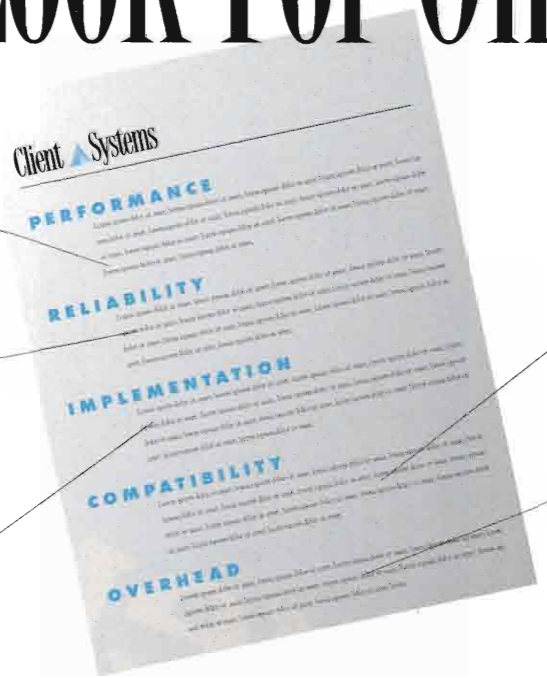

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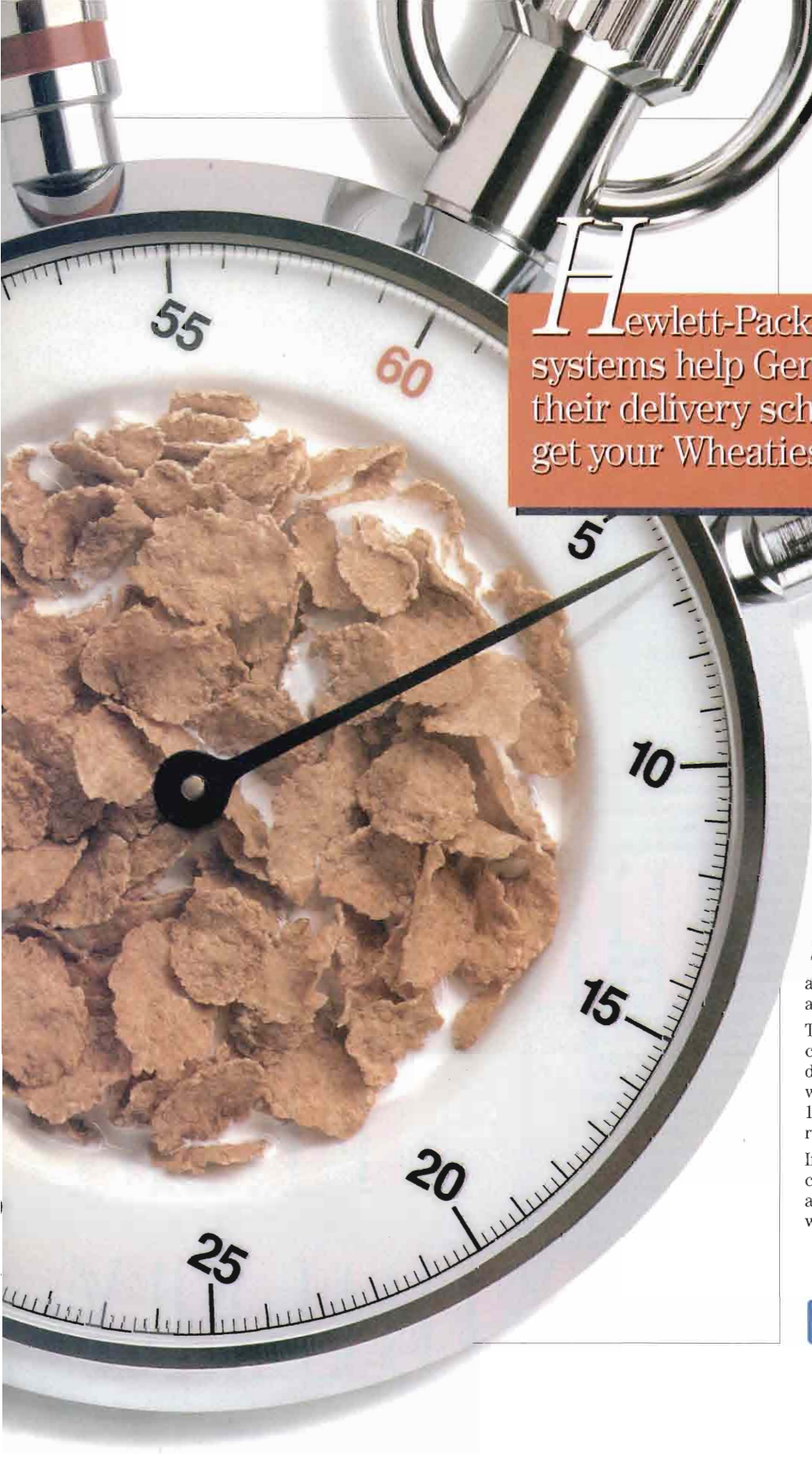

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"Not only is the HP 3000 open, but it's an excellent, easy-to-use transaction-processing system for business-critical operations."

— Mike Meinz,
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SHARING THE WEALTH

There's Room For The HP 3000 In Your Network

MARK HUDSON

When you think of networking, you probably don't think about your HP 3000. But today, many more HP 3000 users are thinking about network connections and communications. According to a recent survey conducted by DMA Inc., over half of the HP 3000 customers are looking at integrating their computing devices into a network environment over the next 12 to 18 months.

With the flattening of traditional hierarchical organizations, fewer not more, communication layers will become the norm. Not only among managers, but also among and between workgroups. Information must flow freely between workgroup members and management layers, regardless of traditional boundaries. Only knowledge workers with timely access to information can help reduce an organization's development and response time.

The HP 3000 offers networking solutions that make it possible to acquire and share information with existing mainframes, heterogeneous divisional and departmental systems, and desktop devices. For example, the HP 3000's support of networking standards has enabled Viking Pump (Cedar Falls, Iowa), a leading manufacturer of internal gear industrial pumps, to integrate its HP 3000 systems into a multivendor environment.

Viking Pump provides its end users with enterprise-wide access to information. According to Joe Welsh, director of Information Systems at Viking Pump, "The HP 3000 environment has given Viking Pump an open and flexible communications environment allowing us to meet our business needs in a cost effective way."

THE AVAILABLE OPTIONS

THE NETWORKING solutions offered on the HP 3000 can be broken down

into several categories:

• Networking Foundation — Products which provide basic connectivity in LAN and WAN environments.

• Server-to-Server Integration — Products that enable integration with HP 3000, UNIX and other midrange systems such as the DEC-VAX.

• Desktop Integration — Products that enable the HP 3000 to serve different desktop devices such as PCs, terminals, Macs and workstations.

• IBM Communications — Products that integrate the HP 3000 into IBM mainframe and AS/400 environments.

Networking Foundations

A physical connection is the first step in a network solution. The HP 3000 links can be divided into two groups: links that connect to LANs and links that connect to WANs.

802.3/Ethernet and 802.5/Token Ring are the LAN protocols supported on the HP 3000. 802.3/Ethernet is the most commonly used and the hardware is included with every HP 3000 Series 900. 802.5/Token Ring provides a slightly higher bandwidth and is ideal for IBM installations or where Token Ring is already being used.

Support for Fiber Data Distributed Interface (FDDI), a 100 Mbps optical fiber-based networking standards, will be available with MPE/iX release 5.0. FDDI is a reliable high-speed backbone solution.

For WAN communication, the HP 3000 offers X.25, IBM SNA/SDLC and NS Point-to-Point.

Server-to-Server Integration

For multivendor communications, the HP 3000 supports ARPA services. ARPA is a de facto standard and is the most popular multivendor communication protocol. The HP 3000 implements FTP, the ARPA service for remote file transfer, and supports Telnet, the ARPA virtual terminal service. The HP 3000 also supports Berkeley Sockets for program-to-program communication in a multivendor environment.

Recently, the Finnish University Library System completed a project that established an integrated multivendor network that included systems from IBM, DEC, SUN and HP. Librarians, students and professors have transparent access to library resources throughout its 20 universities and research institutes. Because the HP 3000 supported the TCP/IP-ARPA services (FTP, Telnet) they used, it was integrated into their multivendor solution.

Viking Pump, a manufacturer of internal gear industrial pumps, uses the HP 3000 in a multivendor environment.

For HP 3000-to-HP 3000 communication, HP offers NS, HP's networking service suite. NS provides all generic networking services, such as virtual terminal, remote file transfer and program-to-program communication.

For HP 3000-to-HP 9000 communication, customers should use ARPA's FTP and Berkeley Sockets for file transfer and program-to-program communication. Customers that require virtual terminal capabilities can use NS VT or ARPA's Telnet. The HP 3000 also offers FTAM for file transfer and X.400 for electronic messaging for customers who need to implement OSI services.

Desktop Integration

A range of desktop integration solutions are available for the HP 3000 across MS-DOS, MS Windows, MS Windows for Workgroups and MS Windows NT, IBM's OS/2, Apple's System 7 and UNIX operating systems in any number of devices like PCs, Macs, UNIX desktops, laptops and terminals.

• Network Operating System (NOS) — To facilitate the sharing of data and resources among desktop users, the HP 3000 supports Novell NetWare, Microsoft LAN Manager, Sun's Network File System (NFS). Apple's AppleTalk will be supported in MPE/ix 5.0.

• Host Application Access — HP and third parties such as Walker Richer & Quinn (WRQ) and Unison Tymlabs enable end users to access and execute host applications from a networked desktop device.

• Electronic Mail — HP Open DeskManager is an integrated E-mail solution that provides support for Lotus cc:Mail and MS Mail clients, which can exchange messages and share directory services without using a gateway.

For Internet access, an HP 9000 can be used as a gateway. With this solution, HP OpenMail on the HP 9000 is used to provide the link between HP Open DeskManager and the Internet. Alternatively, third-party products, such as NetMail/3000, provide a direct software connection between the HP 3000 and the Internet.

• Decision Support — With products like HP's Information Access, Cognos' Impromptu and Trinzic's Forrest & Trees, desktop end users can spend less time gathering data and more time solving business problems. The products provide non-batch solutions which allow end users to query data from IMAGE/SQL and ALLBASE/SQL databases.

• Desktop Management — Plan-B from ORBiT Software initiates PC backups

from the HP 3000 and ensures valuable PC data is protected. Another solution for desktop management is HP's Software Vendor, is a tool that manages the distribution and installation of software in a network environment.

American Institute for Research (AIR; Washington, D.C.), a non-profit organization specializing in research in the behavioral and social sciences, implemented a network solution where the HP 3000 acts as a host and a server. PCs which were serially connected or standalone are now connected to the network.

Users access business applications running on the HP 3000 through WRQ's Terminal Emulation Network solution. In addition, they access and share office automation applications, such as Borland's QuattroPro and printers through Novell NetWare for the HP 3000. "We have optimized printing resources, improved data integrity and centralized data backup through this network," maintains Bryan Hardwick, director of MIS for AIR.

IBM Communication

For integration into IBM computing environments, the HP 3000 provides a comprehensive offering of IBM connectivity products supporting Systems Network Architecture (SNA) protocols and IBM Bisynchronous (BSC) protocols. HP-IBM SNA IMF provides IBM 3270 emulation for interactive communication with IBM systems.

HP-IBM SNA DHCF allows IBM users interactive access to the HP 3000. HP-IBM SNA/NRJE and HP-IBM BSC RJE products provide batch access to IBM systems. The HP-IBM LU6.2/PU2.1 product provides for program-to-program communication between an HP 3000 system and IBM systems.

The HP 3000 supports the Simple Network Management Protocol and IBM NetView Alerts for TCP/IP and IBM network management environments, respectively. By providing these capabilities, the HP 3000 can actively participate in the management of the multivendor network in which it resides.

Whether its to connect the HP 3000 with other HP 3000 systems, UNIX systems, mainframes or desktop devices, the HP 3000 offers networking solutions. In addition, the HP 3000's networking solutions will continue to be enhanced with new technologies to meet future networking requirements. — *Mark Hudson is product manager with the Commercial Systems Division at Hewlett-Packard.*

P R O F I L E S

Collier-Jackson

Hewlett-Packard Company and Collier-Jackson announced versions of Collier-Jackson's new VisionShift(client-server applications for the HP 3000 and HP 9000 series of Precision Architecture-RISC (PA-RISC) business servers. Running under the HP MPE/iX and HP-UX operating systems, the recently announced VisionShift suite will include enterprise-wide accounting, human resources and payroll line-of-business solutions.

Introduction of the VisionShift line leverages Collier-Jackson's experience with Microsoft Access, Microsoft Visual Basic programming system, Applications Edition and the Microsoft Office as a solutions development platform. The result is fully integrated business applications that work together on the desktop with the ease-of-use and flexibility of Microsoft Windows, Word, Excel and Mail.

VisionShift Accounting

VisionShift Accounting includes General Ledger, Accounts Payable and Accounts Receivable. This powerful yet easy-to-use application allows users to assemble a complete corporate financial system to track and report data across multiple periods and years, control business costs and improve cash management. Collier-Jackson's exclusive account generation process automatically builds the general ledger structure that fits a customer's exact business needs, in both single and multicompany environments.

VisionShift Human Resources

VisionShift Human Resources puts HR information at the executive's fingertips to provide businesses the tools to attract and retain the quality workforce that will keep them competitive in the '90s. VisionShift Human Resources improves analysis and decision making on employees and applicants, helps in performance evaluations and facilitates regulatory compliance. The Payroll application provides a system that handles any pay cycle, unlimited deductions and the most complex withholdings and accruals.

Development of VisionShift for the HP 3000 and HP 9000 will provide users in mainframe alternative and client-server environments with best-in-class business applications optimized for MPE/iX, HP-UX, UNIX, Microsoft Windows NT and Relational Database Management technologies, all designed to deliver the vision of accessibility to information.

VisionShift is a trademark of Collier-Jackson. Microsoft, Microsoft Access and Visual Basic are registered trademarks and Windows and Windows NT are trademarks of Microsoft Corporation. UNIX is a registered trademark of UNIX Systems Laboratories, Inc.

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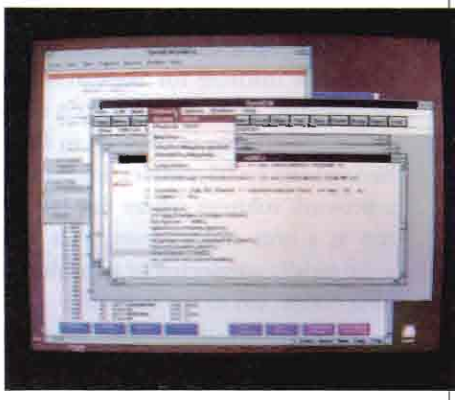

SpeedEdit is truly an open systems text editing sub-system. SpeedEdit is available for fifteen different operating systems including MPE, MPE/iX, HP-UX, DOS, MS-Windows, and Windows-NT. Vendors such as IBM, SUN, Sequent, SCO, Univel, and others are also supported. SpeedEdit was the first true Windows programmers text editor. SpeedEdit stands alone as the only text editing system available for MPE, MPE/iX, HP-UX, and MS-Windows. SpeedEdit is available to run under most operating systems as a true Windows or X-Windows application, or a character mode application running on ordinary terminals or PCs acting as terminals. What this means to the manager interested in open systems is a true cross platform development tool which will allow programmers to maintain peak levels of efficiency when it comes to the task of text editing.

SpeedEdit isn't stingy on capability either. SpeedEdit is the most robust text editing environment for any platform, including the HP 3000 and provides users with much sought after features such as split screen editing, keyword expansion, keyboard macros, language sensitivity, color highlighting of reserved words, modified text and comments. What really makes SpeedEdit a valuable tool is the ability to customize just about every aspect of its personality, allowing each user to achieve maximum productivity.

Programmability, split screen capabilities, language sensitivity, over 200 editing functions, multifile edits, screen scrolling, and much more make SpeedEdit a tool that compliments the development efforts of any programming staff, large or small alike.

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Wilco AMS

Wilco AMS specializes in concurrent, cross platform printing solutions for HP 3000 serial ATP/DTC, HP 3000 MPE/iX network, Novell NetWare, Apple EtherTalk and UNIX TCP/IP including HP/UX, SunOS, SCO, Solaris, Microsoft and other network operating systems.

Wilco's NetQUE 3000 is an external multi-protocol print server for any two printers (serial or parallel). With NetQUE, you can locate printers ANYWHERE on thin net (10Base2) Ethernet, twisted pair (10BaseT) Ethernet or Token Ring networks. All Centronics interface printers, including any HP LaserJet model, can be connected via NetQUE's high speed IEEE-1284 Bi-Tronic parallel port. NetQUE provides sustained throughput up to 200K bytes/second through the parallel port.

A multi-function serial port operates as a CONCURRENT input supporting an HP 3000 ATP/DTC connection with Terminal Type 22 and 26 remote spooling/status checking. Alternatively, the serial port can be used as fully independent output for a second printer or as a full duplex connection to a remote RS-232 terminal or peripheral.

For HP 3000 network printing, Wilco's inexpensive HP 3000 MPE/iX LAN print driver provides the capability to continuously transfer HP 3000 spool files thru Ethernet to printers equipped with the Wilco NetQUE. The BSD HOST option is required to operate the LAN printing software.

NetQUE provides total TCP/IP compatibility including TCP, IP, UDP, ICMP, ARP, RARP, BOOTP, TFTP, lpd and Telnet protocols. Network management includes SNMP MIB II and character plus enterprise MIBs. Gateways are also supported. On board lpd allows network connected hosts to transfer print files DIRECTLY to the printer using standard UNIX supplied software and utilities.

In addition to NetQUE, Wilco offers NetJET 3000, an MIO-specific Ethernet printing solution for HP LaserJet 4 Plus, 4, 4Si, IIISi, DesignJet, PaintJet and DeskJet 1200 printers. Wilco also provides a complete line of multi-port RS-232 printer sharing systems offering specific support for HP 3000 connections.

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Hewlett-Packard

A long-time HP 3000 customer, MagneTek, Inc., manufactures electrical products for industrial and residential use. The company is headquartered in Los Angeles, California and has 15,000 employees worldwide. Specific MIS challenges have been to reduce costs, increase division-wide computing capacity to allow for future growth, decrease response time for on-line inquiries, and give customers the ability to check order status 24 hours a day.

The Consolidation

Within the Motors and Controls Division, headquartered in St. Louis, Missouri, many HP 3000s in manufacturing sites were approaching capacity. It was decided that combining remote operations on a larger central HP 3000 would enable MagneTek to address its MIS goals well. So, two Series 960s in Tennessee, a Series 955 in Michigan, and a 980/100 running order entry, sales analysis, logistics, and forecasting in Missouri were consolidated onto a 3-processor Corporate Business System in 1993. A Series 980/100 site in New Jersey was added in December, 1993. A board upgrade brought the system to its current 992/400 status, and then operations from a Series 70 in Wisconsin joined in earlier this year. When a Series 935 in Indiana comes on-line this summer, approximately 16 manufacturing plants, 3 business headquarters, and over 800 users will be running on this 24 hour-per day, 7-day-per week system.

Financial Results

Because the HP 3000 Corporate Business System replaced existing leases on older equipment, MagneTek avoided capital outlay for hardware. Cost savings began the day the new computer went on-line. Software investment was recouped in less than one year. Bottom line savings are expected to be $1.7 million over a 5-year period.

The dramatic increases in computing capacity have allowed some users to see as great as 8- to 10-fold improvements versus the smaller on- site machines they had been accessing before. The Motors and Controls Division has completely eliminated its backlog of batch processing at the end of each business day. Cycle times are reduced by as much as 70 percent, and processing times have been cut significantly. There is now a more cohesive integration of on-line resources for management and customer inquiries, and users report higher satisfaction. "Consolidation is a smart thing to do," Henry concludes. "It's been very smooth."

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EDI Solutions

By taking a unique hands-on approach to care management, QualMed Plans for Health of Oakland, California is revolutionizing the way HMOs serve their members. They were selected along with several other HMOs to participate in the Health Insurance Plan of California (HIPC), a one-of-a-kind program that offers health insurance to small group employers through a state-run pool. In order to participate in HIPC, QualMed had to be equipped to receive eligibility and enrollment information electronically.

QualMed began searching for an EDI translation package to operate on their HP 3000. Since HIPC would soon require care providers to electronically process the ANSI 834 Benefit Enrollment and Maintenance transaction set if they wished to enroll members under the HIPC Small Group Employers program, time was a primary concern. QualMed recognized the importance of a timely installation of an EDI translation system as well as immediate training for their staff to operate the system to its full potential. QualMed selected EDI Solutions' EDItran system based on its ease in implementation and EDI Solutions' ability to offer training almost immediately.

EDI Solutions' EDItran system enabled QualMed to receive the 834 transaction set for current members in order to meet the deadline. Yet the system will also allow them to accept information from trading partners that adopt EDI later. At the root of the system's flexibility is its capacity to send and accept large volumes of data in a variety of formats. In an environment with so many different standards, this flexibility will make QualMed's future transactions with a wide variety of different trading partners as quick and efficient as possible.

Joyce Rosevear, director of programming at QualMed, believes that the company's new information system prepares them for whatever healthcare reform might hold. "Our purchase of the EDItran software for our HP 3000 platform addressed not only our immediate need to accept the 834 transaction, but also the future needs of our clients and business partners. We're in a good position to perform whatever transactions will be necessary to do business."

EDI Solutions™

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Quest Software

The Atlanta Technology Center (ATC) is today the site of the largest data center within Hewlett-Packard. Chris Rink an Information Technology consultant for the ATC was tasked with building an environment that was fault-tolerant and would logically network ATC applications making "the system" appear to the user as a large mainframe. This had to be achieved without changes or modifications to the ATC applications.

After researching all options, HP selected NetBase from Quest Software for its reliability, robustness and Quest's reputation for outstanding support.

NetBase provides a comprehensive suite of networking functions for MPE computers including: Network File Access, Output Management, Data Shadowing, Performance Statistics and Remote Procedure access. NetBase creates a high performance fault tolerant network that integrates any number of MPE, UNIX and desktop systems or networks, allowing this integrated network to act as a single system. As a result, the product achieves workload leveling, creates a transparent network, provides easy disaster recovery and makes scalability affordable.

In particular, the ATC was interested in one of the services of NetBase, Shadowing, which automatically replicates data in real time to multiple machines. "The ability to shadow all file types, not just databases, was an important factor in our selecting NetBase," commented Chris. "To administer multiple copies of the applications would have required us to hire more staff. We actually decreased our support staff after bringing up NetBase by 85 percent!"

One of Chris's counterparts in the Application Support and Development Organization is Wendy Odlum. "We needed a way to more effectively manage database access. If we had 50 copies of a database and it had a problem, that problem would replicate itself 50 times. It would have taken 10 people to support and fix the problem in any reasonable time frame. We needed to limit the number of identical databases in use. Using NetBase we were able to achieve this." With NetBase, updates to multiple databases are no longer a chore. Wendy used to log on to 50 machines and stream 50 jobs, now she administers the entire system from a single job stream.

Wendy observes, " NetBase is invaluable and invisible - and it allows me to do more with less, exactly what everyone is striving for these days.

QUEST SOFTWARE

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Hewlett-Packard

The California Educational Computer Consortium (CECC) develops and maintains customized financial software systems for the educational sector. CECC membership spans the entire state of California and serves roughly 144 school districts, community colleges and county offices of education. The HP 3000 is its platform of choice. As part of the public education system, the CECC is under great pressure to provide cost-effective computing services. Specifically, their challenge is to create high quality software and provide excellent support while decreasing development costs and reducing operational redundancy.

The Consolidation

Recently, their existing HP 3000s were "out of horsepower," constantly running at 80%-90% CPU utilization levels. To meet its goals and address clear needs for future growth, CECC decided early in 1993 to pool resources and consolidate two Series 960s and one Series 70 onto a single HP 3000 Corporate Business System 992/300. The new system provides, conservatively, twice the performance — and reduced HP hardware and software support costs — as the combined systems it replaced.

Results

"While precise figures are difficult to calculate, savings have been substantial," according to Dr. Robert Berry, Administrator of Information Systems for the San Bernadino County Schools. "Actually, you could say we saved several millions of dollars, because we would have had to change vendors if we hadn't been able to upgrade and consolidate to a bigger machine."

Dr. Berry is pleased with the new system's "absolutely great performance." He adds, "due to its speed, we will soon be going to completely unattended backup, which will allow us to eliminate one shift."

Customer Perspective

Dr. Berry offers his advice to others regarding consolidation:

- "Planning is the key." CECC's extensive pre-planning cycle resulted in a detailed, useful project worksheet that was almost 100 pages long.
- "Think about your disk distribution strategy." This can be important, in order to avoid potential bottlenecks in accessing frequently-used data, for instance.
- "Manage expectations — don't raise them too high." That way, thanks to the tremendous speed of the new system, users will have a pleasant surprise awaiting them.

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Perfect Software Solutions, Inc.

As a leading Hewlett Packard Systems Integrator and Channel Partner serving the Northeast corridor, Perfect Software Solutions, Inc. specializes in helping HP customers take advantage of emerging technologies.

When one of their customers, Hann & DePalmer, came to Perfect Software looking for a system upgrade from its "classic" HP 3000, Perfect Software urged them to plan for the future, and identify the key technology issues related to long term business objectives.

Two objectives came out of this process:

1) the ability to link electronically with its key clients, and
2) having an "open environment" to allow Hann & DePalmer to rapidly bring new technologies to its clients.

Hann & DePalmer provides Integrated Marketing Support Services, helping Fortune 500 companies execute their marketing programs through a variety of Literature Distribution, Database Management and Fulfillment services. Recognizing that technology was changing the ways that companies market their products, they were convinced that the only way to insure their own success was to redefine their role as an "information provider".

Perfect Software Solutions helped Hann & DePalmer map out a strategy which included:

- Migration from HP Classic to RISC-based computing.
- Network based computing.
- Multiple systems for balancing work load during crucial peak demand periods.
- Integration of HP 3000 and HP 9000 resources across a company wide network.
- Integrating desktop tools with HP 9000 and HP 3000 databases for ad hoc query/reporting.
- Establishing standards for HP 3000, HP 9000 and PC-based software development

Perfect Software identified key "enabling" technology components of the long term strategy, such as voicemail, E-mail, Remote Order Entry, automatic file transfers and Voice Response systems for Order Administration and Data Capture.

Current plans include the implementation of Edify, a network based workflow automation product. Through the use of "electronic agents" which can be trained to act based on information received via phone, fax, E-mail or a database, Edify will permit Perfect Software to re-engineer entire marketing processes, including in-bound telemarketing, 24 hour a day order entry capability, and consumer surveys.

The HP 3000 and HP 9000, with their support of Open System standards, helped Hann & DePalmer meet its cost and capability requirements. And by adopting a long term technology strategy, Perfect Software has helped put Hann & DePalmer in a position where new technologies can be plugged in as they mature.

PERFECT SOFTWARE SOLUTIONS, INC.

Circle 457 on reader card

Quest Software

Our company uses HP 3000s, HP 9000s and Windows PCs connected on a TCP/IP enterprise network. We run Informix On-Line RDBMS on the HP-UX platform and use the Informix 4GL and Embedded SQL/C languages. We also use Windows and Visual Basic for PC client/server development.

NetBase Client allows our application developers to integrate legacy Turbo Image databases with UNIX and PC based applications quickly and easily. Once the developer understands the client technology (Informix 4GL, Visual Basic, etc.) integrating the Turbo Image data is quite easy. NetBase Client has the look and feel of local Turbo Image, so there is virtually no learning curve associated with accessing the legacy data from an HP-UX or Windows PC. In fact, we use the standard IMAGE and MPE file system manuals for reference on the NetBase Client parameters. NetBase Client allows us to take advantage of the much faster development times offered by the UNIX and Windows based technologies and still incorporate the legacy data that our users rely on. The response time of our on-line applications using NetBase Client is excellent.

NetBase is a generalized HP 3000 file server that virtually eliminates the expense and the inevitable maintenance quagmire waiting for those who pursue a case-by-case custom server development strategy. The price of the product is a true bargain considering the simplicity, ease of use and productivity it offers. NetBase paid for itself on our first big client/server project by reducing the development time to half of what it would have been had we been forced to develop custom client/server interfaces to access the legacy Turbo IMAGE data. NetBase Client is perfect for rapidly developing on-line UNIX applications that require legacy Turbo IMAGE data.

Quest's Technical support staff have gone above and beyond the call of duty in resolving technical issues often helping us with HP 3000 technical problems that don't even involve their software. Their people are prompt, courteous professionals who really know what they are talking about. *— Matt Murphy, Project Leader, Whitmire Distribution Corp.*

QUEST SOFTWARE

Circle 483 on reader card

No Fault Consolidation

Ensure Data Availability With A Consolidated HP 3000

KATHY PIERSON

In the 1860s, when America was just beginning to industrialize, Henry David Thoreau took a contrarian stance. Urging his peers to "simplify" their lives, Thoreau advocated that Americans reject technology and return to nature. Now, 130 years later in post-industrial America, a similar watchword is being sounded from Silicon Valley rather — Consolidate!

The consolidation of multiple HP 3000 systems into a single, larger model is becoming an increasingly common business activity. Significant cost savings and operational efficiencies are usually cited as the primary reasons. But a successful migration means careful planning.

In a consolidated environment, past experience shows that a systems' disk I/O subsystem is the most critical area when considering high system and data availability.

To explore the data availability issues, let's examine the resources of Power Range Unlimited, a fictional mail-order company. Before consolidation, its warehouse distribution system runs on an HP 3000 Series 70 with 8 GB of disk. HP DeskManager resides on a dedicated Micro3000 XE with 4 GB attached. The company's telemarketing/order entry applications are on an HP 3000 Series 980/100 with two I/O cards and 18 GB of storage. For now, none of these systems have high-availability products, nor do they utilize user volumes.

So, suppose there's a head crash on one of the HPDesk disk drives. With disk-I/O subsystem annual mean time between failure in the 3 percent to 4 percent per gigabyte range, a failure like this

on a small disk configuration should occur only once every seven to eight years. As a non-recoverable error, a head crash requires a reload of all the disks from the most recent backup tapes.

The time required for this process can easily take two to three hours or more. During the reload process, the HP 3000 is down too. Users can't access HPDesk during that time, but the rest of the company's business — the warehouse management and the vital inbound telemarketing functions — remains up and running.

Let's assume that Power Range starts looking at costs more closely. They run a back-of-the-envelope comparison and realize support costs would drop by 25 percent if they had a single CPU instead of three, while system capacity would increase by 35 percent. And, replacing their older disk drives with newer ones would result in a total support savings of nearly $50,000 per year — a 55 percent decrease over current levels.

On the basis of these projections, they are granted approval to upgrade and consolidate their three systems onto an HP 3000 Corporate Business System 992/200.

The approach for consolidating their storage is simple: attach disk drives to the new environment in one system domain, without physically or logically dividing up the data according to the company's warehouse, HPDesk and telemarketing functions. If the failure outlined above repeats itself, a disk mechanism problem then occurs.

The recovery process consisting of a full system reload still must take place, but there is a critical difference in this second example. Even though failure rates are incredibly small, statistical probabilities do increase numerically when the number of components increases. Due to little advance planning for the statistical eventuality of a head crash, the system's downtime now affects all users. Business is at a standstill.

Order takers and warehouse workers alike must revert to paper-based backup mode. And, because the reload involves 30 GB instead of 4 GB, the reloading process from backup takes much longer — upwards of 15 hours instead of two or three.

Downtime Doesn't Have To Happen

TO AVOID THE problem of having all users affected during the disk reload process, one of the first things Power Range should have done is divide storage into logical groupings by way of user volumes — dividing data, applications, etc. on separate disks or sets of disks (see *Figure 1*).

MPE/iX User Volumes (or Volume Sets) are significantly improved over Private Volumes on MPE V systems, which were a bit cumbersome to use and could negatively affect system performance. Thanks to integration of user volumes into the MPE/iX volume manager code, there are no extra instruction paths and so no noticeable performance impact in today's environment.

User volumes are free of charge on MPE/iX. With no software to buy, no extra I/O overhead and no performance degradation, the only cost is the time required to convert your existing system configuration to a user volume one, and perhaps a more difficult data management. Having the company's data and applications divided according to functional area insures that if there should be a problem in an isolated disk, the operations manager can recover, reboot and reload just the smaller affected application environment (Volume Set #2 in *Figure 1*). HPDesk is down for two to three hours, but warehouse management and telemarketing activities continue as soon as the system is rebooted. Moving beyond volume sets, the next level of protection against downtime due to disk I/O problems is through parity disk arrays.

"Parity" is a high-availability option which provides data recovery information instantly from a duplicate disk, thus allowing the array to remain in operation without interruption despite an unreadable disk address, disk mechanism failure or similar data problem.

Figure 2 illustrates a part of Power Range's environment when they decided

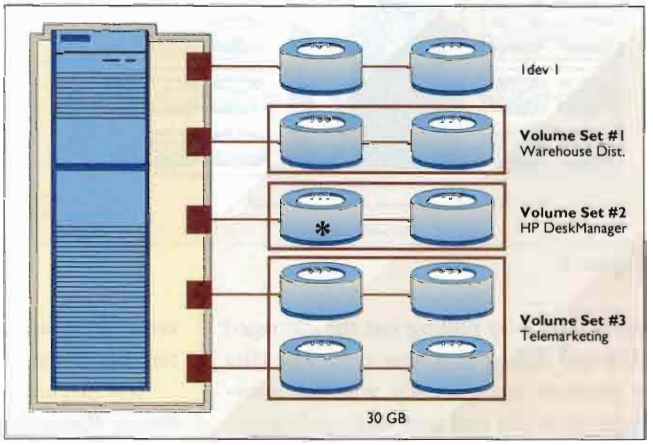

Figure 1.

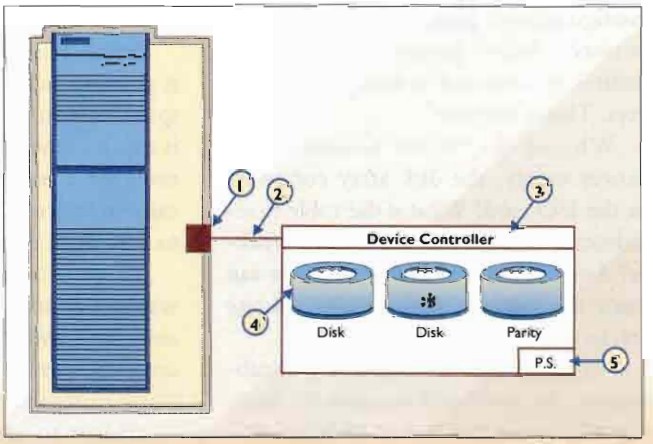

Figure 2.

to install RAID. Note that, like most disk drives, there are five points of failure in this I/O subsystem: the I/O card; the cable; the central device controller; the disk mechanisms (platters and head assembly); and the power supply.

Disk arrays using parity are an excellent way to protect against mechanical failure such as a head crash. If a head crashes, information on the parity disk allows data on the damaged disk to be reconstructed during access when the mechanism experiences a problem. Further, the system manager can do a "hot" replacement by pulling out the damaged disk and sliding in a new one. The data is repaired transparently without interruption to the end user and application, thereby eliminating any downtime.

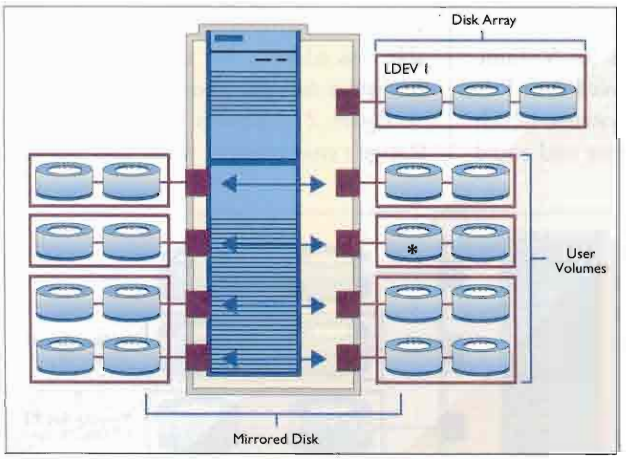

Figure 3.

So, disk mechanism failures no longer pose a problem when the subsystem is configured with parity disk arrays. There persists a belief, however, that all disk failures are removed by installing disk arrays. This is not true.

What if the failure occurs in the power supply, the disk array controller or the I/O card? What if the cable is accidentally sliced by an inattentive worker? Any of the other points of failure can cause the entire system, or user volume set, to go down.

For a fully fault-tolerant disk I/O subsystem, the need still remains to attack the four remaining points of failure in a RAID configuration.

Mirror, Mirror On The Disk

Disk mirroring provides high availability by completely duplicating the entire disk hardware subsystem from the interface card in the HP 3000 on out to the disks themselves. High data availability is achieved by automatically maintaining identical information on two partner disks, with minimal disk write overhead and without the application's awareness.

Mirrored disks must be of the same model, often inexpensive SCSI drives — and should be connected on separate interface cards. If either disk in a mirrored pair fails, the system continues to operate normally by accessing the undamaged disk.

When the partner has been repaired and is ready to resume operation, the system copies the data from the good disk to the repaired one to bring them back into a consistent state. All of this happens transparently, without interrupting normal system operation.

By implementing disk mirroring, Power Range is actually building a "bullet-proof" disk subsystem. Because of replication, all five points of possible failure are eliminated when their mirrored disks are correctly configured.

Another advantage of mirrored disks is performance. If you use independent spindles, your I/O per second capacity is much higher. Secondly, most applications see a real performance boost, because mirrored disks have built-in logic to read from either drive in the pair.

There is a cost to redundant hardware, of course. But there also are costs associated with downtime — and for a growing number of companies, the risk of incurring those downtime costs is too significant to ignore. How strong the business case for disk mirroring becomes is dependent on the potential financial losses, customer satisfaction issues, user disruption and overall degree of crisis that a critical, lengthy failure will bring.

Ironically, HP 3000 systems have proven to be so reliable that some customers say they feel safe operating "without a net." HP, cringes when it hears that the results of lengthy and usually preventable downtime has not been seriously considered. Experience is clear: when applications are business-critical, systems should be as failure-proof as possible. When consolidations are undertaken, investments in high availability solutions — especially mirrored disk configurations — are investments wisely made.

Optimal Environment

IN THE final scenario (see *Figure 3*), Power Range decides to pursue an optimal protection strategy. They have installed a 2.7 GB parity disk array for protection of its system domain (ldev 1), divided disk storage into logical and physical groupings via user volumes on independent SCSI disk drives, and have mirrored every user volume disk.

When the same head crash occurs, a notice appears on the system console — but thanks to disk mirroring, no data is lost and there is no interruption to the users or applications. The damaged disk is replaced online. If the cable to that same disk array is cut, the system switches automatically to the mirrored pair, and again — with no delay to users, and no downtime to reboot or reload.

Mirrored Disk/iX is available for PA-RISC-based HP 3000s. The product ranges in price from about $5,410 for a system with a 20-user license to $52,700 for a large system with an unlimited user license, not including the mirrored hardware components themselves, which are usually inexpensive SCSI drives.—*Kathy Pierson is the Consolidations Program Manager for Commercial Systems Division in Cupertino, California.*

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Miles B. Kehoe

Optimizing PC Performance

Sometimes I think I'm the last person I know who has a 386/33 PC and is happy with it. I know I can get a great buy on a 486-based Vectra, or even a Pentium-based PC, but my current system works fine. Oh, sure, I know I'd see the difference once I upgrade, but I need a larger monitor more than I need a faster processor. But still, there are ways to improve the performance of your system when you use Windows, short of trading up to a faster processor.

SWAPPING AND DISK OPTIMIZATION

One of the key steps you can take to keep your system running well is to optimize the organization of data on your hard disk. There are a number of commercial products that can perform this optimization for you reliably and with minimum risk. Personally, I use the tools provided with Symantec's Norton Utilities.

When you first save programs or data on a new disk drive, your file is stored in sequential sectors. To retrieve the file, the disk drive positions the head to the correct track and reads all sectors one-by-one. If your file is larger than a single track, the disk controller moves the head only after it has read all the sectors on the current track.

As you change or delete files, sectors become unused and are added to the list of free sectors maintained by MS-DOS. To provide maximum utilization, these free sectors are used whenever necessary for new or modified files. However, if a new file takes more than one sector, MS-DOS might put the first section of the file in one free sector, while the rest of the file might reside in sectors potentially anywhere on the disk. Once you've owned a disk for any length of time, you'll find that many, if not most, of your files are fragmented across non-sequential sectors on the disk.

If only your data files are fragmented, you might not see much improvement by optimizing your disk. But Windows programs and support files can become fragmented as well, which will make your system seem slower over time. You should note that your disk doesn't need to be very full before this fragmentation can start to impact your performance. Get a good commercial disk utility, optimize your files and enjoy the performance your system can deliver.

THE SWAP FILE

If you are using a 386 or higher system, you can use Windows' 386 Enhanced mode to configure part of your hard disk as extended memory. However, this large swapfile is usually one that cannot be moved. Because the swap file can be one of your single largest files, fixing its location on disk can impede the optimization process. It also can be a problem when you perform your regular backups, because the swap file is not usually a file you want to backup. And you *are* doing regular backups, aren't you?

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these two problems with the swap file: create a separate disk partition and drive identifier, and locate the swapfile there. It is easiest to do this when you first install your system, but with proper backup you can re-partition your drive at any time.

Note: any time you re-partition your disk drive using the MS-DOS utility FDISK, you will lose all existing data on your disk. Be certain to have a current backup of your data and a system floppy disk with which you can boot, format and recreate your data. Also, be sure you allocate enough time to reorganize your drive. It will always take twice as long as you think, so make sure you won't need to use your system until you have completely finished the process.

Once you have created a new partition and the new drive letter, and you have restored your files from backup, use the Windows Control Panel to locate the swap file on the new drive. Do this and you'll never have to worry about less than maximum optimization of your data and

The key step is to optimize the organization of your data.

program drives, and you'll never need dozens of disks to backup the swap file.

GET MEMORY-BASED

If you are running a PC with lots of memory — 16 MB or more — you might find you can significantly improve your system by creating a RAM disk for Windows. While a full windows installation can take as much as 15 MB of disk space, a minimum installation can fit in as little as 9 MB. If you create a RAM disk of 10 MB or so, you can use the RAM drive for Windows and see significant speed improvement.

Start by creating a RAM disk using the RAMDRIVE.SYS utility included with Windows. Install a minimum configuration of Windows onto your hard drive, being sure to exclude the wallpaper images and utilities you don't use. Next, you need a batch file to copy the entire Windows directory to the RAM drive and set your PATH. Finally, you will need a batch file to copy any changed files back to hard disk when you exit Windows. This includes the .INI files, .GRP files and any other file or DLL that a new application might install.

Once the files are copied — for example, at the beginning of every working day — you can use Windows and see super performance from your old clunker. You might even decide to get a larger monitor too, instead of wasting all that money on a new CPU.

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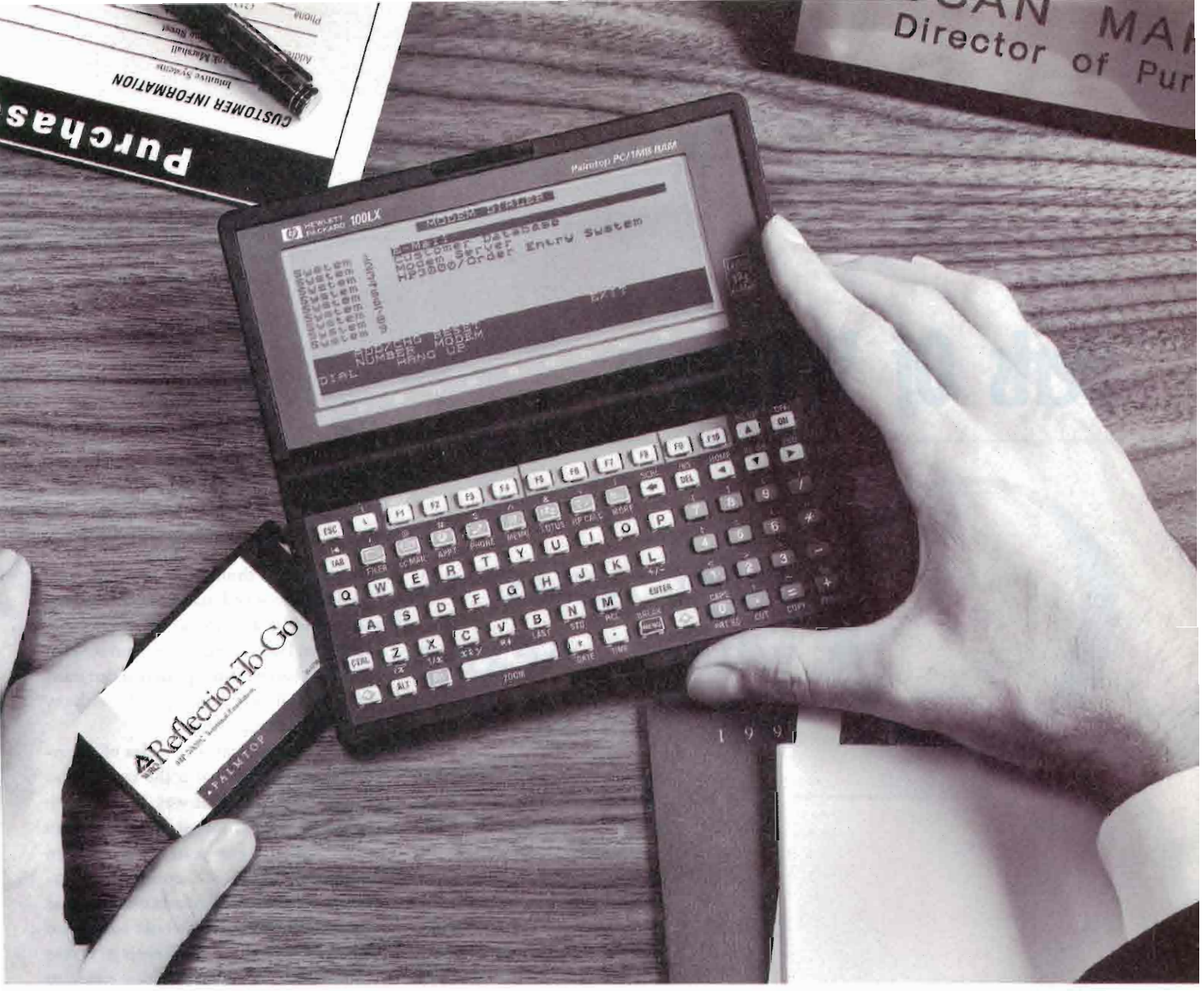

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CIRCLE 262 ON READER CARD

Fred Mallett

Perls Of Wisdom

Oyster guts is where pearls come from.

Ever notice that things change as you get older? First off, for guys anyway, your eyebrows get curly. Next thing you know, your opinions change. At least that's what happened to me.

Anyone who knows me, has probably heard my opinion about "If it ain't shipped with the system, I don't want to know it." That was my "younger" opinion about standards. The thought was that "standards are adhered to by companies, so what I get is standard." Have you ever seen the list of standards HP-UX conforms to? I can't even pronounce most of them.

That means I should be able to take all this home brewed standards-based stuff, such as shell scripts that are POSIX shell-(ksh) based, and C code that is ANSI correct, from my HP-UX machines and bring it to the old SunOS or Ultrix machines in the lab, and it will all run, or compile, perfectly. Right? RIGHT? Stop laughing.

What does standard mean? It means everything being shipped by all vendors, because they all adhere to some form of standard or "emerging" standard. It means nothing about compatibility with other systems. With all these standards around, you'd think we could take one tiny little piece of binary code, or a shell script, and be able to run it on multiple platforms. But in reality, we cannot. That is why I changed my opinion about standards. It really had nothing to do with my eyebrows getting curlier.

What is a standard? My idea of a standard is something that is the same across platforms, and *acts* that way. That is, you should be able to move it across platforms with impunity. For years we have been hearing about POSIX-compliant commands. I always thought that would let me create shell scripts that would run across multiple platforms. But where is it? It sure would have made administration easier, to be able to use the same scripts on all hosts in the network, without loads of case statements to determine which commands, options, and path to use.

Here's the standard: Now that I'm older, function is more important than form in many ways. The form of standardization happening in the industry does not realize my vision of standards. Amusingly enough, the programs I used to discourage, the not-shipped-with-the-system, compile-it-yourself type stuff, have turned out to be the real standards.

For the last few months my company has been putting together a Perl class under the direction of Dave Shaw. As time went on I realized the beauty of Perl. Oh, lots of thanks go to Jeff Detterman of Rockwell International for shaming me into getting this course under way in the first place.

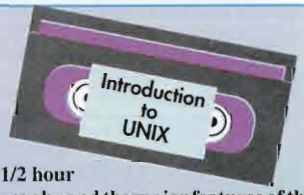
The programs I used to discourage, the not-shipped-with-the-system, compile-it-yourself type stuff, have turned out to be the real standards.

For those few that don't know, Perl is a language concatenated by Larry Wall, and freely distributed under the GNU "Copyleft." Instead of writing, I use the term concatenated, because Perl gives the impression of all your favorite UNIX things linked together. If you use the shell, write shell scripts or write C code, you can use all these skills together in Perl. If you do any of these, you can use them, and slowly learn the others as needed to accomplish tasks.

The real gem of Perl, is that once installed on all machines in the network, Perl programs can be run on different hardware platforms. No need to keep multiple versions of binary code around. The reason is that Perl compiles the program at run time. That way the binary image is always correct for the architecture being run on. This sounds bad, but the compile is incredibly fast, unless you write a huge program full of routines that seldom get executed. Granted, if you are dealing with a huge program, this could become an issue. But then, Perl is not really designed to write applications in, but more like to write tools in. The difference is in scale, not complexity.

Perl officially stands for Practical Ex-

Introduction to UNIX Video



Introduction to UNIX as presented by Dr. Bourne is a 4 1/2 hour long video that covers the principles behind the UNIX philosophy and the major features of this complex, yet powerful operating system. If you are a computer user, programmer or systems administrator that is planning to migrate to any of the many varieties of UNIX, then this is a *must see* video.

Recommended for: • Programmers • System Administrators migrating to UNIX

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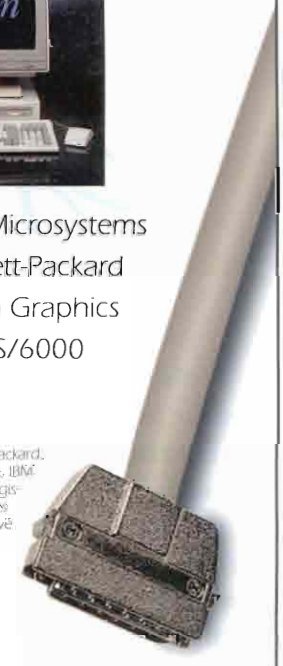

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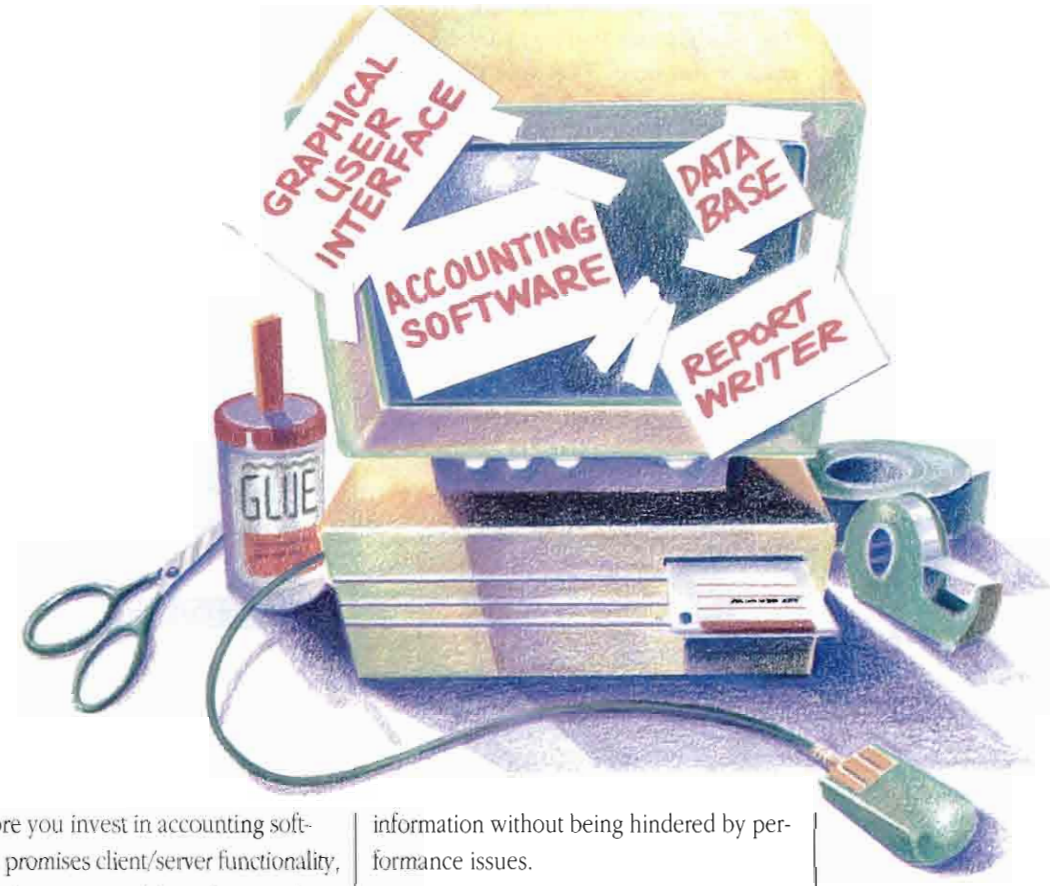

Before you invest in accounting software that promises client/server functionality, you better be sure it isn't based on a makeshift architecture.

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If you're fluent in UNIX, you'll have no trouble writing in Perl. It is a combination of a command-interpretive language like the shell, and a compiler-like C.

traction and Report Language. It is a language very similar to the shell and the C language. If you are fluent in UNIX, you will have no trouble getting used to writing in Perl. This is because many things carry over, such as regular expressions, file testing and program flow. Perl is a combination of a command-interpretive language like the shell, and a compiler-like C. It is easy to write a Perl program that looks like a shell script:

```
#!/usr/local/bin/perl
$pi=3.14; #Note the semi-colon
$vol = ( $pi * 4 * 1.5 ** 2 ); #another
one
print "the volume of a cylinder 4 tall by
3 in dia. is $vol\n" ;
```

The only difference here is we named the Perl program instead of a shell, and the statements need a semicolon after them. Note that the variable assignment had a

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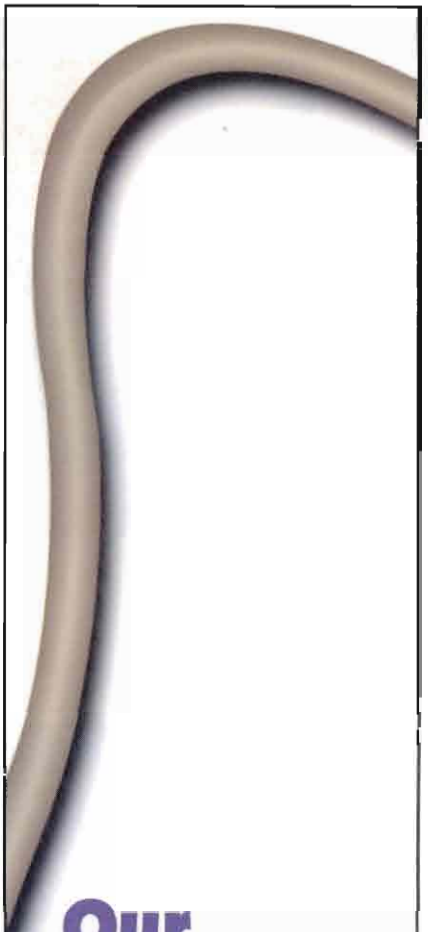

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"$" before the variable name ($pi and $vol) even when doing an assignment. It also is easy to write Perl that looks somewhat like C code:

```
#!/usr/local/bin/perl
if ($x == $y) {
print " values are equal\n";
} else {
while ($i print $i++ , ++$i ;
}}
```

Here we used an equality test to determine whether to print the values are equal, and if not, used some C-like auto increments on the variable $i. Note that you can use then increment ($i++) or increment then use (++$i) a variable.

Some areas of Perl that are not C-like include: no "main" routine is used; no compile necessary; no libraries or includes (done when Perl itself is compiled); and many syntax changes.

Future versions of Perl are directed by input from the users of the tool.

Some areas of Perl that are not shell script-like include: no syntax errors at run time, they will be caught by the compile phase; programs are written in blocks (using braces as seen above); many built-in functions that ease program development; many syntax changes; and no arbitrary limits on files open, string length, recursions, etc.

Some of the features that make Perl great include: arrays can be list type (accessed by element number); arrays can be associative type (accessed by key "word"); functions include network, file and process control activities; functions include many UNIX command functions; source code debugger is built in; and compile error messages are very helpful (instead of cryptic).

Some of the features that make Perl bad: has a goto function :^)

So long as Larry Wall and friends don't get fed up and decide to retire to Corpus Christi as windsurfer bums, you determine the direction Perl takes by posting to comp.lang.perl on the Internet. Future versions (Version 5 should be out by the time you read this) are directed by input from the many users who believe in the tool. Ultimate gray matter rulership is by Larry Wall and friends in their "spare" time. The beauty is that control is had by people who use the tool, not by a group that analyzes market directions and dollars.

THE BLACK SIDE OF PERL

Well, there had to be one. The problem is that no one sends you Perl automatically. You must pursue it. It can be had from the Internet. For those without Internet access, it is available from user group libraries such as InterWorks and InterEX. There are even individuals who will make copies for a small media fee. Once you get it, you must compile it. This is not as bad as most things from the Internet, because there is a configuration program that tries its best to create a functional makefile. The InterWorks library has pre-compiled versions for Domain/OS and HP-UX. Support for Perl is better than some purchased applications. The Internet news group comp.lang.perl is very lively, and there are numerous FAQ ftp locations.

So, how do you learn Perl? Well, O'Reilly & Associates Inc. (Sebastopol, Calif.) got involved and there are two books available. One is called *Programming perl* for those expert hackers who like to dive in manhours first. For those of us who like a gentler introduction, there is the *Learning Perl* book that acts more like a tutorial. There are also some contractors like Tom Christiansen who teach Perl. Another way is to contribute to my "curley haired retirement fund" and take the Perl class from us (^;

Mallett's Internet address:
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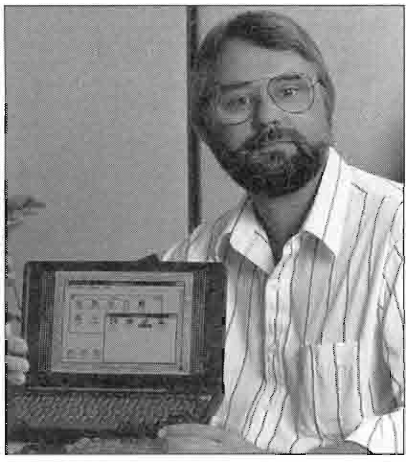

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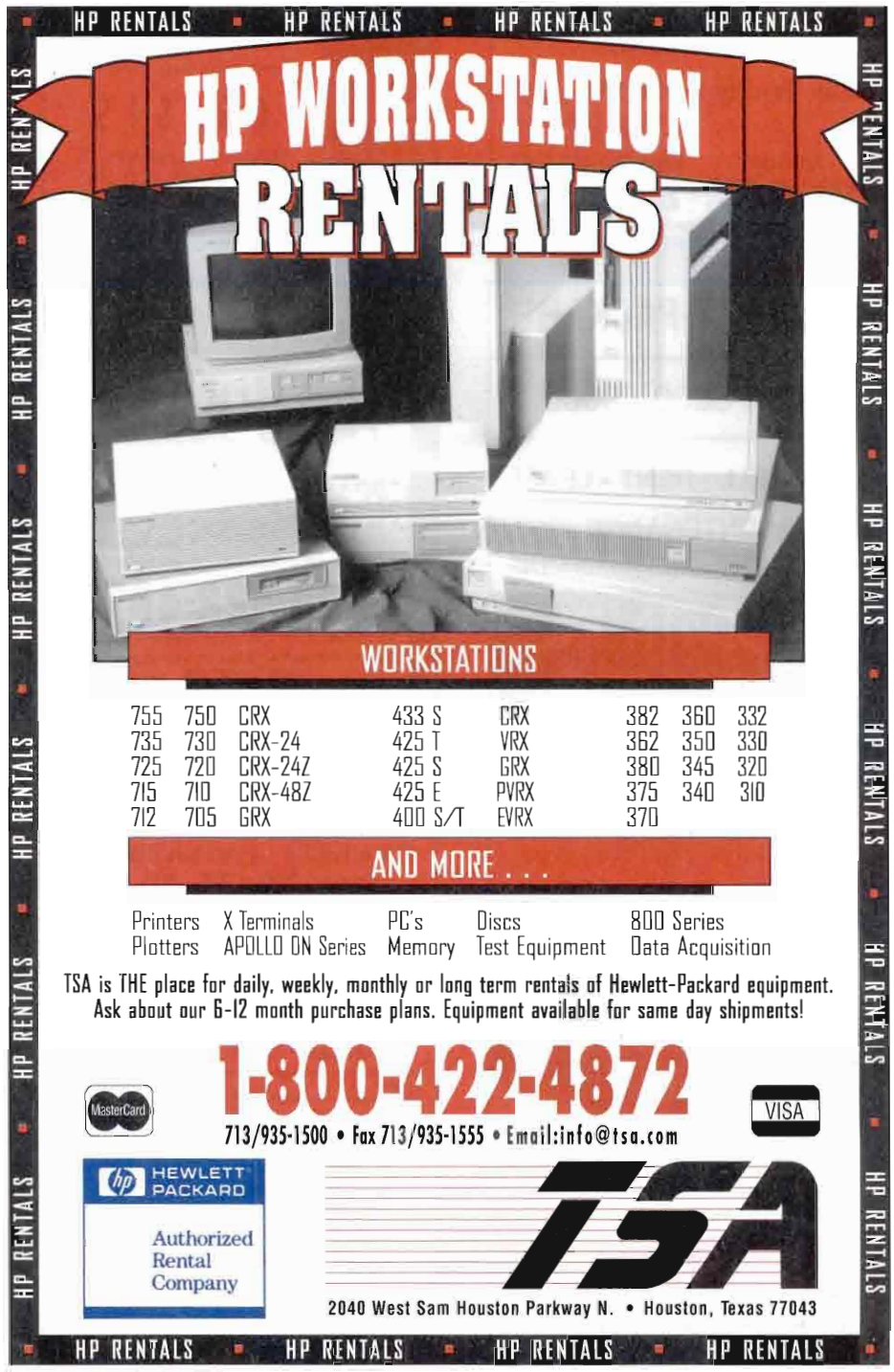

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It's A Fine Line

Timing Is Everything When Hiring Contract Programmers

By Gordon McLachlan

Times are tough, resources are tight and your backlog keeps growing. You need more manpower, but your management won't let you hire anyone. What's a person to do?

Companies are increasingly using contract programmers as a way to meet project targets, while keeping permanent headcounts down. You can outsource entire development projects, but that requires lengthy planning, and makes you give up serious direct control. But, in many cases, contract help is a bona fide solution.

As well as adding bodies to your roster, contractors can be used to increase your bench depth. Are you stuck with a bunch of aging 3K COBOL jockeys, when what you need are aggressive young C monkeys with UNIX experience? A contractor may be that role player you need to jump-start a project, or to help you bring it home on time.

Along with skills, contract help lets you buy flexibility. If you play the game the way it's supposed to be played, you can let the extra help go when it's no longer needed.

Perhaps the best part is that you can often bury the cost of contractor manpower into a project budget, or make a user department take the hit directly. In these days of downsizing, a dollar shuffled off to some other department is a dollar earned.

But, while often an attractive option, use of contractors is not without a downside. Renting usually costs more than buying, and contractors are no exception. The flexibility you want will cost you in the form of a higher hourly rate than what you pay your regulars.

In the short-term these additional costs can be justified by accelerating a project or reducing short-term training costs, but any savings will evaporate if you keep contractors around for too long. Contracts longer than a year or so don't make much sense.

Keeping contractors around too long also has indirect costs. A good contract programmer will become virtually indistinguishable from your permanent people fairly quickly. Sometimes they can be the best people on your staff, if only because they know you can ditch them without notice if they screw up. The longer they have been around, the more it will hurt to lose their skills when they leave. There's nothing wrong with that, but it can make it hard to cut the cord. You always seem to have one last project to do before you can let the contractor go.

After a contractor has been around for a while, they also start to identify more and more with your company, and you with them. I think this phenomena is closely related to the Stockholm Effect, a tendency for prisoners and their captors to identify with and sympathize with one another. This mutual dependency also can make it hard to release them.

Also, your regulars may resent the contract help if they stick around too long. This is especially true if you've shunted your old-timers aside to handle maintenance, while the new development goes to contractors.

Some of your people will surely do the arithmetic, maybe the toughest thing they've done this week, and deduce that the company is paying 90 grand a year for each contract head, but they aren't making nearly that much. They may buy the short-term flexibility explanation at first, but not after a couple of years.

However, don't underestimate the effects of groupthink on your poor contractors. One of the fringe benefits of a contractor is a fresh point of view. After a year or so, they start thinking like everybody else in your department. That may not be an advantage.

Some organizations develop a real over-reliance on contract help. At one company I worked with, over 50 percent of the systems people in some divisions were contractors. Many of these had been in the same position with the company for two or three years. It seemed like once you settled in, you could have a contract for life. Last year the company cut back its contractor headcount a bit, and permanently hired some of them. But the problem was 10 years in the making and they've still got a long way to go.

I guess the moral is, when you get into a contract, know how and when you are going to get out. You don't want things dragging out like a U.N. peacekeeping mission.

—McLachlan's Internet address: mclachlan@cardinal.com

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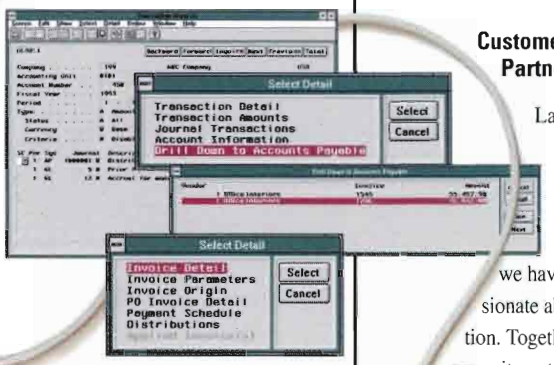

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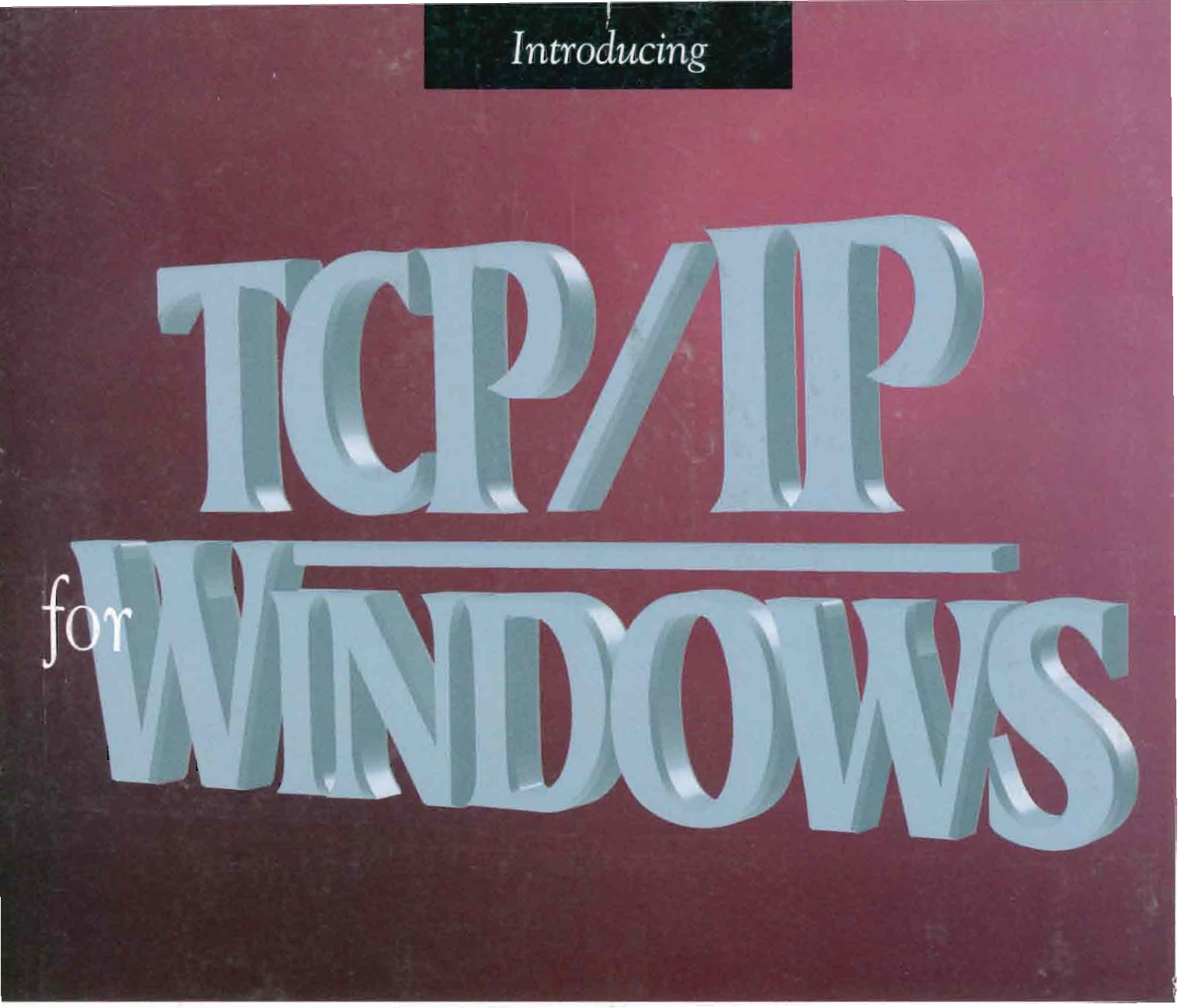

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