

# HP Professional

THE INDEPENDENT MAGAZINE FOR NEWWAVE COMPUTING ▲ VOL.5 NO.10

OCTOBER 1991 ▲

NEW WAVE

## Client-Server Computing

- ▶ Accounting Software Vendors Take Stock In Networked Systems
- ▶ HP NewWave Office: The First Step Toward Workflow Automation
- ▶ HP OpenView Puts Information Systems In Perspective
- ▶ PC Integration: When Will The Dream Become A Reality?



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# The Vital Center



By Don Marks

Loot, lucre, cash, credit or collateral—call it what you will, money matters, and it matters more when there's less. MIS managers have grappled with this fact of corporate life longer than anyone. Last year, when the U.S. economy went flat and money began to tighten for consumers, MIS departments already had been feeling the pinch for quite a while.

My reason for raising this pessimistic point isn't to foster doubts about your computing investments, or even to in-

still caution. On the contrary, tough times or no, if your company intends to survive, it will have to maintain and enhance its technology infrastructure. Difficult as that can be in recessionary periods, it's an essential cost of doing business and an important long-term investment for any organization. After all, economic expansion *will* return, and when it does you won't be able to afford missed opportunities.

No, I'm accentuating the negative this month because I believe the present "economic downturn" has had profound—and not entirely desirable—effects on corporate information strategies and the role of MIS.

Clearly, for the established computer vendors, the corporate MIS department is no longer the revenue mainstay it once was. Its functions, in many cases, have been dispersed throughout the corporation, and individual departments have assumed responsibility for their own piece of the larger corporate network. Support duties for these departmental systems often fall to an administrator with relatively little training in the management of information systems.

What this means for the way we manage computer systems isn't obvious at first glance. You might think that the equation of smaller departmental systems and less experienced internal support personnel leads directly to low-cost hardware, shrink-wrapped software and a standards-based, plug 'n' play approach to networking. You might think this, that is, if you listened only to what the vendors say when attempting to entice new customers. Unfortunately, the connection between open systems and decentralized resources isn't quite so pat.

## The Power Struggle

There's no question that HP sees its new customers offloading applications from mainframes to smaller, decentralized systems or implementing distributed client-server networks. The new HP 9000 8x7S series and the increasingly open HP 3000 offer a

tantalizing lure indeed for the new breed of corporate customer. Whether provided by VARs as part of turnkey solutions or purchased fully-configured through HP's "Instant Ignition" program, the Nova systems are effortless to install and support.

But the success of decentralized computing raises a crucial political question for MIS: Who controls the client-server network? Will MIS reassert itself and demonstrate the value of centralized responsibility for information resources, or will decentralization accelerate with corporate networks breaking up like so many Baltic states? Can individual departments or—as some advocate—even smaller entities such as workgroups effectively negotiate interconnectivity within a larger, more "democratic" framework?

There are obvious precedents—and advantages—for each approach. Corporations have benefitted from handing computing responsibility out to individual department chiefs. More conscious of the bottom line and better aware of application requirements, these managers have purchased systems and constructed networks well-suited to the needs of their users. Frequently, these users can maintain their own systems more cost-effectively by outsourcing support services or hiring consultants to handle complex connectivity issues.

On the other side of the LAN, however, lies the philosophy that information systems should be a general corporate resource—a basic service available to the entire company. Supporters of this approach argue that scattering responsibility for implementation and maintenance of information systems throughout an organization leads to unnecessary duplication of effort and unbalanced technology development. Industry standards may solve some of these problems, but truly integrated information networks are possible only through a high degree of centralized planning—and that requires a strong MIS.

For better or worse, money will probably decide the question of centralized planning. It will also determine the future of MIS. Companies willing to forego significant technology upgrades or imprudently reduce computer spending through draconian budget cuts may save money in the short term only to find themselves swamped with connectivity problems in the long run. Spending money to bring older systems up to date or achieve enterprise-wide integration may look extravagant right now when every dollar counts, but it could, in the long-run, provide the means for a stronger recovery.

A handwritten signature in black ink that reads "Don Marks".

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## INDUSTRY WATCH

Bill Sharp

# A Winning Smile

There is nothing unusual about seeing high level HP managers smile these days. They seem to be making quite a habit of it. So when Bernard Guidon smiled broadly during an HP - CompuServe/Collier-Jackson press briefing at the INTEREX show in August, it came as no surprise. The software firm's commercial products, up to now running on HP 3000 systems, would be ported over to HP 9000 Series 800 business systems and servers.

This is good news for Collier-Jackson fans and for HP-UX users as well. HP's winning ways are attracting a widening array of software choices for its user community. So it's no wonder that Guidon not only smiled, but positively glowed.

So much for the expected. What was interesting was that Guidon continued to smile as his co-host, CompuServe/Collier-Jackson vice president Gary Vigneau talked about not only linking his product with HP ALLBASE/SQL but also with the customer's choice of third-party databases such as Informix, ASK/Ingres and Oracle.

It's not particularly remarkable that a software supplier would consider supporting more than one database, but to feel comfortable enough with the idea to talk about it in front of an HP general manager, now that was interesting. I found myself listening to Vigneau and doing snap-glances over to check the status of Guidon's grin—yep, still there.

### Open Competition

After years of the proprietary approach, where a major vendor either provides *the* solution, or allows an independent software vendor (ISV) to do the job, it still

seems odd to see both major vendor and ISV solutions allowed to compete freely in the marketplace. Guidon's smile was proof that open systems in the software arena is alright by HP. He's happy to see ALLBASE selling wherever possible, but he won't stand in the way of customers who want to use another DBMS instead.

Of course it works that way—you're probably thinking—that's the idea behind open systems, turkey! Sure, you're right, but stop for a moment and name the number of large hardware and large software vendors who freely operate this way. Smaller vendors often have little choice but to play open systems—open is the best hope they have of breaking into computer markets. But the bigger vendors are, for the most part, still clinging to those proprietary profit margins.

How can you tell what constitutes an open systems approach to software? Just apply this test to any large vendor: Can you take a major product and place it in

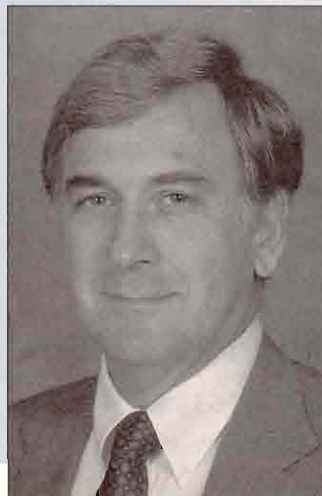
an environment entirely surrounded by standards-based products from other vendors? If you can, then the product in question is probably an open one. What you find in playing with this is that some seemingly open products are not open at all, while other products are more open than you might think.

### Open And Not-So-Open

If you look at the article on OpenView in this issue (see pg. 40), you'll find that OpenView Network Management Server can run on HP, Sun or (soon) IBM workstations. And atop OpenView, you can run a growing array of third-party network management applications. It will even talk to some third-party network testing hardware. So you can surround OpenView with products from other vendors, and it will still function as promised—that is open.

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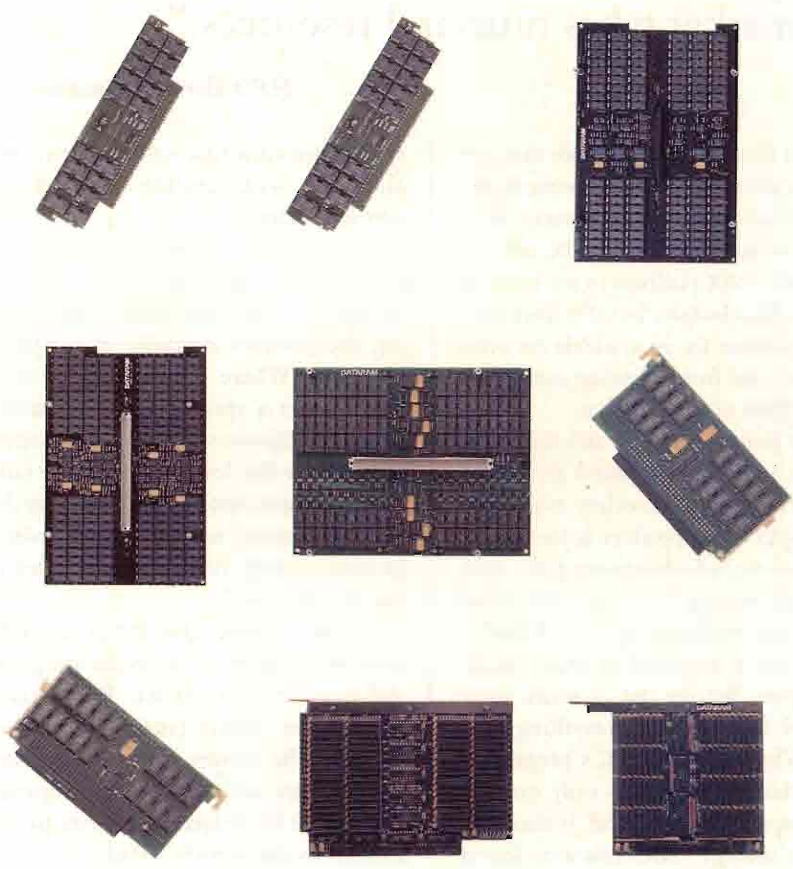
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**“R** &D expenditures in software are overwhelmingly in the open systems arena. But getting products to market takes time and resources.”

*HP's Bernard Guidon*

tions will also function on more than one platform and allow users to choose which database they prefer for that crucial function. You can bet that HP-UX will not be the last UNIX platform to see this software. Collier-Jackson benefits from having its software freely available on other hardware, and from allowing users to tie in the DBMS of their choice.

Now just in case you still think I've been on some far-off island for several years, let's provide another example—DEC's NAS. This product is the subject of a great deal of advertising right now. In fact, it's hard to think of a DEC product that has not lately been NAS-ized in an ad. NAS is supposed to make everything open. But, in fact, it seems to be designed to integrate everything with VMS. Why only on DEC's proprietary VMS, which in turn runs only on DEC VAX proprietary hardware? Is that truly an open strategy? NAS connects lots of things and apparently does this very well, but given its high price tag and focus on VMS, you have to wonder if it can really compete in an open systems market.

Proprietary pry bars only work so long as users have no open systems choice. But, says Guidon, “Customers are far from being stupid, and they figure things out very quickly.”

### **Supply And Demand**

ISVs aren't exactly slow on the uptake, either. Collier-Jackson's Vigneau states his case clearly. “What we are striving to do is to remove the hardware platform from consideration,” he says. “We will sell our software on its functionality and the customer can pick the hardware on other criteria. We will have one set of

application code that will run on several platforms, with separate databases and user interfaces.”

This allows Collier-Jackson or any other vendor that is equally open to concentrate on delivering features and making the product available on multiple platforms. Where a customer has standardized on a specific SQL-compatible database, Vigneau will smile and connect to it. And while lots of vendors are talking about open systems, and some are delivering, Vigneau reports that the Collier-Jackson strategy still generates “a lot of raised eyebrows.”

Guidon reports that R&D expenditures in software are overwhelmingly in the open systems arena. But getting products to market takes time and resources. The picture that emerges here is that there are a lot more companies that will be freely linking software to one another in the months ahead.

According to Guidon, increasing numbers of software vendors are producing plug and play products, products that function like building blocks, allowing systems integrators and users to combine them as they wish to create the final system. “More and more companies are making a business out of supplying one or more of these blocks, and the user wants the freedom to choose who is the best supplier for each block,” he says.

Why is this change not more evident? It takes time, says Vigneau. “Customers are still getting used to open systems,” he says. “I think that we are going to see a tidal wave effect and everybody will be doing it. It is getting close to exploding now. We are betting on it, just like HP did.” ■

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**PlotMIUtil™** prints ME10/ME30 MI files on any model HP LaserJet, PaintJet, and DeskJet printers, or on a Postscript-capable printer:

- A single copy of PlotMIUtil can serve the printing needs of an entire site
- Runs stand-alone, or seamlessly integrates into any PlotMI script, HP-UX shell script, or lp spooler script
- Compresses all output data for faster downloading and printing
- Prints drawings faster than pen plotters
- Drawings may be printed on A or B size media (LaserJet 2000, PaintJet XL and Postscript capable printers support the larger media size)
- Offers extensive user control over line style, pen color and pen width

**PlotMIView™** displays ME10/ME30 MI files on the VGA, EGA, or CGA display of a personal computer, or on the graphic display of an HP 9000 Series workstation:

- Single keystrokes allow navigation, zooming, and panning
- Pan and zoom controls for observing finer drawing details
- WYSIWYG: drawings appear on the display exactly as they would if plotted on paper by PlotMI
- Extremely fast display
- Low cost PC hardware may be used for view-only work
- Runs on any PC compatible, and laptops for portable *in-the-field* viewing
- Supports a virtual memory feature for viewing extremely large drawings
- Custom batch files which allow seamless integration with networks automatically retrieve drawings from a central server for PC viewing
- Single keystrokes can trigger hardcopy plotting, by PlotMI, on local or remote printers and plotters

DAAI products are sold with a 30-day money-back guarantee and free, unlimited technical support by phone or fax. Call, write, or FAX today for detailed product information, price list, and details on bundling and volume discounts.

# DAAI

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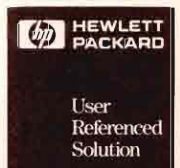
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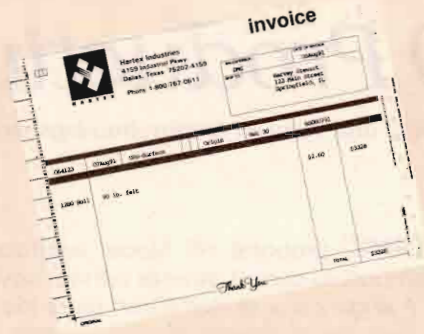
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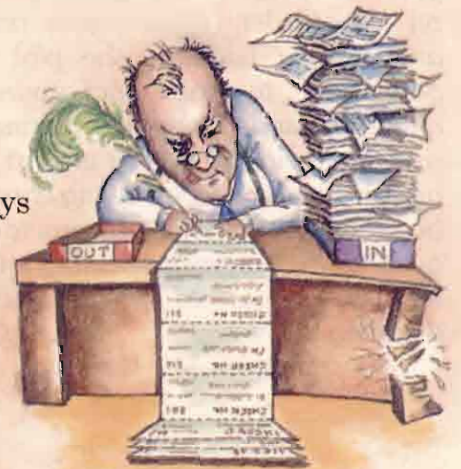
This is the 2<sup>long</sup> time that passes  
while you wait for the forms  
that 2<sup>HIGH</sup> printed.

This is your 2<sup>big</sup> warehouse  
that stores the forms that  
2<sup>HIGH</sup> printed.



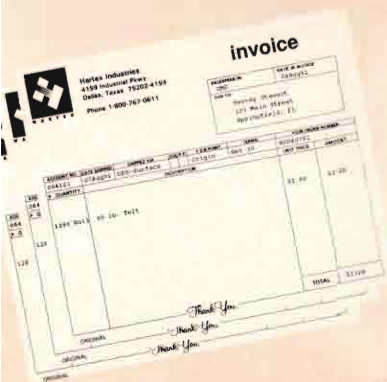
This is the 2<sup>many</sup> trips lugging around  
the forms that 2<sup>HIGH</sup> printed.

This is the 2<sup>busy</sup> accountant who pays  
for the forms that 2<sup>HIGH</sup> printed.



This is the 2<sup>much</sup>  
waste that's created  
when you throw  
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CIRCLE 265 ON READER CARD

## SQL Access Group Demonstrates Prototype Network

*Third-Party Products Comply With SQL Specs*

In an unprecedented display of vendor cooperation, the SQL Access Group gave reporters, analysts and customers a glimpse into the not-so-distant future of database interoperability with a demonstration of a prototype network. While proving the maturity of the ANSI SQL standard, the scope of the exhibition was a positive sign for the overall potential of the standards-based networking industry.

For the event, 16 well-known producers of client retrieval systems and database servers modified their systems to comply with a recently agreed upon SQL spec which was jointly developed by the 42 members of the SQL Access Group and the X/Open consortium.

(The X/Open said it will implement the spec in its Common Applications Environment.)

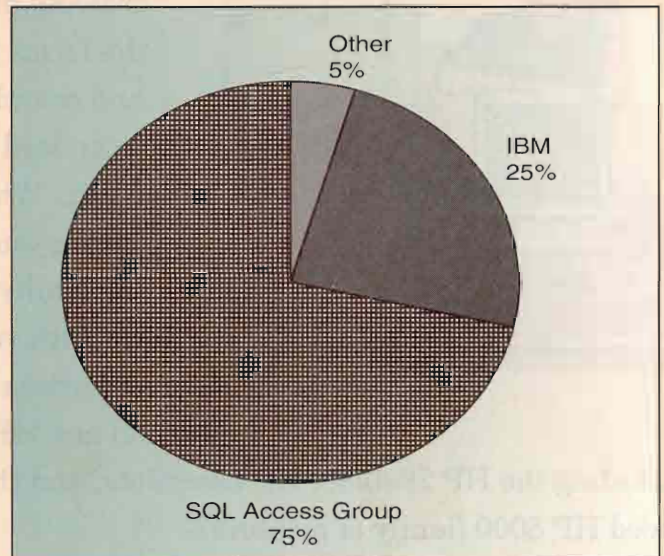
The prototype featured multiple front-end applications accessing database servers simultaneously. The Access Group's Paul Perkovic explained that the interoperability was made possible by a common description of the

database structures. The applications and servers interoperated by accessing tables and reading columns, headers and names over user-transparent connections.

Among the demo'd permutations were a Cincom flight planning system accessing Oracle; Ingres Windows 4GL to DEC's Rdb/VMS; Sun Simplify to a Fujitsu RDB-11 system remotely located in California; HP NewWave Access to NCR Top End/Sybase; and Oracle SQL Forms to Teradata.

Notably absent from the event were database goliaths IBM and Computer Associates. "These are international standards we're working with here," stressed Jeff Balboni, chairman of the group's technical committee. "OSI forms the basis of the network and X/Open developed the API. IBM has its own proprietary interoperability technology."

He added that many of the vendors, including IBM and CA, provide gateways that allow some degree of interoperability with unlike data structures. "The API defined by this group," he explained, "is ANSI embedded SQL and



*Forty-two of the leading ANSI-compliant SQL database companies, including Sybase, Oracle, Informix and Ashton-Tate are represented in the two-year-old SQL Access Group, representing 75 percent of the database market.*

a NIST verification suite."

The group said that Phase II of evolving the SQL spec will involve the Call Level Interface subroutine library and support for TCP/IP, which was acknowledged to be the most widely-used networking protocol. "We're still prioritizing work," said Balboni.

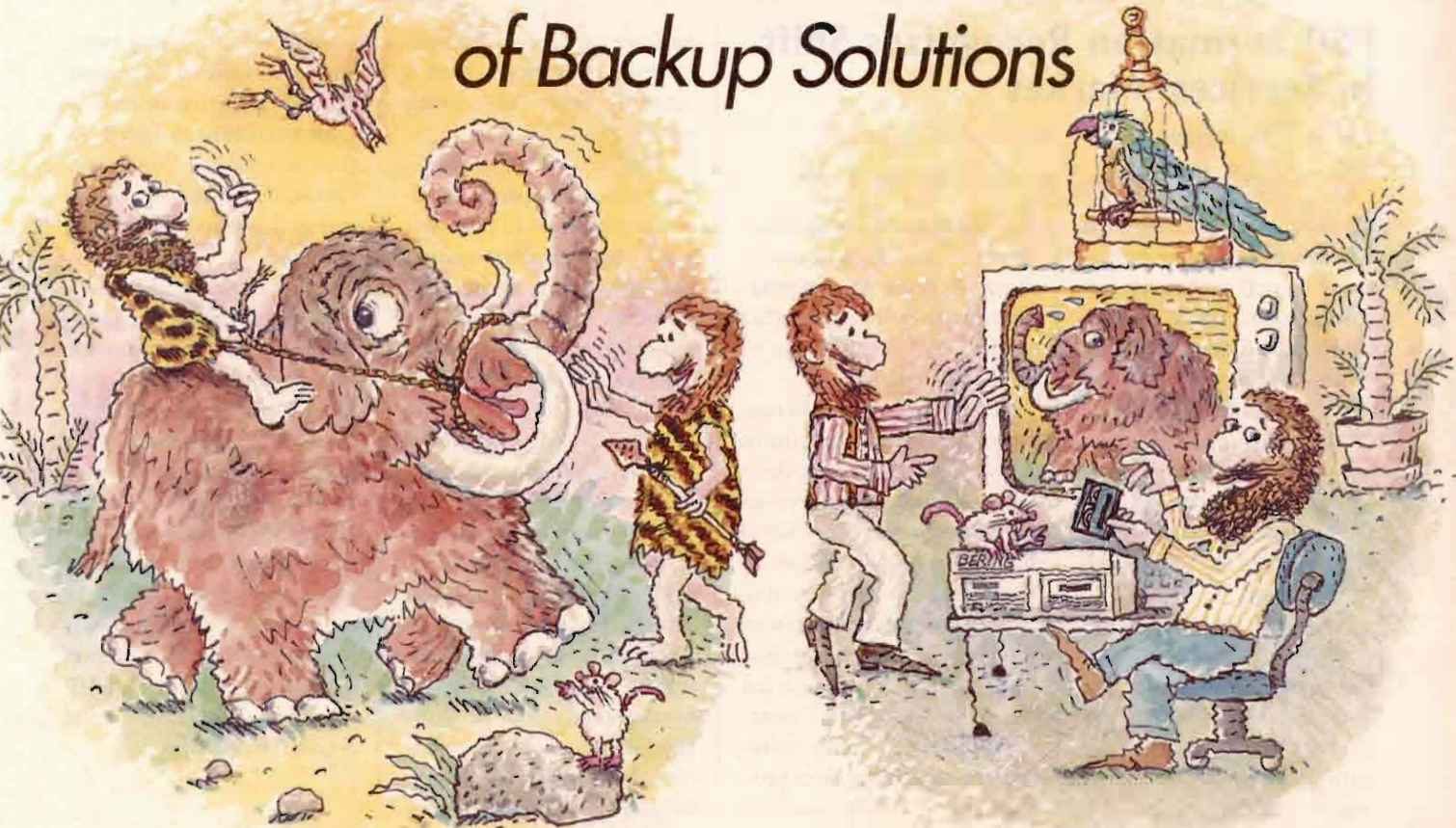
After TCP/IP, Balboni said Novell IPX would be the most likely candidate for development. But he said another important issue for the group will be determining

branding verification and quality testing methodologies.

While not a standards body, the Access Group claims to be anxious to accelerate the standards research underway at ANSI and ISO, among others. In concert with X/Open, the group is expected to publish the current spec document shortly.

—Evan Birkhead, Contributing Editor

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## PSD Formation Recognizes Shift In Services' Market

*HP's Consulting And Educational Services Meet Needs Of Open Systems Environments*

**R**ecognizing that customers now require more professional support services vs. traditional maintenance services, HP recently formed a separate Professional Services Division (PSD) within its Worldwide Customer Support Operations (WCSO). PSD provides consulting, educational and project-management services in support of HP's open systems strategy.

With the implementation of PSD, HP's service organization has been restructured to focus resources specifically on professional services, at the same time broadening its service portfolio to include

multivendor and non-product specific consulting and educational offerings. Any information systems site can use PSD services; HP doesn't have to be the systems base.

Tying together different systems within a common network and supporting these components has long been an HP strong point. Now HP is leveraging this expertise in multivendor and open systems support by bringing it to the forefront. In the past, systems support focused on hardware reliability; next, support moved on to stressing availability and then productivity. Today's issues are

professional services for open systems. Hewlett-Packard is meeting these new needs with PSD.

The core of PSD's consulting business is expected to focus on migration to open systems, application integration and information technology planning. Open systems also will play a key role in the educational services sector, with training including courses covering OSF/Motif, UNIX systems and multivendor networking.

Along with the PSD formation, Hewlett-Packard introduced three new professional services: Information Technology Strategy Consulting, to provide effective open systems solutions; Business Solutions Services, to ensure that client information technology investments have

sound business justification; and Open Systems Education, a comprehensive open systems curriculum offered either as self-paced or formal classes, 80 percent of course material is applicable to all platforms.

"The Professional Services Division is key to our overall support strategy to provide total open systems solutions to customers worldwide," states Ann Livermore, PSD marketing manager. The new unit is headed by Chu W. Chang, formerly Group Controller for WCSO. A staff of more than 4,600 stationed in more than 100 countries is now providing professional services to HP and non-HP sites alike. — Ron Levine, *Field Service Editor*

---

## HP Reports Nine Percent Growth

*Third-Quarter Profits Increase Despite Market Slump*

**T**he U.S. economy may be slow on the mend and competition remains fierce in the computer marketplace, yet Hewlett-Packard continues to report increased earnings. HP's fiscal year ends this month, and its third quarter numbers indicate that the full-year net will reflect a favorable response to its corporate reorganization and industry-stunning workstation introductions. In the third quarter ending July 31, HP reported a nine percent increase in net revenue and eight percent growth in net earnings.

Still, despite an increase in sales and service revenue and

an increase in both U.S. and international orders over third quarter fiscal 1990, these results were not as good as expected.

Orders for the HP 9000 Series 700 introduced in March exceeded expectations, but the company couldn't keep up with customer demand. Currently, HP is promising delivery times of eight to 20 weeks for Series 700 workstations. Many speculate that the production delays are the result of a backlog in chip orders from Texas Instruments. TI manufactures the floating point unit for the Series 700 implementation of PA-RISC.



HP's corporate reorganization and commitment to the Series 700 along with this summer's PA-RISC-based Nova introductions were a reaction to a drastic 18 per-

cent drop in earnings in fourth quarter fiscal 1990, and an overall 11 percent year end net. HP's President and CEO John A. Young oversaw the revamp of the company's computer business and instituted an early retirement program, which he expects to help reduce the growth of operating expenses, which were down from a year ago.

Other factors including an 11 percent increase in sales abroad and an encouraging acceptance of new products in the marketplace should help HP position itself for opportunities as they emerge in 1992. — Andrea Zaved, *Assistant Editor*

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too, with rack mounting options and cable lengths of up to 80 feet.

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CIRCLE 112 ON READER CARD

## PeopleSoft's/HRMS Supports ALLBASE/SQL Under MPE XL

*HP Plans Implementation In Personnel And Payroll Management*

**P**eopleSoft Inc.'s PeopleSoft Human Resource Management System (PS/HRMS) now supports HP 3000 RISC-based computers running HP ALLBASE/SQL under MPE XL.

This is the first RISC-based computer platform to be supported by PeopleSoft. HP's corporate headquarters purchased PeopleSoft's HRMS with the intention of using it internally for personnel, benefits and payroll management applications.

PS/HRMS is an integrated human resource management

solution based on a client-server architecture. It supports multiple RDBMSs, hardware platforms and Microsoft Windows 3.0.

All three PS/HRMS applications — Benefits, Payroll and Human Resources — will be available on the HP 3000 platform in January 1992.

Contact PeopleSoft Inc., 1331 N. California Blvd., Walnut Creek, CA 94596; (415) 946-9460.

**Circle 373 on reader card**

## Speedware Performs At 51.6 tps With ALLBASE/SQL

*Supplied To All North American User Groups*

**I**nfocentre Corp., the developers of Speedware, completed its performance benchmarks for HP's ALLBASE/SQL RDBMS at the HP factory in Cupertino.

Using a Transaction Processing benchmark, Infocentre produced what are the fastest performance results to

date of any 4GL or toolset available on the HP 3000 and ALLBASE/SQL.

The benchmark results show Speedware performing at a rate of 51.6 transactions per second. This measurement represents less than 30 percent overhead compared to HP's standard benchmark

## HP Forms Partnership With Deltec Electronics

*CPS Group To Sell 2000 Series UPSs*

**H**ewlett-Packard and Deltec Electronics recently teamed up to sell Deltec's 2000 Series Uninterruptible Power Systems (2000 Series UPSs) through HP's Complementary Products Sunnyvale (CPS) Group.

The 2000 Series UPSs protect hardware and data from utility power line problems and they reduce the cost of running the computers on tomors June 1, 1991. Through this exclusive agreement, HP customers who purchase a 2000 UPS also will receive software that provides monitoring, network status messages and automatic server shutdown for systems backed up by the 2000 Series UPS. This software is compatible with HP-UX and Apollo Domain operating systems supporting HP's network applications.

Contact Deltec Electronics Corp., 2727 Kurtz St., San Diego, CA 92110; (619) 291-4211.

**Circle 372 on reader card**



written in the C language.

HP's expectations for third-party ALLBASE/SQL tools and 4GLs was a 50 percent performance differential between their respective

products and the C program.

Infocentre also announced it will supply its Speedware software to all regional and local HP user groups in North America. On-going training and consulting will be available through local Infocentre sales/support offices.

Contact Infocentre Corp., 7420 Airport Rd., Ste. 201, Mississauga, Ontario, Canada L4T 4E5; (416) 678-1841.

**Circle 371 on reader card**

## Cognos Announces Product Enhancements

*Integrates PowerPlay, InQuizitive With VISIBILITY*

**A**t this summer's INTEREX conference in San Diego, Cognos made several announcements involving its PowerHouse, PowerHouse ARCHITECT, InQuizitive and PowerPlay products.

The company announced

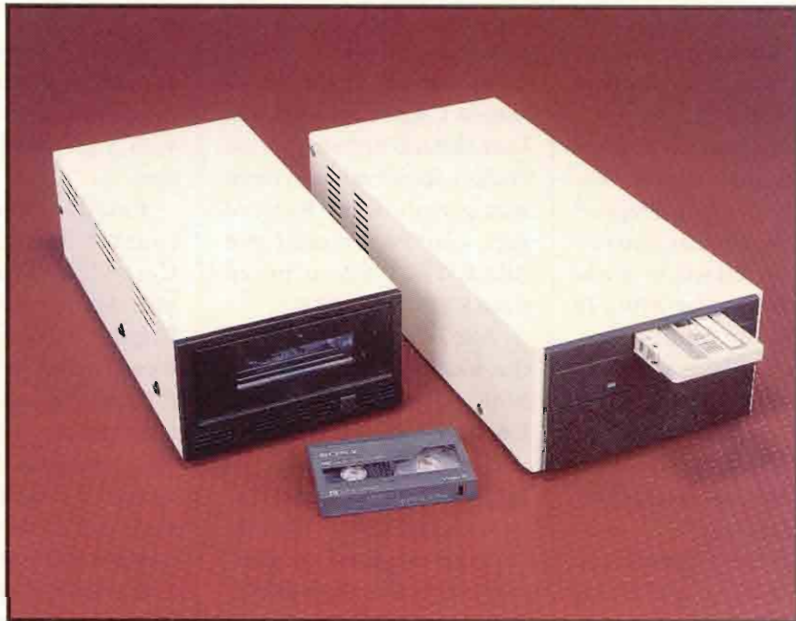
new versions of its PowerHouse fourth generation language. PowerHouse 4GL 5.26 for MPE V systems now provides user interface improvements such as moveable/removable MODE and ACTION files, and in-field editing, as well as an

interactive application debugger for improved application development and debugging in this environment. PowerHouse 4GL 5.26 is priced from \$5,000 to \$40,000.

Cognos also announced new versions of PowerHouse

and the PowerHouse StarBase relational database system for HP 9000 Series 700 and 800 workstations. PowerHouse 6.03 features advanced user interfaces with full color support, pull-down menus, pop-up windows, screen overlays, dynamic highlight-

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ing, scrollable fields, variable size screens and designer function keys, as well as a screen painter and interactive application de-bugger.

The advanced features of StarBase 3.10 include concurrency controls and a two-phase commit protocol which assures the accuracy of data in multiple databases. StarBase 3.10 features improved compliance with SQL standards, and better network security when using the TCP/IP network protocol.

PowerHouse 6.03 and StarBase 3.10 are priced from \$5,940 to \$224,100 depending on the number of users.

PowerHouse also now fully supports the HP ALL-

BASE/SQL RDBMS. Both the latest terminal-based version of PowerHouse 4GL (6.19) and the upcoming client-server version (7.09) support HP ALLBASE/SQL.

One final note on PowerHouse: A client-server version of the product designed for HP systems has entered field testing and will be available in December 1991. It will enable HP MPE XL systems to take advantage of client-server computing using PCs running Microsoft Windows that interoperate with host applications running on MPE XL servers.

Cognos also introduced version 5.6 of its application maintenance product, Power-

House Architect. The new version is fully compatible with PowerHouse 4GL 5.26 and includes user interface improvements, access to all current Cognos products, and User Defined Security, which enables information systems managers to define levels of user security. PowerHouse ARCHITECT 5.26 is priced from \$2,000 to \$10,000.

Also, Cognos announced that Visibility Inc. (Stoneham, MA) will resell and integrate Cognos' end-user reporting and analysis tools — InQuizitive and PowerPlay — with VISIBILITY. VISIBILITY is an integrated manufacturing software system for discrete manufacturers with make-to-order, engineer-to-order and make-to-stock production requirements. It is

written in PowerHouse. The combination of InQuizitive and PowerPlay will enable VISIBILITY users to explore and analyze manufacturing data easily and thoroughly with a graphical user interface.

Finally, Cognos announced that Cardinal Data Corp. (Needham Heights, MA) will integrate and resell Cognos' InQuizitive end user report writer with its PRO/FIT financial and distribution software for HP 3000 and 9000 computers. The next revision of PRO/FIT will include a built-in data dictionary for InQuizitive.

Contact Cognos, 67 S. Bedford St., Burlington, MA 01803; (617) 229-6600.

**Circle 367 on reader card**

## Saber-C Integrates With HP's SoftBench

*Developers Can Create, Test, Debug And Enhance C Applications*

**S**aber Software Inc. announced the integration of its Saber-C programming environment with SoftBench, a software development framework from HP.

This integration of Saber-C Release 3.1 allows development organizations that have chosen SoftBench as their software development framework to use Saber-C to create, test, debug and enhance their C applications. Saber-C users can work through SoftBench, an open-integration CASE framework, to communicate with other CASE products.

For example, a Saber-C user can directly access configuration management, analysis and design, project



management, or any other tools that are part of their SoftBench framework.

Contact Saber Software Inc., 10 Fawcett St., Cambridge, MA 02138-1110; (617) 498-3000.

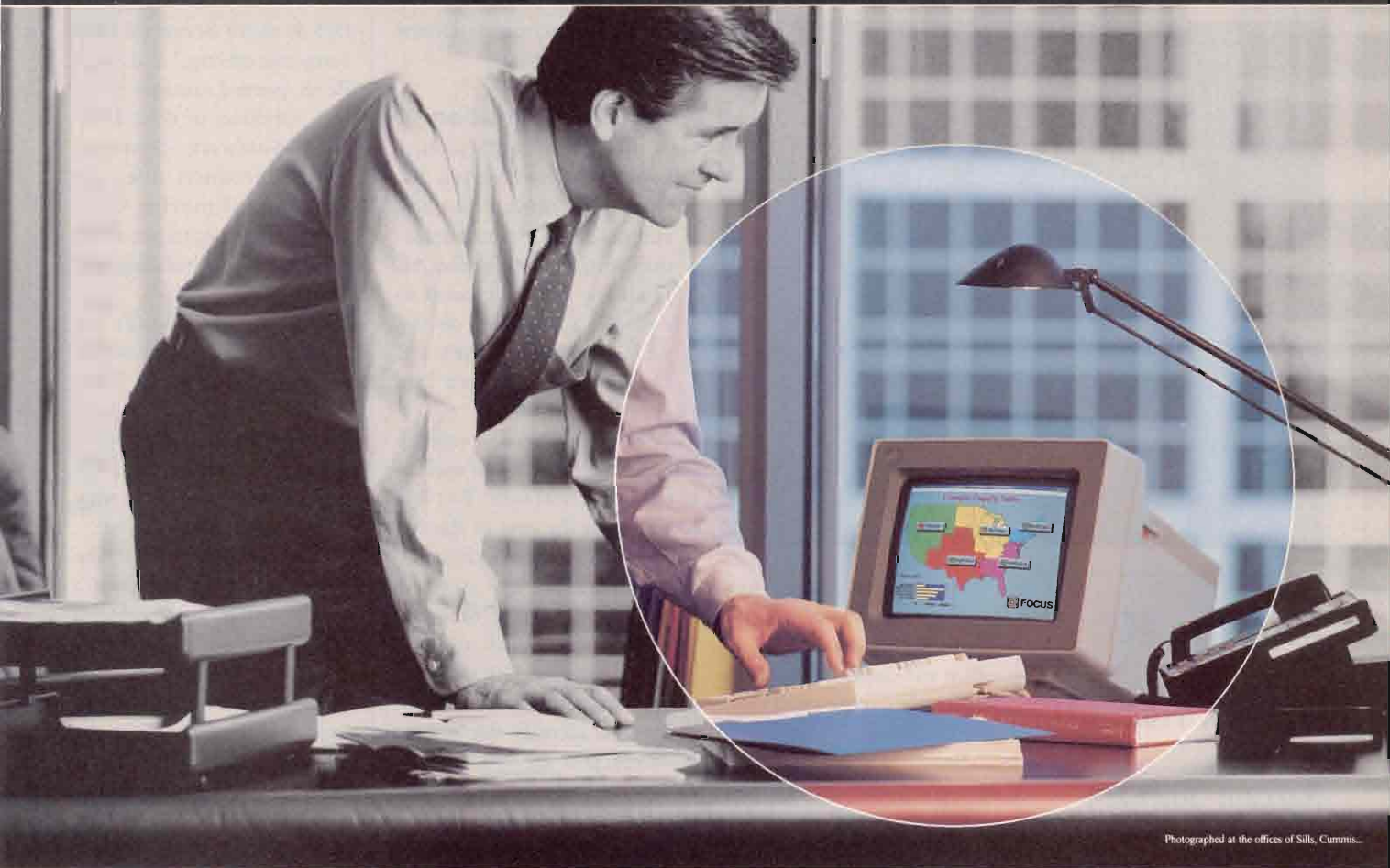
**Circle 366 on reader card**

## For Your Information

- HP announced three courses that teach users and information systems managers how to work in a UNIX operating system environment. The courses—"UNIX System: An introduction For New Users;" "UNIX System: Managing Users And Their Environment;" and "UNIX System: Transferring Files and Directories"—are applicable to non-HP as well as HP computers based on a UNIX operating system.
- Island Graphics Corp. announced that it's shipping full-color versions of IslandDraw and IslandPaint together as a complete UNIX-based graphics package for Sun Microsystems' Open Windows. (415) 491-1000.
- Wesson, Taylor, Wells & Associates (WTW) has opened a regional office in the San Francisco area to expand its ability to provide greater service to its west coast and national clients. (803) 699-5781.
- Quarter-inch data cartridge tape drives produced by Archive Technology, Sankyo Seiki, Tandberg Data and Wangtek comply with the 525 MB QIC-525 development standard for recording format and were certified by Pericomp Corp. (714) 752-5942.



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Ingres, Sybase, Informix, TurboIMAGE, KSAM, or Allbase/SQL—without extracts or data conversions. FOCUS gives you fast and easy access to all your HP data, from simple reporting to in-depth analysis.

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CIRCLE 247 ON READER CARD

## Cable-Free Communications



The Verran AC  
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Marconi Software  
Lends New Meaning  
To "Plug And  
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As businesses grow, new walls go up while old ones come down creating more office and cubical space to accommodate more equipment and employees.

Sometimes this means rearranging and moving the computing environment, too. Minicomputers, PCs, printers and peripheral devices need to be properly connected to each other to work, but running new cables every few weeks or months is time consuming and error prone.

If your department or company is in transition or you find yourself moving your peripherals around in order to communicate with your computers, the Verran AC DataLink from GEC Marconi Software (Reston, VA) could save you time and effort.

The Verran AC DataLink takes data from your computer and transmits it through the building's AC electric

power lines to any peripheral up to 300 feet away.

### DataLink Operation

A minimum configuration consists of one Verran AC DataLink connected to a host computer via a communication port, and one Verran AC DataLink DPS connected to a parallel (Centronics) device, i.e., a printer. Both AC DataLinks are plugged into an electrical outlet.

DIP switches are used to set the personality of each of the AC DataLinks. For example, in the case of the AC DataLink connected to the computer, the DIP switches are set to dedicate or assign the AC DataLink to that computer. The DIP switches are also used to create an address to identify the printer where you are sending the data — Peripheral I, for example.

The AC DataLink DPS connected to the printer uses DIP switches to identify the printer. In this example, the printer is identified as Peripheral I. The DIP switches can be altered at any time as the computing environment changes.

When you print with the host computer, the sending AC DataLink searches around the building's electrical circuit until it finds the receiving AC DataLink with the correct address (Peripheral I), then starts sending the data at a transmission speed of over 800 characters per second.

"In many situations, using the DataLink and DataLink

DPS is more beneficial than computer cabling," said Susan Boers, general manager of the U.S. Division of GEC Marconi Software Systems. "These products offer the flexibility of moving computer equipment to just about anywhere in a building you need it."

The AC DataLinks are compact in size and weigh just over two pounds. They use FM (Frequency Modulation) as their means of communicating over the power line, and span a frequency spectrum of 95 to 140 KHz.

The processor inside the AC DataLink incorporates a CPU, 8 KB of ROM, a UART, and a baud rate generator. The CSMA protocol is utilized to minimize dead time while complying with CENELEC standards.

So, if you're expanding to the floor above you, or you need to temporarily reconfigure your computing environment and can't justify running cables through a wall, consider cablefree communications with the Verran AC DataLink solution.

The Verran AC DataLink is priced at \$345, and the Verran AC DataLink DPS is priced at \$395. —George T. Fruch, Technical Editor

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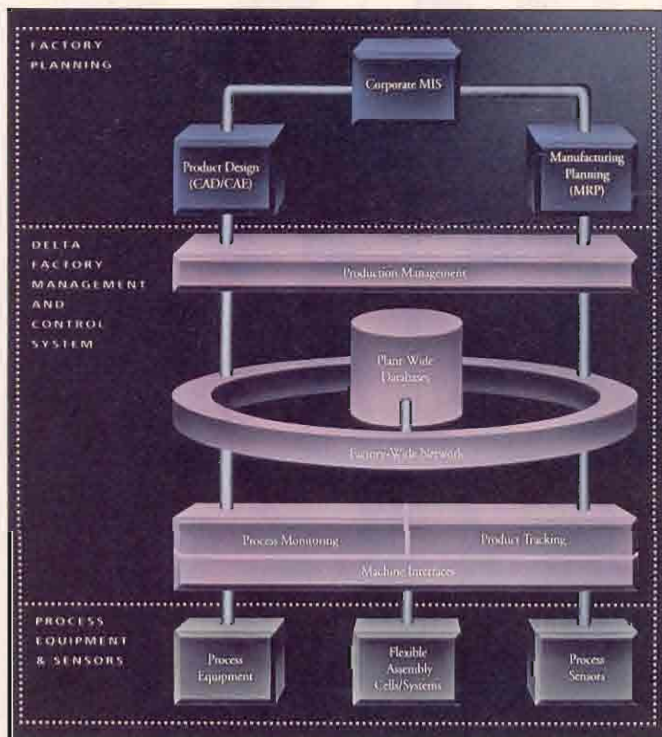
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On a shop floor, accessing certain types of information often has been painstakingly slow or even impossible—until now. DELTA, from Cimflex Teknowledge, is a full-scale Factory Management and Control System (FMCS) for repetitive, discrete manufacturing. DELTA is a suite of eight standard software modules for real-time and historical process monitoring, product tracking and production management.

DELTA forms a continuous information loop that collects information in real time from the factory floor machines, then distributes it to engineering and production planning and out to other factory information sys-

tems through a plantwide network and relational database.

DELTA's architecture lets factory-floor computers communicate on a peer-to-peer basis and through a central hub. This type of environment allows for high transaction rates by avoiding bottlenecks associated with a central processing computer. The DELTA architecture allows new applications and factory-floor devices to be easily integrated.

## The Blueprint

The modules that comprise DELTA are designed to monitor, track and report on factory floor operations.

The Work In Progress module reports the movement of manufactured units through the production facility. The module provides real-time data on queue size and activity as well as historical reports. The current production counts, yields and status of processes are tracked in real-time by the Production Monitoring module.

As a safety feature, The Machine Fault Monitoring module monitors a device's operational characteristics, checks for alarm conditions and alerts personnel.

The Serialized Tracking module lets the user control the serialized unit process flow by routing serialized units through all valid process steps. The Component Traceability module is generally used with the Serialized Tracking module and collects

key information on component setup, component placement and purge requests.

Test results are collected and stored in a relational database where they are immediately available through the Test Data Collection module. This module also provides the Failure Reporting and Tracking module with unit failure test results from single or multitester environments. The Failure Reporting and Tracking module also captures data from troubleshoot and repair station interfaces in real time and stores the data in a database.

To establish and maintain statistical control throughout the manufacturing processes, the Statistical Process Control module supplies information by detecting the causes of variation that should be eliminated. Ongoing monitoring then allows for the detection of processes moving out of statistical control limits so corrective action can be taken.

The DELTA modules are based on UNIX, C and an SQL-compatible relational database management system (Oracle), the OSI model and TCP/IP. — George T. Fueh, Technical Editor

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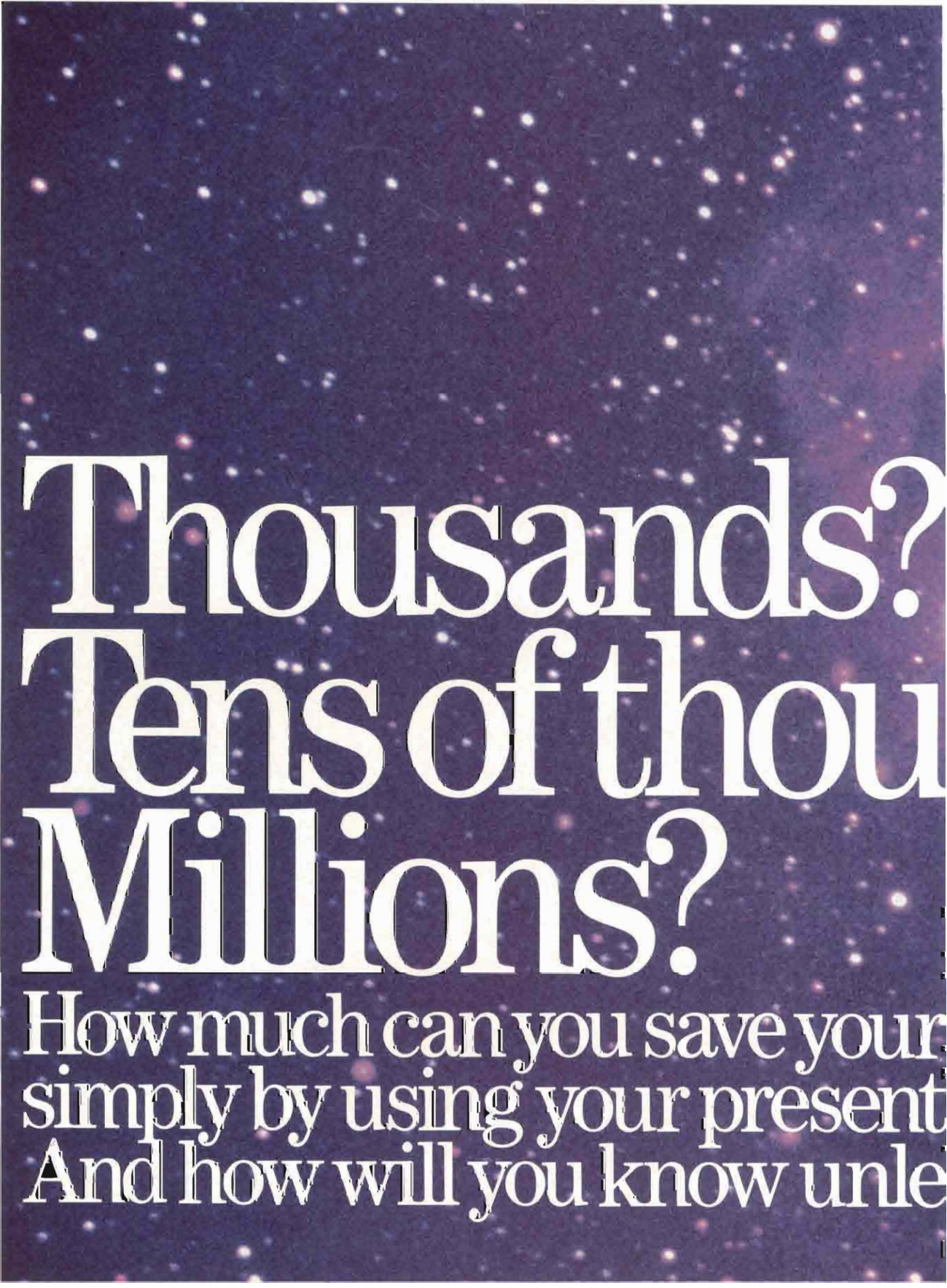
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# FINANCIAL DECISIONS

Faced With A Cost-Conscious World Of Multivendor Networks,

Accounting Software Vendors Take Stock In Client-Server Computing

BY ROBERT SHELLEY

Client-server computing is coming at all of us very quickly. Some are preparing for it and others are taking a wait-and-see attitude. Whatever your position, it's worth looking around to see what other companies are doing. Then you can decide for yourself when it's the right time to adjust your strategic information plans—or at least devise a contingency plan to reduce the risk of being left behind.

Overall, the accounting software vendors seem to have adopted the same attitude toward the client-server model. Tapping into their thinking can help all of us better understand the risks and opportunities presented by this major change in the use of computing hardware and software.

As with many emerging technologies, there isn't even a consensus as yet on the definition of "client-server" computing. Most people do agree, however, that it's made up of three components: clients, servers and a network that connects the two. The clients (usually PCs or workstations) make requests for services, and the server (often a minicomputer) services those requests. The services might include changing a record in a file on the server or asking for a report. The requests for services are communicated over a network, so that as this form of com-

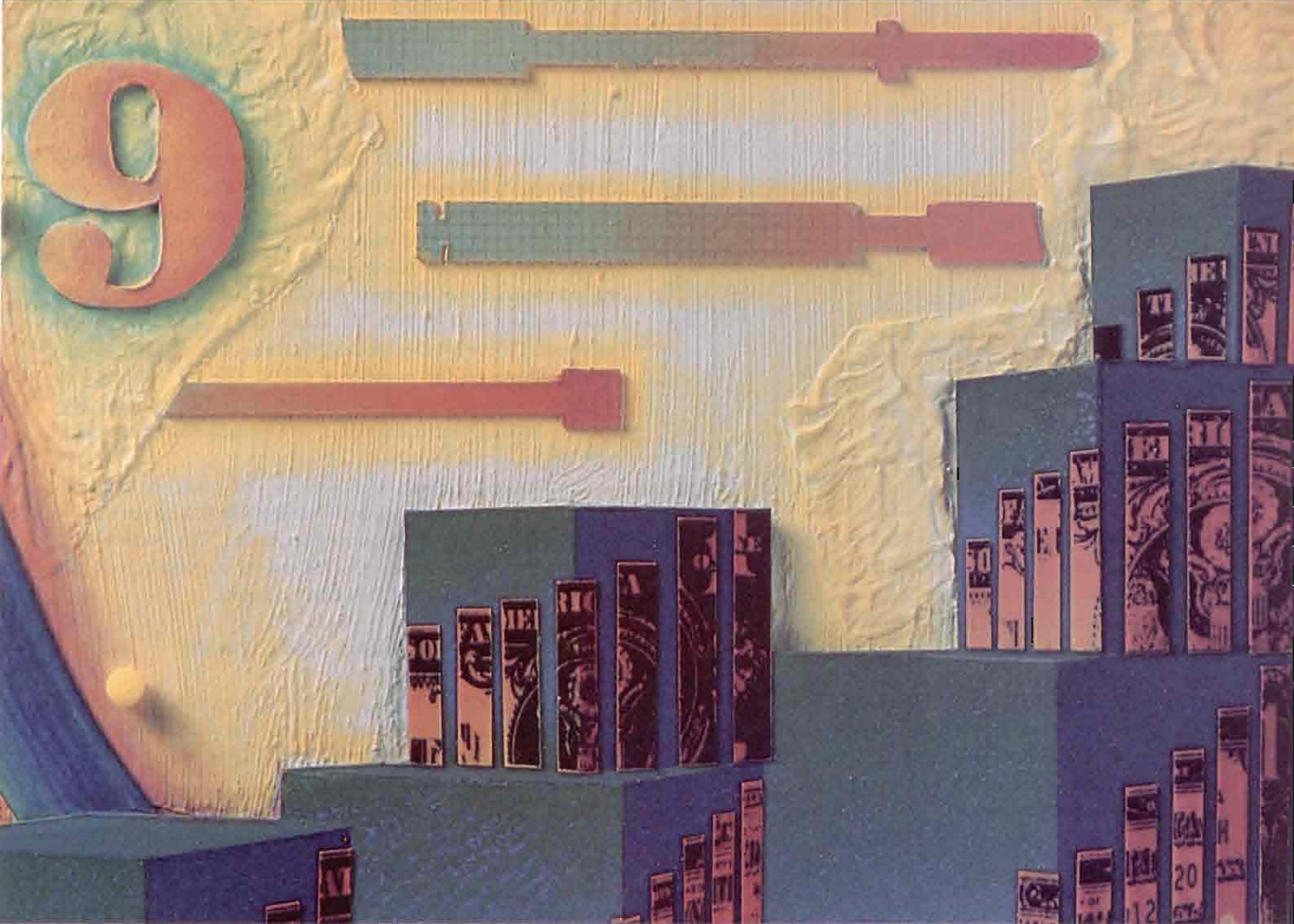
puting grows, clients can have access to many servers instead of just the one they use most often.

## Vendors Make The Move

THE ACCOUNTING SOFTWARE vendors don't agree about how to approach client-server computing, but no one should be surprised at that. Although some vendors have made a significant commitment, others want to gather more market feedback. At the same time, some new vendors are coming over from other hardware platforms, hoping that a client-server offering will be their ticket to success in the HP market.

Among the traditional HP vendors, ASK Computer Systems' (Mountain View, CA) commitment to client-server computing has been perhaps the most interesting to watch. Over a year ago it announced a strategic decision to rewrite all of its manufacturing and accounting software in a relational database environment using client-server architecture. It chose Ingres as its database vendor and began work. Well, to make a long story short, ASK liked Ingres so much it bought the company.





This level of commitment to client-server computing is the exception among most accounting vendors. But one by one, each vendor—in its own way—is recognizing the benefits that client-server can provide to customers.

HP for its part has been offering its own accounting and manufacturing software packages for years. It has now decided, however, that as computing technology moves toward industry standards (i.e., relational databases, client-server architecture and enterprise-wide computing) customers will be best served by a new approach. HP hasn't chosen to develop new software packages to meet these needs, but instead to work with selected software vendors committed to these new industry standards.

According to Peggy Wargo, HP Product Manager, "We'll continue to support our installed base of accounting and manufacturing software customers, but as they decide to move to the next generation of software, HP will support that effort by providing a list of software vendors that we feel meet HP's standards of excellence. The customer then will make his final choice." Some of the vendors selected by HP so far are ASK Computer Systems, Computer Associates, Lawson Associates and Collier-Jackson.

Mitchell Humphrey is taking a different approach from some of the other vendors, by developing the basic client-server tools for itself. "In this way, we won't have to depend on or be affected by someone else's priorities," says Ken Benvenuto, senior vice president. "Our approach to client-server will allow us to continue serving our traditional HP market, but also will allow us to expand into the HP-UX market. Perhaps most important, we'll provide our own software products for customers using ALLBASE, Sybase or Oracle, and we'll be able to add other relational database products to this list in the future."

This approach is consistent with HP's decision to unbundle TurboIMAGE and ALLBASE/SQL from HP 3000 hardware sales. The open systems approach is to let customers pick the database that's best for their intended application.

MCBA (Glendale, CA) could be the accounting software vendor with more installations across more hardware platforms than any other vendor. So, what are they doing to prepare for client-server? MCBA now is able to offer its products on the HP 9000 platform using the Informix relational database product. This is made possible by the development of a new product from Ryan McFarland (Austin, TX) called RM/plusDB, that

**m**any customers plan to offload mainframe financial applications to smaller, more cost-effective business servers in the coming years.

provides a gateway to translate RM/COBOL indexed file requests into database requests. Integration with additional relational databases, like Oracle, will be available upon Ryan McFarland's release of RM/plusDB for these databases.

Collier-Jackson has taken quite a few steps in recent months to better position its products for the client-server computing environment. Most important, it has selected JYACC Inc. (New York, NY) as its technology partner. JYACC produces a product called JAM, a front-end tool for databases, that's independent of hardware, operating systems, networks and databases. By using JAM, Collier-Jackson will be able to offer its customers a Windows 3.0 interface on the client and, initially, will support servers on the HP 3000, DEC VAX and several UNIX platforms, including HP-UX. According to Jim Douglas, VP of research and development, "We want to get away from proprietary systems."

Adds Mike Fisher, manager of technical services, "Because we want to protect our customers' software investments, we are re-engineering our applications to run in both the current host-based and the new client-server modes of operation. We are even taking extra efforts to allow both modes of operation at the same time."

Collier-Jackson also recently announced that it has integrated Cognos' PowerPlay, an executive information system product that runs under Windows 3.0, into its accounting software line. It will sell both PowerPlay and utility programs that extract user-selected data from Collier-Jackson software products, like the general ledger, and download it to the PC and into PowerPlay. At that point, the user can see graphic summaries of accounting data on his PC. That is, users can then view business information from a top-down perspective. They can begin with a broad view of information and then drill down through window graphics of increasing detail by clicking on a portion of the graphics with a mouse.

This sharing of processing and distribution of the functionality of the overall software offerings of a company provides an excellent example of the use of appropriate technology in a client-server computing environment.

Lawson Associates is one of the new vendors entering into

the HP community, but it comes to this market with strong credentials. Its software is installed on more than 700 mainframe computers—primarily IBM machines. Lawson has chosen the HP 9000 Series 800 platform as its point of entry into the HP market. The primary reason for making this move was that many Lawson customers were ready.

According to Bill Long, VP controller at Robbins Manufacturing, "We wanted to make a platform change, and Lawson really sold me on the benefits of UNIX. We felt HP-UX and an HP 9000 would help us do what we do more economically and save us a substantial amount of money each month in maintenance."

"By 1995, we expect 50 percent of our revenues to come from the UNIX market," adds Edward Mielech, Lawson's marketing manager for open systems products. "We really see it moving that way." Lawson's UNIX products also are available on the DEC ULTRIX and IBM AIX platforms.

### Commitment And Caution

**A**NOTHER WELL-APPOINTED vendor making forays into client-server computing is Dun & Bradstreet Software (Framingham, MA). D&B has paired up with Powersoft Corp., makers of PowerBuilder, a PC-based application development toolkit, in attempt to adapt its existing accounting applications to client-server environments. Traditionally a big player in the IBM mainframe arena, Dun & Bradstreet plans to use PowerBuilder to develop client modules running under Windows 3.0. The new front-end modules are designed to lighten the load on centralized mainframes and make greater use of the processing power available in PCs.

D&B expects the current downsizing trend to impact the server side of the equation as well. According to D&B Software Executive Vice President and Chief Technology Officer, John Landry, many of the company's customers plan to offload mainframe financial applications to smaller, more cost-effective business servers in the coming years. "We are giving customers a migration path that provides client-server benefits while maintaining current system investments," Landry says.

Oracle (San Mateo, CA) has a family of accounting software products called Oracle Financials. Matt Duncan of marketing relations says that "the Oracle Server database and Oracle Financials Server together centralize all database and data-intensive processing for Oracle Financials. The Oracle Financials Clients process all the online, end-user operations. Oracle Financials client-server computing allows end users to share the same accounting database and, at the same time, get the full processing speed and power of their individual client PCs."

Multiview, a vendor whose products are written in PowerHouse from Cognos Corp., is taking a careful look at client-server architecture. PowerHouse 7.0, the next version of this 4GL, is due to be released this fall and will be fully compatible with client-server computing. Although users of

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PowerHouse will be able to continue using PowerHouse applications with terminals and less powerful PCs, they also will be able to perform client-server operations on 386 PCs running Microsoft Windows 3.0. Richard Langevin, president of Multi-view says, "We'll be moving aggressively into PowerHouse 7.0 in the future, but we'll do so carefully and thoughtfully."

This fall Smith, Dennis & Gaylord (SD&G; Santa Clara, CA) is releasing its client-server offering, Visual XL. It uses an HP 3000 Series 900 as the server, with clients running SD&G's software written in Visual Basic from Microsoft. The client interface includes pull-down menus, scroll bars and buttons that allow the user to "point and click" through each accounting application. It also provides the ability to "cut and paste" data from the HP 3000 into a variety of PC-based applications.

Steve Dennis, chairman of SD&G, says, "We're very excited

## You should expect to see some new pricing structures emerge for client-server versions of accounting software packages.

that Microsoft chose to work with us as one of a few beta developers in the minicomputer arena." And according to Ray Duncan of *PC Magazine*, "Visual Basic converts Windows application development from a professional specialty requiring months of study into a recreational activity that's accessible to even the most casual programmer." Although this is a strong statement, it seems likely that additional vendors will choose Visual Basic as a path to implementing client-server capabilities in their products.

Other companies that are considering the move to client-server architecture or have already adopted this approach include Cardinal Data (Needham Heights, MA), Infocentre (Mississauga, Ontario), Software Systems Technology Inc. (New York, NY) and Sotas International Inc. (Haverhill, MA). Cardinal Data's PRO/FIT Network supports MPE V, MPE XL and HP-UX and provides integrated online links to manufacturing software such as MM3000 and other MRP systems. Software Systems Technology's Diamond package runs on all HP platforms as well as MS-DOS and takes advantage of multiplatform communications.

Sotas International's Accountable Solutions package has moved from the HP 3000 to the HP 9000 and HP-UX. "Over the past year, a lot of people began to demand applications for their UNIX systems, and they're using PCs to access these applications on UNIX servers," notes Art King, marketing direc-

tor for Sotas. "We'll look at having the PC do more of the work as users ask for it," he adds.

Although this isn't a comprehensive review of what all vendors are doing in preparation for client-server computing, it is representative of the various approaches being pursued or considered by this group.

### Prices Subject To Change

SHARED PROCESSING MAY have some impact on how vendors price their products in the future. Imagine, if you will, a company that has been using one of the larger vendors' software products for many years and is very happy with it. While the company is growing, the software is so good that the accounting department has been able to keep its staff count to five people plus the controller. However, to keep up with growing sales, the department decides to upgrade its HP 3000 Series 68 to a Series 958. When it informs the software vendor of this hardware change, it's astounded to find out that there's a \$40,000 upgrade charge for using the same general ledger and accounts payable packages on the bigger machine.

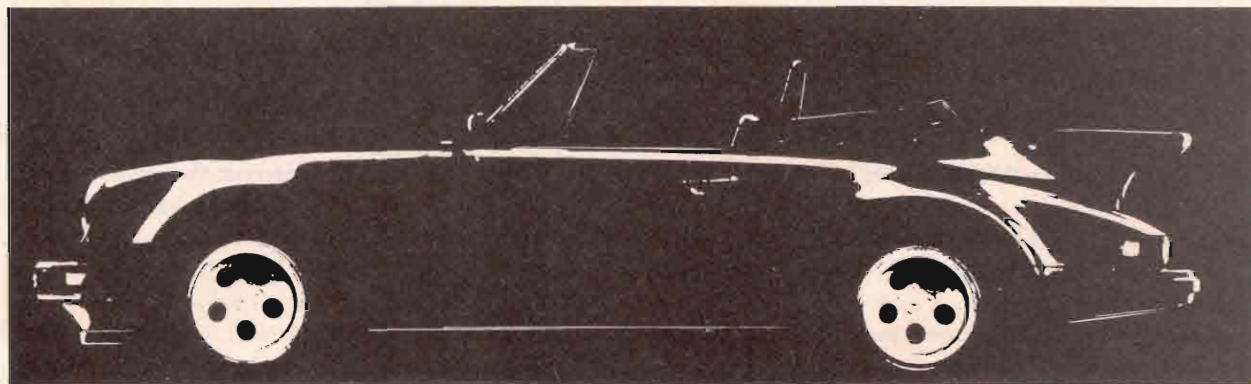
This very real scenario has occurred many times in the last few years. And it's difficult for a vendor to justify such upgrade charges when the number of people using the system—and, therefore, one of the key components of "value added"—is unchanged. Basically, the method of pricing based on cpu size makes the assumption that the computer running the software is dedicated, or almost dedicated, to this one application. That assumption, if it was ever valid, is no longer valid for general accounting software products.

The market is reacting by offloading accounting applications to smaller platforms, which not only eliminates the upgrade fee but maintains or even decreases the annual software maintenance fee. Of course, an even worse scenario for the current vendor is that the organization will consider buying a LAN, with robust LAN-based accounting packages, for less money than the cost of the upgrade. Thus, the vendors in the long run can hurt themselves by pushing too hard for upgrade fees when there is no good business reason for such action.

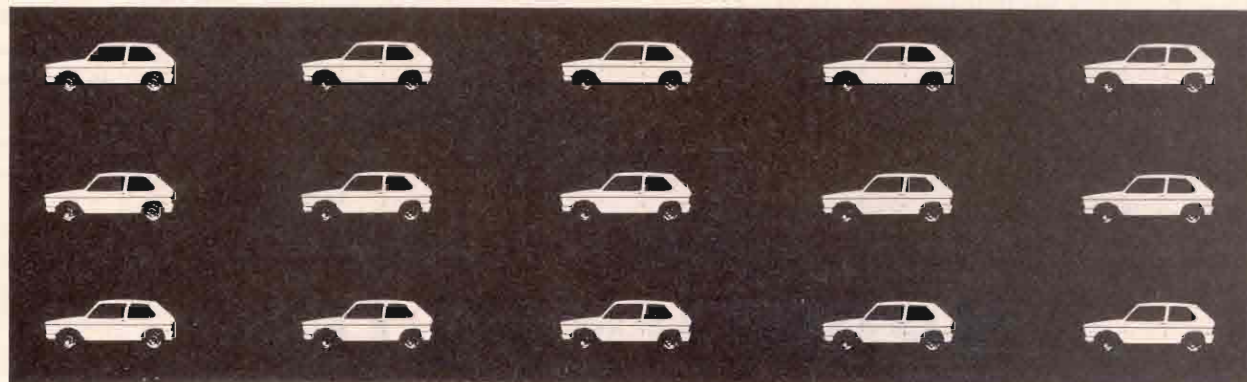
It's interesting to note that, the amount that an organization offloads their general accounting software to smaller cpus, leads the organization closer to the client-server model. Just connect the "accounting server" into a LAN that's also connected to the central minicomputer, and you have the foundation for a true client-server architecture.

You should expect to see some new pricing structures emerge for client-server versions of accounting software packages. The one that might be easiest to sell is a base price for a server (perhaps still based on cpu size, but much lower than the current price) and a separate (and also lower) price for each client using the system, that allows for shared processing. The biggest fear the vendors have is that any restructuring of pricing can be a "bet your company" proposition, in the sense that

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if they aren't careful, they may find themselves in a cashflow bind. Obviously, customers of accounting software don't want this to happen anymore than the vendors do.

### The Bottom Lines

**T**HERE ARE SEVERAL conclusions you can make about client-server computing in the HP world at this time:

- Client-server looks promising, because it makes good sense to get the maximum benefit from existing computing resources.
- It is bringing new accounting software vendors to the HP market. With new vendors arriving, the HP community will have more options to choose from, thus making the choice to buy HP even more attractive.
- We should see a large number of client-server offerings from all categories of software vendors, to the extent that the accounting vendors are representative of all vendors.

If you're convinced that client-server computing makes sense, but you're now working with a central minicomputer connected to terminals and PCs with communications software, what should you do to prepare for the future? First, as you replace each terminal or older PC, be sure to do so with at least a PC running a 386SX processor with 2 MB of memory and a

40-MB hard disk. The price difference between this kind of PC and a new terminal is very small.

Next, get a copy of Microsoft Windows 3.0 for one of your PCs, as well as a word processor and a spreadsheet that use Windows. You'll soon begin to appreciate the benefits of the common user interface afforded by Windows-based applications and the ease with which you can share data across applications.

Last, if you don't currently have a LAN, consider getting a small one for one of your departmental applications. In this way you can start getting generally familiar with networking, its benefits for an organization and how a network can fit into the overall design of your computing environment.

The sooner you get started learning about client-server computing, the better prepared for it you'll be. Just as minicomputers changed our world in the 1970s and PCs revolutionized computing in the 1980s, client-server computing will be a strong force in the 1990s. The reason is that it provides the power of the mainframe, the integration of the minicomputer, and the flexibility of the PC—everything needed to realize the vision of organization-wide information integration.—*Robert Shelley is president of Highgate Financial Systems in Berkeley, CA.*

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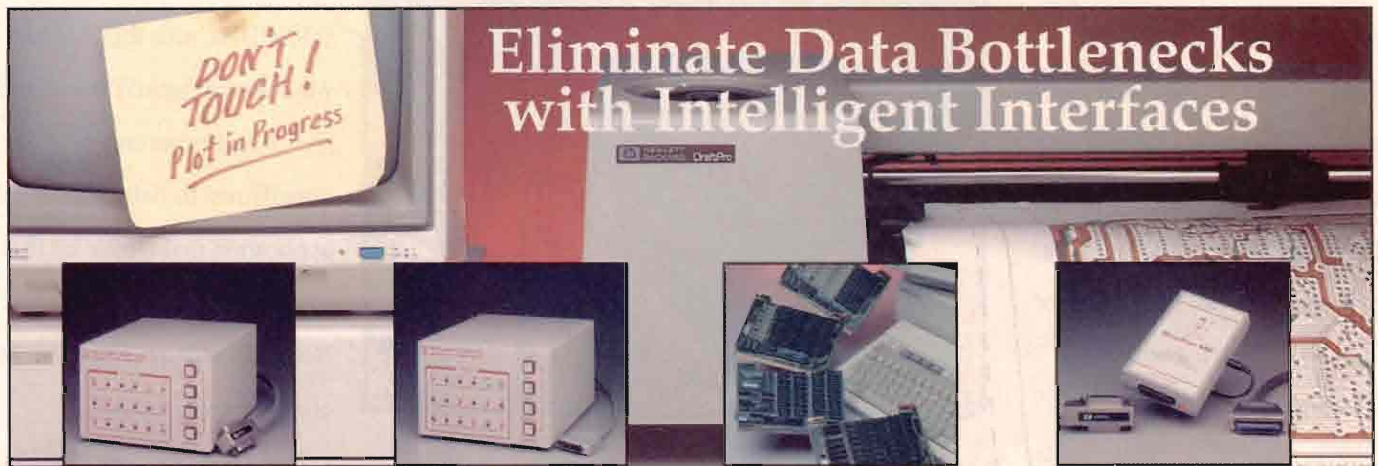
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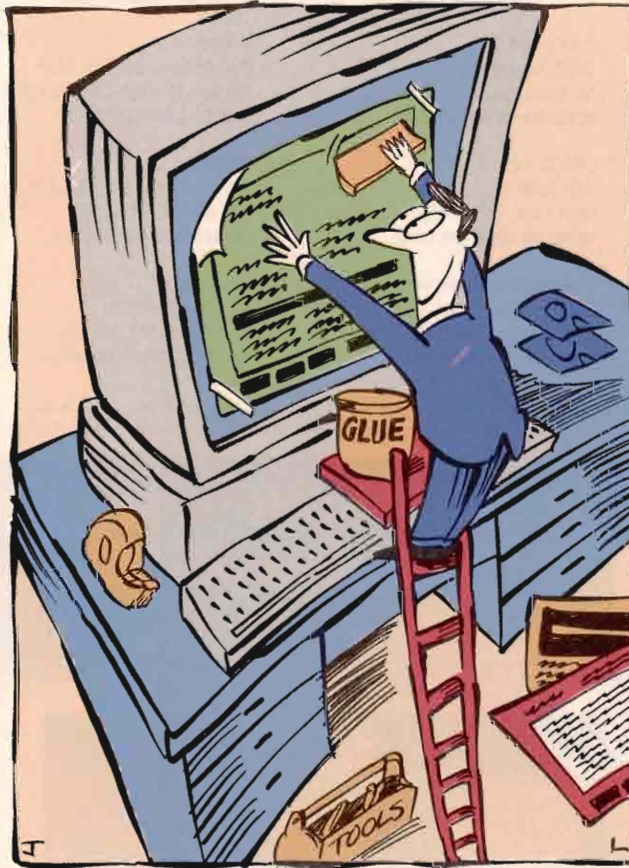
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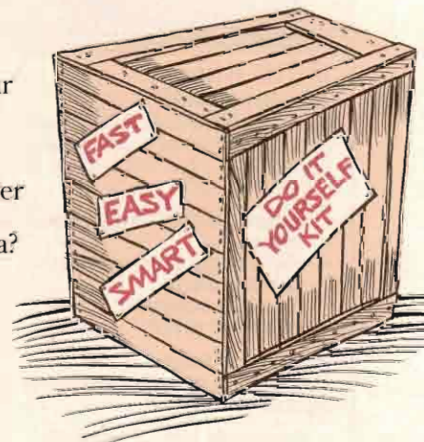
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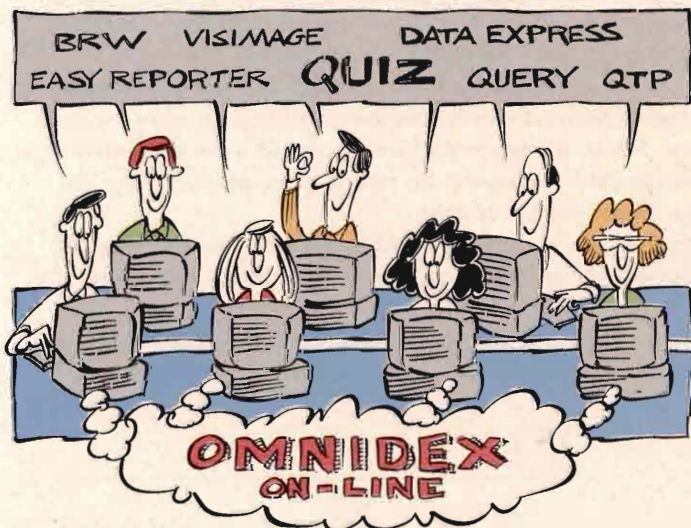


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# OPENVIEW

## M A D E C L E A R

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**N**

etworks grew up piecemeal during the '80s, formed from those wonderkluge appendages that hardware vendors sold you to turn a tidy profit while making it barely possible for you to strap all your boxes together. Unless, of course, you worked with one of those nifty network niche suppliers who carved out a slick piece of the market and left the rest untouched. Whichever route you chose, the solution probably was both partial and proprietary.

The fun started when our support friends in the back room, trying to make the growing network octopus function like a single organism, found it behaved more like a school of startled minnows scattering in all directions. Network management is supposed to make the network manageable, but although the concept has been around for several years, products have lingered somewhere over the horizon, always just out of sight.

Today the network management picture is changing rapidly, and HP is on the verge of becoming a dominant and constructive player in the market. HP OpenView is a family of products which, if we believe the experts, is overdue.

The problem in today's networking market is not what simple office LANs do, but rather what complex commercial networks do—and don't do. One thing they do, you see, is occa-

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BY BILL SHARP

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sionally fail. In other words, networks don't always do what they're supposed to. Amidst all those complex cross-platform communications, things simply go wrong, and finding those things can be excruciatingly difficult—so the network managers say.

"In a multivendor environment, each supplier has its own proprietary set of network management tools for hubs, bridges, routers and other networking components," says Larry Robinson, DME program manager at HP's Colorado Networks Division, Fort Collins, CO. "Network administrators are sitting around a big table with all these output devices from 14 different network management tools, and it's more than they can keep up with." What HP and several other network management suppliers are touting these days are new products that purport to provide a single, standard portal through which to view all the network management solutions they may require.

IBM gets credit here for being the first to sound the alarm, crying out in 1986 that network management was getting out of control, and offering its own product, NetView, to quell the disturbance. Unfortunately for Big Blue, users had a tough time getting a grip on just what network management was going to do that was worth a lot of their money. The perceived need was below the market's threshold of pain.

For a while network management went begging, says Howard Hecht, program director for Enterprise Network Strat-

egies at The Gartner Group, Stamford, CT. "Nobody made any money at it. Network management has been a long-term strategic gamble and a sinkhole of R&D dollars."

## Enter HP OpenView

**T**HIS IS A STRATEGY HP has tried many times: Ask the customers what they want and when they look confused, engineer it carefully and watch them buy it. What's different in the case of OpenView is that HP has learned from its earlier stumbles and is reacting rapidly, delivering effective products that fully embrace standards. HP followed up by working to get industry-wide support for its offerings. As a result, today OpenView appears to be the network management platform of choice.

"Nobody expected that HP would come up with a product that is technically one of the two or three best," says Hecht. "Nor did they expect that HP could effectively market OpenView outside its own customer base. HP has taken a concept and productized it and is allowing vendors to start developing products to work with it. It is a technically superior product, and it is easy to develop software on OpenView, so vendors can port to other platforms. You can buy it today on HP, Sun, and in the very near future, on the IBM RS/6000. It is a true multivendor product."

Here are the major OpenView terms and what each means: **OpenView Network Management Architecture**—This is not a product, but a conceptual framework, a model for the creation of object-oriented, standards-based network management products. This isn't blue smoke and mirrors, but neither is it a deliverable product with an order number and a price. Think of it as a road map.

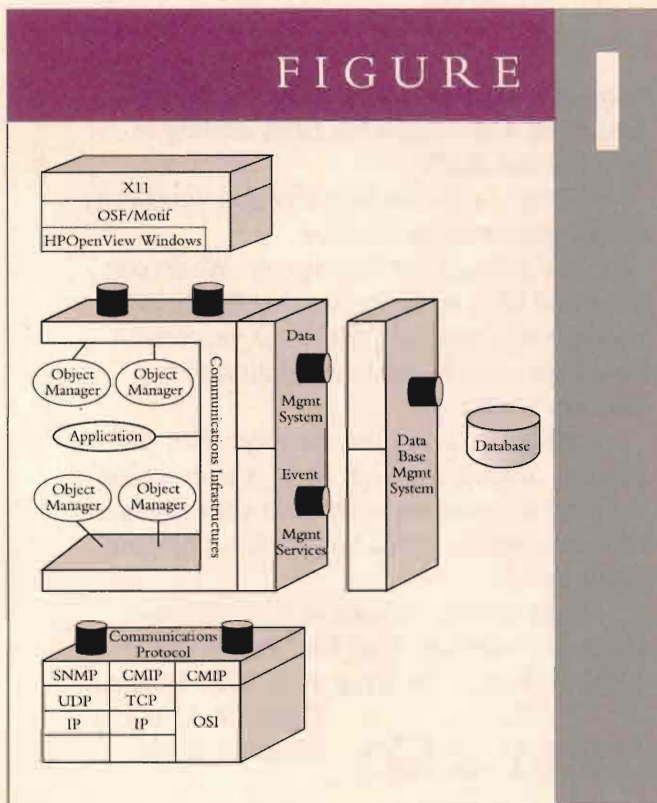
**OpenView Network Management Server (NM Server)**—This is a set of basic network management services designed to act as an open systems platform for specific network management applications software. It is also the core of HP's submission to OSF in the joint HP/IBM proposal for an industry standard DME (more on this later). If you as a user want your own unique network management application, this is the foundation for your work. It is also the development platform for independent software vendors. OpenView NM Server includes several components (also see *Figure 1*):

- Communications protocols include implementations of SNMP and the Common Management Information Protocol Over TCP/IP (CMOT).

- Communications infrastructure is the OpenView Application Programming Interface (API) to provide access to all management services and protocols, including SNMP, CMOT and later CMIP over OSI.

- Event management services provides a central point to generate, receive, route and log network events such as failures, object state changes and security violations.

## FIGURE



**OpenView Network Management Server:**  
*The network puzzle has many pieces.*

**W**hat's different in the case of OpenView is that HP has learned from its earlier stumbles and is reacting rapidly, delivering effective products that fully embrace standards.

- Data management services organizes data access to protect the application developer from the need to know data storage details. It eliminates the need for a data storage subsystem.

- OpenView Windows uses OSF/Motif as the graphical user interface for the system. This provides a consistent programming interface for application development.

- OpenView NM Server lists at \$5,000 for a single user and \$25,000 for the software developer version.

**OpenView Network Node Manager (NNM)**—A specific network management application optimized to provide fault, configuration and performance network management for multivendor Transmission Control Protocol/Internet Protocol (TCP/IP) or Simple Network Management Protocol (SNMP) networks.

NNM does some nifty things to make the network management job easier, including:

- Automatic discovery, which finds and identifies all the devices on the network regardless of vendor, and updates them when status changes.

- Single-view management to allow user-developed or third-party applications to be integrated into the system. This means any network management applications can be accessed through OpenView NNM. This might save on desk space.

- Dynamic data collection allows NNM to make use of MIB data from devices on the network (see MIB discussion below).

- Application builder is a tool to help build applications around SNMP devices without programming.

OpenView NNM lists for \$15,000.

**OpenView System Manager**—This is a PC-based product for monitoring and managing multiple networked HP 3000 systems from a central point. The system manages HP 3000 systems over an NS network and runs on top of OpenView Windows. System Manager notifies the operator when problems defined by the operator arise. OpenView System Manager lists for \$1,500.

**OpenView Windows**—Here is the original OpenView prod-

uct, introduced in 1988 as a PC platform for network management applications. System Manager runs on top of this. OpenView NM Server is a greatly souped-up version of this product.

**OpenView Hub Manager and OpenView Bridge Manager**—Both of these products are PC-based managers of the items their names imply. Both sit atop OpenView Windows.

**OpenView Interconnect**—This product is a \$2,000 add-on to OpenView NNM that allows that product to look after bridges, routers and hubs.

**OpenView Datacommunications and Terminal Controllers (DTC) Manager**—A counterpart to the NNM, also based on TCP/IP communications. It runs on a PC, from where it keeps tabs on terminal networks.

**LanProbe**—Unlike the rest of the family, this product is not solely software, but is a hardware/software hybrid. LanProbe is permanently installed at sensitive points on a large network to proactively collect data on the behavior of all devices on the network. This is particularly helpful in keeping tabs on network components that don't adhere to industry standards. LanProbe can analyze the behavior of these nodes and relay the information to other OpenView products that would otherwise be unable to determine how the non-standard nodes are behaving.

LanProbe capabilities are being integrated into the OpenView family as the family and its capabilities grow. HP's diagrams now routinely show LanProbe sitting out there on the network, gathering data. And a new addition to the SNMP standard will make this end of the game even more open. This month at Interop, you can see the first implementations of RMON MIB, an acronym to curdle your milk. It stands for Remote Network Monitoring Management Information Base.

LanProbe product manager Mark Hoerth of HP's Intelligent Networks Operation, Palo Alto, CA, says the new standard allows compliant network management products such as OpenView to interoperate with compliant network instrumentation products from other vendors. Second, RMON MIB provides "a vast increase in functionality for network measuring devices," says Hoerth. He calls the capabilities the next generation of functionality for network measurement. These new RMON MIB capabilities will include an Ethernet traffic matrix, more alarms and thresholds, more error counters, more historical trends capabilities and more packet filtering.

### OSF's DME Software Card Cage

**H** P IS GETTING THE upper hand in the standards game, and the best evidence yet may be the OSF DME. The Open Software Foundation asked for technology for use in an industry standard Distributed Management Environment and HP made some very effective political moves. As a result, HP and IBM teamed up to offer an OpenView-based

proposal that has since gathered a lot of support. As of this writing, the OSF jury is still out, but the betting has been rather heavily in favor of HP. Why?

"We worked hard to make our submission do what OSF wanted," says HP's Robinson. The offering uses HP OpenView NM Server coupled with IBM systems management technology, object-oriented user interface and system resource manager. Tivoli Systems, Austin, TX joined the group, contributing object management technology. NCR also added its object manager technology, particularly useful for pulling in DOS. Groupe Bull and HP cooperated on a management API that already has been adopted by X/Open. Finally, HP offered to integrate Siemens Nixdorf's global directory service based on X.500 and its OSI protocols, both already adopted by OSF as part of the DCE.

"The exciting part of DME is that it is kind of a "future-proof" platform that will be extendable to accommodate new technologies as they come out of the standards bodies," says Robinson. "This includes new services such as inference engines or an artificial intelligence environment that can decide what actions need to be taken for hands off management of distributed environments. There's a whole range of capabilities that could readily be integrated into the DME platform."

"We call it a software cardcage," says Robinson. It isolates the network management applications environment and makes it very easy for developers to come up with more. And the applications they have written don't have to be rewritten. It will make some very dramatic changes in the market."

HP is saying the right things about DME. At the time this article was written, it still didn't know if its proposal would become a major part of the DME. But just as with the DCE proposal, it has stated clearly that it will support the standard, whatever technology OSF chooses.

Gartner Group's Hecht has little doubt about the outcome of OSF's decision. "HP and IBM's joint submittal will be the big winner," he says. "DEC was the closest competition, but the cast of characters HP has lined up far exceeds that of DEC." He is certain the DME choice will result in a "substantial increase in HP's share of market" for network management.

### Dances With Blue

**C**OMPETITION IN NETWORK MANAGEMENT has changed substantially. IBM was the first to speak of the need, then came HP's first so-so offering, then Sun started signing up customers with limited systems and DEC began marketing solutions for not very open systems. Lots of third parties took a sniff at the promising market but without many tangible results. Finally, HP re-emerged with strong strategy and technology.

We have a market in network management that is still so ill-defined that market research types fear to say who owns what

portion of it. HP's Robinson guesstimates HP at 25 to 30 percent, but adds that he expects DME to stimulate a dramatic increase. "We will beat other people to the market," he says.

Is this just fluff? Perhaps not. One of the outfits impressed with what HP has to offer in OpenView is Big Blue itself. IBM agreed to license HP OpenView NM Server as the basis for its own revised family of network management products. IBM will integrate OpenView with its own SystemView, which seems only natural since the names imply that they are related anyway. The underlying framework for both products will therefore be identical, says Robinson, making them interoperable.

HP can well afford to relax and enjoy IBM success with SystemView—part of each sale goes straight to HP. Robinson implies that further cooperation between Big Blue and Medium Blue is likely.

### If Ever I Would Buy This . . .

**B**EFORE CINDY'S COMPANY BOUGHT an expensive network management product, she sat at her desk and used her computer every day. After the new network management product was installed and running smoothly, Cindy still sat at her desk and used her computer every day. This is the crux of cost justification for network management—most users don't perceive the need. The network either works or it does not work. Why shell out shekles?

Being a clever outfit, HP commissioned an outside consultant to complete a study of typical network management environments from company-wide down to the department level, looking at labor and administrative costs. "We have more than 300 different network management tasks identified, including how long network managers sit at their computers and the different types of equipment used," says Carol Crall of HP's Colorado Networks Division, who managed the project.

"We have an extremely complex set of spreadsheets that calculate what a customer can save, so they can decide if network management makes sense or does not for their situation," she says. "We can show in your environment what integrated network management can do for you. And we are committed to keeping our model up to date as the market changes."

OpenView Program Manager David Schwaab of Colorado Networks Division, Fort Collins, CO, expects the future direction of OpenView to be the integration of multivendor network management tools to provide better tie-ins for integrated software vendors and systems integrators.

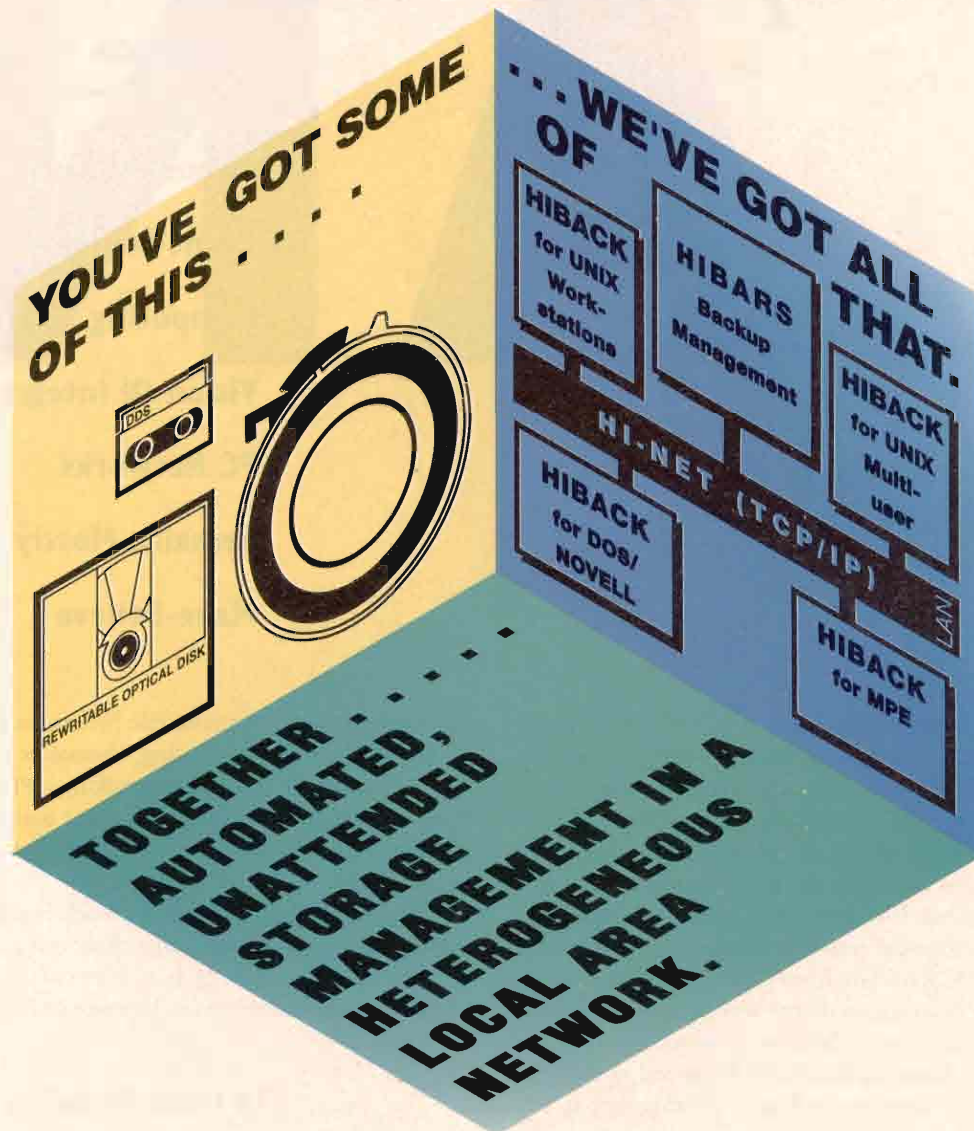
Developments unfolding this fall will help determine whether HP's efforts will result in just a new family of network management products, or move the industry further along the road toward HP's vision of a computing Camelot.

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# Fantasy

# LAN

BY GORDON MCLACHLAN

Although Crucial To  
Client-Server

Computing, The

Vision Of Integrated

PC Networks

Remains Mostly

Make-Believe

**I**ntegrating PCs sounds tough, and it is. It's one of those deals where you have to go and develop a strategy — something you administrator types lose sleep over. You know what it means: You've got to risk your career and your department's budget on stuff that will probably be available in six months.

Unfortunately, you've got to do it. Anything requiring a strategy has vital reasons. If it didn't, you could just bluff your way through. Here, the vital reason is client-server computing — an irresistible force, a mission from God.

Unfortunately, PCs make mediocre servers and your average "real" UNIX workstation or mini is a real sorry excuse for a client. That means hooking up PC clients to real computers if you want the most bang for the buck. In other words, PC integration.

The key to developing a PC integration strategy is a good imagination. Integrating PCs means you have to pretend a lot. For instance, you can pretend your PC is a terminal. This is the easy way out. By using some Telnet and X Window PC software on a TCP/IP link, you can be as happy as a lobotomy patient. It's only vaguely client-server, but if you have a slick-enough user interface, you can fool most of the rubes.

Another approach is to pretend your PC is a little UNIX machine. With the proper client software, you can bend that sucker to your will and make it use File Transfer Protocol (FTP) or

Sun Microsystems' Network File System on a UNIX server.

The final, and most exciting, alternative is to pretend your real computers are big PCs. By sticking a PC-derived network operating system (aka Novell Netware) onto one of your servers, your PCs can be as brain-dead as they want to be, and still be integrated.

The trouble with the first approach is that it's too easy. It doesn't require very much imagination, and it doesn't make very good use of all that desktop iron. It's pretty obvious that a good PC integration strategy has to be more challenging.

## The Great Pretender

**T**HE OPEN SOFTWARE FOUNDATION (OSF) — the official arbiter of good taste in networking — has decreed that its Distributed Computing Environment will provide for PC integration (PCI) both by pretending real computers are PCs and vice versa. To the OSF, low-end interoperability means file- and print-serving. At the high-end, it encompasses application programming interfaces (APIs), electronic mail, remote program execution and terminal emulation.

To handle all this heavy pretending, OSF went to two competing products. Sun's PC-NFS and LAN Manager/X, which was





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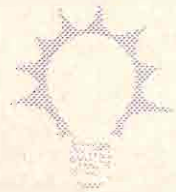
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CIRCLE 288 ON READER CARD

## Interestingly, HP is backing out of the LM/X development picture, aiming to buy whatever the Microsoft/AT&T pairing comes up with.

submitted by HP and Microsoft, have both been recommended by X/Open and included in its latest X/Open Portability Guide (XPG4). That was pretty much the reason they were selected by the OSF for inclusion in its DCE.

LAN Manager was originally developed by Microsoft and HP to enable UNIX machines to be used as servers for MS-DOS and OS/2 clients. For whatever reasons, there is currently no UNIX client module.

LAN Manager/X, like OS/2 LAN Manager, provides:

- Standard APIs for developing client-server applications.
- Comprehensive print spooling and management that include:
  - Multiple print queues for a single printer.
  - Use of multiple pooled printers for a single print queue.
  - Printer access security.
  - Time scheduling of print jobs.
  - User and administrative management of print queues and job priorities.
- APIs for LAN administration.
- Interprocess communications APIs.
  - Named pipes for bidirectional communications.
  - Mailslots for one-way communications.
- Station-to-station messaging.

LAN Manager/X also provides PC access to native UNIX files under UNIX security mechanisms and provides better server scalability than OS/2 because of the wider range of server platforms available under UNIX. LAN Manager would be a great idea, if it could only pick up a market-share percentage bigger than single-digits.

That's where NFS comes in. PC-NFS provides more primitive file-sharing and print spooling capabilities than LM/X, but it is an official de facto standard on UNIX systems. (That means it already works and has sold a lot of copies.)

Available as a public domain specification through Sun and X/Open, NFS also can be had via source-code licenses, so there are literally hundreds of licensees and more than a million NSF users out there on every conceivable platform. As a matter of

fact, NFS 2.0 clients are fully supported by DCE through its Andrew File System (AFS) distributed file system.

Is supporting both systems a contradiction? The OSF says no. By adopting both standards, UNIX workstations don't have to become LAN Manager clients, and PCs aren't forced to use NFS clients. Although the PC/workstation distinction becomes more blurred by the moment, it's a pleasant fiction that allowed a political compromise.

### LAN Manager's Allure

**T**HE QUESTION REMAINS: If NFS works, is available and is a standard to boot, why waste time and money chasing LAN Manager/X? For one thing, NFS is only a part of Sun's Open Network Computing architecture, which is a direct competitor of the DCE. That makes it somewhat of an anathema to OSF members who originally banded together for the sole purpose of screwing Sun into the ground. It's probably safe to say that OSF members won't be going out of their way to make any improvements to NFS.

LAN Manager, which Microsoft plans to integrate into its OSF- and POSIX-compliant 32-bit portable New Technology platform, not only provides more current capabilities than NFS, it has more development headroom. That is, the OSF folks want it to live.

HP has committed heavily to LAN Manager, endorsing it on all its platforms, including PCs, HP 9000 systems running HP-UX and the HP 3000 line. AT&T has incorporated LAN Manager into its StarGroup network strategy and DEC uses LAN Manager inside its PCSA product, which connects PCs to VAX networks.

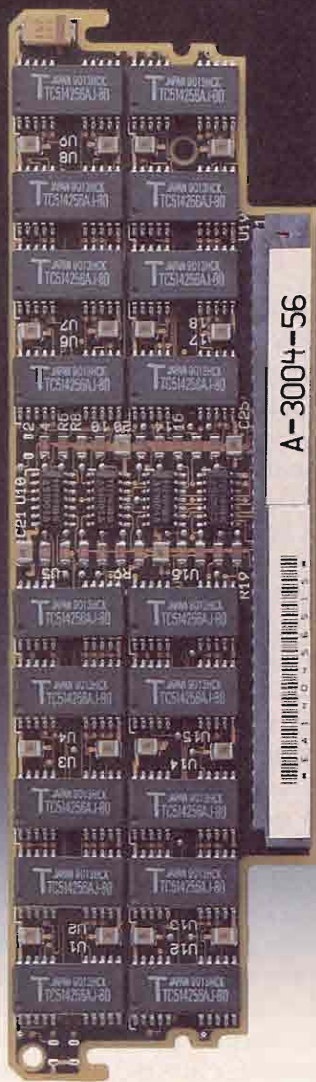
Unfortunately, Microsoft did not develop LM/X as a portable piece of code. Rather, each vendor has licensed LAN Manager software, which it has had to rewrite. Although each licensee can call its product LM/X, they have all been different, and did not interoperate completely.

### The Right Choice

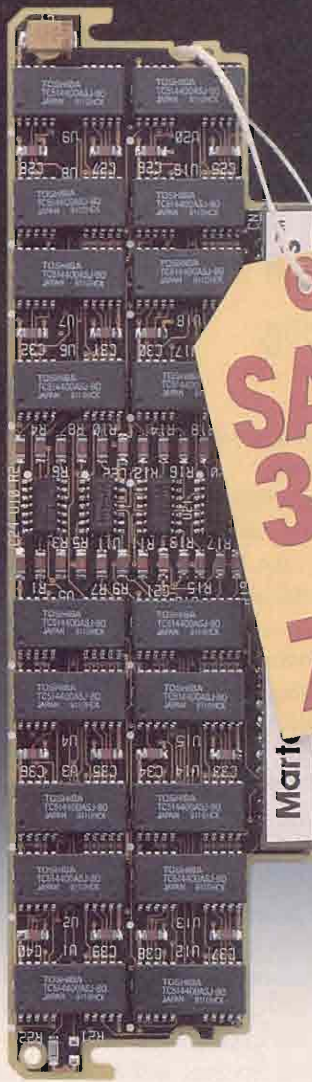
**A** RECENT DEVELOPMENT agreement between AT&T and Microsoft will hopefully eliminate this problem and spur application development for LAN Manager/X. Interestingly, HP is backing out of the LM/X development picture, aiming to buy whatever the Microsoft/AT&T pairing comes up with. HP claims to be perfectly happy with this arrangement. It's certainly going to be cheaper. HP will continue to support its existing LM/X 1.1 installations.

The new version of LM/X, which Microsoft and AT&T are actually calling LMU (for LAN Manager for UNIX systems), will be designed for easy portability between platforms, including AT&T's UNIX System V Release 4 and the Open Software

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Portable Netware,  
which is aimed at the same  
32-bit market as LM/X,  
is not anybody's idea  
of a standard platform,  
but it has a massive  
installed base and a  
big vendor following.

Foundation's OSF/1 operating environment, which also includes non-UNIX operating systems.

In addition to bringing UNIX versions of LAN Manager together, the new product also will address interoperability with the OS/2 and, presumably, the New Technology versions, and will "interact virtually seamlessly" with them, according to the companies.

AT&T and Microsoft promise that "most" of the LAN Manager application programming interfaces and features will be the same for the OS/2 and UNIX versions. According to a Microsoft spokesman, that means that "for the client application, there won't be any differences." Platform differences may affect the timing of the OEM versions, but will not affect client application development at all. AT&T and Microsoft will develop an OEM Adaptation kit for LAN Manager built on the UNIX System V Release 4 platform. Porting the code will be the responsibility of the OEMs, but both AT&T and Microsoft will be able to directly sell end-user versions and value-added enhancements of the product.

Microsoft and AT&T also promise that subsequent releases of LAN Manager for UNIX Systems will be available in the "same time frame" as the OS/2 versions. New versions of LAN Manager will be influenced by input from users, independent software vendors and the Open LAN Manager council, which was formed by 24 LAN Manager OEMs in April.

The first version of LAN Manager for UNIX Systems will be Release 2.0, to be delivered in late 1991. This version will have the features of the current Microsoft LAN Manager 2.0 for OS/2. Current implementations of LAN Manager for UNIX, including those from AT&T and HP are stuck at version 1.1.

Additional features included in OS/2 LAN Manager 2.0 include:

- Beefed-up file security.
- Login scripts that can be shared between users.

- Resource usage audits and reporting.
- Improved performance via use of an I/O subsystem, rather than having LM handle all the network I/O.
- Subdivision of LM networks into management domains, or groups of servers, that can be administered as a single entity. Managing servers in groups greatly simplifies administration.
- Disk Mirroring and Disk Duplexing.

Version 2.1 will reportedly add support for Apple Macintosh clients, dial-in support, TCP/IP hooks and NetWare connections. No delivery date has been announced for this product under any O/S.

### NetWare: The De Facto Factor

IBM, SO FAR, HAS BEEN silent on the issue of LM/X, owing in part, no doubt, to its ongoing artillery duels with Microsoft. IBM and Microsoft had previously promised to bring Big Blue's divergent OS/2 Extended Edition and the LAN Server network into line with standard OS/2 and LAN Manager, but the disintegrating IBM/MS partnership seems to have scuttled that concept.

This brings up a nasty little issue. What about Novell's NetWare?

Portable Netware, which is aimed at the same 32-bit market as LM/X, is not anybody's idea of a standard platform, but it has a massive installed base and a big vendor following. HP, IBM, DEC, Data General, NCR and Unisys are all on the NetWare server bandwagon, and it already supports DOS, OS/2 and Apple Macintosh clients.

This installed base, coupled with enhanced hooks into TCP/IP, SNA and OS/2 have made NetWare a contender. With half of the LAN OS marketplace in its pocket, but no backing from the standards bodies, Novell is in a strange position, but may come out smelling like a rose.

Portable NetWare is OS- and platform-independent. Even HP has put Portable NetWare on the 3000, and Innovus, Inc. is marketing it with HP's blessing for the HP-UX platform. As mentioned before, IBM also has endorsed Portable NetWare for its RS/6000 line of RISC-based workstations. With no public show of enthusiasm for Microsoft or LM/X, IBM's motives are unclear.

A bit of imagination might let you forget that NetWare doesn't have all the fancy APIs and pipes and things that make a DCE, but it makes a fine file server.

With a little more imagination, maybe you can just pretend that LM/X and the DCE don't exist and that NetWare is the standard. It's been done before and it'll be done again.

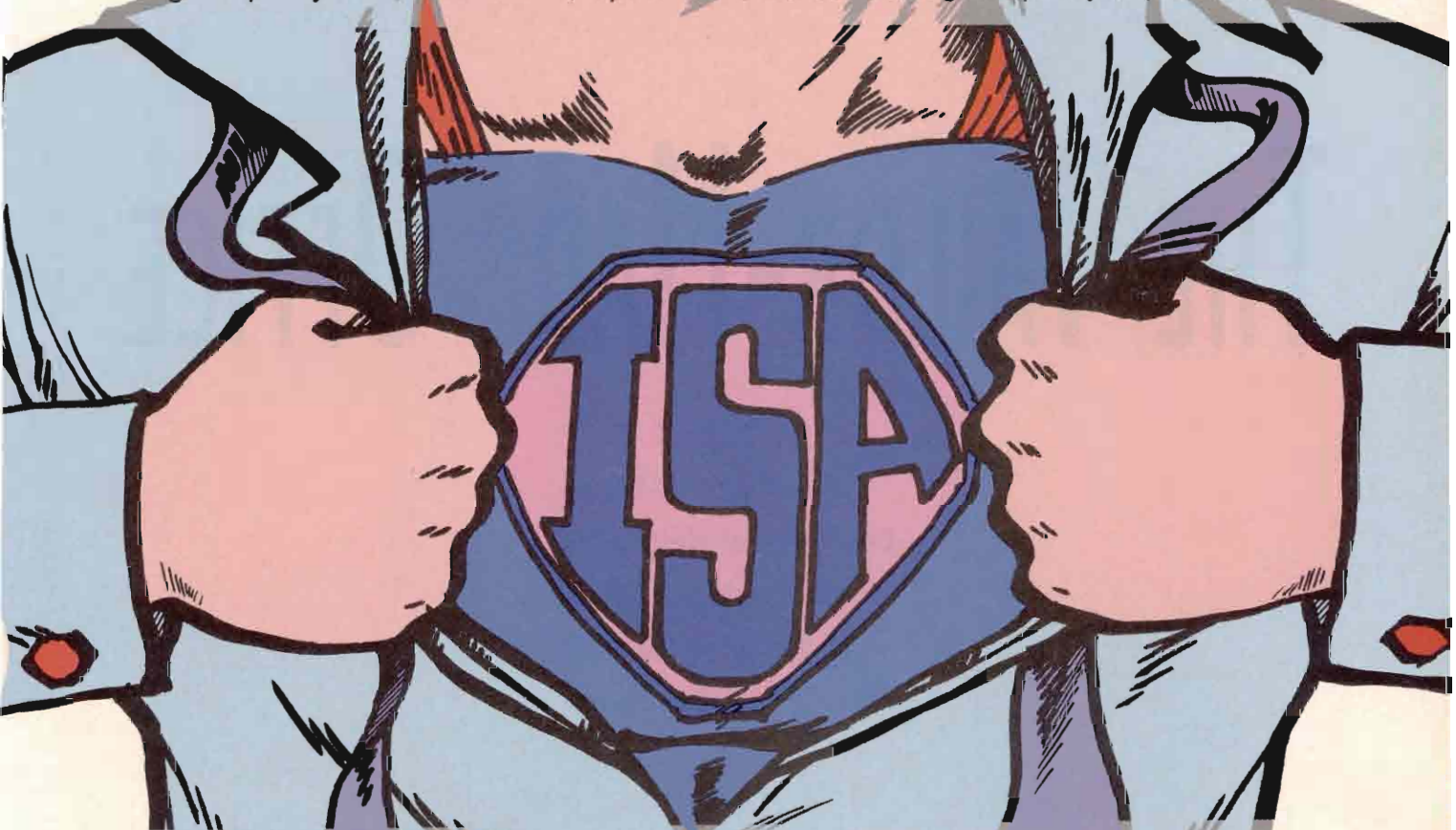
Remember, it's all just make-believe. —Gordon McLachlan  
is a consultant for National Tech Team in Detroit MI.

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# A

BY PAULA JACOBS

According to many industry analysts, HP's NewWave Office has added a new, creative dimension to the office environment. Its practical application of object-technology has introduced solutions not possible with conventional programming methods and won the hearts and minds of new commercial users. Since June 1990, HP has shipped an estimated 2,000 copies of NewWave Office to approximately 1,000 customers. Within this first year, 65 percent of the copies sold went to traditional MPE users and 35 percent to new UNIX customers. HP has targeted NewWave Office at a number of key commercial applications. "The typical NewWave Office user is a knowledge worker in a Fortune 500 company," says Steve Jeffery, HP's marketing manager for NewWave Office. His product is ideally-suited to facilitate most of the office tasks this type of user needs to perform.

In business-intelligence applications, NewWave Office allows data to be gathered efficiently from sources inside and outside an



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## The ability to integrate both old and new applications, combined with support for multivendor platforms has extended computing capabilities in ways never before imaginable.

organization in combination with PC-based tools. With document-management, users can capture and organize all types of data and documents for shared use in enterprise-wide computing. Process automation or workflow communications helps automate numerous business applications, such as expense reports and travel requests, using electronic mail and fax.

It's at the desktop level in the DOS-Windows environment where this value-added functionality is most evident. Here NewWave Office provides an interface that masks the complexity of the network behind the desktop, enabling users to interact with icons and extract data from various sources. The ability to integrate both old and new applications, combined with support for multivendor platforms has extended computing capabilities in ways never before imaginable.

NewWave Office is a standards-based suite of 28 software products and services that HP touts as the only comprehensive portfolio of multiplatform client-server office products and services available in the industry. The latest release incorporates client-server software-distribution capabilities, support for Novell's NetWare, and platform support for the SCO UNIX System V Release 3.2 for the Intel 386. HP has introduced NewWave Office as an open-systems solution to provide communications, decision-support, and information-sharing services. Communications facilities include electronic mail, network-wide ad hoc query, and terminal-emulation capabilities. These features are designed to enhance productivity and efficiency, facilitating information exchange in a multivendor environment.

### Office Overalls

**N**EW WAVE OFFICE IS designed to create a seamless interface between applications. This feature means that users don't notice a difference between UNIX and the MPE environment; to the user, the two operating system platforms, together with PCs running DOS and MS-Windows, are all part of the same office fabric.

This seamless integration was a key selection criterion for HydraCorp, a wholly owned subsidiary of Niagara Mohawk that develops alternate energy sources throughout the United States. HydraCorp oversees accounting and project management for almost 30 companies. Financial analysts must be able to track project development activities over a two to three year period.

Until a year ago, a 3Com LAN network of PCs and servers

was used to support 75 users at corporate headquarters. When HydraCorp decided to upgrade its office system, the company evaluated both DEC ALL-IN-1 and IBM OfficeVision. "Neither DEC nor IBM offered the seamless integration we required," explained MIS Manager Kelly O'Donnell. "I did research for an entire year before selecting NewWave Office. That's when we migrated to an HP 9000 system running UNIX and LAN Manager."

The company needed to protect its investment in existing PC/LAN DOS applications, including Lotus, WordPerfect and EMIS, as well as its PC-compatible hardware. "We went with HP because integration was so easy," says O'Donnell.

HydraCorp has implemented several NewWave Office applications. ARPA Services are used for multivendor communications for different networks, including file transfer over the company's three Novell networks. HP AdvanceLink provides CC terminal emulation. The company uses both OpenMail and AdvanceMail electronic mail as a cost-effective mail solution. AdvanceMail runs on the PCs, connecting to the HP host; this solution enables users at the seven remote sites to dial in and retrieve their messages.

### Database Accoutrements

**T**HE DESIGN OF NEW WAVE OFFICE, with its agent capability, is well-suited to custom development applications. One customer who has taken advantage of this feature is Hoescht-Roussel Pharmaceuticals, the pharmaceutical division of the German manufacturer Hoechst Celanese and an HP shop for 14 years.

"It's very important for our application environment to allow people in our building access to our database for strategic applications," explained Eric Herbel, director of Clinical Systems. "That's why we moved to a Windows-based environment and the main reason we went with NewWave Office two years ago. There were no other alternatives available that offered the same capabilities."

Hoescht-Roussel must make accurate judgements about clinical data, and submit clinical reports to the Food and Drug Administration to determine whether clinical testing is safe and efficacious. Using NewWave Office, the company developed custom software called the "Computer-Assisted New Drug Application" (CNDA). This interactive clinical data review and re-

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porting tool allows the clinical research department to access clinical data stored on an ORACLE database. The result is a significant improvement in the quality, style, and appearance of these reports. Because of NewWave Office's seamless integration, CNDA also is accessible to other client-server applications in the environment.

Presently, in the clinical research department 175 staff members, most of whom aren't sophisticated computer users, use NewWave Office on 386 PCs. These users come from a wide range of educational backgrounds and include secretarial support staff, clinical researchers with graduate degrees and physicians.

The clinical research department is running several applications under NewWave on the PC, including NewWave Office, NewWave Excel, PowerPoint, and the Word-for-Windows word processing package. The PCs are connected by an HP StarLAN 10 and an HP EtherTwist with StarLAN/10 hubs connected to a ThickWire coax backbone.

The network also includes an HP 3000/960, HP 3000/70, HP 9000/350, and an HP 9000/635 configured as an image server running HP AIMS (Advanced Image Management System). As part of a client-server architecture configuration, both HP 3000/960 systems are used as file servers and print servers to an ORACLE database. Future plans include the installation of NewWave Mail as a front end to HP DeskManager.

"The main benefits we're seeing," says Herbel, "are a very easy-to-use interface, integration possibilities between different applications and powerful client-server applications. We also have started to implement a strategy to integrate HP AIMS image management to maintain images of case-related forms with original clinical data from physicians."

### A Stitch In Time

**P**ROCESS AUTOMATION APPLICATIONS help users automate business processes, increasing efficiency and productivity. Saving time and money through process automation has historically been a top priority in manufacturing and related process industries. Users in these application areas can take full advantage of the object, agent and mailing capabilities of NewWave Office.

One example of a company doing just that is McMillan Blodell, a paper mill and plywood manufacturer based in Pine Hill, Alabama. McMillan Blodell managers needed an efficient way to monitor the status of activities on the manufacturing floor. The company has five HP 3000s, 300 PCs (both 286 and 386) and 20 portables. All five 3000s are interconnected over LANs and the 100 PCs are connected using the HP OfficeShare network to support 450 users.

"We were looking for a common graphical user interface that worked over more than one operating system," says Jim Bonner, MIS director for the company. "NewWave supports

our four operating systems—UNIX, MPE, DOS and OS/2. That's what attracted us."

NewWave Office has enabled the company, a long-time user of HP DeskManager, to integrate Information Access tools, communications and compound document creation applications into one user environment. For example, NewWave Access provides a query capability to integrate databases on the mini-computer and download to PCs running Microsoft, Excel spreadsheet, Lotus, AmiPro word processing software and the Charisma drawing package.

The implementation of NewWave Office has resulted in greater efficiency, higher employee productivity and enhanced employee participation in company activities. "We find that the concept of objects has become natural for our users because it's so intuitive and easy to use," explained Bonner. "The agent capability enables us to automate repetitive tasks on a daily basis," she notes, adding, "For example, the agent wakes up every morning and checks to see what merchandise has been ordered outside of the company and is available in our receiving department."

Since 1984, the city of Palo Alto has been an HP installation with two HP 3000 Model 949s and one Model 70. HP Information Access has been the front end tool used to retrieve information from databases residing on the 3000 system and combine it with other data in PC database tools, such as dBase and R:Base. To share information among departments, the city relies on HP Resource Sharing.

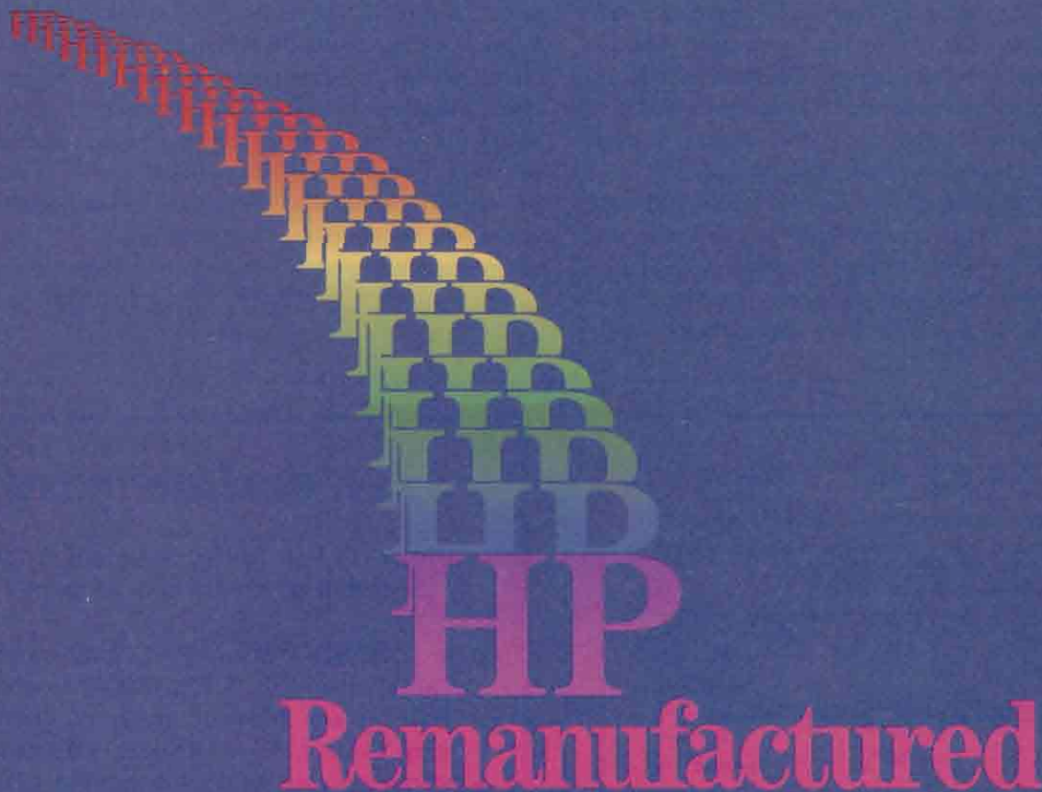
Like any other urban area, even pleasant, laid-back Palo Alto requires quick access to data from several sources and agencies, including financial databases, utility systems, in-house payroll, fire, police, building inspection and planning. NewWave Office enables Palo Alto's public servants to get the information quickly and easily. For example, the Fire Department always gets requests from the State of California as well as the Federal government requesting information about hazardous material. Invariably this information is required in different formats.

"When HP introduced the NewWave Access GUI, we made the decision to adopt NewWave," explains Dianah Neff, director of information resources. "Previously, we had used Inform and Report/Dictionary 3000, which are fine tools for programmer access but not for the end-user," she says, "We expect to automate even more processes to save our users considerable time."

### Sartorial Elegance

**A**LTHOUGH APPLICATION environments may vary considerably, common threads link the training requirements and the implementation of NewWave Office. First, most customers need only minimal training, although PC users generally adapt more easily than traditional terminal users. Second, as HP recommends, gradual, phased-in imple-

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mentation is the most effective. Third, because of the product's intuitive nature, both training and implementation are easy. And finally, it's the consistent user interface that facilitates implementation and rapid user adaptation, even when a site has several operating systems.

According to many customers, the design of NewWave Office is simple and intuitive enough to permit a gentle learning curve. In fact, most have found in-house training sufficient. For example, Palo Alto developed an in-house curriculum in conjunction with HP. All computer users are required to attend a two to three day training class. Taught in four-hour segments, the class incorporates the use of both packaged and custom applications. The training program has been highly successful, with about 600 to 1,000 users taking PC training on an annual basis.

As Hoescht-Roussel's Herbel explains, "Everything we heard about NewWave Office in terms of ease of use and training is true. While our training time takes the same amount of time as before, the sophistication level is significantly higher."

Says McMillan Blodell's Bonner, "Users are delighted with NewWave Office and very comfortable with manipulating objects and double clicking, such as dropping objects in a printer or file cabinet." Today, 15 people are using NewWave. Initially, the company introduced NewWave only to the program-

ming staff. Now the mill manager and some office clerical personnel also are using NewWave.

At HydraCorp, all 75 company users rely on NewWave regularly, and because of their familiarity with PCs, have adapted easily to NewWave Office. "Our staff enjoys using objects instead of menus and find that they can still do what they have always done. In fact, everyone is looking forward to using Windows, which we plan to add next year," says O'Donnell.

Object-oriented technology, client-server architecture and the virtues of NewWave have been extolled for the technical environment. But the real test of long-term success is how well NewWave Office continues to be accepted in commercial settings. To date, it appears that HP has delivered on its promise to provide customers with a tool that is easy to use and implement and that provides a seamless interface between applications. These are the features the commercial environment requires and the ones critical to widespread acceptance by users of varying sophistication levels.—*Paula Jacobs is a marketing consultant and writer based in Framingham, Massachusetts. She specializes in the implementation of new technologies.*

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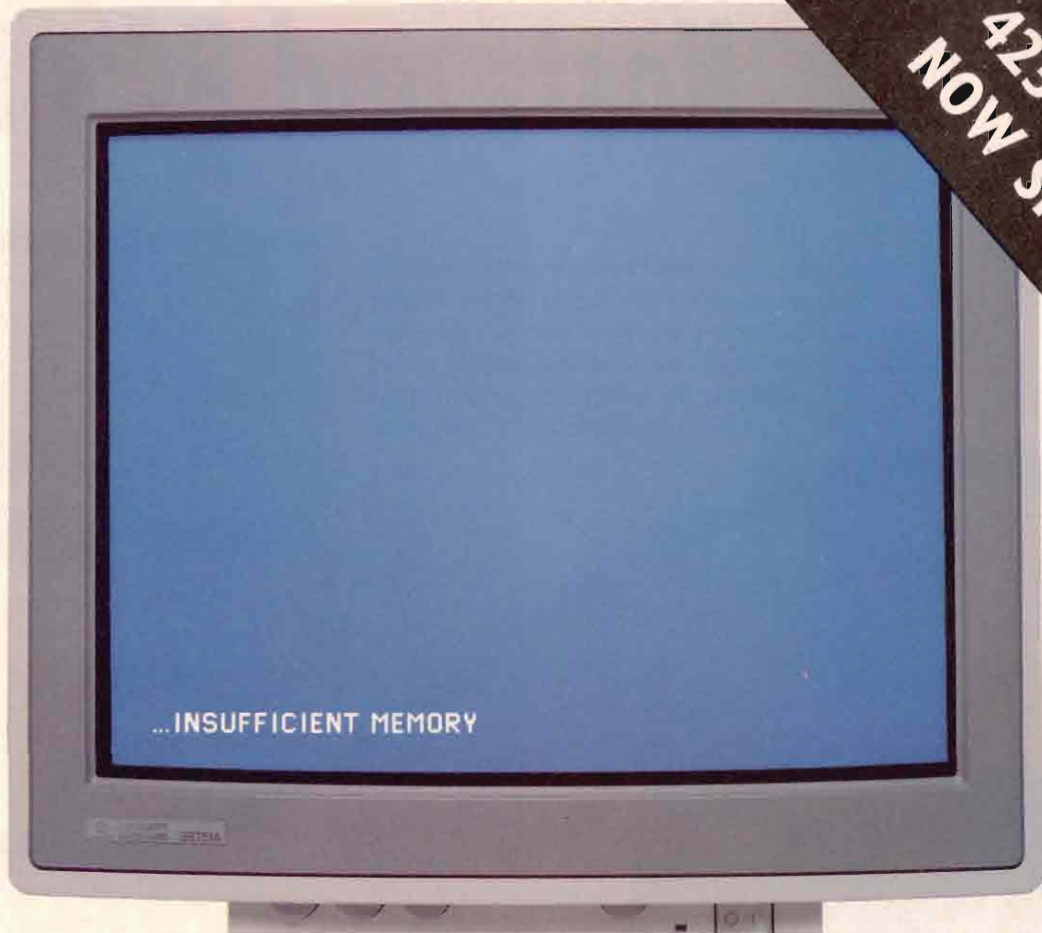
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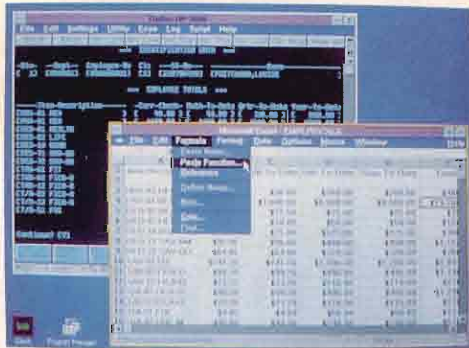
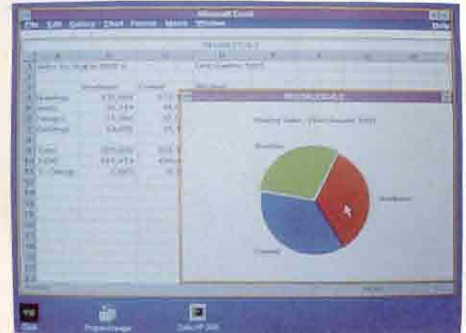
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## Camintonn Workstation Memory

SUN	SPARCstation 1, 1+, 2, IPC
HP	9000, Model 300/400 Series
DEC	VAX 4000 DECstation 5000 DECstation 3100 VAXstation 3100/2000 MicroVAX III/II/PDP
IBM	RISC 6000
Silicon Graphics	IRIS, Models 4D/20, 4D/25

# Hosts and PC's have

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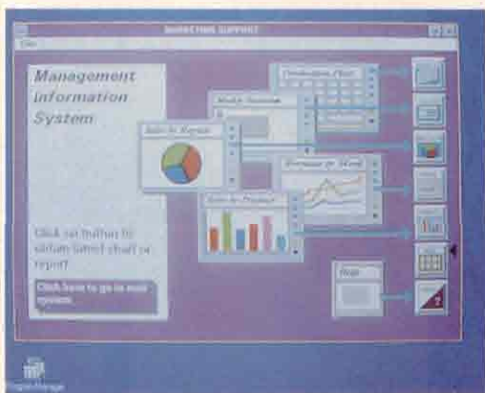
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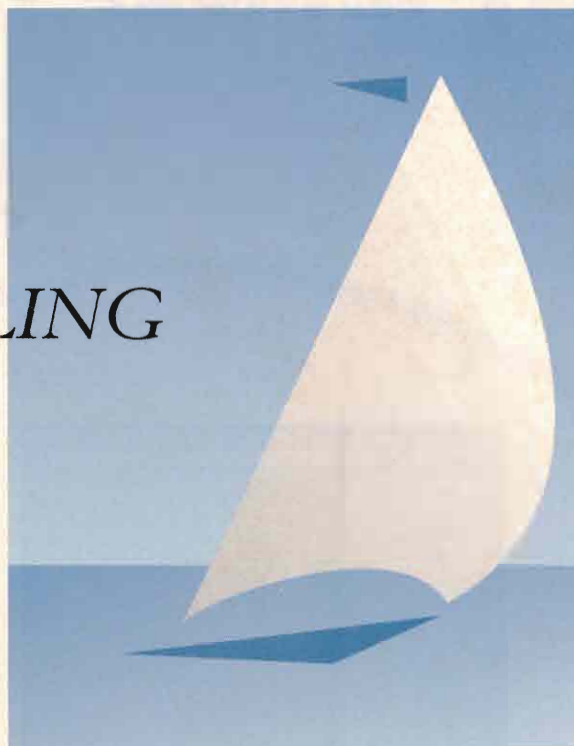
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CIRCLE 141 ON READER CARD

# CLEAR SAILING



## Navigate Your Way Through Executing Jobstreams With Bradmark's TeleScope

Electronic mail has become a core application in many offices, and its benefits to operations staff are numerous. But even the most sophisticated electronic mail packages available on the HP 3000 don't provide a facility for operations staff to communicate with one of their most important "users"—their jobstreams. Bradmark Computer Systems (Houston, TX) recognized this and developed TeleScope to provide bidirectional communication with jobstreams and interactive control of jobstream execution.

### Product Inspection

TeleScope closes the gap between people and executing jobstreams by providing three types of functions: a monitoring program, a communications utility program, and a set of programmable intrinsics.

The jobstream monitor, appropriately named "Monitor", is the facility for managing jobstream execution and directing inquiries to jobstreams. Through the

Monitor you can execute the familiar MPE commands for jobstream control (ABORTJOB, ALTJOB, BREAKJOB, RESUMEJOB and SHOWJOB) as well as the TeleScope specific commands CALL and HANGUP, SEND and RECEIVE, JOBS, MESSAGE, PRINT and TREE. The Monitor also supports the execution of most other MPE commands and an MPE XL style command redo facility as well as online help.

You can use the Monitor without making any changes to your jobstreams. This facility provides an easy means of determining what programs are running within each jobstream and the priorities of those executing programs. (The actual amount of information you are shown is limited by MPE security.) The source file of the executing jobstream then can be printed on the terminal or a printer through the use of the PRINT command, if you know the name of the source file.

TeleScope allows a much greater level of jobstream control if you make changes



By Joel Martin

## TeleScope (Version A.00.04)

**SYSTEM REQUIREMENTS:** HP 3000 running MPE V or MPE XL.

**PRICE:** \$2,000 (first copy, Micro 3000) through \$3,500 (first copy, Series 960) plus annual maintenance. 90 day warranty.

**Bradmark Computer  
Systems Inc.**

**HEADQUARTERS:**

4265 San Felipe  
Ste. 820  
Houston, TX 77027  
(713) 621-2808  
(713) 621-1639 FAX

**PRODUCTS:** DbGeneral, TeleScope,  
SUPERDEX

**FOUNDED:** 1981

CIRCLE 315 ON READER CARD

to your jobstreams, and the easiest way to do this is to have your jobstream run TeleScope's TSUTIL program. TSUTIL sends checkpoint messages that can be read using the MESSAGE command of the TeleScope Monitor. A variation on the TSUTIL command, TSUTILPAUSE, allows you to create a pause of from 0 to 1,440 minutes (24 hours) in the jobstream in addition to sending a checkpoint message. These pauses can be useful in providing an opportunity to review the progress of an executing job.

If the jobstream has had an error or a condition necessary for the job to continue hasn't been met, then you can CALL the jobstream from TeleScope and use the TSSETJCW command to abort the remainder of the jobstream by remotely setting a job control work (JCW).

### See For Yourself

The greatest level of jobstream control will only be realized if you make changes to the programs run within the jobstreams as well as to the jobstreams themselves. TeleScope provides a set of programmable intrinsics that let you build a TeleScope interface into your COBOL, PASCAL or FORTRAN programs. The steps required to change a program are relatively straightforward.

Unfortunately, because both the documentation and the product tape lack a complete sample program, modifying a program to call the TeleScope intrinsics is more difficult than it should be. After a bit of trial and error and lengthy study of the documentation, I was able to write a program that communicated with the TeleScope Monitor.

My sample program was designed to read records from one file and write them to another. By including the appropriate TeleScope calls in my program source code, I was able to CALL the program from the TeleScope Monitor and ask the program (using the TALK subcommand) to tell me how many records had been written to that point as well as the key value of the record just written.

This type of application of TeleScope

provides an effective and accurate mechanism for forecasting the completion time of long running jobstreams while taking into account the system load and other factors that will influence a particular run of a job.

If my jobstream were running too slowly, then with TeleScope's TSSETPRI command, I could raise the executing priority of the running program in an effort to speed its completion. Similarly, if the jobstream were consuming too much system time, I could issue the TSSETPRI command to lower the programs executing priority, thus delaying its completion but freeing more system resources for other users.

TSSETPRI is naturally constrained by MPE security. It won't let you change a programs executing priority to a value higher than that allowed for jobstreams or higher than that allowed for the logon account of the particular jobstream. When I attempted to raise a program's priority to the CS queue, the action wasn't allowed presumably because of our system jobstream limit of DS queue execution.

With a bit more effort, my sample program could have used the TeleScope intrinsics to provide me with a mecha-

nism for remotely shutting down the jobstream from a TeleScope session. This could be considered a "remote control" for your jobstream.

### Jobstream Insight

You may be thinking that to shut down a jobstream isn't a big deal, and you may now use the ABORTJOB command of MPE to shut down jobs that are still running at the time you start your back-ups. The problem with the ABORTJOB approach is that you may create a logical inconsistency in your data by aborting a job that performs data updates. Imagine that a program run within a jobstream reads a dataset of paid invoices, writes a record to a monthly receipts file that isn't a dataset, and then flags or updates the invoice as having been processed.

If you use the ABORTJOB command while this program is executing, you stand a good chance of interrupting the program after the output record has been written but before the input record has been updated. Should this be the case, then restarting the job may result in two output records being written for a single input record. This isn't the type of problem that's always immediately apparent, but it's the type of problem that causes the folks in accounting to get very upset when finally discovered.

Modifying the jobstream to allow it to be gracefully terminated from the TeleScope monitor, while precluding the possibility of introducing a logical inconsistency in the data, is no more difficult than equipping the program to respond to a simple inquiry as I was able to do in my sample program. The same intrinsics that provide the communications facility can be set-up to test for a shutdown message at those points in your application program where the data is logically consistent.

And, if you want to interrupt execution of the jobstream, then you could send a pause message from TeleScope. This approach is preferable to suspending the jobstream using the MPE BREAKJOB command, which may put you at risk of keeping files or datasets

locked while the job is suspended, thereby preventing access to that information by other users as well as preventing the backup of those files.

### Navigation Tools

The manual is professionally published and includes the expected table of contents and index, but it isn't an "easy read." I found two things necessary for effective navigation of the manual—frequent reference to the table of contents and reliance on a chart found early in the manual that describes the interrelationship of the TeleScope modules and commands. But even the chart I found so helpful could use some reworking.

TeleScope has a few idiosyncrasies that could be easily fixed in a following release. The TeleScope Monitor isn't very forgiving about command syntax.

MPE commands issued from the Monitor don't work if prefaced with a colon, and job numbers must be typed as "J123" rather than the more common "#J123" or the more preferable "123". You would generally not use TeleScope to communicate with another session but if this were desirable, then the Monitor could require "#S123" to differentiate sessions from jobstreams.

It also would be a trivial but helpful change to accept MESSAGES (with an "S") for the syntactically correct MESSAGE command. More effort also could be put forth in the handling of error messages, and all of the error messages could benefit from a more in-depth explanation in the documentation. Some context-sensitive help to aid in identifying the problem would also be a welcome enhancement. There needs to be some

clarification of the differences between similar commands, e.g. SEND and TALK, TSUTILPAUSE and TSPAUSE, MESSAGE and RECEIVE. And it would be nice if you didn't have to create your own UDC command.

TeleScope has some rough edges, and the documentation will take more study than should be necessary, but with a little effort it can be an effective tool for remotely viewing and controlling batch jobstream execution. TeleScope's ability to provide you with a customized look inside an executing application program, presuming you can alter the program itself, will be a dream come true to many an HP 3000 operations manager. If you have problems managing long-running or time-critical batch jobs, then TeleScope could be the answer you need. ■

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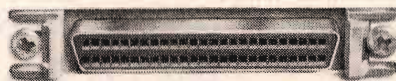
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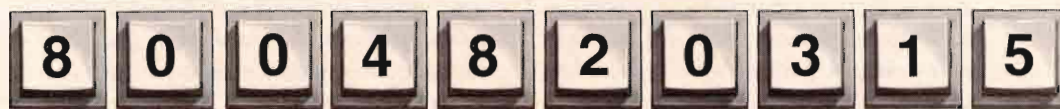
# To Fit All This



# Into This



# Call This



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CIRCLE 467 ON READER CARD

# Freedom

# OF

# Speech

## Los Altos Software's DBFree Lets You Communicate With IMAGE Databases – In Your Own Natural Language

A database is only as good as the information contained within it. However, if access to that information is difficult and time-consuming for the user, a good database won't look good for very long.

DBFree, from Los Altos Software (Los Altos, CA) is a natural language processor for IMAGE databases. DBFree has more than 35 commands that let you perform inquiries and update operations against specific databases on your HP 3000.

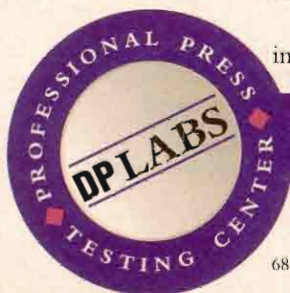
Using artificial intelligence, DBFree interprets statements entered in the natu-

ral language of the user. The natural language aspect of DBFree lets you use freeform statements. You also can make online inquiries, produce offline reports and perform updates.

### Breaking The Ice

Installation of DBFree consisted of the Autoload Process, activating the DBFree UDC commands, and linking the databases you want to access with DBFree.

The Autoload Process is straightforward. You need to be logged on as MANAGER.SYS. Once the tape is in-



By George Frueh

There must be something better than the patch panel to switch users between systems...

I know but we can't afford it

We need more ports so all our terminals and PCs can access the host computer...

Can't afford it...

When the system goes down, we need a switch to move users to the back-up, without re-cabling...

Can't afford it...

Any hacker can dial in to our system. Can't we do something about security?

Can't afford it...

We need a LAN to share laser printers and high speed modems...

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We need more Ethernet terminal servers...

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**800/275-3500**



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## FIGURE

```
? FIND LEADS.SOURCE = "BARUG" OR SOURCE = "SCRUG" REPORT END
```

```
BUSINESS-PHONE      = 619/555/1212
LEAD-NUMBER        = 1478
SOURCE              = BARUG [Bay Area Regional Users Group]
EFFECTIVE-DATE     = 89/07/10
SALES-REP-ID       = SUSAN [Susan Woita]
STATUS              = 3 [Have decided to license]
BUSINESS-NAME      = ABC COMPANY
ADDRESS (01)       = 1738 Emerald Way
ADDRESS (02)       = San Diego, CA 92123
STATE               = CA [California]
ZIP-CODE            = 92123
COUNTRY             = US [United States]
TIME-ZONE           = P [Pacific Coast]
BUSINESS-KEY       = ABCCOM
SUB-SOURCE         = FTL [Follow the Leader Mailer]
```

FUNCTION MENU	PROCEDURE MENU	HELP	REFRESH	24 1	SAVE PROCEDURE	NATURAL LANGUAGE	EXIT DBfree
------------------	-------------------	------	---------	------	-------------------	---------------------	----------------

*DBfree's FIND command lets you access any information in the database.*

stalled, you restore three stream files by executing the command:

```
RESTORE *T:ZMLOAD
```

To start the Autoload procedure, enter:

```
STREAM ZMLOAD1
```

This also sets up the DBfree account and then submits a RESTORE to load the files.

The file ZCX.PUB.DBFREE contains UDCs that must be in effect for the account(s) where you plan to use DBfree. We put this file in PUB.SYS, and then executed the SETCATALOG command for system-wide access.

Linking databases and establishing their accessibility with DBfree is performed by the supervisory user. Once DBfree is up and running, the menu system can be used to perform these tasks.

### Chatting With DBfree

To start DBfree, you type DBFREE at the MPE colon prompt. Once started, DBfree prompts you for a password. The supervisory password is SUPER, and should be changed after logging in for the first time.

Once in, DBfree displays a question mark (?) as its command prompt. The command prompt is where you enter your natural language command.

You can change your password by typing PW-ACCESS at the ? prompt, then follow the screens for changing your password. You also can press the F1 (Function Menu) key. Pressing F1 brings up a function menu from which you se-

## DBfree

**PLATFORMS:** HP 3000 running MPE or MPE XL; IMAGE

**PRICE:** DBfree is priced at \$2,500 and includes one year maintenance; No extra charge for Native Mode Version

### Los Altos Software

#### HEADQUARTERS:

425 First Street, Suite E  
Los Altos, CA 94022  
415-941-6030  
415-941-9072 FAX

**PRODUCT LINE:** Fastrack 3000, ASAP/3000, Q-PLUS, DBfree

**FOUNDED:** 1979

**OWNERSHIP:** Private

CIRCLE 316 ON READER CARD

lect "Establish and Maintain Password Access".

Before you can issue commands, phrases and statements to interrogate your database(s), you first must make each database accessible to DBfree. This is a one-time activity.

Typing HELP DATABASES at the command prompt displays the available databases. To access one of these databases, you enter the command *B = database name*, where database name is the name of the database you want to access.

Los Altos Software supplied us with a demonstration version of its Fastrack 3000 Sales Leads Tracking and Marketing Information System. To make Fastrack accessible we entered:

```
? DATABASE = FASTRACK
```

The Natural Language component of DBfree is composed of commands, phrases and statements. A command is a word that tells the system what you want to do. Examples include CHANGE, FINDALL and LIST.

A phrase contains a single command and further defines the command action. LIST FIRST-NAME is a phrase. A statement can contain one or several phrases, and reads like a paragraph.

Phrases in a statement form a complete procedure in the same way sentences in a paragraph form a complete thought. The following statement lists the first and last names of all contact people for LEAD-NUMBER 528:

```
? FIND CONTACTS.LEAD-NUMBER 528: LIST  
FIRST-NAME LAST-NAME END
```

### Positive Feedback.

As you enter commands and phrases, DBfree responds in a very positive and efficient way. For example, when you issue a phrase using the proper syntax, an answer is generated and displayed on the screen. Depending on the type of phrase you enter, DBfree will ask you if you want the response displayed offline.

In the event you enter a phrase with a syntax error or an incorrect usage of a command, DBfree displays an error mes-



sage. For example, if you wanted to obtain data on all sales leads located in the eastern time zone, you enter:

```
? FIND LEADS.TIME-ZONE "E" REPORT END
```

In the previous phrase, accidentally leaving off the E in word ZONE would result in the error message:

```
9016-C: WHAT DOES THAT MEAN? TIME-ZON.
Explain?
```

Typing Y or YES at the Explain prompt displays information about the error. You can also get information about the error and its remedy by typing:

```
? HELP 9016
```

Other DBfree commands include the boolean operators AND and OR, and the arithmetic functions ADD, SUBTRACT, MULTIPLY and DIVIDE.

The READ command reads each record of a sequential file into an item. A common use of this command is to view the contents of an MPE file. The REPORT command lists all significant information in the active dataset entry. The DELETE command purges one or more entries from the database. (You can establish security within DBfree allowing selected users read-only access.)

Probably the most frequently used command is FIND (see *Figure 1*). With it you can access virtually any information in the database. FIND selects entries in the dataset based on a relationship between an item and some value. Items can be any in the dataset you're looking at, while the relationship can be equal to, not equal to, less than, or greater than.

The function keys on your keyboard let you access other menus, save procedures, transfer to the natural language command prompt for entering natural language commands, and exit DBfree.

DBfree's help system can be accessed in different ways. Typing HELP, followed by a category or element, displays information about that item. For example, to obtain a brief description of the FIND command, type:

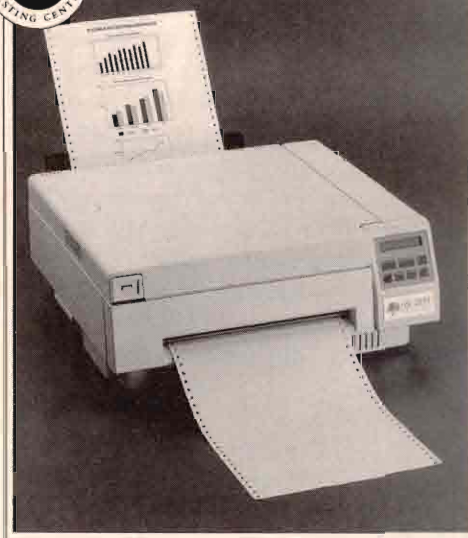
```
? HELP FIND
```

You can also pull up DBfree's Help Menu by pressing the F3 key. The Help Menu contains: Command Description & Syntax, Accessible Databases, Item Information, Dataset Information, Error

Messages, Principles of Operation and Natural Language Overview.

With DBfree, you can bring the power of artificial intelligence to your HP 3000. By combining Natural Language commands into phrases, you can obtain as well as update the information in your IMAGE database fast and efficiently. ■

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## NETWORKING

Tim Cahoon

Datacommunication and Terminal Controllers (DTC) into one version that serves both HP 9000 and HP 3000 systems. There's so much good news in this announcement, I'm going to have to confine myself to comments about the DTC itself. You should understand, however, that the new DTCs are controlled by the HP OpenView DTC Manager.

Things have changed since the days of Classic systems with terminals plugged into their end panels. The RISC machines are a complete success and PCs are dirt cheap. The HP gospel of open systems finally has reached the lowest levels of the organization (even my local office). Client-server computing is becoming a reality, and HP is announcing bigger and bigger server/processors. All of these changes make the DTC an important part of HP's future.

As we know, the PA-RISC machines, both 3000s and 9000s are network based. The only physical connections are for disk drives, tape drives, printers and network connections. Your terminals now connect to a highly specialized box (in reality a terminal server) called a DTC. One or more of these DTC boxes, a DTC16 or DTC48, can be located throughout your site and attached to the local network. This provides tremendous flexibility and reduced wiring costs.

### What The New DTC Does

There are two types of DTCs. The DTC16 is a small box with two slots for terminals ports. The DTC48 is larger and has six slots. As you can guess from their names, the DTC16 can have up to 16 ports and the DTC48 up to 48 ports.

Attention HP 9000 users! HP recently integrated its two

These ports provide physical connections for terminals. Each port allows a terminal user to have up to five concurrent connections. What's astounding is that one user can have connections to different hosts using different protocols from that one port.

Terminals physically connected to the DTC gain some major advantages: powerfail recovery, type-ahead and multiple connections to give the terminal user a big productivity boost. Printer sharing is another benefit offered by the DTC. Any printer attached to a DTC port can be shared concurrently by up to five HP hosts, either HP 3000 MPEXL machines or HP 9000s.

The basic function of the new DTC is to connect you to another host, and a "host" also can be defined as a port on another DTC. This means it's possible to connect the terminal ports of systems such as the Classic 3000 directly to the ports of a DTC in a back-to-back mode. Any other system connected to a DTC

could then access these systems. This method can be used to add almost any non-networked hosts, modem pools, and

X.25 PADs to your network. Using DTC ports in this fashion may eliminate the need (and the additional cost) for a Data PBX.

For the basic job of communicating with your HP 3000, the DTC uses a proprietary protocol called AFCP (Avesta Flow Control Protocol). The AFCP was devel-

oped to provide high performance access across the LAN. For the HP 9000, the DTC uses Telnet over TCP/IP.

To access remote, non-HP hosts such as Sun workstations, the basic DTC configuration provides for outbound TCP/IP Telnet support. This feature allows any user on a DTC to communicate with any host that supports Telnet. One exception to that is the AS/400. IBM chose to implement a little used variation of Telnet called LINE MODE. The DTC doesn't support it yet, but then again neither does anyone else.

### Mixing With UNIX

On our networks we find a variety of UNIX-based systems. To communicate with these systems, this summer HP introduced ARPA Services/XL for the DTC. This product allows UNIX hosts to communicate with your HP 3000s using Telnet and FTP. Inbound Telnet and FTP are the main components of this re-



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lease. Inbound Telnet comes in two flavors, Telnet Access and Telnet Express.

FTP stands for File Transfer Protocol and it's the only program to reside on your HP host. It allows you to transfer files between a UNIX machine and an HP 3000 XL computer system. Because it does reside on the HP 3000, the price is based on cpu size.

Telnet Access can handle up to 40 sessions and comes as a card that slips into a slot in a DTC48. (Older DTC48s may require a memory upgrade.) This product is aimed at smaller systems or where you might need to add access for a few more users.

Telnet Express handles twice the number of sessions (80) and is for a site with considerable Telnet activity. This solution comes as a dedicated box that attaches to your LAN and is treated like a "normal" DTC.

Both Telnet solutions enable you to access an HP 3000 from a Telnet host by having the DTC convert Telnet to AFTP and back again. This protocol translation has been optimized for VPLUS applications. DTC Telnet also has been optimized for accessing hosts across an extended LAN. Both of these products can coexist on your LAN. You may start out with one Telnet Express box and later add a Telnet Access card if needed to a DTC48. These solutions allow you to mix and match to meet your needs.

VPLUS block mode and character mode applications are supported, too. However, as stated in the ARPA Services/XL data sheet, "HP ARPA Telnet does not emulate a particular terminal type or convert control characters. The system you're accessing and the application you're running must support the terminal or terminal emulator you are using." Until the HP MPE XL lab rewrites VPLUS to run on a VT100 terminal, you may want to check out Preview from Tymlabs. Preview allows you run block mode applications on almost any type of terminal.

Many features available to physically connected devices aren't applicable to Telnet users. Type-ahead, powerfail re-

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# **H** *P estimates that host-based solutions generate seven times more overhead than its solution on the DTC.*

covery, programmatic access, printer support, and non-VPLUS block mode are all items currently not supported via ARPA Services/XL.

To help get you started on the ARPA Services bandwagon, HP has created two packages to save you money. HP ARPA/40 Services/XL is available for the 920 to the 932 systems. This package contains Telnet Access and FTP. HP ARPA/80 Services/XL has Telnet Express and FTP and is available for the 935 to 980 systems. Both packages are viewed as only an entry point. You can add additional Telnet solutions at a later date as needed.

## **Travel To New WANs**

For WAN (wide area networks) connections there is a lot of good news in the DTC announcement. First, you can add an X.25 card to your DTC16 or DTC48. With this card in place a user on a PAD (Pad Assembler-Disassembler), you can access any system using inbound PAD support via the DTC. As of the HP OpenView DTC Manager release 10.5, inbound Telnet over X.25 is now possible. A remote user running Telnet over X.25 can pass through the DTC X.25 card to a DTC or, transparently, to a host. When connecting to a DTC, the user can manually access his choice of host at the DTC prompt.

This new Telnet option is important for HP 9000 users. X.25 support always meant installing a card in your machine. If only inbound access is required, the DTC X.25 card is a resource that can be shared by hosts throughout the network.

Outbound X.25 access can be shared by connecting the ports of an HP PAD to the ports of a DTC in a "back-to-back" or multiplexor arrangement. Any device connected to a DTC port becomes a resource available to almost every host, HP and non HP, in your network.

Performance across a WAN is always an important issue. HP addresses this in the ARPA Services/XL Technical Data Sheets, which state: "PAD will provide higher performance, less expensive interactive sessions over X.25 than Telnet." As you can probably guess, X.25 is viewed as HP's current solution to WAN connectivity. It's possible to have DTCs located in remote areas of your WAN under the control of the local DTC Manager. Creating an extended LAN has been done quite successfully for customers.

Performance is another topic of great interest. Many protocols, such as TCP/IP, are very cpu intensive. By offloading the communications services from the main processor you save valuable resources. HP estimates that host-based solutions generate seven times more overhead than its solution on the DTC.

Having the software in the DTC and not on a specific host also means anyone can use it. Host-based solutions tend to lock you into communicating with only that host. You also have the additional cost of duplicating the software on all your host machines.

It was about seven years ago that HP released the ATP ports to reduce cpu overhead resulting from communications. Today, with networked systems, we can almost totally eliminate it. You could speculate that the future may find the DTC as a standalone product; it gives us the means to communicate with the world. That's something we were only dreaming about four years ago. —*Tim Cahoon provides wide area network and HP technical support for the manufacturing operations of a Fortune 500 company.*

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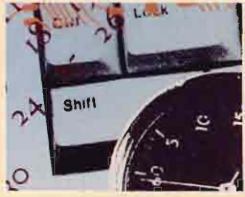
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HP-UX

Andy Feibus

When I started working with UNIX, the first shell I used was

Bourne (**sh**). After two weeks of frustration, I discovered that the C shell (**csh**) provided more features and certain useful tricks; so the C shell became my shell of choice.

I've been using the C shell for about six years. It still provides all of the features that I "need"—aliasing, command history editing, and job control. Sure, some features of the C shell are rickety—editing previously executed commands using substitution commands. However, it's served me well and it's much better than the Bourne shell.

Recently, a new shell has emerged: the Korn shell. It was created at Bell Labs in 1982 and is essentially a superset of the features available with the Bourne shell. HP-UX was one of the first operating systems to include the Korn shell; now SCO UNIX System V/386 Release 3.2.2, IBM's AIX, and AT&T System V Release 4 include it, too.

If **ksh** is your login shell, the following start-up scripts are executed:

- **/etc/profile** — The system-wide **sh/ksh** start-up script. This script usually contains commands that the system administrator wants all users to execute on login.

- **\$HOME/.profile** — Your local start-up script, containing those commands that you want to execute each time you login. If you're careful, this script can work with both **sh** and **ksh**.

- **SENV** — If you (either in **\$HOME/.profile** or **/etc/profile**) assign a value to the shell variable **BENV** and then **export** this variable, the file name stored in **BENV** is executed each time the **ksh** is invoked (either at login or any time thereafter). One possible value for this

variable is **\$HOME/.kshrc**. This environment file usually contains the definitions of aliases and the setting of certain options.

Shell Variables

To assign a value to the variable name and then **export** it, use the following commands:

```
$ name=value
$ export name
```

or, the single command:

```
$ export name=value
```

An exported variable is one that is part of your environment; commands executed from this environment can obtain the value for this variable. For example, if you assign the value **vi** to the **EDITOR** shell variable, this value isn't available to the **mailx** program until you **export** it.

TABLE

Variables Set By The Shell

<b>?</b>	The status value returned by the last executed command.
<b>OLDPWD</b>	The previous working directory set by the <b>cd</b> command.
<b>PWD</b>	The current working directory set by the <b>cd</b> command.

Variables Set By You

<b>EDITOR</b>	The name of the editor you use; certain UNIX programs reference this variable to obtain the name of an editor. If the <b>VISUAL</b> variable isn't set and this variable ends in <b>vi</b> or <b>emacs</b> , then the corresponding option (see <b>set</b> , below) is turned on.
<b>ENV</b>	The name of the shell environment file that is executed each time the shell is started.
<b>HISTFILE</b>	The name of the file used to store the command history.
<b>HISTSIZE</b>	The number of commands stored in <b>HISTFILE</b> .
<b>PATH</b>	The shell search path; the directories within this search path are searched for commands that are executed.
<b>PS1</b>	The value for this variable is expanded to create the primary shell prompt. The character <b>!</b> in this value is replaced by the command number.
<b>TMCOUT</b>	If set to a value greater than 0, the shell will terminate if a command is not issued before the specified number of seconds elapses.
<b>VISUAL</b>	If the value of this variable ends in <b>vi</b> or <b>emacs</b> , then the corresponding command editing option (see <b>set</b> , below) is turned on.



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Some shell variables are automatically set by the shell and some you assign. All shell variables are referenced by preceding the shell variable name with **\$** (e.g., **\$ENV** references the shell variable **BENV**). See *Table 1* for some variables set by the shell, and those set by you.

You also can create shell variables. Within **ksh**, you can define the type of a variable using the **typeset** command. Values assigned to shell variables are converted based on the variable's type. If you don't define a variable's type, its value is considered a standard string.

One particular variable type is the **integer** type, that is assigned using the **typeset** option **-i**. For example, to create a shell variable **COUNTER** and assign an integer value of 9 to it, execute the following command:

```
$ typeset -i COUNTER=9
```

# **K**sh arithmetic statements use the same expressions used by the C programming language

Once a shell integer variable has been created with **typeset**, you can use the **let** command to assign an arithmetic result to the variable. For example, to assign the result from the arithmetic statement **\$BUTR1 \* 25 - 13** to **COUNTER**, do:

```
$ let COUNTER="$BUTR1 * 25 - 13"
```

**Ksh** arithmetic statements use the same expressions used by the C programming language (including the **B?**, **:**, **++**, and **--** operators). As you might have noticed, referencing the integer variable **BUTR1** in the above statement doesn't require preceding the variable's name with a **\$** (it's assumed).

Notice, also, that the statement is quoted; the **\*** is otherwise expanded using filename expansion rules (i.e., a wildcard pattern match for the files in the local directory). Another way to perform the above **let** command without using quotes is with:

```
$ COUNTER=$((BUTR1 * 25 - 13))
```

## Setting Options

In addition to typing variables using **typeset**, **ksh** also provides a bunch of options you can control using the **set -o** command. For example, to prevent re-

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direction (i.e., using the > to redirect **stdout** to a file) from overwriting an existing file, use the command:

```
$ set -o noclobber
```

Some other options to note:

■ **ignoreeof** — Prevents you from using CTRL-D to **exit** from a shell. Instead, you must use the **exit** (or, for a login shell, the **logout**) command.

■ **bgnice** — Processes placed into background run at a lower priority than foreground jobs.

■ **emacs** — Use **emacs**-style editing for command history editing.

■ **vi** — Use **vi**-style editing for command history editing. When enabled, entering a command is like being in text entry mode in **vi**. Press the ESC key to place you in command mode — that lets you move/edit commands you previously entered. Pressing RETURN executes the command.

To disable an option, use **set** with the **+o** option (instead of **-o**).

### Korn Control

Like the C shell, **ksh** provides full job control. Not only can you run a job in foreground (the shell waits for the job to complete before continuing) or background (the shell requests the next job before the current job completes) mode, but jobs also can be suspended.

To suspend a job, you must first assign a **suspend** character via the **stty(1)** command. For example, to use CTRL-Z as your **suspend** character, execute the command:

```
$ stty susp ^Z
```

To monitor the status of background jobs, enter the following command:

```
$ set -o monitor
```

Once **monitor** mode is set, a status line prints when a background job completes. You can move a background or suspended job to foreground mode using the **fg** command; suspended jobs can

be placed into background mode using the **bg** command. Refer to your documentation for details.

Finally, redirection in **ksh** is almost the same as redirection in the Bourne shell. The only exception occurs when **noclobber** mode is set; to override **noclobber** mode, append a | to the > redirection. For example, if the file **goober** already exists, to overwrite this file with the current date, use the command:

```
$ date >| goober
```

Next time: **ksh** command history and aliases.—*Andy Feibus is an interplatform systems consultant based in Atlanta, GA and author of UNIX, Quick! from Professional Press Books.*

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New features include preprocessor support, including embedded SQL preprocessors by Oracle, Informix and other industry standard SQL databases; support for HP 9000 Series 400 workstations; support of dynamic shared libraries on Sun platforms; and support for loading FORTRAN object code.

In separate announcements, Saber announced a major purchase agreement with Sun Microsystems and the integration of Saber-C with HP's SoftBench tool integration platform.

Saber-C Version 3.1 runs under UNIX on HP 9000/300 and 400 Series workstations, Sun-3, Sun-4/SPARC and the DECstation. It's priced at \$2,995. Contact Saber Software Inc., 10 Fawcett St., Cambridge, MA 02138-1110; (617) 498-3000.

**Circle 400 on reader card**

### Elan License Manager Offers Shorter Key Lengths

Elan Computer Group announced Release 1.4 of its Elan License Manager. The product offers shorter key lengths (as short as 10 characters), easier installation and the ability to nodelock certain licenses to individual CPUs.

Elan License Manager provides UNIX software developers with a mechanism for safeguarding their software from piracy. In addition, it implements a floating license manager to simplify the purchase and sales of software licenses to end users on networks.

Contact Elan Computer Group Inc., 888

Villa St., 3rd Floor, Mountain View, CA 94041; (415) 964-2200.

**Circle 399 on reader card**

### WRQ Gateway Connects HP Desk To MHS-Based E-Mail

Walker Richer & Quinn began shipping MailMessenger for MHS (Message Handling Service), a product that connects HP 3000-based electronic mail systems to MHS-based LAN mail systems and to other host-based mail systems with MHS gateways.

MailMessenger for MHS gives mailbox holders on HP host mail systems, including HP Desk Manager and WRQ's own PostHaste, the ability to communicate electronically with their colleagues on many different kinds of mail systems.

MailMessenger for MHS allows users to exchange both text and binary files and to send and receive mail via their usual E-mail interfaces. It uses WRQ's client-server protocol PPL for communication between the HP 3000 and the LAN. Price is \$5,000. Contact WRQ Inc., 2815 Eastlake Ave. E., Seattle, WA 98102; (206) 324-0350.

**Circle 398 on reader card**

### Digital Tools Announces Motif Version Of AutoPLAN

Digital Tools Inc. released AutoPLAN, graphical project management software for HP 9000 workstations running under HP-UX Motif.

AutoPLAN gives users the ability to do online project planning and monitoring through a "point and click" approach. With its Work Breakdown Structure (WBS) major projects can be subdivided into smaller components (subprojects) that can be run on individual workstations and a super network can be created over the network.

AutoPLAN supports PERT, CPM and Precedence Network methods of planning. It supports PostScript printers and plotters and runs under UNIX on the HP 9000/300 and 400 workstations, as well as the new HP 9000/700 Series, running HP-UX with the Motif operating environment.

AutoPLAN is priced at \$2,995 per license for the floating user version and \$1,495 for the nodelock version. Contact Digital Tools Inc., 18900 Stevens Creek Blvd., Cupertino, CA; (408) 366-6920.

**Circle 397 on reader card**

### Lawson Develops Accounting System For 800s

Lawson Associates Inc. announced the Lawson Accounting System for HP 9000 Series 800 systems, operating under HP-UX Release 7.0.

Lawson's Accounting System, which maintains all aspects of a company's financial organization, comprises several integrated application packages: general ledger (with optional modules for ratio analysis, cost allocations, flexible budgeting and financial report writing), accounts payable, accounts receivable, fixed assets and project accounting.

Pricing begins at \$20,000 and varies depending on platform size, system configuration and number of users. Contact Lawson Associates Inc., 1300 Godward St., Minneapolis, MN 55413-1764; (612) 379-0258.

**Circle 396 on reader card**

### NSD Releases Three Products For HP Systems

NSD Inc. announced two new products and one product upgrade for HP systems: TimeSync, InterTask and an upgraded TranSpooler product.

TimeSync is a software utility that automatically synchronizes the internal clocks of computers on a network to within one millisecond of each other. TimeSync supports ARPA Services, LAN Manager, LAN Manager/X and Network Services protocols. Servers and clients are available for a wide range of operating systems including MS-DOS, OS/2, SCO-UNIX, HP-UX, MPE V and MPE XL. TimeSync eliminates manually adjusting and setting the time and date on multiple machines.

InterTask is a client-server facility that allows an HP 3000 MPE system to invoke HP-UX processes on remote HP 9000 nodes over a TCP/IP network. InterTask clients run on HP 3000s and servers run on HP 9000s. InterTask provides a means of integrating MPE and HP-UX production scheduling using established MPE tools. Remote HP-UX processes can be executed by invoking the InterTask client from any HP 3000 on the network. InterTask can be used for both online and batch application interfaces.

TranSpooler is a bidirectional spoolfile relocation program that allows for manual or automatic spoolfile transfer between MPE systems or between MPE and HP-UX systems. Transfers are performed using Network Services over ThinLAN, ThickLAN, EtherTwist or X.25 networks. TranSpooler's new features include the ability to print on IBM hosts through SNA/NRJE. Another new feature is a broadcast facility which sends spoolfiles to multiple nodes from a single node. Spoolfiles can then be distributed to multiple devices, allowing simultaneous distribution of reports to all receivers. Contact NSD, 1400 Fashion Island, Fourth Floor, San Mateo, CA 94404; (415) 573-5923.

Circle 395 on reader card

### FOCUS Interfaced To OMNIDEX, ALLBASE/SQL

Information Builders Inc. announced FOCUS interfaces to Dynamic Information Systems Corporation's (DISC) OMNIDEX Information Management Systems and to HP's ALLBASE/SQL relational database management system, operating on the HP 3000 Series 900.

The OMNIDEX interface provides seamless support for both IMSAM and OMNIDEX. IMSAM allows for partial key and sorted sequential access on TurboIMAGE databases, while OMNIDEX provides high speed retrieval and flexibility on TurboIMAGE databases. Prices range from \$2,200 to \$20,680 and are based on configuration.

The FOCUS interface for ALLBASE/SQL provides full read/write access to native ALLBASE/SQL without the need to convert or re-enter data. It's priced from \$4,200 to \$29,400.

Contact Information Builders Inc., 1250 Broadway, New York, NY 10001-3782; (212) 736-4433.

Circle 393 on reader card

### CTI Unveils Diskless/Memory Based UNIX

Commercial Timesharing Inc. announced a diskless/memory based version of INTERACTIVE Systems Corp. UNIX along with an integrated CASE toolkit for application software development on HP and Intel platforms.

The new operating system was developed by INTERACTIVE's networking products group with CTI providing the functional design requirements and operating system testing. CTI will document, support and distribute it as the Cell Controller WorkStation (CCWS) version under a master disk licensing agreement from INTERACTIVE.

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## NEW PRODUCTS

The new operating system eliminates the triple cost liabilities associated with initial purchase, maintenance and administration of hard disk drives in industrial environments and/or large networks. Contact Commercial Timesharing Inc., 2650 S. Arlington, Akron, OH 44319; (216) 644-3059.

**Circle 392 on reader card**

### HP Expands DeskWriter Line

HP extended its HP DeskWriter printer line with a model that offers laser-quality color printing for Macintosh printers. HP also announced a high-capacity, black-ink print cartridge for the HP DeskJet (for PC-compatible computers) and HP DeskWriter (for Macintosh computers) family of printers.

The HP DeskWriter C printer produces black or color output with 300 dpi resolution. A new QuickDraw-based printer driver enables users to use all Macintosh word-processing, business-graphics, spreadsheet, presentation and other programs that have black as well as color-output options. The HP DeskWriter C printer is \$1,095.

HP's black-ink print cartridge for the HP DeskJet and HP DeskWriter printers lowers the printing cost of these printers by 25 percent. It prints 1,000 laser-quality pages for about three cents per page.

The new cartridge's redesigned internal mechanism allows the cartridge to hold twice as much ink. It is priced at \$31.95.

### QIC Format Tape On HP-UX Workstation

Isahk Co. Ltd. announced the ISA 504x Series QIC tape drive which provides HP-UX workstation users with file backups and data transfer capability to and from other UNIX machines supporting the QIC tape formats.

The 5040 and 5041 are HP-IB interface models that emulate the HP9144 cartridge tape drive with support for the CS80 communication protocol.

The 5040S is a pure SCSI interface

model designed for use with the HP 9000 Series 400 operating under Domain/OS. The 5040S Opt HP-UX supports a modified SCSI interface which enables this drive to operate with the HP 9000 Series 400/700 HP-UX under existing SCSI software drivers.

Contact Isahk Co. Ltd., 1102, 11/F., Austin Pl., 7-9 Austin Ave., Tsimshatsui, Hong Kong; tel: 3674877.

**Circle 390 on reader card**

### ASK Increases MANMAN Functionality

ASK Computer Systems Inc. introduced a new lot tracking module, a suite of report writing tools and Release 8.0 of its MANMAN information management system for HP 3000 computers.

The new offerings include a MANMAN/TRACKER, an integrated lot tracking system, and Interactive Software System's User Data Management System (UDMS), a family of report writing tools designed to enhance existing applications. MANMAN Release 8.0 for the HP 3000 features functional upgrades to six product modules and minor enhancements to all other modules.

MANMAN/TRACKER is priced from \$6,120 to \$78,500. UDMS report generating tools are priced from \$55,400 to \$100,000.

Contact ASK Computer Systems Inc., 2440 W. El Camino Real, Mountain View, CA 94039-7640; (415) 969-4442.

**Circle 389 on reader card**

### JetForm Adds NewWave Support

HP and JetForm Corp. announced that the JetForm line of electronic-forms software will be made available for the HP NewWave desktop software. JetForm will add object-oriented HP NewWave support to its JetForm-Design and JetForm-Filler software products.

HP NewWave features will allow JetForm software to create NewWave objects that provide easy-to-use electronic forms to help companies manage forms production and processing. These new JetForm

objects will include Design Objects, which are used to design new forms, and Form Objects, which are used to make forms or objects or to hold data supplied by users.

JetForm for HP NewWave will be included in the upcoming JetForm Release 3.0. JetForm-Design is \$495 and runs under Microsoft Windows. JetForm-Filler is \$199.

### Applix Upgrades Asterix For UNIX Workstations

Applix Inc. released Version 1.1 of Asterix, an open suite of desktop productivity tools for UNIX workstations and X-terminals.

Version 1.1 expands Asterix compound document capabilities to include: audio for voice annotation, color pixel editing and live links to third-party applications. Asterix 1.1 also provides fax support via macros and adds interprocess communications capabilities to the Asterix extension language facility.

Asterix is now available on all HP 9000 workstations, Sun-3 SPARC-based workstations, MIPS R3000 RISC Computer systems and DECstation/DECsystem RISC workstations and X-terminals. Contact Applix Inc., 112 Turnpike Rd., Westboro, MA 01581; (508) 870-0300.

Circle 388 on reader card

### Oak Grove Systems Updates Printer Line

Oak Grove Systems Inc. (OGS) released the LZR-30 WorkGroup Printer, a PCL level 5 and HP-IB compatible system printer for HP 3000 and HP 9000 platforms.

Designed for word processing, spreadsheets, business graphics, forms overlay and data processing applications, the LZR-30 offers a 30 ppm speed, 300 dpi laser print resolution at a 150,000 page-per-month duty cycle. It's priced at \$16,995 for simplex or \$21,995 for optional duplex mode.

OGS also announced an HP-IB and remote spooled interface board which is incorporated internally in the LZR-16 ScrollWriter printer. Previously, HP 256X system printer and HP293X remote spooled

emulations were not available together, but had to be purchased as two separate external devices. Oak Grove's proprietary design provides both system interface HP-IB and serial remote spooled interface. Users configure for either HP-IB, ATP, ADCC or DTC printer connectivity. Contact Oak Grove Systems Inc., 1550 El Camino Real, Menlo Park, CA; (415) 325-1500.

Circle 387 on reader card

### VisionWare Enhances Its X Windows Server

VisionWare Ltd., announced XVision version 4.0 its PC-based server for the X Window System.

XVision enables PCs networked over TCP/IP to one or more host systems (UNIX or non-UNIX) to display multiple X clients alongside Local Windows programs, including support for copy and paste between DOS and X.

This new version supports the X11r4 protocol, including all fonts as well as many X11r4 enhancements and server extensions. It also supports X color classes including support for 256 colors. You can use the host window manager of your choice, or to allow MS Windows to control X clients, you can use any Windows-compatible graphics adapter and display and more.

Contact VisionWare Ltd., 57 Cardigan Lane, Leeds, LS42LE, United Kingdom; 44 532 788858.

Circle 323 on reader card

### AICS Research Enhances QueryCalc Report Writer

AICS Research Inc. released Version 2.0 of QueryCalc, its 4GL/report writer/spreadsheet for the HP 3000. V2.0 is a performance release of the report writer. Among other performance improvements, V2.0 incorporates MR-NOBUF serial reads of IMAGE datasets.

Version 2.0 also includes enhanced set manipulation capabilities for qualifying keyed search items in TurboIMAGE, IMAGE and KSAM databases, without regard to the type of database.

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## NEW PRODUCTS

Contact AICS Research Inc., P.O. Box 4691, University Park, NM 88003; (505) 524-9800.

**Circle 383 on reader card**

### Cadre Promotes Teamwork/FORTRAN Rev

Cadre Technologies introduced Teamwork/FORTRAN Rev, a tool for reverse engineering of FORTRAN programs and that also provides an easy migration path to CASE.

Teamwork/FORTRAN Rev graphically reveals the structure of existing software, enabling engineers to understand undocumented code, create accurate documentation, identify major components and data structures, and assess the impact of software changes.

This tool automatically generates Teamwork Structured Design charts from FORTRAN source files. These charts can be displayed graphically in Teamwork/SD, incorporated into documentation using document-processing tools like Inter-leaf and Frame, or printed directly.

Teamwork/FORTRAN Rev supports most industry-standard dialects of FORTRAN; the language extensions implemented on HP Apollo, Sun, DEC and IBM workstations; and server IBM mainframe and Cray extensions.

Pricing for Teamwork/FORTRAN Rev begins at \$9,700 for the first seat.

Contact Cadre Technologies Inc., 222 Richmond St., Providence, RI 02903; (401) 351-5950.

**Circle 382 on reader card**

### Dataram Expands Memory For HP Apollo DN3500-5500s

Dataram Corp. doubled the expansion capacity of its memory board for HP Apollo DN3500, DN3550, DN4000, DN4500 and DN5500 Series workstations.

The earlier DR-40 had offered users of the HP Apollo workstations expansion increments of 4 and 8 MB, and now the new DR-40E gives DN5500 users a 16 MB version as well.

A 1-, 4- or 8-MB DR-40E board can be installed in a DN3500, DN3550, DN4000,

DN4500 or DN5500 workstation, boosting total memory to either 16 or 32 MB.

Four 16-MB boards bring memory capacity in the Series DN5500 up to its maximum of 64 MB.

All three versions of the DR-40E can be intermixed in the DN5500 Series, thus providing users with an even wider spectrum of memory configuration options.

The 4 MB version sells for \$820, the 8 MB version for \$1,500 and the 16 MB version for \$3,000.

Contact Dataram Corp., P.O. Box 7528, Princeton, NJ 08543-7528; (609) 799-0071.

**Circle 381 on reader card**

### Logicraft's Omni-Ware Available On HP Systems

Logicraft Inc. announced that its Omni-Ware product line now supports HP Apollo 9000 Series 400 workstations running HP-UX. Omni-Ware is a high performance server that provides HP Apollo 9000 Series 400 users with access to MS-DOS version 3.3 and up, OS/2, SCO UNIX, and MS-Windows applications.

DOS sessions can be started through Motif. Data can be transferred between windows with standard copy and paste tools. Logicraft provides MS-Windows 3.0 drivers that let you use the monitor's full display area. An optional VGA video emulation supporting up to 256 simultaneous colors also is available.

Omni-Ware supports logical disks up to 480 MB. These logical disks fully emulate PC/AT fixed disks. Local hard disks are available as options. Users can access the remote logical disks and local hard disks simultaneously. With logical disks, PC files are stored on the host's disks providing file security and backup, PC files also may be stored on the local hard disks.

Contact Logicraft Inc., 22 Cotton Rd., Nashua, NH 03063; (603) 880-0300.

**Circle 379 on reader card**

### Camintonn Offers Memory For 9000/425e

Camintonn Corp. introduced its CMH-9425e memory expansion module for the



HP Apollo 9000/425e.

Camintonn CMH-9425e modules, which are fully compatible with HP memory controller hardware, diagnostics and operating systems are available in 4, 6 or 8 MB ECC memory upgrade kits. Each kit consists of a pair of SIMMs that can be installed into the HP 9000/425e system processor unit. The 4 MB kit uses 1 megabit SOJ DRAM, the 8 and 16 MB versions use 4 megabit SOJ DRAM for maximum density and minimum power consumption. All modules support advanced single-bit error correction and double-bit error detection.

List price for CMH-9425e modules is \$800 for 4 MB, \$1,600 for 8 MB and \$3,200 for 16 MB.

Contact Camintonn Corp., 22 Morgan, Irvine, CA 92718; (714) 454-6500.

Circle 378 on reader card

### Fibronics Adds HP Apollo Protocol Support

Fibronics International introduced HP Apollo protocol support for its FDDI product line, System Finex. The Fibronics FX8210 translation bridge now provides transparent communication between FDDI direct attached workstations for HP and workstations attached to Ethernets.

The FX8210 translation bridge supporting HP Apollo traffic is fully interoperable with all other components of System Finex. And FX8210 is interoperable with FDDI bridges from DEC and FDDI direct attached workstations from Silicon Graphics, MIPS and Sun. Fibronics SNMP-based network management system, Interview, provides control, management and monitoring of the entire FDDI network and all attached subnetworks, such as Ethernet and Token Ring. Contact Fibronics International, Communications Way, Independence Park, Hyannis, MA 02601-1892; (508) 778-0700.

Circle 377 on reader card

### HP Enhances LaserRX, RXForecast And GlancePlus/V

HP released a new version of HP LaserRX software for MPE V, MPE XL and UNIX

systems that has a record-and-playback feature that can automate repetitive tasks, such as graph printing and multiple cpu analysis. In addition, the software offers macros that can be recorded and played back from the LaserRX user interface as well as an MS-DOS command line. Both software versions support HP NewWave version 3 and Microsoft Windows version 3.0.

HP also announced an enhancement of HP RXForecast software for MPE V and MPE XL systems that enables users to determine how many active jobs or sessions may occur during a future timeframe. This forecasting depends on information from HP LaserRX, that collects data on the number of active jobs and sessions running on a given system during a given time.

And, an enhanced version of HP Glance Plus/V incorporates cpu, disk and memory detail screens as well as user-defined filters, and helps users isolate and resolve performance bottlenecks with greater ease.

### Trinary Systems Unveils EDI Windows

Trinary Systems released EDI Windows, an EDI control and translation software product designed to meet both customer and vendor requirements through a single source.

EDI Windows can support concurrently multiple versions of X12, EDIFACT, TDCC, UCS and WINS standards, to include all industry and trading partner specific subsets. Connections to all public value added networks and most private networks are available.

EDI Windows "Jobs" can be defined to perform communications, transfer data, execute EDI translation, send mail, create reports, update applications, extract data from applications and/or execute user programs. Jobs can run on demand, on an unattended schedule, or as called from within user programs.

Contact Trinary Systems Inc., 17187 N. Laurel Park Dr., Ste. 348, Livonia, MI 48152; (313) 462-0056.

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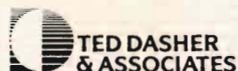
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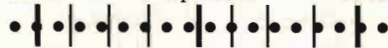
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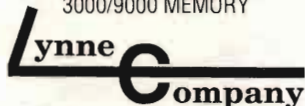
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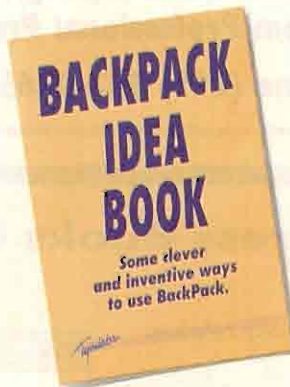
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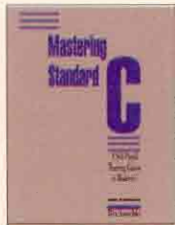
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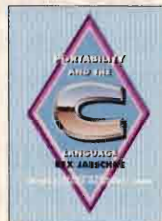
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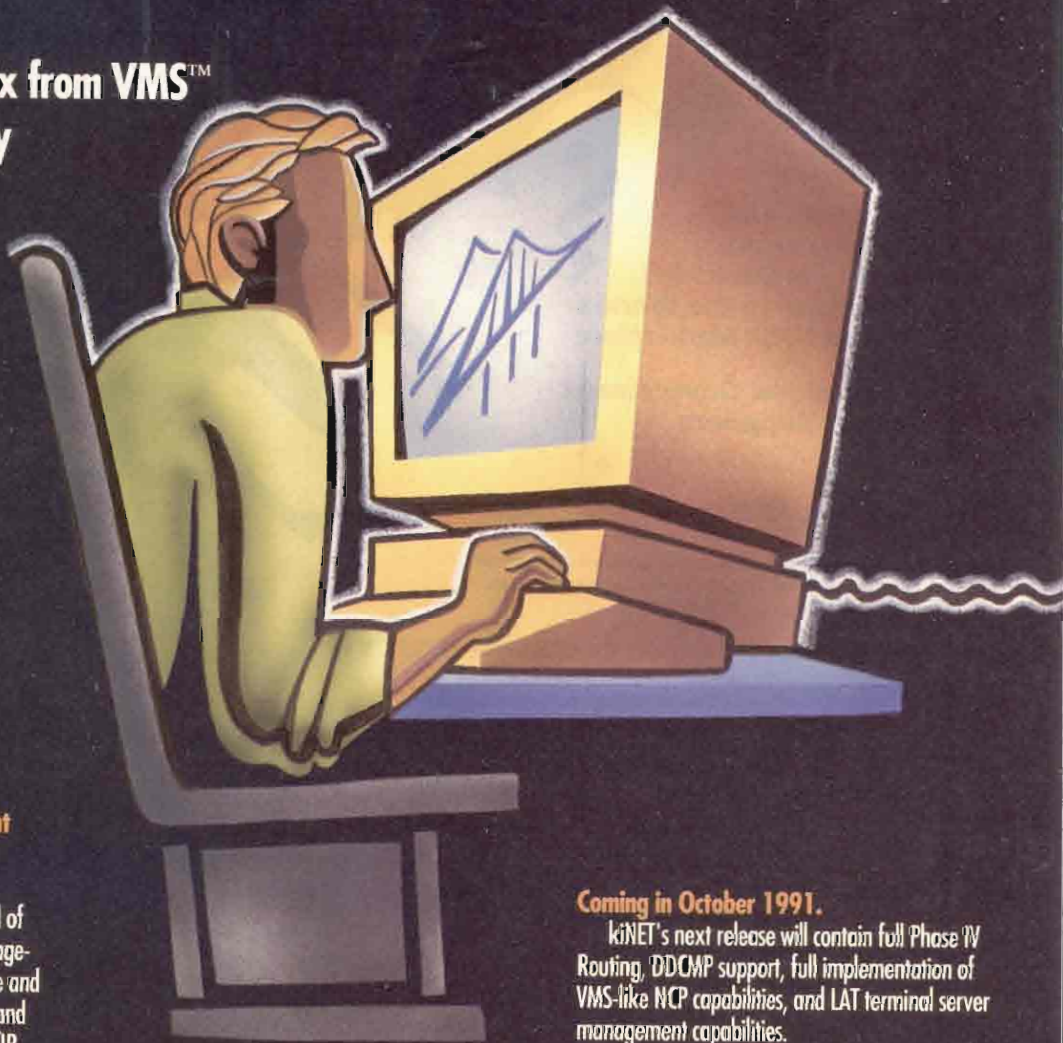
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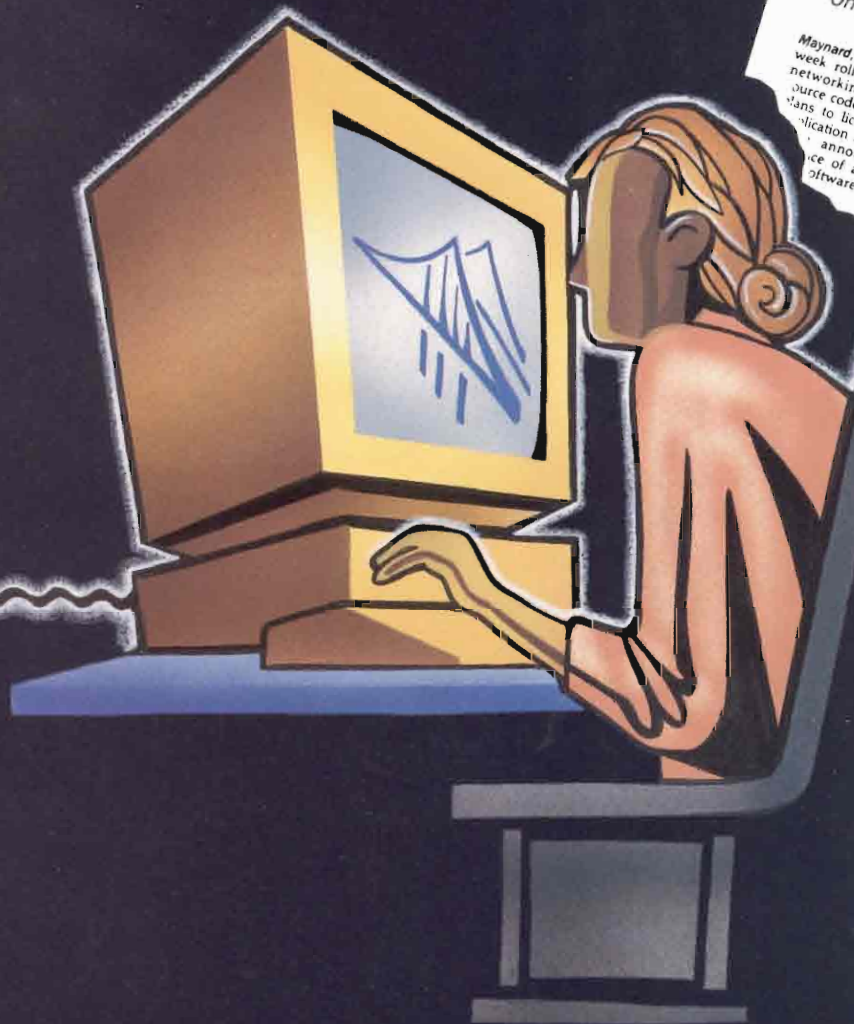
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BY MITCH WAGNER

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The undersigned Vendors and End Users acknowledge and are encouraged by DEC's most recent announcements in regard to providing DECnet as a defacto/non-standard protocol across UNIX platforms by making their Ultrix DECnet "End-Node" code available.

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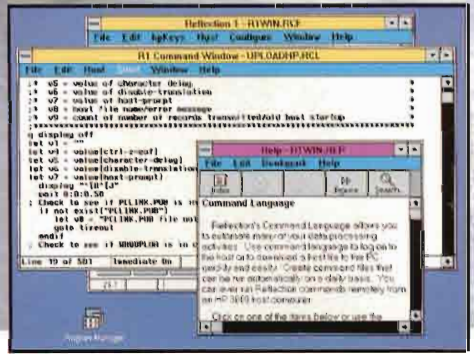
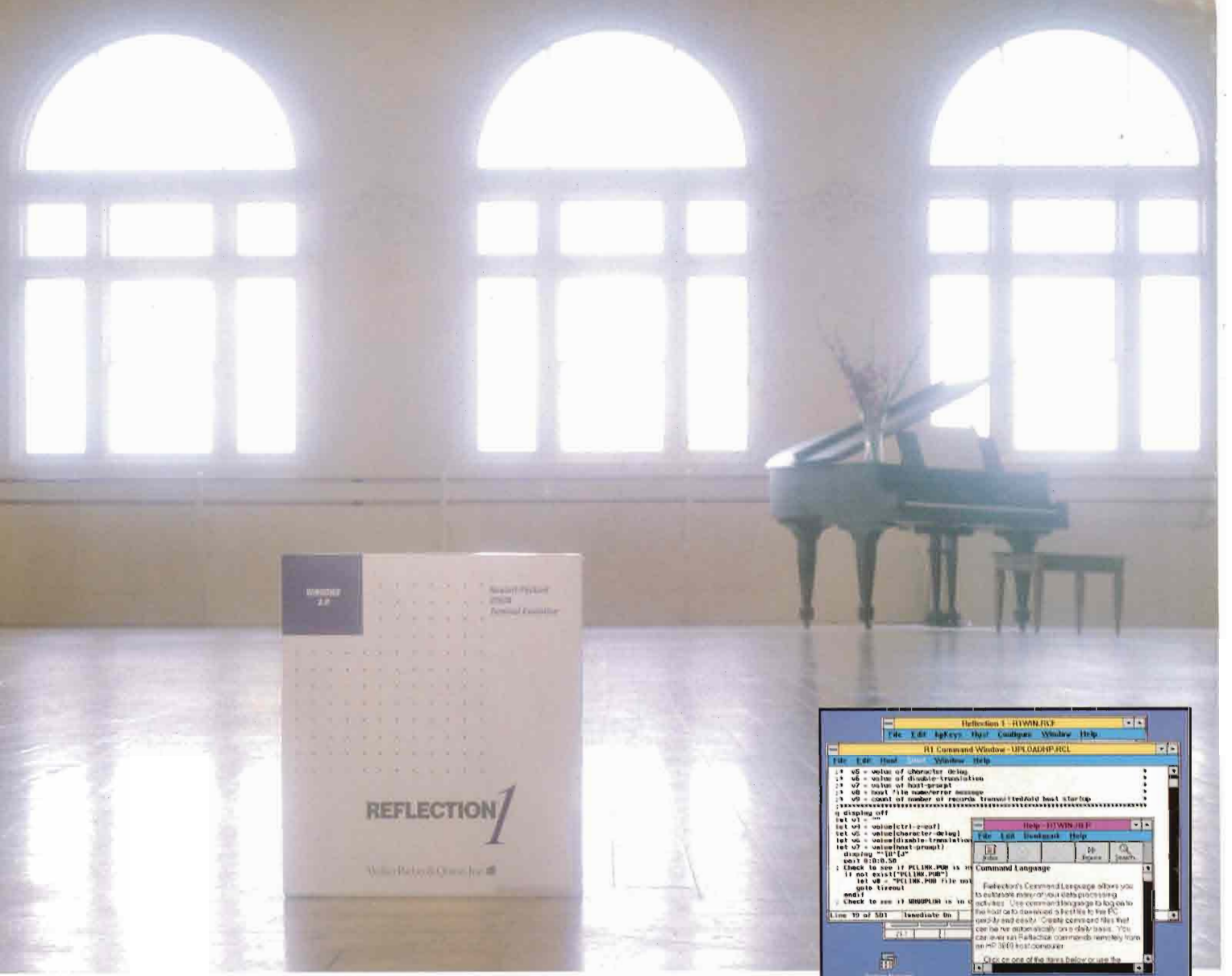
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