The Magazine For Hewlett-Packard Enterprise Computing

HP Professional

NOVEMBER 1994

SPECIAL SUPPLEMENT
Mass Storage Technologies
BEGINS AFTER PAGE 16

THE STRAINS OF DISTRIBUTED COMPUTING

PCs AND WORKSTATIONS HARMONIZE

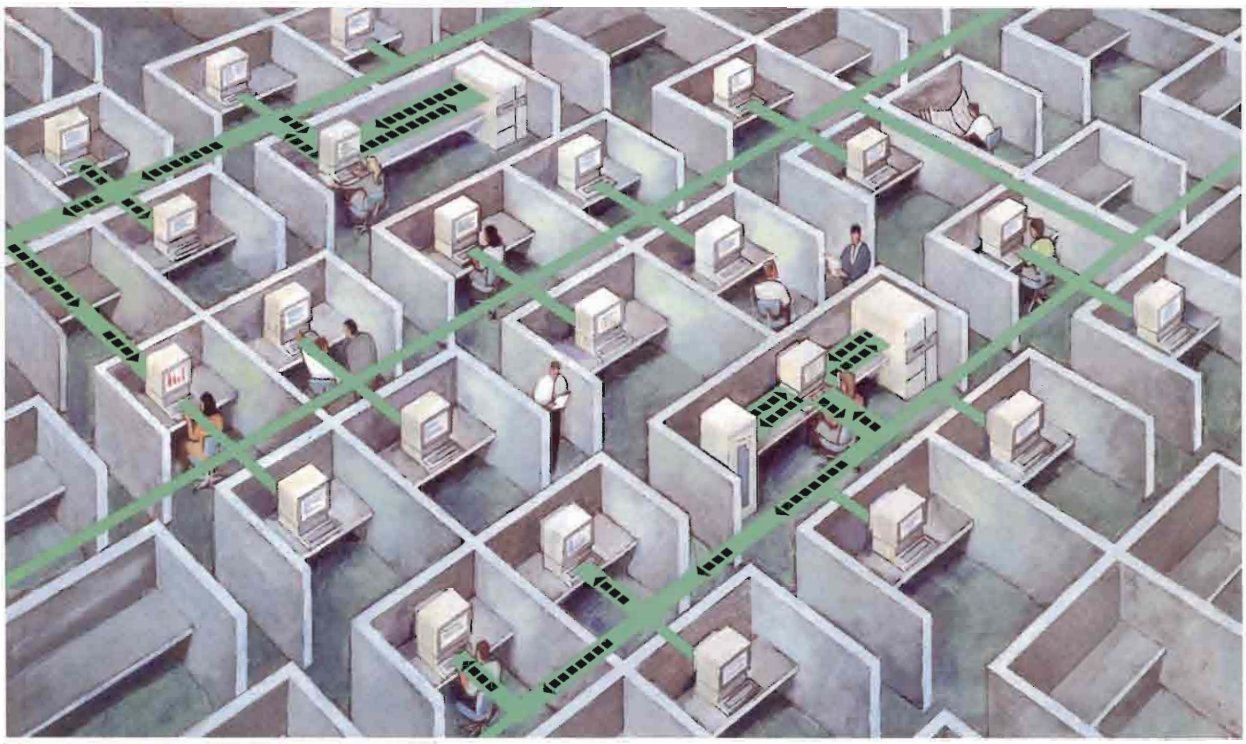
NETWORKING: INTRO TO X

INsites: MEADOX MULTIVIEW

Enterprise-Wide Integration

Variations On A Theme

FileTrek: The Software That Helps Data Navigate Your Enterprise.



Don't let your data take another uncharted trip—let FileTrek guide your files.

FileTrek™ automatically and transparently transports your data to and from the most cost-effective storage medium—hard disk, optical jukebox, or 8mm stackers. This client/server, network-based, distributed Hierarchical Storage Management (HSM) software adds value to your entire enterprise:

- Uses accepted industry standards to protect hardware and software investments, promote system portability, and support heterogeneous environments. Standards include IEEE Mass Storage System Reference Model, IEEE Optical Systems Architecture, OSF Distributed Computing Environment, MIT X11, and OSF Motif.
- Allows storage devices to be moved from workstation to workstation, and media to be moved from storage device to storage device, without disrupting the system.
- Allows multi-tiered migration from hard disk to storage device, and from storage device to storage device.
- Provides network managers with a secure yet flexible method of migrating data. File migration criteria can be set up for each workstation and may be based on age, size, location, ownership, frequency, and high water mark.
- Makes all storage options across the network appear like local unlimited file space.
- Supports SunOS, Solaris and HP-UX platforms.
- Works seamlessly with Artecon's hardware storage options (HP, NKK, IDE jukeboxes; and Exabyte 8mm stackers) to form the total storage solution.

Call Artecon today. Optimize network storage and take control of your enterprise's data with FileTrek.

1-800-USA-ARTE
1-800-872-2783

Enterprising solutions for your enterprise.™

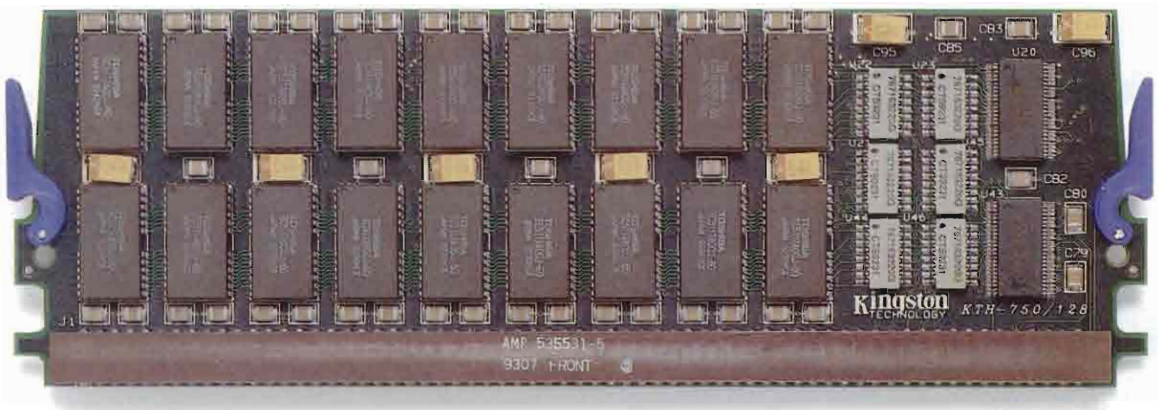
Artecon ™

CIRCLE 242 ON READER CARD

PO Box 9000, Carlsbad, CA 92018-9000
(619) 931-5500 FAX (619) 931-5527
email: sales@artecon.com
A Member of the Nordic Group of Companies

Artecon Canada, Inc. (416) 487-7701 ▲ Nihon Artecon, Ltd. 81-3-3280-1210 ▲ Artecon, S.A. 33-1-69-1818-50

Artecon and the Artecon logo are registered trademarks of Artecon, Inc. All other trademarks are proprietary to their respective manufacturers.



Now Shipping!
HP/Apollo Series 9000 Model 750, 755 Memory

KTH 750/128
32, 64, 128MB

The HP Memory To Remember.

Hewlett-Packard Memory Enhancements

Kingston's HP and HP/Apollo memory enhancements lead the industry in competitive pricing, reliability, compatibility, selection and availability. Our workstation memory is backed by a lifetime warranty and free, comprehensive technical support. With Kingston HP and HP/Apollo compatible memory upgrades, you may spend less, but you truly get more.

Guaranteed Compatibility

As a Hewlett-Packard Channel Partner, we guarantee absolute compatibility of our memory upgrades with HP and HP/Apollo systems. We test every memory upgrade with HP's own system diagnostics and operating system. Our memory upgrades are so compatible that Hewlett-Packard itself is a regular customer!

HP/Apollo Memory	
HP 3000 Business Systems 9X7 Series	16MB, 32MB and 64MB kits
HP/Apollo 9000 400 Series	4MB, 8MB, 16MB and 32MB kits
HP/Apollo 9000 700/RXstations	1MB, 2MB, 4MB and 8MB modules
HP/Apollo 9000 700 Series	8MB, 16MB, 32MB, 64MB and 128MB kits
HP 9000 Business Servers 8X7 Series	16MB, 32MB, 64MB and 128MB kits

Kingston has a full line of memory and storage upgrades for most popular HP and HP/Apollo workstations. With new products being announced every week at Kingston, give us a call for our latest offerings.

Kingston Storage Products

Having built our business around high quality computer memory, we've gone the next step and developed a solid family of storage products. Whether you need internal or external, fixed or removable storage solutions, Kingston has the reliable products for your system.

For More Information

Call our workstation memory experts at ***(800) 251-9056*** *or* ***(516) 673-6300*** *(East coast office). We'll be happy to answer any questions you have about our memory upgrades for Hewlett-Packard, Data General, Digital Equipment, IBM, NeXT, Silicon Graphics, Solbourne, Sun and other popular workstation manufacturers.*

Kingston Makes Memory For Workstations From These Manufacturers:

- *HP*
- *Data General*
- *Digital Equipment*
- *Sun*
- *NCD*
- *IBM*
- *NeXT*
- *Silicon Graphics*
- *Solbourne*
- *Tektronix*

Kingston TECHNOLOGY CORPORATION

THE INSIDE NAME IN UPGRADES

17600 Newhope Street, Fountain Valley, California 92708 (800) 251-9056 (714) 435-2667 Fax (714) 435-2618

CIRCLE 281 ON READER CARD

LIE BACK WHILE YOUR NETWORK BACKS UP.

Now, you can relax with IEM and Alexandria. Alexandria is designed to supervise every facet of your UNIX network backup. So, while you are taking it easy, Alexandria will:

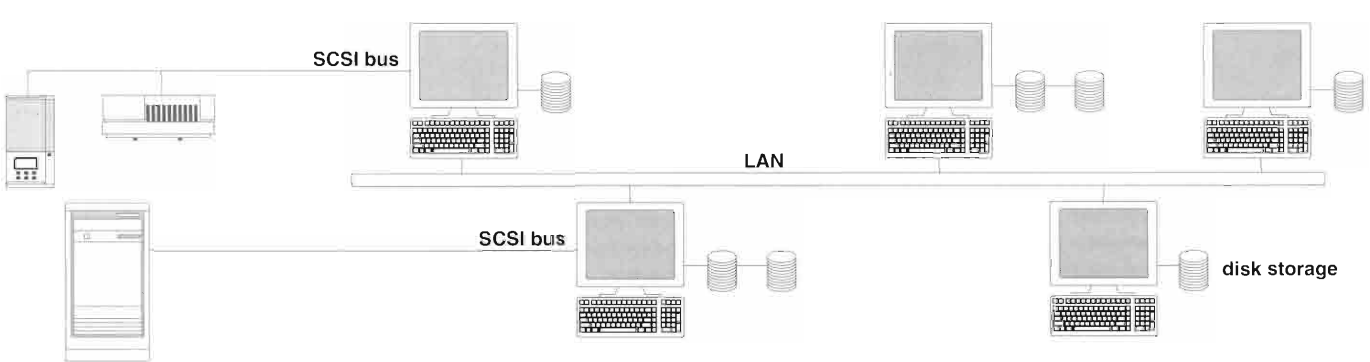
- **Work 24 hours a day, 7 days a week, and never take vacation.**
- **Organize and automate your system backups and archives.**
- **Manage all of your backup media — including optical.**
- **Back up your entire network — even if it consists of several UNIX platforms.**
- **Work with IEM's 4mm and 8mm carousels and autofeeders as well as HP's optical libraries.**

Backup Devices
Drives, Autofeeders, and Jukeboxes

- *4mm tape*
- *8mm tape*
- *3480 tape*
- *Optical disk*

Alexandria Servers
HP 9000 700/800 and non-HP UNIX-based machines

Alexandria Clients
HP 9000 300/ 400/ 700/ 800 and non-HP UNIX-based machines



IEM specializes in HP-compatible solutions. For more information on IEM products, please contact us at one of the numbers below.

In the U.S. and Canada:
IEM, Inc., P.O. Box 1889
Fort Collins, CO 80522 USA
Phone: (1) 303-221-3005
(1) 800-321-4671
Fax: (1) 303-221-1909

In the United Kingdom:
IEM Europe, Ltd., Colorado House,
Cromwell Park, Banbury Road,
Chipping Norton, Oxfordshire OX7 5SR
Phone: +(44) 608 645000
Fax: +(44) 608 645155

All Others
IEM International Sales
1629 Blue Spruce Drive
Fort Collins, CO 80524 USA
Phone: +(1) 303-221-3005
Fax: +(1) 303-221-1909

© 1994 Anis Inc., A1.0694
Alexandria is a trademark of Spectralogic

CIRCLE 122 ON READER CARD

Contents

November 1994

Vol. 8, No. 11

When Worlds Collide

26

By Marty Poniatowski

The integration of PCs and workstations doesn't have to be the cataclysmic collision it was once thought to be. DCE brings galactic harmony to your network environment.

Share The Wealth

34

By Feisal Mosleh

As businesses migrate their applications and data onto multivendor platforms, they are replacing mainframe-based OLTP software with client-server-based OLTP software. And Encina/9000 is a key component of the OLTP evolution.

COLUMNS

UNIX: Correspondence Preponderance
By Miles B. Kehoe
Forwarding And "I'm Out" Responses Available From UNIX Mail **40**

Networking: X On The HP 9000 Series 800
By Tim Cahoon
X Terminals Help Make The Shift To UNIX Easier **42**

Objectively Speaking: So Many Objects, So Little Time
By Richard Riehle
Choosing An Object-Oriented Method Can Be As Easy As Choosing Between Scylla And Charybdis. **46**

Managing Your HP 3000: A SPOOK-y Replacement
By John P. Burke
It's 10 O'clock. Do You Know What Your Spooler Is Doing? **49**

And Another Thing: To Manage Or Not To Manage
By Gordon McLachlan
For Some, Holding A Management Position Can Lead To Burnout **64**

Editorial 7

Letters To The Editor 8

Industry Watch 14

INsites 24

New Products 51

Reader Information 58

Product Showcase 59

Advertiser Index 63

PRODUCT WATCH:

Cognos Inc.'s PowerPlay 4.0 16

Interleaf Inc.'s WorldView2 18

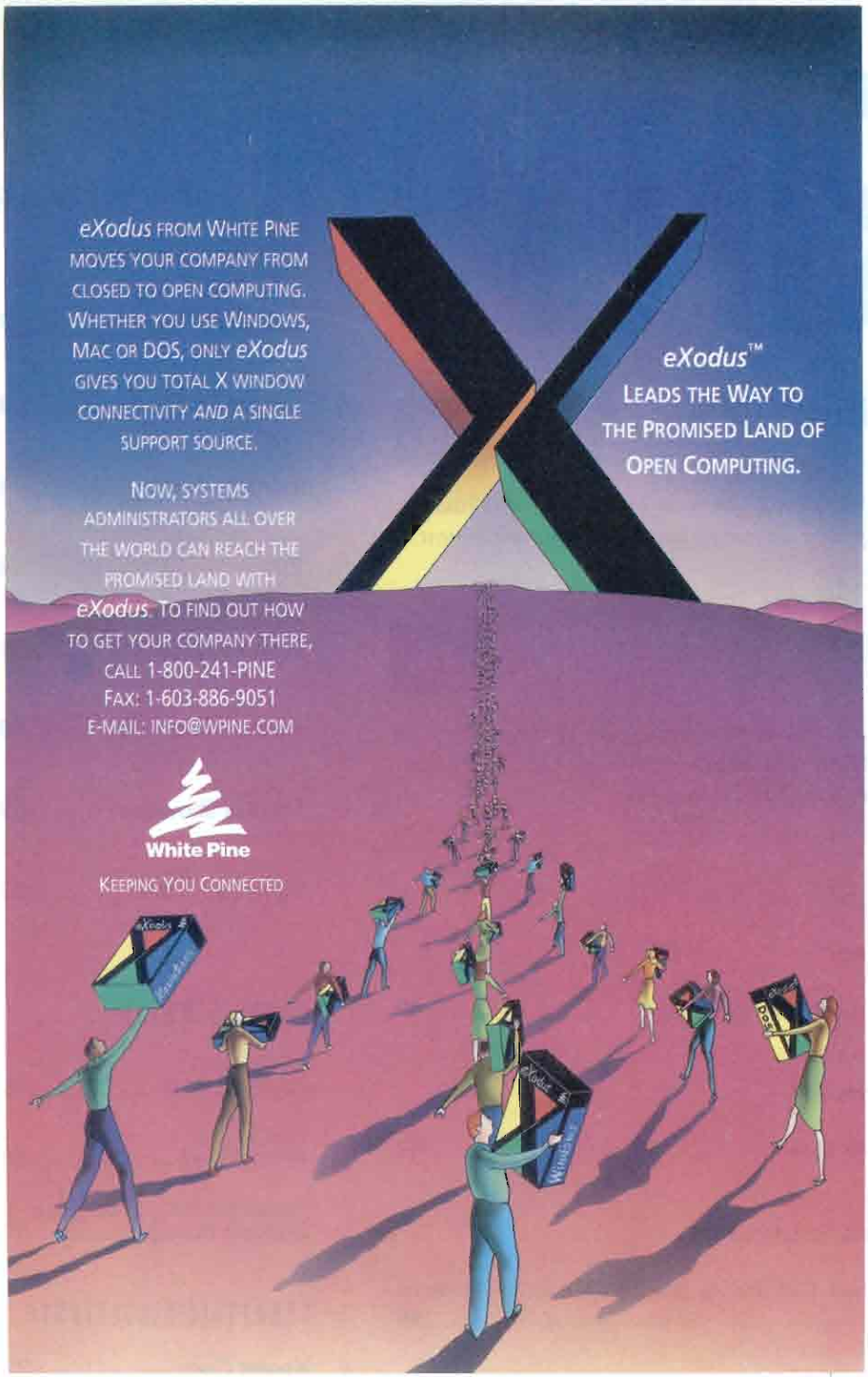
Novadigm Inc.'s Enterprise Desktop Manager 20

STRATEGIC DIRECTIONS:

Xpoint Corp. 22

HP Professional

Cover Photo by Terry Vine/Tony Stone Images



CIRCLE 476 ON READER CARD

HP PROFESSIONAL EDITORIAL ADVISORY BOARD

Patrick A. Adamiak
HP 3000 Product Marketing Manager

Nigel Ball
Marketing Director For HP's General Systems Division

Thomas W. Crowley
Director of MIS at Barber Colman

Glenn Osaka
General Manager of HP's Professional Services Organization

John R. Logan
Vice President of Aberdeen Group Inc.

Michael J. Meinz
Principal Technical Consultant at General Mills Inc.

Bard F. White
CIO and Worldwide Director of MIS for Spalding Sports Worldwide

HP Professional

PUBLISHER Leslie Ringe

EDITOR-IN-CHIEF Charlie Simpson
TECHNICAL EDITOR George A. Thompson
ASSISTANT EDITOR Deborah Schwartz

APOLLO EDITOR Fred Mallett
HP 3000 EDITOR John P. Burke
NETWORKING EDITOR Tim Cahoon
PC/UNIX EDITOR Miles B. Kehoe
SOFTWARE ENGINEERING EDITOR Richard Riehle
CONTRIBUTING EDITOR Gordon McLachlan
CONTRIBUTORS Jim Esch, Feisal Mosleh, Marty Poniatowski
EXECUTIVE CONSULTANT Carl B. Marbach

TECHNICAL SERVICES

DIRECTOR OF TECHNICAL SERVICES David B. Miller

DESIGN & PRODUCTION

EXECUTIVE DESIGN DIRECTOR Leslie A. Caruso
ART DIRECTOR Al Feuerstein
ASSOCIATE ART DIRECTOR Jennifer Barlow
DESIGNER Patty Wall

PRODUCTION MANAGER Bill Hallman

CIRCULATION

CIRCULATION MANAGER Ron Langmacher
DIRECTOR OF FULFILLMENT Marjorie Pitrone
CIRCULATION CONSULTANT Carrie Eisenhandler
CIRCULATION COORDINATOR Doreen Schrack

MARKETING

PROMOTIONS DIRECTOR Timothy M. Kraft
MARKETING MANAGER Gloria Goodwin
SENIOR GRAPHIC DESIGNER Christine Minder
GRAPHIC DESIGNER Mark Broomell

GROUP PUBLISHER Jeffery S. Berman

CARDINAL BUSINESS MEDIA, INC.

PRESIDENT AND CHIEF EXECUTIVE OFFICER: *Robert N. Boucher*
VICE PRESIDENT & CHIEF OPERATING OFFICER *James S. Povec*
VICE PRESIDENT & CHIEF FINANCIAL OFFICER *Thomas C. Breslin*
VICE PRESIDENT, PUBLISHING SERVICES *R. Patricia Herron*
VICE PRESIDENT, HUMAN RESOURCES *Dorothy J. Flynn*

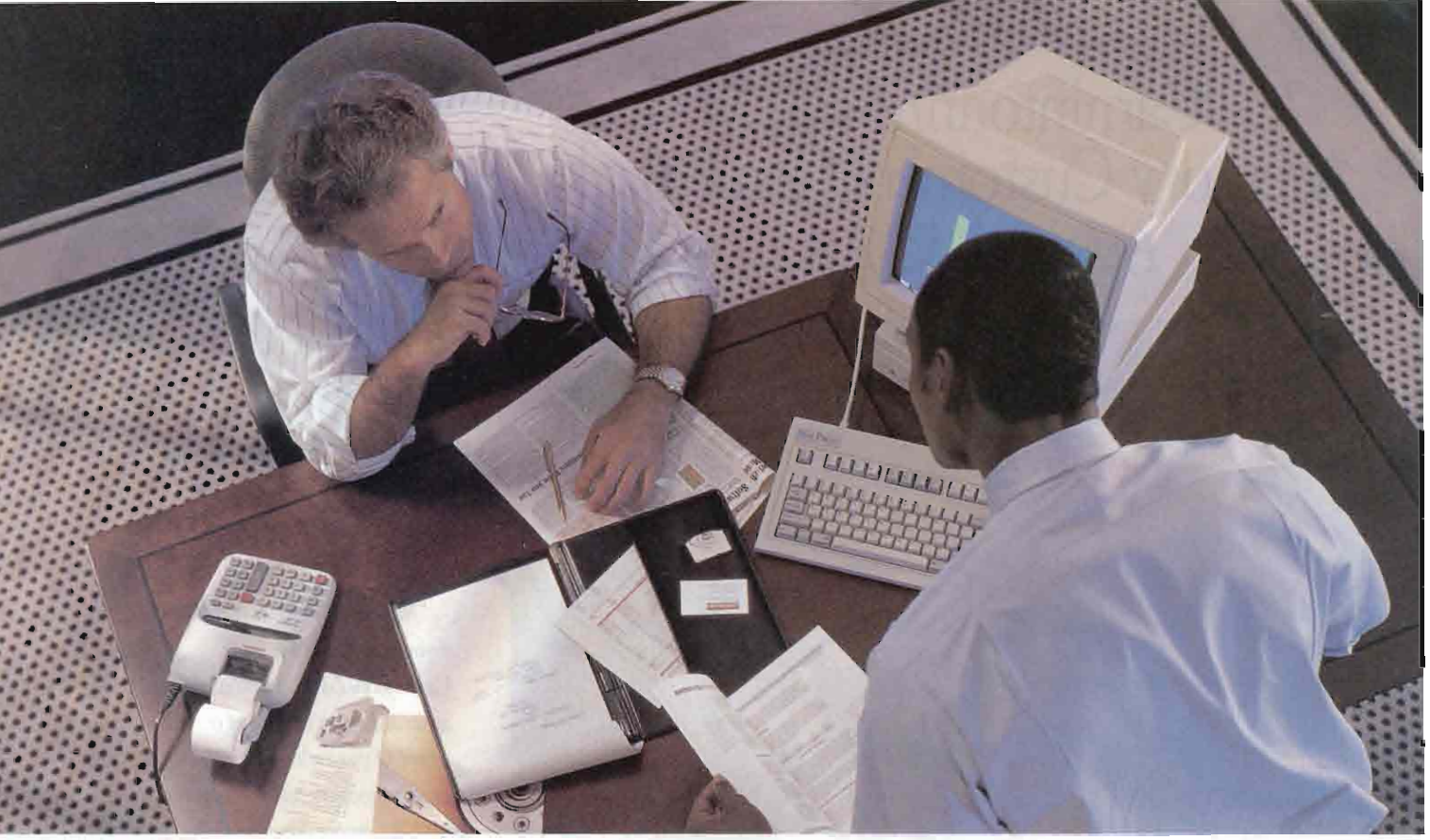
For more information on how to contact your sales representative, see page 63. For address changes or other subscription information please call (708) 564-1385 or FAX (708) 564-9002. Editorial, advertising sales and executive offices at 1300 Virginia Dr., Ste. 400, Fort Washington, PA 19034 ■ (215) 643-8000 Corporate FAX (215) 643-8099. To reach staff listed on masthead via UUNET, send MAIL to: LAST NAME@CARDINAL.COM

HP PROFESSIONAL ISSN 0896-145X is published monthly by Cardinal Business Media Inc., 1300 Virginia Dr., Ste. 400, Fort Washington, PA, 19034. Subscriptions are complimentary for qualified U.S. and Canadian sites. For reprints, contact Reprint Management Services, 505 E. Airport Rd., Lancaster, PA 17601; (717) 560-2001, Fax (717) 560-2063. Second Class postage paid at Fort Washington, PA 19034, and additional mailing offices. POSTMASTER: Send all correspondence and address changes to HP PROFESSIONAL P.O. Box 3052, Northbrook, IL 60062.
COPYRIGHT © 1993 by Cardinal Business Media Inc. All rights reserved. No part of this publication may be reproduced in any form without written permission from the publisher. All submitted manuscripts, photographs and/or artwork are sent to Cardinal Business Media, Inc. at the sole risk of the sender. Neither Cardinal Business Media, Inc. nor HP PROFESSIONAL magazine is responsible for any loss or damage. HP PROFESSIONAL is an independent journal not affiliated with Hewlett-Packard Company. HP and Hewlett-Packard are registered trademarks and HP PROFESSIONAL is a trademark of Hewlett-Packard Company.

Canada Post International Publication Mail (Canadian Distribution Sales Agreement # IPM0264431

Printed in U.S.A.

BPA ABP



Storage isn't all zeros and ones. It's dollars and cents.

The underlying technology is important — but the *cost* of long-term storage management is a key business issue. To best meet the needs of your application environment and the scope of your budget, let Dataram help develop your storage investment strategy.

Profit from our technology and our experience.

Dataram's RAID-Ready™ and DATARAID® high availability storage solutions, and our storage consulting services, are focused on protecting and managing your data more efficiently.

1-800-DATARAM

Save time. Save energy. Save money. Call to schedule your storage management review or to find out more about our memory and storage solutions.

Your storage supplier should be more than just bits and bytes.
Dataram...your business partner in storage management.

DATARAM
Memory & Storage Specialists

CIRCLE 240 ON READER CARD

Camintonn/Z-RAM Memory Customers Come Back Again And Again.

Memory products for:
digital
HP Apollo
IBM RISC
Silicon Graphics
SUN
PCs and
Laser Printers

Why would you leave the nest if you're well taken care of? Camintonn/Z-RAM customers come back again and again because of our 12-year record of proven leadership. Not just in high quality products, but also in prompt customer service, knowledgeable technical support, and a 24-hour repair-or-replace guarantee. Backed by a lifetime warranty.

And since Camintonn/Z-RAM has the broadest line of memory products available, manufactured and rigorously tested in the United States, the quality product you need is ready for immediate delivery. What's more, we're almost always the first to offer 100% compatible memory for the newest systems – often before they're available from the original manufacturers. Guaranteed performance and a 12-year track record of growth and financial stability. That's a message worth repeating. Call us at 1-800-368-4726 for an immediate quote for your system.

Because We Take Care Of You.

FREE
Camintonn/Z-RAM Atlas
Your Guide To The World Of Memory

Fax this form back to us and we'll send you the Z-RAM Atlas – a $49.95 value!

Name _____
Title _____
Company _____
City/State/Zip _____
Phone _____ Fax _____

Which computer platforms are currently in use at your company? (check all that apply)

DEC _____ SGI _____
HP _____ SUN _____
IBM _____ PC LANs _____

CAMINTONN CORPORATION
The last word in memory
Z-RAM®

Tel: 800/368-4726 or 714/454-1500
Fax: 714/830-4726
U.K. Tel: 44/865-784747 • Fax: 44/865-784750

Camintonn/Z-RAM world headquarters located at 22 Morgan, Irvine, CA 92718-2202. European headquarters located at Oxford Science Park, OX4 4GA, U.K.
© 1994 Camintonn Corporation. Product and company names are trademarks or registered trademarks of their respective companies.

See us at COMDEX, Booth #5230.

CIRCLE 294 ON READER CARD

See us at DECUS, Booth #720.

Into The Valley?

DEC To The Left, IBM To The Right; HP Charges Forward

By Charlie Simpson

There's nothing wrong with good healthy competition, it builds corporate character and thrills customers. Just ask AT&T and MCI. And now, HP has joined the pack of the hungry. In late September, HP publicly, officially, unashamedly announced its "AS/sault" on IBM's AS/400 system.

Now if it were only the D-Day that the *New York Times* and *Wall Street Journal* made it out to be. With HP's resources stretched across other fronts, this could turn out to be another Bay of Pigs. Or at best it will HP's own little Grenada, a temporary public relations coup.

Granted it's somewhat exciting to see the competition being named in ink. I was getting a bit nauseated by "the other computer company," or "our competitors, who are also our partners in some regard," euphemisms that have been choking the press.

However, according to Tom Willmott of the Aberdeen Group, "HP has been challenged by the AS/400 for years, despite the 400 being a proprietary system." HP is now attempting to identify an audience of high-profile users in the IBM arena, much like it did a few years ago when it went after mainframe users. Makes sense.

Despite the already impressive list of defectors, including Andersen Consulting, SSA, Synon and XL/Datacomp, Willmott points out that, "HP will have to do more than a bold ad campaign" and price incentives to win the loyal AS/400 VARs and users.

Having made headway into the large environments, HP must now storm the hill of small- to medium-size businesses where the AS/400 is firmly entrenched. For despite its "proprietariness," the AS/400 offers these shops a turnkey total package solution. Something most of these small-shop, non-techie, UNIX-shy IS people still seek.

And even if HP convinces the AS/400 camp that the hardware is right, there is still millions of dollars in existing software solutions. These solutions will have to be converted to the HP way at a cost. The small companies may not have the bucks and the 30 percent discount might not be enough to cover the switch.

And what about all the loyal HP troops who have been buying HP equipment all along? Where are their discounts? Are they left with, as John Logan of Aberdeen Group suggests (and not jokingly) between trips to Italy and Denmark, "having to buy a used AS/400 and then trading it in to HP."

Maybe AS/400 users don't want HP's discounts. The IBM user group, COMMON, elected to not allow HP to display hardware at their recent conference in San Antonio. Also, some ISVs are reporting that the announcement helped them sell AS/400s because users now have a backup strategy to port to in the future, if necessary.

So, as far as making good copy for the trade papers, the AS/sault campaign is fun. But it's going to be a long, cold winter, and HP better be prepared to dig in and fight.

• • • • • • • •

For years, you've been reading our views in our editorial and back page columns. Beginning in 1995 *HP Professional* opens up the back page to our readers. If there is an issue you feel passionately about, or want let the world know about, let us know. We'll publish articles, comments, tips, techniques, beefs, poems and prose on subjects that will help other readers solve their HP computing problems.

Charlie Simpson

simpson@cardinal.com

Words On Wireless

I just finished reading George A. Thompson's article, "Remote Possibilities" from the July 1994 issue, and I wanted to let you know that I thought the piece was very well done. It covered the major players in the wireless networking market, and explained each technology in an understandable way. You were also able to differentiate the individual companies from one another, which is often so difficult to accomplish.

I also wanted to let you know that Photonics Corp.'s address has changed. The new address is: 2940 N. First St., San Jose, CA 95134. The new phone number is (408) 955-7930, and the fax number is (408) 955-7950.

I hope to see further articles focusing on wireless LANs.

Elizabeth Cardinale
Associate Account Executive
Miller Communications

STANDARDS ARGUMENT

To me, there are even too few or ill-defined standards around. It's a daily nuisance to combine software with software, or hardware with hardware. We were even apt to accept the de-facto monopoly of companies like Microsoft just to get some de-facto standards! Well, it shouldn't be.

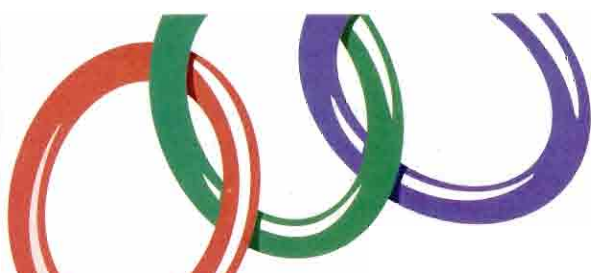
Thomas Pauli
System Management
PSI AG at BAM

EDITORIAL KUDOS

It was with a great deal of interest that I read your latest editorial in September 1994 issue. Your use of personal experience as an analogy was superb. With little fanfare I also noticed the addition of an Internet mailbox that I could not ignore. Keep up the good work.

James G. Hayhoe
Manager, Technical Services
Westinghouse Electric

HP Professional welcomes comments from its readers. Letters may be edited for brevity and clarity, and should be addressed to: HP Professional, 1300 Virginia Dr., Ste. 400, Fort Washington, PA 19034. Fax number: (215) 643-4827. Internet address for staff listed on the masthead:
LASTNAME @ CARDINAL. COM
Please include a phone number for verification.



Forge a Link Between Client & Server with MiddleMan™

MiddleMan is a powerful new software development tool designed for building client/server applications in a networked Windows environment. With **MiddleMan** you can link the flexibilitiy of PC's with the centralized control of host systems.

A suite of host server programs and a client component provide the core of **MiddleMan's** functionality. Access to the server programs can be made from almost any MS Windows program through **MiddleMan's** Client Interface Program via DDE. This means that most MS Windows programs have access to the server programs on the HP3000 by using their built-in macro language. MiddleMan **features:**

- Direct Image and TurboImage database access. Developers can design applications that read, write, delete and update databases, KSAM or MPE files.
- No terminal emulation software is required to use applications developed with **MiddleMan** as no session is needed on the HP3000.
- Powerful trace and debugging facility for application testing and error correction.
- A network file transfer facility is included and can be used simultaneously with multiple server programs.

MiddleMan requires HP's ThinLAN Link on the HP3000 (product #36923A ThinLAN 3000/iX Network Link). Prices for **MiddleMan** start at just $995.00 and include both host and client programs.

MINISOFT

MiniSoft Inc.
312 Maple Ave.
Snohomish WA 98290
FAX 206/568-2923
Ph. 800/682-0200

MiniSoft Marketing AG
Papiermühle
CH-6048 Horw, Switzerland
FAX 41.41.47 38 66
Ph. 41.41.47 23 20

MiddleMan is a registered trademark of MiniSoft Inc. All other trademarks are the property of their respective owners.

CIRCLE 472 ON READER CARD

PICK A CARD.

Any card. The memory you need is in stock, tested and ready to go. Order today. Upgrade your system tomorrow.

You'll get the quality and service you expect from the leader in HP workstation enhancements. We specialize in HP, it's the platform we know best.

Newport Digital TURBO cards and memory products are guaranteed to meet or beat HP quality standards. Every card we ship has been rigorously tested in a fully functional workstation, just like yours.

Risk free. Our total quality program gives us the confidence to offer an unconditional lifetime warranty. If one of our products fails, we'll ship a replacement by overnight express. We'll do anything we can to keep your workstation working.

Call Today. Speak with an expert on Hewlett-Packard computers. We'll make sure you get the cards you need.

Evaluate any of our memory products for 30 days. If you're not completely satisfied, return it without obligation.

NEWPORT DIGITAL

1-800-383-3642

CIRCLE 246 ON READER CARD

What Were HP Professionals Doing At Interex?

MEETING THE EXPERTS!

September 21, 1994, Denver, Colorado — The HP Professional booth at Interex 94 was buzzing with activity as dedicated HP 3000 users stopped by to meet one-on-one with Hewlett-Packard's HP 3000 Experts and HP Professional Technical Editor George A. Thompson.

Whether their questions pertained to new applications and tools for MPE/iX, HP's Client-Server Program, or MPE/iX and UNIX interoperability — everyone walked away with plenty of relevant technical information.

If you didn't have a chance to drop by this year, we'll see you next year!

In the meantime, contact HP Professional with your technical questions.

Photos: Gloria Goodwin

MARK HUDSON
HP 3000 Client-Server Program Manager
Hewlett-Packard

GEORGE STACHNIK
Product Manager MPE/iX
Commercial Systems Division
Hewlett-Packard

VINCE GRITSCH
Channel Development Manager
Commercial Systems Division
Hewlett-Packard

HP Professional

Charlie Simpson
Editor in Chief
(215) 643-8072

George A. Thompson
Technical Editor
(215) 643-8075

Deborah Schwartz
Assistant Editor
(215) 643-8074

WAnna Be Insignia.

We Finally Figured Out What Wabi Means.

	SoftWindows	Wabi
Number of compatible applications you can run	Thousands	13?
Networking capability	Yes – supports NetWare, LAN Manager, Banyan VINES, TCP/IP	Not yet
Number of UNIX platforms you can run them on	Sun, HP, IBM, Digital, and SGI	3?
Availability	Shipping	On & Off
Microsoft Windows 3.1 and MS-DOS 6.21 included	Pre-installed	No

Everybody needs somebody to look up to – if you're looking to run Microsoft Windows™ and MS-DOS®-based applications on your UNIX workstation, you'll look up to SoftWindows™.

Only SoftWindows provides complete Microsoft Windows and MS-DOS compatibility for thousands of applications, across a range of UNIX platforms. Plus access to PC networks, printers, modems, file servers and support for PC CD-ROMs. The best part is you don't have to grow up to be like Insignia – SoftWindows is shipping today! Call us about our free evaluation program: **508-682-7600.**

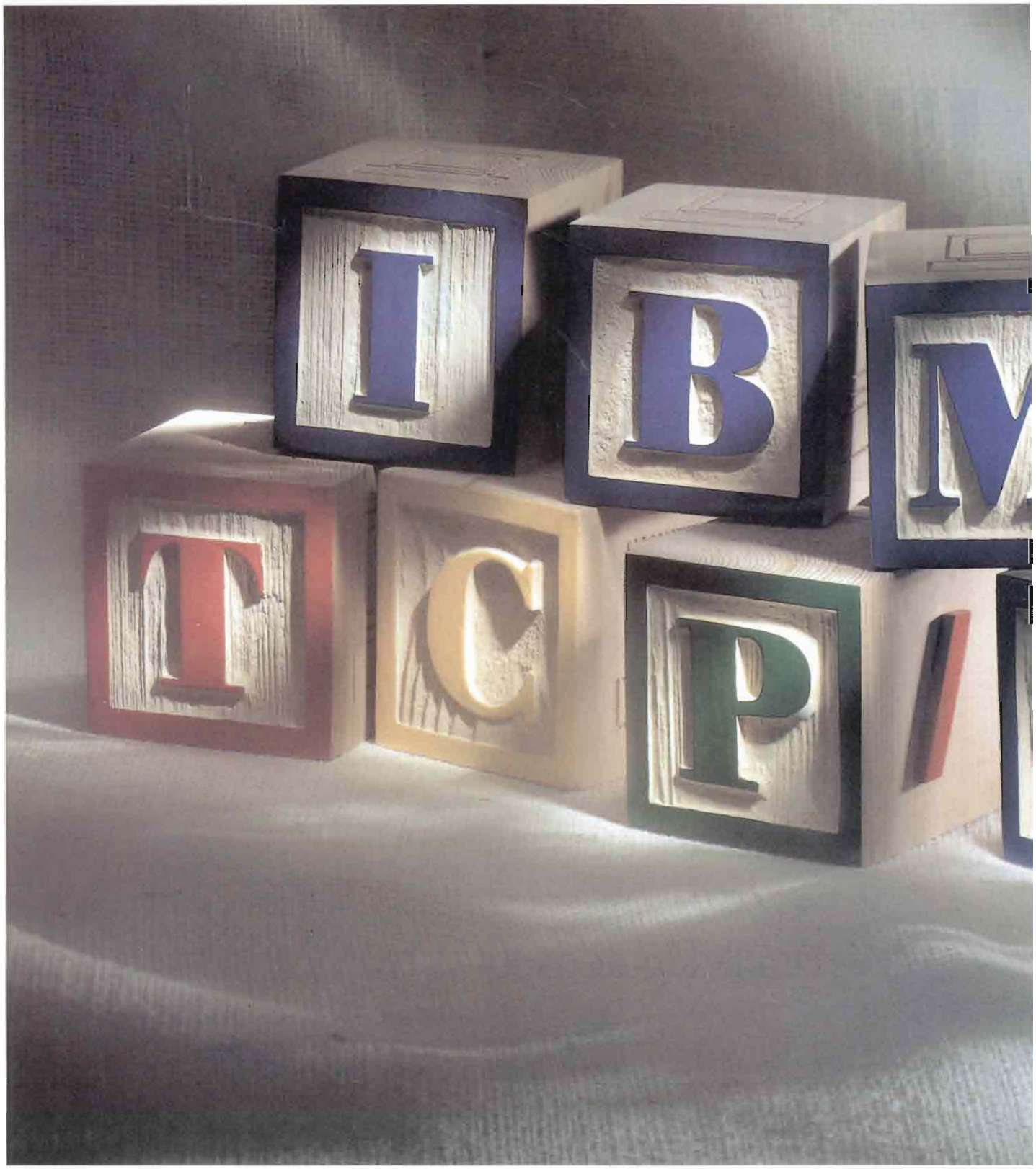
MICROSOFT WINDOWS COMPATIBLE

Insignia Solutions®

Insignia Solutions Inc., 6 Campanelli Drive, Andover, MA 01810

©1994 Insignia Solutions Inc. Insignia and Insignia Solutions are registered trademarks of Insignia Solutions Inc. Microsoft and MS-DOS are registered trademarks and Windows and the Windows logo are trademarks of Microsoft Corporation. SoftWindows is a trademark used under license. All other product names are trademarks or registered trademarks of their respective holders.

CIRCLE 218 ON READER CARD



A smart way to spe

It's also a smart way to maximize the PC networking capabilities of OS/2® or DOS with Windows.™ In fact IBM® TCP/IP workstation software is a perfect building block for linking users running on virtually all IBM environments including AIX,® OS/400,® VM and MVS, as well as non-IBM systems.

IBM TCP/IP for OS/2 or DOS/Windows

With IBM TCP/IP for OS/2 or DOS/Windows you not only get industry-standard network software, you also get a feature-rich package. File transfer, terminal emulation, mail, network printing, remote command execution and network management are just some of the applications included. Optional features include NFS,® Netbios, X-Windows (OS/2) and application development toolkits.

Of course one of the most attractive features of IBM TCP/IP solutions is the kind of support and service that only IBM offers. To order or for more information, call 1 800 CALL-IBM, Dept. SAO32.

IBM TCP/IP. When it comes to making it all work together, we know our ABCs.

IBM, OS/2, AIX and OS/400 are registered trademarks of International Business Machines Corporation. NFS is a registered trademark of Sun Microsystems, Inc. Windows is a trademark of Microsoft Corporation. Dealer prices may vary. © 1994 IBM Corp. All rights reserved.

CIRCLE 474 ON READER CARD

IBM

l interoperability.

George A. Thompson

HP Goes Mild To Wild

When normally born-to-be-mild HP launches an aggressive advertising campaign everyone takes notice, especially when it is directed at an IBM sweet spot — its 275,000 AS/400 user installed base.

HP's bold announcement of its AS/sault campaign (HP's internal code name) in early October surprised IBM which hastily launched a counter-attack via ads in the *Financial Times*, *New York Times* and *Wall Street Journal*. "It obviously hit a nerve at IBM," says Doug Gibson, marketing manger for HP's General Systems Division. "They are validating our program by their reaction to it."

The Open Midrange Alternative Program (OMAP) is targeted directly to IBM's AS/400 installed base who are moving toward client-sever computing. Although news reports have focused on the 30 percent discounts being offered by HP as part of the program, it's nothing new. Such discounts have been traditionally offered to large corporate customers — exactly those who are "feeling the most pain," according to Jim Yu, program manager for OMAP. More importantly, HP has set up seven transition centers (five in the United States and two in Europe) to provide education and training, and to leverage partnerships with tool providers. "Over 95 percent of the AS/400 CASE tool vendors are teaming with HP," says Yu.

Since 1991, HP's Mainframe Alternative Program (MFA) has been been successful by using a "surround strategy" to position HP 9000 and HP 3000 systems within corporations turning to UNIX for the first time. Despite its new 64-bit PowerPC-based Advance/36 platform alternative for S/36 users, transitions to a new RISC-based architecture are going to take time.

HP feels the time is now. HP's Gibson puts it this way, "IBM has acknowledged us a viable alternative."

HP SERVES UP VIDEO FOR CBS

While IBM AS/400 users ponder about their UNIX alternatives, CBS Television has already decided that HP's Video Server will be its first digital-based broadcast video server. Purchased from HP's two-year old Video Communications Division, the video server is expected to replace traditional videotape "cart" systems. A cart is a robotic carousel which manages a library of videotape cartridges and is programmed to play back commercials, promotional spots and other short-form pre-produced programming.

CBS plans to install the video server at WCIX-TV (Miami, Fla.), a CBS-owned television station. WCIX also will be using HP's ad-management software, for automating scheduling playback of adver-

tisements and programs to air. The HP software allows users to perform online programming of upcoming advertisements and other video clips at the same time that the server is feeding commercials and video clips to the transmitter for broadcast.

HP sold its first broadcast video server to KOLD-TV (Channel 13), a CBS affiliate in Tuscon, Ariz. In September, HP announced that Delta-System GmbH, an HP dealer in Munich, Germany will also use an HP broadcast video server in a turn-key installation for the Radio Television Luxemborg (RTL2) broadcast company (Munich, Germany). RTL2 is a subsidiary of CLT/RTL, a multinational company owned by Bertelsman, a well-known European publishing company.

Multimedia mavens take note: HP's video server can store 4,000 30-second commercials, uses MPEG compression and runs at the broadcast quality rate of 15 Mbps, but is user changeable over the range of 1.5 to 15 Mbps. Disk-based online storage is expandable from six hours to 51 hours of programming. With three video output channels, the server includes software redundancy, dual standby power supplies and failure-proof disk storage modules.

MR. BIGSHOT DATABASE

When you think video, you have to think storage. Consider the fact that it takes 100 GB to store three minutes of feature-length movie film. But HP and Sybase are thinking even bigger — as in terrabytes (TB).

In August, HP and Sybase agreed to create a Very Large Database (VLDB) engineering laboratory. Located in Emeryville and Cupertino, Calif., the labs' first milestone will be to get a one TB VLDB system up and running within a year, according to Dave Mascarenhas, manager of database consulting for HP's General Systems Division, who is responsible for engineering relationship with Sybase. Each facility is using a fully configured 12-CPU HP 9000 Model T500 Symmetric Multiprocessing Server (SMP).

Cable operator Telecommunications Inc. (TCI) is already testing a subscriber database running on Sybase 10. However, Mascarenhas notes that VLDBs "are not just a decision support solution. You can effectively manage an OLTP-based VLDB. Enhancements in hardware technology now make it possible to support large database caches and with RAID technology you can put a terrabyte on an individual spindle." In the future, HP and Sybase have plans to explore more complex data types, archive devices and HSM systems.

TOGETHER AGAIN

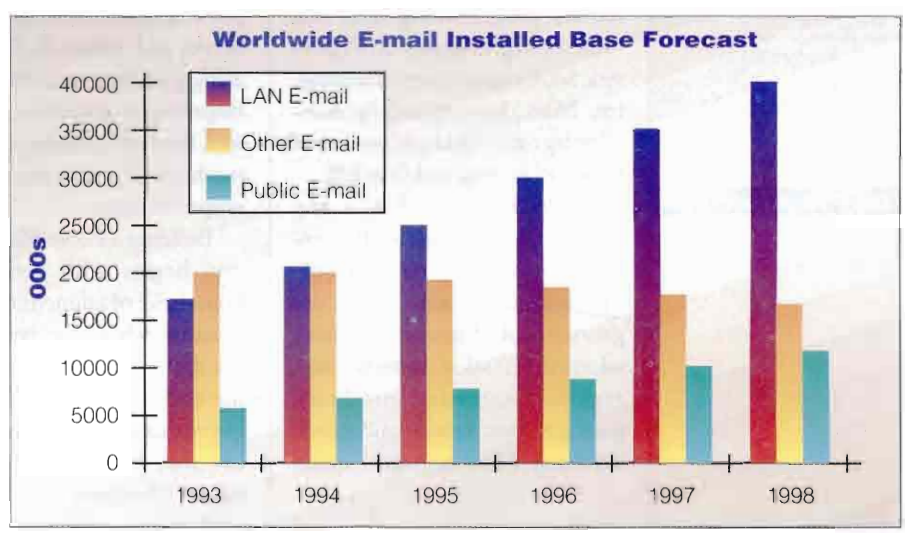
In October, HP and Sybase announced an alliance to jointly provide service and support to Sybase's workgroup-level customers. Sybase customers calling (800) 8-SYBASE will, depending on the operating system, be automatically routed to either Sybase or HP service centers.

All customer cases are shared via EDI, in a customized system that link the two companies call tracking systems. Operating systems covered by HP include Novell NetWare and UnixWare, OS/2, SCO UNIX, and Microsoft Windows, Windows NT and MS-DOS. Sybase products which HP is authorized to handle include SQL Server, SQL Server Manager for Windows, SQL Server Monitor for Windows, Back UP Server, Open Server, Open Client, Embedded SQL and connectivity products.

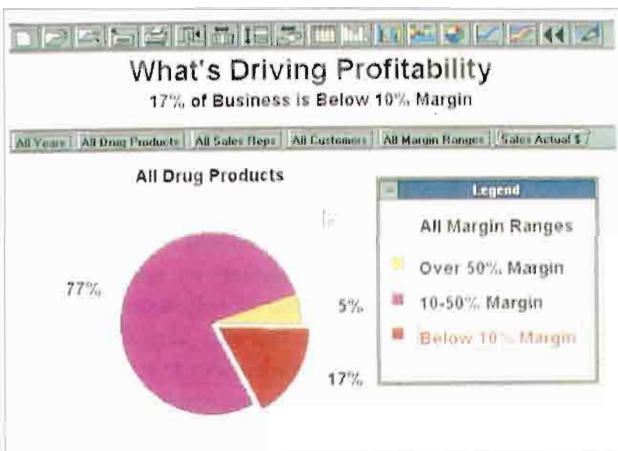
RESEARCH ROUND UP

- LAN-based E-mail remains the fastest growing sector in the worldwide messaging market, according to marketing research firm BIS Strategic Decisions (Norwell, Mass.). In 1993, there were 16.9 million LAN mail users worldwide, including 12.7 million in North America and nearly 3 million in Europe (expected to rise to 38.8 million by 1998). And by the end of 1994, LAN-based E-mail will overtake host-based systems for the first time. Key market drivers include the increased availability of mail-enabled desktop applications, continuing extension of employee mobility and the increasing adoption of groupware applications.
- According to the August 17, 1994 issue of *Market Viewpoint*, an industry newsletter published by the Aberdeen Group (Boston, Mass.), "Digital will never be the same as a supplier, as an employer or as an industry force." For existing Digital customers, Aberdeen is offering this recommendation: the CIO, IS Manager or whoever is responsible for the corporate IS strategy should immediately review their contingency systems migration plan. And to help those customers making the first-date after the Digital-initiated divorce, Aberdeen also offers a few partner suggestions: for general purpose, open systems computing — AT&T, Data General and HP; for scientific and technical computing — HP and Sun; for E-mail and departmental office automation functions — Compaq and Microsoft; for large-scale customized VAX clusters — Tandem; and for large scale worldwide systems integration services — IBM.

Thompson's Internet address: thompson@cardinal.com



Cognos' PowerPlay 4.0 Explores Brand New Dimensions



POWERPLAY 4.0

- Features include ranking, exception highlighting and suppression of zeros
- Runs in Microsoft Windows
- Cost is $695

Cognos Inc.

67 S. Bedford St.
Ste. 200W
Burlington, MA 01803
tel: (617) 229-6600
fax: (617) 229-9844

CIRCLE 351 ON READER CARD

Corporate data usually is not stored or organized in any way that resembles how a business is actually managed. Executive Information Systems (EIS) and Decision Support Systems (DSS) provide intelligence for that data, but often require programming skills that most managers simply don't possess. So, Cognos Corp. (Burlington, Mass.) is trying to help managers by offering a new version of PowerPlay — a codeless EIS.

Multidimensional is a key word for describing how PowerPlay works. For instance, a typical business contains several organizational dimensions (time, salespeople, sales districts, sales regions, countries, products, package sizes, brands and product lines). Most managers' questions deal with information or data at the intersection of two or three dimensions. "These kinds of questions are very hard to phrase in SQL, and when you do phrase it, it takes forever to get the answer back from a relational database," says Robin McNeill, director of PowerPlay Products for Cognos.

To create those dimensional structures, PowerPlay 4.0 includes the Transformer, previously a standalone component. The Transformer builds applications from flat data files, determining a drill-down structure. Dimensions can be renamed, reordered or regrouped. It understands calendar and fiscal years, includes current and prior period time choices, and presents dialogs for creating calculated measures. The Transformer accesses data sources like dBase, Paradox, FoxPro, Excel and Lotus, as well as Oracle, Sybase, SQL Server and other ODBC drivers using queries generated in Cognos' Impromptu database reporting tool. PowerPlay replaces outdated methods of providing access to corporate data.

Building a PowerPlay application begins with defining the boundaries of a dimension map — a matrix where the columns are the dimensions and the rows are the drill-down levels. Next, the query that provides data to populate the dimension map is designed. The query can be executed with several query tools including Impromptu, SQL or whatever does the extract from an Oracle or Sybase database residing on an HP-UX machine. It's usually prepared as a batch run so the query is executed, the model is created and any subsets are created. Then, it is distributed on the LAN for users to pull it down to their PCs.

PowerPlay is a PC product that runs in Microsoft Windows 3.1 with a minimum of 4 MB RAM. The server component runs on a HP-UX host and on an HP IX as well. Users can consolidate data and have it on the server in PowerPlay format, natively or in a virtual drive. Then, multiple users can access it.

Version 4.0 includes ranking across multiple time periods; exception highlighting and hiding of values based on user-selectable ranges; and suppression of zeros. Information can be subdivided, secured by password and distributed to departments and workgroups. Users can assemble and communicate reports with others through Windows OLE functions. Version 4.0 also includes batch processing of PowerPlay reports.

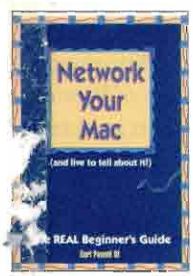
Because PowerPlay is driven from relational data to start with, basically any PowerPlay application is just a query.

PowerPlay lists for $695 and is available directly from Cognos.

—Jim Esch, Contributor

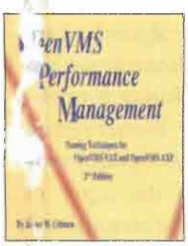
NEW FROM CBM BOOKS:

Your one-stop computing resource library!



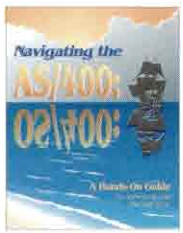
Network Your Mac: The REAL Beginner's Guide
Carl Powell III

Step by step instruction to designing, installing, maintaining and expanding your Macintosh network.
$19, ISBN 1-878956-41-8, Softcover,140 pages



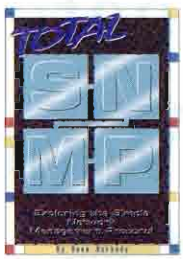
OpenVMS Performance Management: Tuning Techniques for OpenVMS/VAX and OpenVMS/AXP, 2nd Edition
James W. Coburn

Updated tuning tips for OpenVMS/AXP
$40, ISBN 1-878956-40-X, Softcover, 450 pages



Navigating the AS/400: A Hands On Guide
John Enck and Michael Ryan

Master the major components of the AS/400 operating environment.
$39, ISBN 1-878956-31-0, Softcover, 496 pages

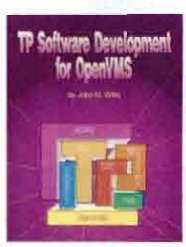


Total SNMP: Exploring the Simple Network Management Protocol
Sean Harnedy

Master the dynamics of SNMP!
Manage the ever-growing number of components in your internetwork.
$45, ISBN 1-878956-33-7, Softcover, 650 pages

A Practical Guide to Windows NT
Kenneth L. Spencer

Easy-to-understand advice on how to get up and running on Windows NT in a network environment.
$25, ISBN 1-878956-39-6, Softcover



TP Software Development for OpenVMS
John Willis

Learn how to develop client/server TP applications using ACMS, SQL and DECforms.
$35, ISBN 1-878956-34-5, Softcover, 360 pages

Benefit from our other helpful books!

C ++: An Introduction For Experienced Programmers
lex Jaeschke

++ problems you'll most likely encounter — d their step-by-step solutions!
3, ISBN 1-878956-27-2, Softcover, 36 pages

The Complete Guide to PATHWORKS
Kenneth L. Spencer

How to implement a PATHWORKS LAN.
$9, ISBN 1-878956-22-1, Softcover, 350 pages, 3 1/2" Disk Included

Introduction to VAX/VMS, 3rd Edition
David W. Bynon and Terry C. Shannon

Learning the VMS operating system.
35, ISBN 1-878956-05-1, Softcover, 16 pages

stering VMS
avid W. Bynon

Mastering the VMS operating system.
40, ISBN 0-9614729-7-9, Softcover, 465 pages

VAX I/O Subsystems: Optimizing Performance
Ken Bates

I/O management and performance.
$49, ISBN 1-878956-02-7, Softcover, 127 pages

The Hitchhiker's Guide to VMS
Bruce Ellis

A whimsical programmer's guide to VMS internals.
$17, ISBN 1-878956-00-0, Softcover, 236 pages

Desktop Systems Integrator Kit
Al Cini

A complete start-to-finish kit for learning how to be a systems integrator.
$49, ISBN 1-878956-28-0, Worksheets, 3 1/2" MAC, 3 1/2" IBM or 5 1/4" IBM Disk Included

The Dictionary of Standard C
Rex Jaeschke

Completely defines standard C language terminology.
$12, ISBN 1-878956-07-8, Softcover, 165 pages

Mastering Standard C: A Self-Paced Training Course in Modern C
Rex Jaeschke

A comprehensive tour of the statements and constructs of the C language.
$20, ISBN 0-9614729-8-7, Softcover, 366 pages.

Ethernet Tips & Techniques, 2nd Edition
Byron Spinney

A handy guide to installing Ethernet networks.
$15, ISBN 1-878956-43-4, Softcover, 95 pages

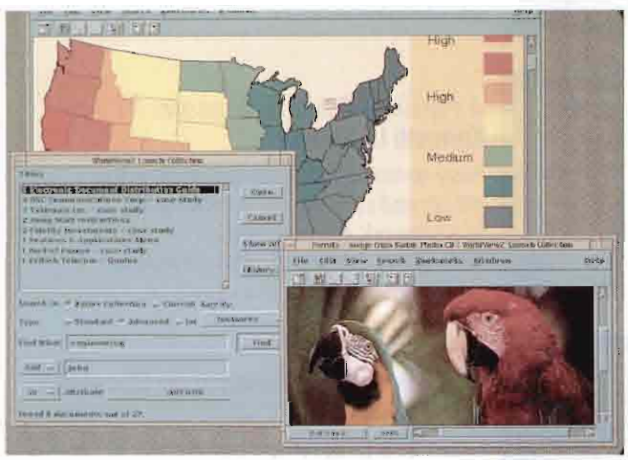
PC Power: A Guide to DOS and Windows Systems for Computer-Literate Users
David S. Quimby

A guide to choosing applications for the most productive computing environment.
$12, ISBN 1-878956-30-2, Softcover, 280 pages

Call Toll Free to order 1-800-285-1755, FAX (215) 643-8099 or through CompuServe– ID 76702,1564.

CBM BOOKS
1300 Virginia Drive, Suite 400
Fort Washington, PA 19034
HPHF1194

Interleaf Creates A Panoramic WorldView



WORLDVIEW2

- Accepts data from 25 different file systems and runs on 20 different platforms
- Creates hypertext links or buttons connecting related sections with the collection
- Price is $195 for WorldViewer2, $9,995 for WorldView Press2 for UNIX and $4,995 for Microsoft Windows

Interleaf Inc.

Prospect Place
9 Hillside Ave.
Waltham, MA 02154
tel: (617) 290-4990
fax: (617) 290-4981

CIRCLE 353 ON READER CARD

Companies today need to be able to incorporate data from a number of different sources into single cohesive documents. In the past, incompatibilities between applications and platforms prevented this data from being combined, except where a literal "cut and paste" was performed. Interleaf's (Waltham, Mass.) WorldView2 helps solve that problem.

WorldView2 accepts data from over 25 different file systems and runs on approximately 20 different platforms. It can assemble disparate types of electronic data into document collections. It also can produce complex documents with text, color photographs and drawings, and multiple typefaces and page styles.

According to Jeff Capeci, advanced manufacturing engineer at Norden Systems (Norwalk, Conn.), WorldView2 provided the functionality and flexibility that they needed. "We liked [WorldView's] ability to take data from several CAD sources and produce the information we needed." Norden Systems, a manufacturer of defense electronics products, uses WorldView2 to generate the documentation that is used by the workers on the shop floor who build their products.

Users can display, annotate, print and reuse information contained in the documents regardless of whether their computer is running the application that created the original file. WorldView2 creates hypertext links that connect related sections to the collection. Also a full-text index locates specific information using intuitive search commands.

WorldView2 consists of two components. The WorldView Press takes documents from all major word processors, desktop publishers and CAD software; prepares them for online viewing; compresses them; and adds hyperlinks and a full-text index. The WorldViewer allows the end user to view a document, search for any combination of words, attach electronic notes, use the hyperlinks and full-text retrieval capabilities, zoom in and print pages on any standard printer.

WorldView2 includes: existing collections can be updated incrementally; a command language interpreter written to provide an alternative full-text user interface or document open security facilities; an API that builds user interfaces on top of WorldView or drives it from an external control program; a meta-collections function that allows multiple smaller collections to appear as a single collection to the user; convolution rendering in which multiple algorithms are incorporated to eliminate the loss of original data during processing; Standard Generalized Markup Language (SGML) support that allows the input of SGML fields and the output original SGML text file; a graphical browser which visually navigates through the outline structure of any collection; a restricted viewer security mechanism that locks a collection to a viewer; and a feature that adds frequently used commands directly to the Windows and Mac toolbars.

WorldViewer 2 is available for HP 9000/700, DEC AXP OSF/1, Ultrix, VAX/VMS and AXP VMS, IBM RS/6000, Microsoft Windows 3.1 and Windows NT, and Sun SPARC. WorldView Press2 is available for HP 9000/700, DEC AXP OSF/1, IBM RS/6000 and Sun SPARC.

WorldViewer2 costs $195. WorldView Press2 costs $9,995 for UNIX and $4,995 for Microsoft Windows.

—Deborah Schwartz, Assistant Editor

Unlock your HP3000 with DataExpress

If your end users can't reach the data they need, reach for DataExpress, the link you've been looking for between your HP3000 and Mac/PC desktops.

With DataExpress, users can pull information off your HP3000 without rekeying and without tying up your MIS people.

Best of all, they can bring data into PC and Mac applications that they already know and count on: Lotus, dBase, Excel, WordPerfect and more. With thirty output format options, DataExpress opens your data to more applications than any other integration package.

In addition to PC and Mac file formats, DataExpress can generate reports, and with the Report Designer option you get WYSIWYG capability, so you can see design improvements as you make them.

DataExpress is the #1 End-User Computing Environment available for the HP3000 today.

For powerful solutions, call 1-800-ANSWERS

Your Integration Software Supplier ®

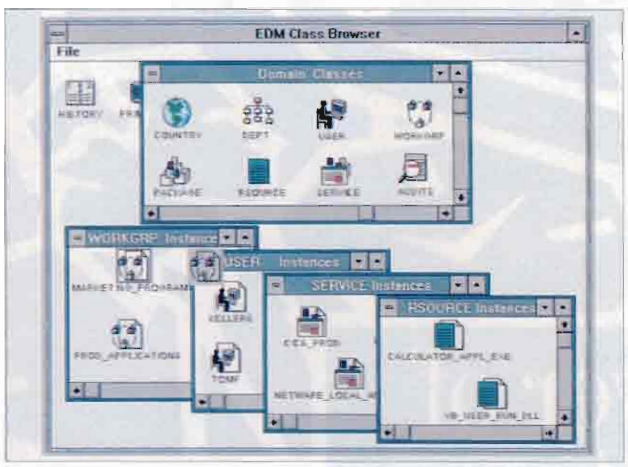
M. B. Foster Associates Limited
50 Water Street
P.O. Box 580
Chesterville, Ontario
Canada K0C 1H0

Tel (613) 448-2333
Fax (613) 448-2588

CIRCLE 168 ON READER CARD OR CALL 1-800-925-1786 CODE 1113 FOR FAX ON DEMAND

Mexico 52 (5) 254-3274 or 3284 • UK 44 (483) 772280 • Netherlands 31 (2503) 40324 • Sweden 46 (470) 828 15 • Israel 972 (3) 3488918 • Pacific Rim 66 (2) 5382623

Desktop Synchronicity With Novadigm's EDM



ENTERPRISE DESKTOP MANAGER

- Automates configuration, change, distribution, security, asset and session management from a central administrative server
- Base platform supports more than 150 desktop emulators and communications protocols
- Pricing is $100 per client and $20,000 for the enterprise server

Novadigm Inc.

One International Blvd.
Ste. 200
Mahwah, NJ 07495
tel: (201) 512-1000
fax: (201) 512-1001

CIRCLE 352 ON READER CARD

When, in late 1993, Florida Power & Light (FPL; Miami, Fla.) decided to add a number of new department and enterprise-wide client-server applications across the 8,500 PCs (mostly HP Vectras) in their state-wide environment, they realized that they couldn't continue to manually maintain and update the programs. According to Beverly Loftus, Technical Services supervisor at FPL, they chose Novadigm Inc.'s (Mahwah, N.J.) Enterprise Desktop Manager (EDM), because "integrating the new programs and keeping up with the current versions of the software was unmanageable without automation.

"[EDM] was the most complete software with the least amount of administrative overhead—peoplewise," adds Loftus.

EDM allows IS managers to automate configuration, change, distribution, security, asset and session management on the desktop from a central administrative server.

EDM:Manager is an MVS, AIX- or HP-UX-based object-oriented server that manages application components, desktop configurations and access policy relationships in a central database repository. EDM:Administrator is a Windows-, OS/2-, AIX- or HP-UX-based systems management workstation for security, application and systems administrators to configure EDM: Manager. EDM:Client is a Windows-, DOS-, OS/2-, AIX- or HP-UX-based desktop resident facility that synchronizes desktop contents with the current, authorized configurations in the EDM: Manager.

The base platform supports more than 150 desktop emulators and communications protocols. EDM also includes six systems management applications that extend system management functions on the desktop.

The configuration management module is an object-oriented facility allowing systems administrators to assign applications to individual users or workgroups by connecting them as related objects. It automatically decides "who gets what" according to enterprise management policies, eliminating the need for manual desktop setup procedures.

The change management module automates the process of identifying, packaging, delivering and controlling versions of configuration updates to the desktop. Changes are synchronized automatically at the object level.

The distribution management module integrates the configuration and change management process with facilities to transport, install/de-install, activate, synchronize, present and execute enterprise applications on the desktop.

The security management module extends enterprise security policies to the desktop, which eliminates manual list-based monitoring or PC security alternatives.

The asset management module provides facilities for auditors, license administrators or help desk personnel to audit desktop contents on periodic or as-needed basis.

The session management module provides a client-server, GUI-enabled alternative for controlling the presentation, security and execution management of 3270 or Frontware applications on the desktop.

Pricing is $100 per client and $20,000 for the enterprise server.

—Deborah Schwartz, Assistant Editor

CHOOSE THE WRONG MIDDLEWARE AND THIS COULD BE YOUR NEXT OFFICE.

Although there's a growing number of vendors who claim to provide middleware solutions, choosing the wrong one could have disastrous results for you and your company.

Most middleware vendors provide only limited solutions. Access to only certain databases and computer systems, limited support for new emerging standards, restrictions on network protocols and new deployment platforms. Choose one of these vendors and your open computing environment today will become your closed environment tomorrow.

INTRODUCING EDA/SQL® RELEASE 3

Information Builders' new **EDA/SQL Release 3** gives you the flexibility to set your own standards for truly open client/server computing... both today and in the future.

Whether you want to retrieve, join or update data, we guarantee transparent SQL access to virtually any database – both relational and legacy – across more than 35 computer platforms. We support more front-end tools than any other middleware vendor and let you choose from today's most popular communications options. We provide copy management facilities for replicating data located in over 60 file formats. And we offer complete compliance to new and de facto open standards such as ODBC, DB-Lib, X/Open, and DCE.

EDA/SQL Release 3 gives you unrivaled performance for OLTP and DSS applications. Special query optimization features provide fast, efficient distributed processing. And our unique **SmartMode**™ option prevents expensive runaway queries. Best of all, **EDA/SQL Release 3** comes with a new pricing structure that offers the best price/performance value in the industry.

Bottom line, **EDA/SQL** middleware is the only choice for open client/server computing today and tomorrow. The other choice... how about an open office?

For more information, to attend a **FREE** seminar or to receive a **FREE** White Paper, "Migrating to Client/Server - A Case for Middleware",

CALL 800-969-INFO
In Canada Call 416-364-2760

EDA/SQL®

"There's no middle ground on middleware"

Information Builders

EDA/SQL is a registered trademark of Information Builders, Inc., 1250 Broadway, NY, NY 10001

CIRCLE 247 ON READER CARD

School Of ReForm

Xpoint Corp. Reforms Itself With A UNIX-based Software Strategy For 1995

"Our focus on the HP 9000 and IBM RS/6000 platforms are very important pieces of the [UNIX] puzzle."

C. Wayne Cape
President
Xpoint Corp.

Xpoint Corp.
3100 Medlock Bridge Rd.
Norcross, GA 30071
tel: (404) 446-2764
fax: (404) 446-6129

CIRCLE 354 ON READER CARD

Since October 1993, Xpoint Corp. (Norcross, Ga.) has been reformed. That's when Xpoint acquired ReForm, a UNIX-based electronic forms and barcoding software application from Pacific Genesys Development Inc. (Vancouver, British Columbia). Until then, the privately-held Xpoint was primarily an IBM AS/400 ISV. "Their product line was similar to what we were already offering in the AS/400 market," says C. Wayne Cape, president of Xpoint.

In 1992, Cape recognized that while the AS/400 platform was still gaining customers, its growth rate was slowing. He also noticed a change in perceptions about the UNIX market. "Companies moving from IBM mainframes to the AS/400 were not looking at UNIX as an alternative. The perception was that the market was lacking good turnkey UNIX applications. But HP and IBM changed that [perception] and helped drive the commercial marketplace." So, recognizing that the commercial UNIX marketplace for electronic forms "was going to be quite large" and not wanting "to be limited to one platform," Xpoint acquired Genesys.

Founded in 1981 as a manufacturers' representative selling other vendors products, Xpoint expanded into distribution for data communications products and eventually introduced pioneering electronic forms and barcoding software for the IBM S/36 and S/38 platforms. According to Cape, that product — FormsXpress — grew into several other products. One product called MedForms is already helping forms-intensive businesses, such as hospitals and clinics, automate their operations.

"MedForms comes prepackaged with many [health-care-specific] forms, like admission forms, flow sheets, payroll and payables, checks, UB-92 and HCSA 1500 insurance forms" explains Cape. "Because they are such sophisticated applications, on-site integration and phone support also are included."

Today MedForm/400 is sold in conjunction with health information systems vendors such as HBO & Company (Atlanta, Ga.) who are rapidly moving their customer base from proprietary platforms to UNIX on Data General, DEC Alpha and HP 9000 systems, according to Cape. Consequently, MedForm has been ported to UNIX platforms. Xpoint opened five additional satellite offices during 1993 to handle its health-care business.

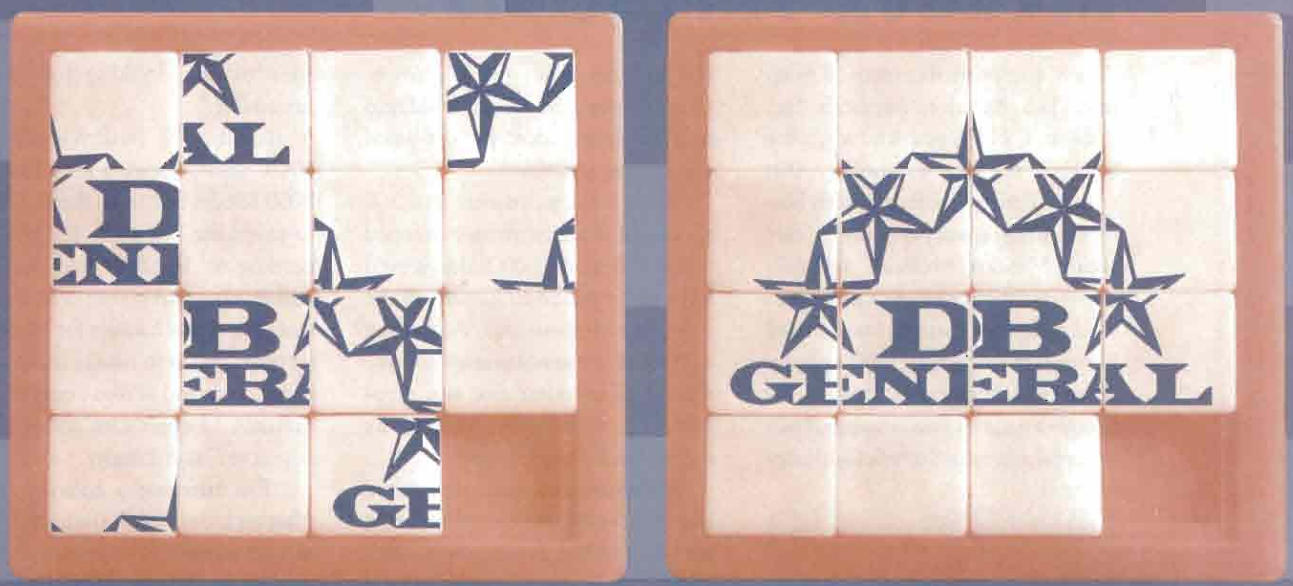
In the future, Cape expects to be "porting our technology to run as a standalone print server product, such as a Novell NLM, which can then be driven independent of the host." Xpoint also is working on a Computer Output To Laser Disk (COLD) software product called Automated Healthcare Solutions. It allows computer-generated reports to be stored on optical disks, and then retrieved and read on DOS/Windows-based workstations in the health-care field. Cape expects a mid-1995 introduction.

ReForm 1.27, a cross-industry application, was upgraded this past April with the addition of fax software and distributed printing support. By December, ReForm 2.0 will be available with data mapping capabilities, a graphical design tool and programming language additions.

With over 5,000 customers and over 60 hospitals using MedForms, Cape has reasons to be confident. Cape estimates that Xpoint will post $5 million in revenue for fiscal 1994 and expects that to increase to $8 million for the next year. And when it comes to being successful in the ever commercial UNIX marketplace, Cape says, "our focus on the HP 9000 and IBM RS/6000 platforms are very important pieces of the puzzle."

—George A. Thompson, Technical Editor

Watch DBGENERAL's Disk Space Management



solve your disk puzzle!

Introducing DBGENERAL Option 9.1!

Your need to take the puzzle out of disk space management has now been solved with the many powerful capabilities in DBGENERAL's new Option 9.1.

DBGENERAL: The Database Console™ continues to be the most complete data management utility available for the HP3000.

HEWLETT PACKARD
Channel Partner

- *Defragment your disk ON-LINE! (No system DOWN-TIME!!)*
- *Control your file locations, hence improving performance!*
- *Regain wasted sectors... and free up as much as 30% disk space!*
- *Relax! All functions are tied to MPE/iX Transaction Manager, ensuring complete data integrity!*

Call today!

1-800-ASK-BRAD

CIRCLE 108 ON READER CARD OR CALL
1-800-925-1786 CODE 1115 FOR FAX ON DEMAND

BRADMARK
Technologies, Inc.

DBGENERAL Option 9.1 is copywrited by SolutionSoft Systems, All Rights Reserved, 1994.

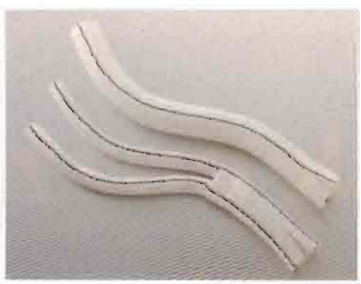
ENGLAND
BRADMARK UK Ltd. (+44) 905-795444

AUSTRALIA
Facer Info. Design (61) 2.484.3979
BELGIUM
Cheops Technology (32) 03.237.7906
S.A.G.E.S. (32) 56.41.83.99
DENMARK
Teamco Data A/S (45) 75.92.5366
FRANCE
ARES (33) 1.69.86.6000
GREECE
HP Consultants (30) 1.777.0561
GERMANY
I.A.B.G. (49) 89.6088.2074
JF Infosys GmbH (49) 6722.6046
SWS Software GmbH (49) 7621.78041
ISRAEL
Softkol (972) 3.534.8967
MEXICO
Infosistemas Finacieros (525) 813.1305
NETHERLANDS
Quant Systems Europe (31) 2518.59105
NORWAY
Teamco Datasoft AS (47) 22.62.72.00
SAUDI ARABIA
Saudi Info. Technology (966) 1.477.4555
SINGAPORE
Info-Tech Computer (65) 737.4161
SWITZERLAND
SWS Software Sys. (41) 31.981.0666
SWEDEN
Ole Nord AB (46) 8.623.0050
Teamco Nardata (46) 9-103-6480
TAIWAN/THAILAND
Siamrica Company Ltd. (66) 2.238.4143
Hewlong Info. Corp. (886) 2.545.2166
WEST MALAYSIA
Solsis (60) 3.256.1911

IN sites

Multiview: At the Heart of Meadox Financials

When you're in the medical business, like Meadox Medicals Inc. (Oakland, N.J.), you know it's the solution not the technology that counts. Patients suffering with life-threatening aneurysms don't care about Meadox Medicals' technology—synthetic materials and fabrics used to replace damaged or diseased human arteries as seen in the photo. What they do care about is the solution—a surgical procedure to repair or replace damaged arteries and arterial walls.



Ken Bender, Meadox' manager of accounting, cared about the solution not the technology when he first suggested scrapping Meadox' customized financial applications running on NCR hardware. It was obvious to him that "NCR was not going to support us." And third-party accounting software could "offer us some flexibility and independence from the MIS department." After working previously in an IBM-shop, IBM was Benders' orginal preference for a hardware vendor. However, "IBM sales people did not show any interest in finding out what our company was all about," says Bender.

In 1988, HP finally got the hardware nod. "Unlike IBM, they wanted our business," says Bender. Converting from the NCR-based system to a new HP 3000 Model 38 took about six months. "It was time consuming. All new programming requests had to be shut down." At about the same time, Bender also decided that financial software from the Multiview Corp. (Burlington, Mass.) could help him handle Meadox' project-based accounting system.

With 50 departments and 200 accounts, if a new project needed to be added, 10,000 fields would have to be added to handle all the possible combinations. According to Bender, it was not unusual to have a chart of accounts that was measured by its height. "At least six inches thick," says Bender.

Multiview automatically created the necessary relationships that Bender needed. For example, with 100 departments, 200 expenses and 200 projects, there are 4 million possibilities says Bender. "Multiview creates them for me. Technically, there is a one-to-many relationship rather than the one-to-one relationship that you are limited to using a flat file," he explains.

Bender has reduced his chart of accounts to 18 pages. Bender has also eliminated the slow down of work that occurred several times a month because some combinations, inevitably, were not identified. "You had to find someone with the authority to make the changes you needed."

By 1990, the growing company was looking for performance improvements from its HP hardware. With the HP 3000 Model 38, it took 10 hours to run a batch of 350 reports. About two-thirds of the reports were project-intensive, used for monitoring product R&D costs. "We live on R&D," notes Bender.

But he says, "we found out the pricing and technology changed," referring to the now PA-RISC-based HP 3000. After leasing a Model 925, Bender found that the same group of reports now ran in five hours. Still within three years, Meadox was looking for "more firepower."

Because of Multiview's HP VAR status, Meadox leased an HP 3000 Model 947 from them. Doing so saved the company $20,000 according to Bender. And the 350 reports now run in one hour and 10 minutes. A trial balance for Meadox' six operating units runs in less than 30 minutes instead of two hours and 30 minutes. "I don't care about speed anymore," says Bender.

"I'm running a balance sheet (that includes 400,000 transactions) in eight minutes, that used to take one hour. Bender adds "I can log on to multiple sessions and run multiple balance sheets, which means there is more time for analysis rather than just number-crunching." With 60 users on a mixture of terminals (running WRQ's Reflection software) and PCs, Meadox also has a Novell network directly connected to their HP 3000. "We take files from the 3000 and use them on the PCs."

In the future, Bender foresees the need for UNIX and integrated packages that work together. As a manufacturer and distributor of medical products, Meadox must adhere to FDA regulations, which means the company has some unique IS requirements.

In the meantime, Bender feels relieved that he doesn't need to distract the MIS department. "They are constantly busy writing a lot of complex production planning applications related to manufacturing, so it's hard to get them excited about accounting applications," admits Bender. "This way everybody wins."

— George A. Thompson
Technical Editor

ISO 9002

Why pay more ?

Now you can add workstations to your Domain/OS or HP-UX environment at only a fraction of the list price.

That's what remanufacturing is all about. Recent model, lower cost equipment that runs like new because it has been rebuilt. From the ground up. To manufacturer's specifications.

Literally manufactured a second time. By **Tryonics**, the people who know how to optimize these systems for your installation—new or existing.

Tryonics delivers the highest quality remanufactured workstations on the market today. Backed with technical expertise, full 90-day warranty and eligible for manufacturer's maintenance contract.

Before you pay more, call **1-800-551-6236**

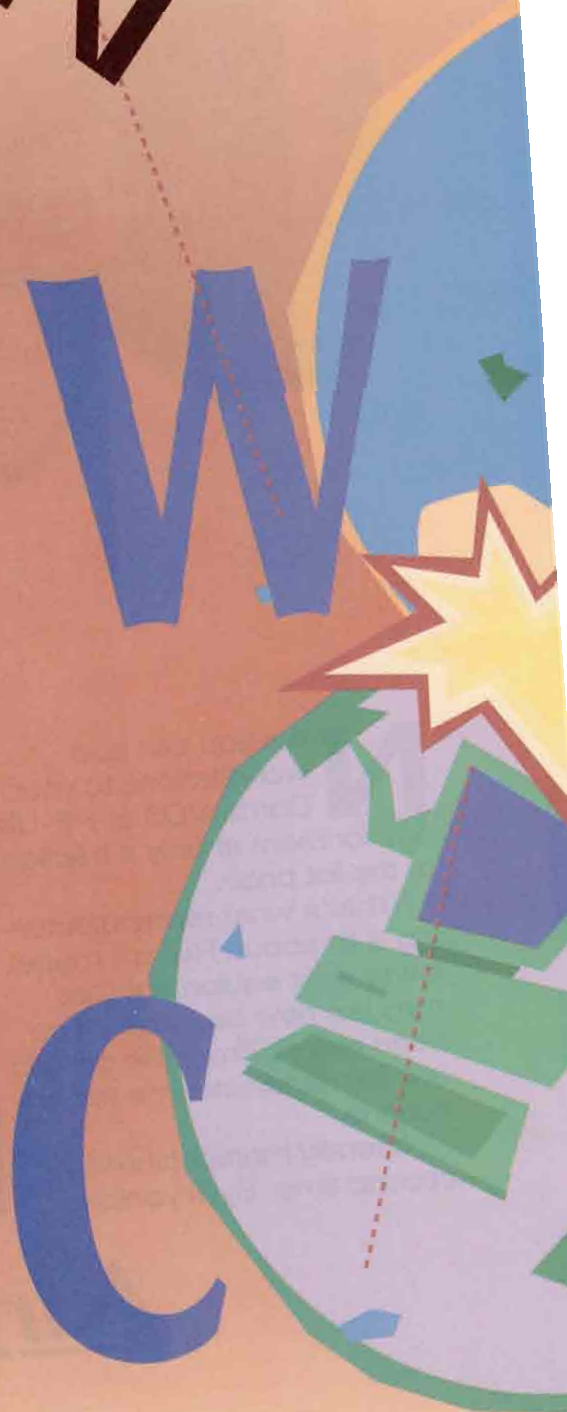
tryonics inc.

Workstation Computers and Services

CIRCLE 477 ON READER CARD

Fax (603) 427-6843 Email: info@tryonics.com 170 West Road Suite #15 Portsmouth, NH 03801

WHEN

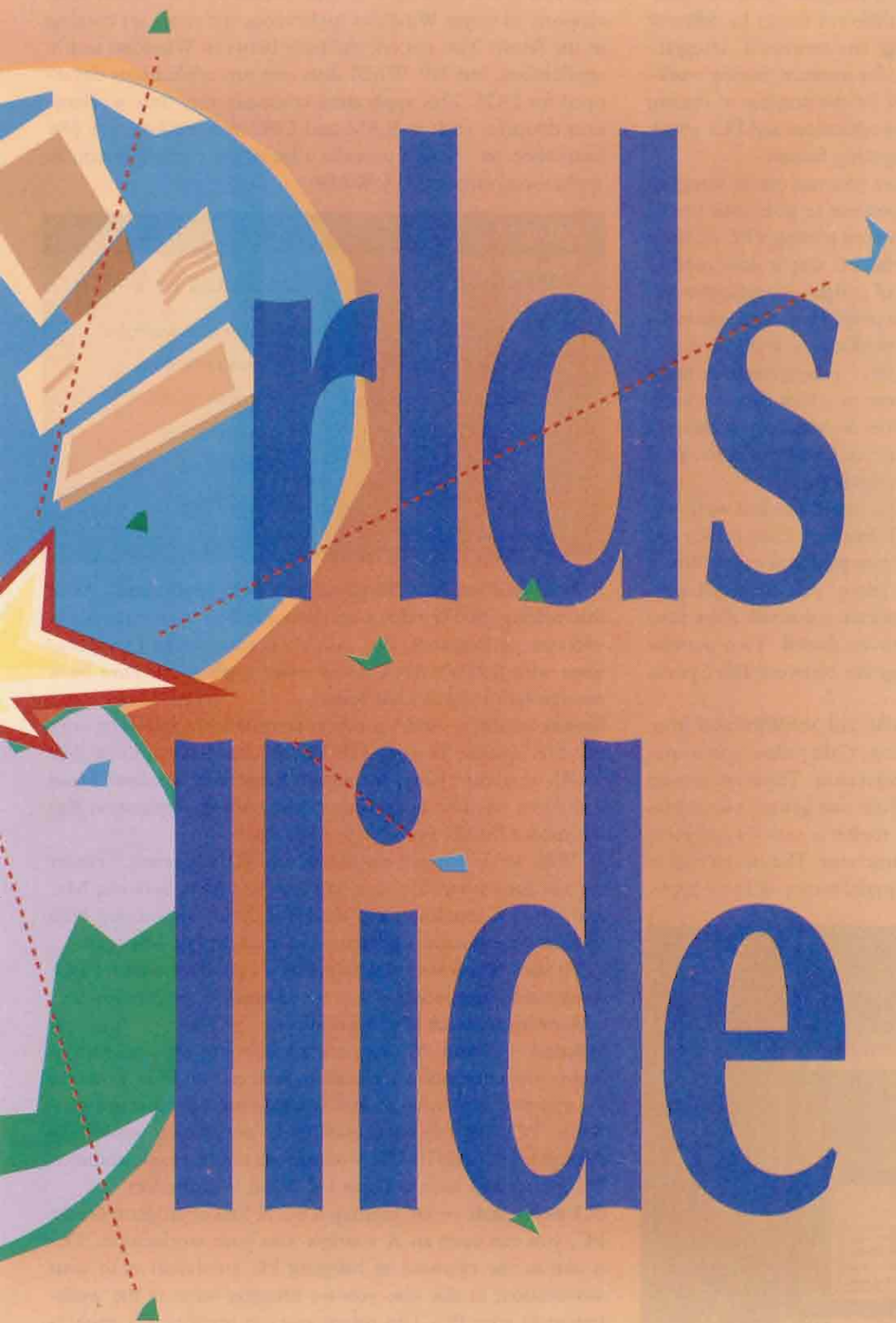


DCE Gives

PC/Workstation Integration

A New Lease

On Life



For years, we have heard of the workstation moving in on PC territory and the PC moving in on workstation territory. Of course, this would mean that one or the other of these platforms is doomed, or at least would have a highly diminished role. This has not happened. In fact, the converse has taken place. Workstations are proliferating and being used in areas that have traditionally been the domain of PCs, and there are certainly more and faster PCs in use than ever before.

The always powerful workstation has become an increasingly desirable platform for a number of reasons. Most notably, a reduction in price has reached a point where products, such as the HP 9000 Model 712, is roughly priced at what

Marty Poniatowski

you would pay for a high-end PC. The inexpensive PC is now everywhere, largely because PCs have increased levels of performance to what is expected from many low-end workstations.

Now that workstations and PCs are so widely used, we have seen a number of techniques used to integrate these two platforms. The term integrate means different things to different organizations. In some computing environments, integrate means nothing more than co-exist; for instance, having workstations and PCs on the same LAN for the purpose of sharing a printer. At the other extreme are workstations and PCs which work together in a distributed computing fashion.

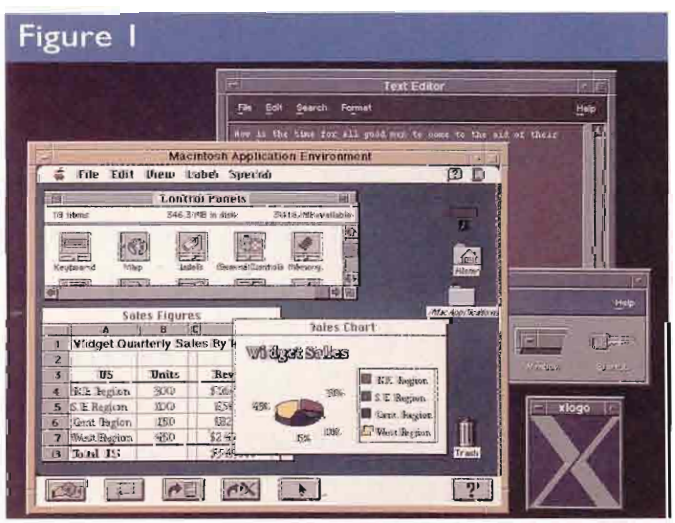
What are some of the techniques you can use to integrate workstations and PCs? What can you use to give your workstation user some PC capabilities without putting a PC on their desk? How can you take a powerful PC that is now used in standalone mode and make it part of a highly integrated environment with capabilities such as security? Here are some technologies to get you started on PC/workstation integration:

Platforms — Workstations and PCs have indeed become more similar in both hardware and the way in which they are used. This means some of the best features of each have shown up in the other. If you haven't yet selected a platform for your applications, perform a thorough evaluation.

Networking — Workstations have always come bundled with networking software. With a Network Interface Card (NIC) and TCP/IP software in your PC, these two platforms can be linked forever. With basic networking in place, you can implement an existing distributed file system application that will allow your workstation and PC file systems to be shared. Two popular techniques of distributed file sharing are Network File System (NFS) and LAN Manager.

Microsoft Windows Emulation — HP WABI and SoftWindows from Insignia Solutions Inc. (Moutain View, Calif.) allow you to run PC applications on an HP-UX workstation. These are second generation products which differ from first generation emulation products in that the Windows toolkit is natively compiled into HP Precision Architecture instructions. This means higher performance. You can expect the performance of these applications to continue to increase for a number of reasons, most notably, the continued increase in workstation performance.

Figure 1



With HP WABI, you open an X window on your HP-UX workstation that is running Windows at 486 class performance and you don't even have to load Windows. HP WABI now supports 13 major Windows applications and more are coming in the future. You can cut and paste between Windows and X applications, but HP WABI does not run applications developed for DOS. This application consumes very little workstation resources such as RAM and CPU and emulates the 386 instruction set. *Table 1* provides a list of the current Windows applications supported by WABI:

Table 1

Windows Applications Supported By WABI:

Aldus PageMaker	Microsoft PowerPoint
Borland Paradox	Microsoft Project
Borland Quattro Pro	Microsoft Word
Corel CorelDraw!	ProComm Plus
Lotus AmiPro	SPC Harvard Graphics
Lotus 1-2-3	WordPerfect
Microsoft Excel	

SoftWindows runs Windows and DOS applications. As of this writing, SoftWindows emulates the 286 instruction set at 486 class performance. But, you are not limited to 13 applications with SoftWindows, many more applications have been run through Insignia's test suites.

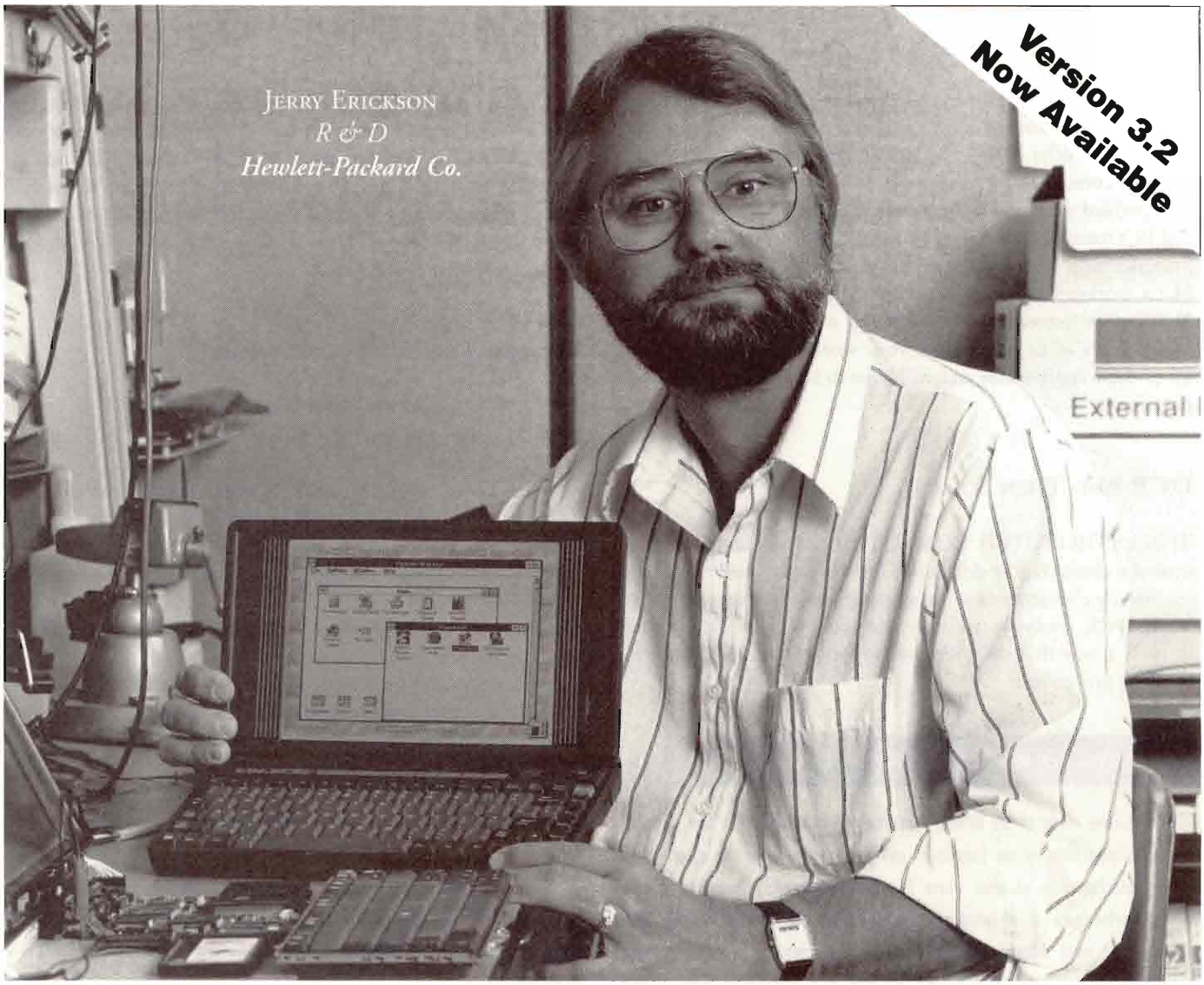
Macintosh Emulation — Some products emulate a Macintosh on your HP-UX system. In your HP Visual User Environment (HP VUE), you can open a Macintosh Emulation window. *Figure 1* shows a window open with the Macintosh Application Environment (MAE) from Apple Computer.

With MAE you get: the Macintosh GUI; System 7.1 Finder for navigation and file handling; cut and paste between Mac and HP-UX windows; and the HP-UX file system and NFS mounted file systems represented in the Mac File Manager.

As with Windows emulation, this is a good solution for PC/workstation integration if you are primarily a workstation user who needs access to Mac applications.

Applications — Many PC applications now run on workstations and many workstation applications now run on PCs. You may be surprised with what is now available on the respective platforms. PCs can run some traditional workstation staples like FrameMaker, and HP-UX workstations can run some common PC applications such as Lotus 1-2-3 and WordPerfect.

PC X Window Server — By running a PC X Server program on the PC, you can open an X window into your workstation. This is almost the opposite of bringing PC emulation onto your workstation; in this case you are bringing some of the workstation to your PC. This means you can invoke an X application on your workstation and control the application from an



"Hewlett-Packard Co. chose DynaComm® as a *realistic* terminal emulation solution for the OmniBook."

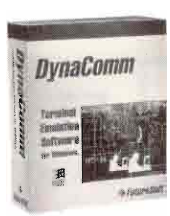
"We needed several different terminal emulations in the OmniBook but couldn't afford the footprint or cost of multiple packages. FutureSoft delivers a comprehensive solution at a responsive price."

At FutureSoft, we know these are serious considerations for your users' desktop PCs, as well as subnotebooks like Hewlett-Packard's OmniBook.

Call us and discover what HP, Microsoft, Digital, AT&T and others already know.

DynaComm delivers:

- Extensive emulation support and network connectivity in one package
- Essential tools, including powerful scripting, full DDE support and graphical dialog and toolbar editors
- Pricing that reflects real value



1-800-989-8908

Call your account manager for more information!

FutureSoft

12012 Wickchester Ln, Suite 600
Houston, TX 77079
713.496.9400 713.496.1090 FAX

Windows is a trademark and Microsoft is a registered trademark of Microsoft Corporation. DynaComm and FutureSoft are registered trademarks of Future Soft Engineering, Inc. Hewlett-Packard is a registered trademark of Hewlett-Packard Co.

CIRCLE 190 ON READER CARD

X window on your PC. In this case, the resources required to run the application are consumed on the workstation. Because workstations offer more expandability and overall performance, this is becoming an increasingly popular solution.

Provided you have the network bandwidth to support several PCs running an X Server program and communicating with a workstation host, you have made your PC look somewhat like a workstation. Keep in mind though, that if you have 10 X Window Server programs running on PCs used to invoke 10 instances of an application, your workstation is running all 10 of these applications and will have to be configured to support this.

DCE And Then Some

THE DISTRIBUTED COMPUTING Environment (DCE) is used to build highly distributed applications. The level of integration we've covered so far might be described as patchwork. Using DCE, hardware, software and networking work together in such a way that the software components execute on two or more processors.

Unlike what we have covered so far, in DCE the hardware may be irrelevant to the operation of a distributed application. This is one of the reasons you can expect to see DCE used as the basis for increasingly more client-server programs in the future. Before getting into what DCE technology is used to develop these applications let's talk about what is wrong with not using distributed computing.

Divided They Eventually Fall

SO WHAT'S WRONG WITH standalone PCs? There are all kinds of things you can't do with non-integrated PCs including the following:

- A number of users who need to work together can't do so, such as those who need to share E-mail and electronic publishing.
- Users can't share resources such as printers and hard disks.
- Services, such as file backups and updating software, are difficult to deliver .
- There is typically little or no security.

What's wrong with centralized or monolithic systems? Just the opposite of the shortcomings of standalone systems:

Overlapping Functionality

One positive result of the healthy competitiveness between PCs and workstations is that some of the benefits of one have shown up in the other.

Performance is an area where PCs have improved. Although it is true that performance of all platforms has increased over the years, PCs have shown the most dramatic increase. The user environment is an area where workstations have greatly improved. HP VUE is a pleasant surprise to any non-UNIX user who sits at an HP-UX system for the first time.

The Common Desktop Environment (CDE), which will soon be available on all HP-UX systems, will bring a nearly identical look-and-feel to most UNIX-based systems. This is an area in which PCs should be admired. Whether or not you like the user interface of Windows, it looks the same on every PC on which it runs. With CDE, you'll have to adjust your thinking very little going from one UNIX-based system to another.

As the diagram shows, there is a substantial overlap between PCs and workstations for the uses shown. The growing overlap between these platforms has broadened the choices you have when selecting a platform for a particular use.

Below is a list of factors to consider:

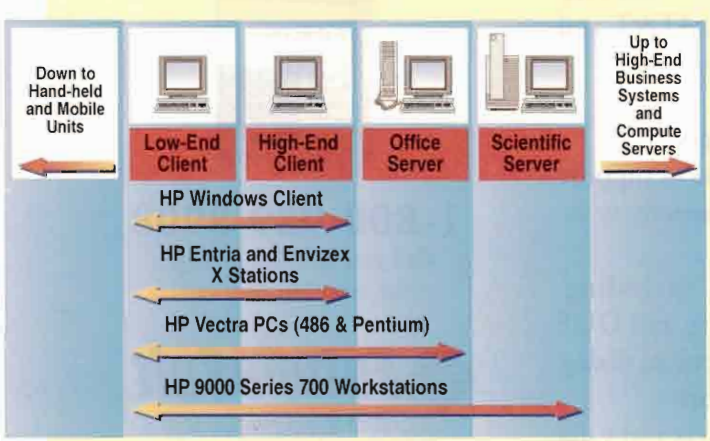
Operating System — Investigate the features of all your operating system options. For instance, if your options are DOS, Windows and HP-UX, take a look at each and don't make assumptions about one being difficult or easy to use.

Central System Administration — Your administration options are changing at a rapid rate. Look at the built-in administration capabilities of the platform and operating system, as well as the add-on products available.

High Security — Security may be of ultimate importance or of little importance to you. Think about your security needs, then consider how the platforms compare.

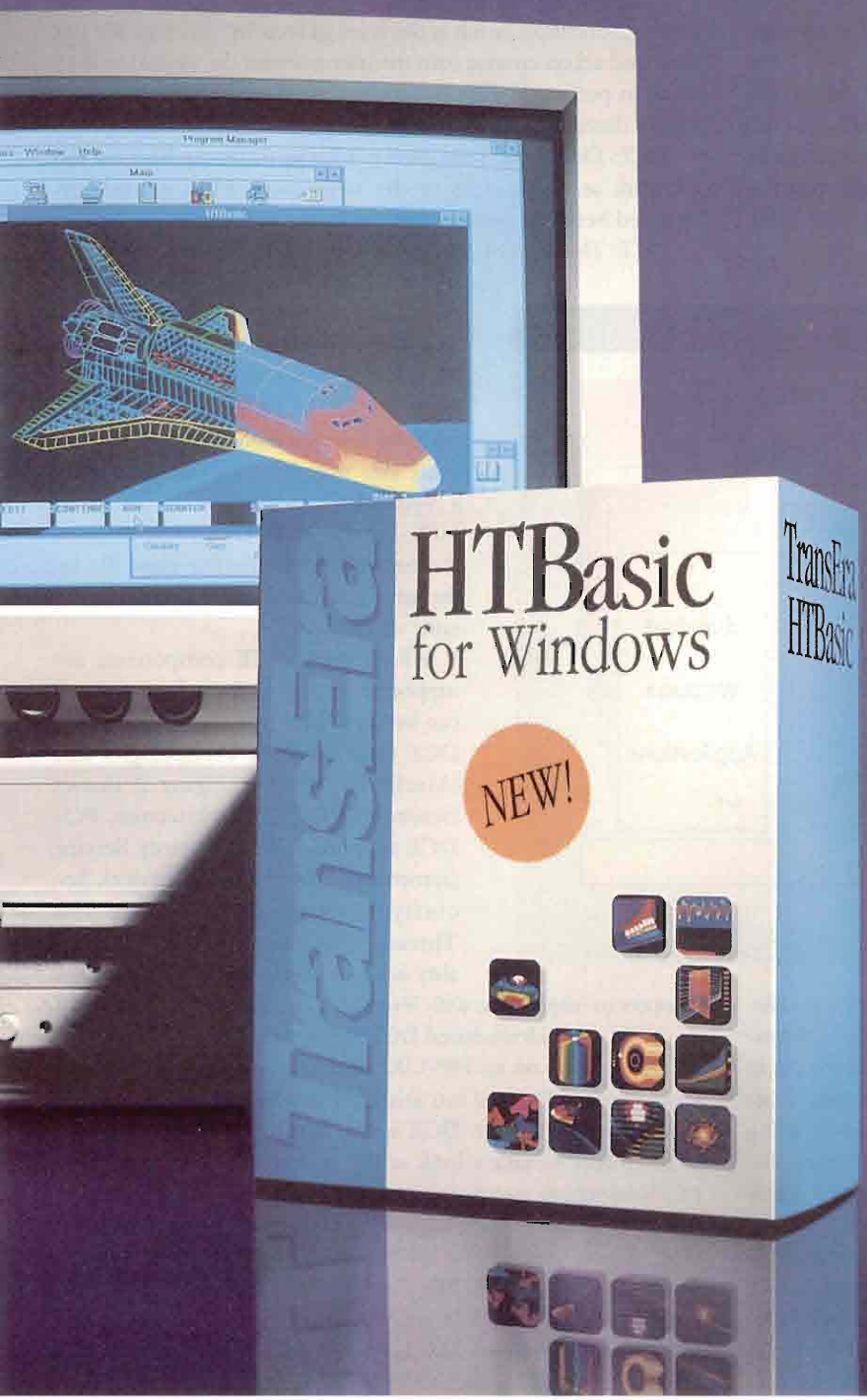
Graphics and Multimedia — There are a lot of options here, too. Be sure your multimedia needs are supported by the platform and that it can handle the processing required by multimedia.

Price — Look at this last. Make your decision based on the other needs first. You'll probably find that if both a PC and workstation fit the bill, the prices will be similar. For instance, you'll find a high-end PC and low-end workstation aren't substantially different in price.



Examples of HP PC and workstation uses.

The power of HP BASIC
The ease of Windows



INTRODUCING HTBasic for Windows! Now the powerful features of the most recognized engineering and scientific control language in the world, HP "Rocky Mountain" BASIC will run under the most popular platform in history– Microsoft Windows!

HTBasic takes advantage of Windows features while maintaining the ease of Rocky Mountain Basic programming. For years, HTBasic has provided all of the powerful HP BASIC functions like COMPLEX arithmetic, matrix mathematics, and HP-style graphics. HTBasic for Windows adds features like full screen editing, long file names, and an on-line reference manual. And HTBasic has extensive built-in support for the most popular IEEE-488 cards on the market.

Since all versions of HTBasic are compatible with HP 9000 Series 200/300 BASIC, HTBasic allows effortless transfer of HP BASIC programs and data files from the Series 200/300 HP Workstations to DOS, Windows, Sun SPARCstation, and HP 700 PA-RISC based machines and back.

Running your HP BASIC code in HTBasic provides unsurpassed programming speed, power, compatibility, and the convenience of the Windows platform.

Call for more information.
801-224-6550

TransEra

345 East 800 South
Orem, Utah 84058
801-224-6550
Fax 801-224-0355

DENMARK
Dan Surveys A/S
(45) 75 150 111
(45) 75 151 626

ENGLAND
Workstation Source
(44) 734 759292
Fax (44) 734 757522

FRANCE
Floppylog
(33) 139 50 79 98
Fax (33) 139 50 80 28

GERMANY
Tech Soft
(49) 30 401 9001
Fax (49) 30 401 9007

ITALY
Intl. Trading Devices ITD
(39) 2 7490749
Fax (39) 2 7610407

JAPAN
Maxam Corporation
(81) 3 5376 3558
Fax (81) 3 5376 3559

NETHERLANDS
Stellingwerff Beintema B.V.
(31) 23 314192
Fax (31) 23 325993

SWEDEN
Systec System Technology
(46) 13 110140
Fax (46) 13 140530

SWITZERLAND
Niederer Electronics
(41) 71 31 41 73
Fax (41) 71 31 45 64

MICROSOFT WINDOWS COMPATIBLE

CIRCLE 290 ON READER CARD

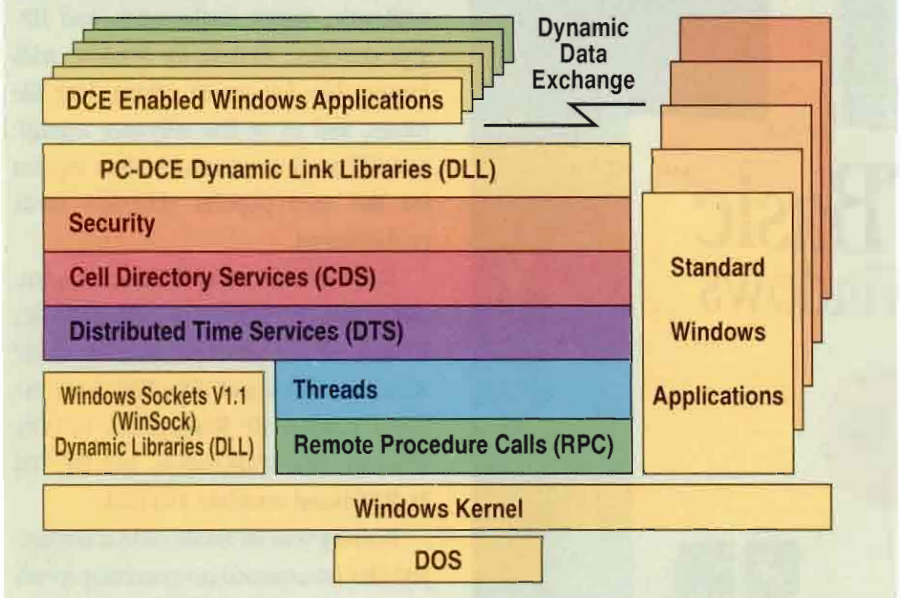
All company and/or product names are trademarks and/or registered trademarks of their respective manufacturers.

Using DCE, hardware, software and networking work together, so software components execute on two or more processors.

- All standard software packages that PC users have grown accustomed to aren't available.
- Big monolithic systems do not have favorable price/performance ratios compared to PCs and RISC-based systems.

DCE supports applications that have none of these drawbacks. Using the components of DCE you can build an application that takes PC/workstation integration to a new level. Here are the major components of DCE:

Figure 2: PC-DCE Architecture



DCE Remote Procedure Call (RPC). RPC models two distributed processes as a subroutine and a caller of the subroutine. You can image a client-server program in which the client (the PC) calls a subroutine on the server (the workstation). Data is passed back and forth between the client and server using RPC. The client and server can now communicate, they can locate one another on the network and data that is sent across the network is converted into the appropriate format.

DCE Directory Service. With many systems on a network, it is important to be able to allow clients to locate servers. Using two components, Global Directory Service (GDS) and Cell Directory Service (CDS), a hierarchy is produced in which the names and attributes of systems are supplied throughout the network. A local set of nodes is called a cell. A CDS appears as a branch in the bigger GDS tree.

DCE Security Service. This is a mechanism by which services are provided to only designated parties. DCE supplies authentication (a user on the network is indeed who they claim to be), authorization (what is the level of security privilege for this user) and access control (can the user perform the operation they want to perform). This is a sophisticated set of objectives in a highly distributed environment.

DCE Distributed Time Service. Clocks on computers on the network are kept close to the same time. Messages are exchanged between systems and clocks are adjusted as needed.

DCE Threads. On a server system, a number of requests can take place. Each request is given its own thread and can proceed at its own speed.

DCE Distributed File Service (DFS). Allows a program to access files on the file server just as if they were located on the local system's disk. This goes beyond what you may have experienced using a Network Operating System (NOS) or NFS, because with DFS every node in the network identifies the same file by the same name and sees it located in the same directory.

All of these DCE components are supported on HP-UX workstations and can be used with products such as PC-DCE from Gradient Technologies Inc. (Marlboro, Mass.). *Figure 2* shows Gradient's PC-DCE architecture. PC-DCE supports RPC, Directory Service (sometimes called Naming Service), Security Service, Time Service and Threads. This complex DCE functionality is made easier for application developers to implement with Visual- DCE, also by Gradient. You can build a Windows-based DCE application using Visual-DCE.

Using DCE on an HP-UX workstation and these Gradient products on a PC you can achieve PC/workstation integration that is state-of-the-art. DCE is the distributed computing tool of the future so take a look at this as one way of creating true PC/workstation integration.—*Marty Poniatowski is a technical consultant in computer-aided engineering for Hewlett-Packard in Stamford, Conn. He is the author of* "The HP-UX System Administrator's 'HOW TO' Book" *(ISBN 0-13-099821-4) published by Prentice Hall PTR and distributed by CBM Books, a division of Cardinal Business Media, Inc. For ordering information, contact CBM Books at (215) 643-8105.*

Would you like to continue to see articles on this topic?
Circle on reader card
yes 350 no 349

270MB UNIT IS AVAILABLE FOR HP9153 REPLACEMENT

ISA announced the addition of a new 270 MB unit to its family of HP9153 replacement Hard Drives with Floppy. ISA has been supplying 46MB and 118 MB units in the market for more than 10 years, and this release would give more choice to the users. Price is $2,220.00. Contact Floppy Disk Family Dept. 713/493-9925.

CIRCLE 400 ON READER CARD

MEMORY BOARDS AND VIDEO RAM AVAILABLE FOR HP712

ISA introduced memory cards and video RAM cards for HP712. The memory cards are available in 64MB and 32MB capacities. For pricing, contact Texas ISA, Inc., 713/493-9925.

CIRCLE 401 ON READER CARD

MULTIFUNCTION 4MM SUB-SYSTEM

Texas ISA, Inc. introduced a new 32GB Multifunction 4MM Sub-System at Interex '94 in Denver, Colorado. Two models are available: 5032S-Dual for DDS-I and 5034S-Dual for DDS-II. The unit features: off-line tape-to-tape copy, verify, mirroring, cascading, and alternating drives. Supports HP, SUN, IBM and DEC. Contact John Larmie; 713/493-5746.

CIRCLE 402 ON READER CARD

GUI STORAGE MANAGEMENT SOFTWARE

Texas ISA, Inc. introduced a new MOTIF based total backup management software. It provides the users with the ability to: identify servers and clients, choose data to be backed up, set media recycling policies, define automated backup schedules, monitor and control backups and devices, and browse, select and restore data...fast! Contact John Larmie; 713/493-5746.

CIRCLE 403 ON READER CARD

ISA NEW POWER MANAGEMENT SOLUTIONS

ISA and Mitsubishi Electric developed a new intelligent UPS (Uninterruptible Power Supply) system combined with ISA's well-known Model 7020, or 7030 Auto Shut-Down unit. The system features: Simplified shutdown process initiation, Timer operation, Network, Remote Control, Digital and analog sensor inputs. Multi-Platform support (HP, Sun, IBM, DEC, SGI, etc.) 1, 2, 3KVA models are available.

CIRCLE 404 ON READER CARD

HP9122C HP9153C Replacements

ISA Floppy Disk Family

ISA 1015
(HP9122C Compatible)
3.5 inch dual
HP-IB SS/80

ISA 2025
(HP9153C Compatible)
40MB with 3.5 inch single
HP-IB CS/80 SS/80

ISA 1060
5.25 inch single
HP-IB SS/80

ISA 1015S *(NEW SCSI)*
3.5 inch
single
(HP internal FD compatible)
SCSI-for HP9000 300/400/
700/800

ISA 1060S *(NEW SCSI)*
5.25 inch single
SCSI-for HP9000 300/400/
700/800

• Memory Card • I/F Card • Floppy • Hard Disk • MO Disk • QIC Tape • DAT •

ISA, the Largest HP Enhancements Manufacturer

HEAD OFFICE: ISA Co., Ltd. 2-4-15 Okubo Shinjuku-ku, Tokyo 169, JAPAN
Tel: 03-3208-1150 Fax: 03-3208-1335

USA:	Texas ISA, Inc:	Tel: 713-493-9925	Fax: 713-493-2724
S.E. ASIA:	ISAHK CO., LTD:	Tel: 330-1977	Fax: 330-1077
EUROPE:	EURISA SARL:	Tel: 1-48-61-48-95	Fax: 1-48-61-49-06

CIRCLE 245 ON READER CARD

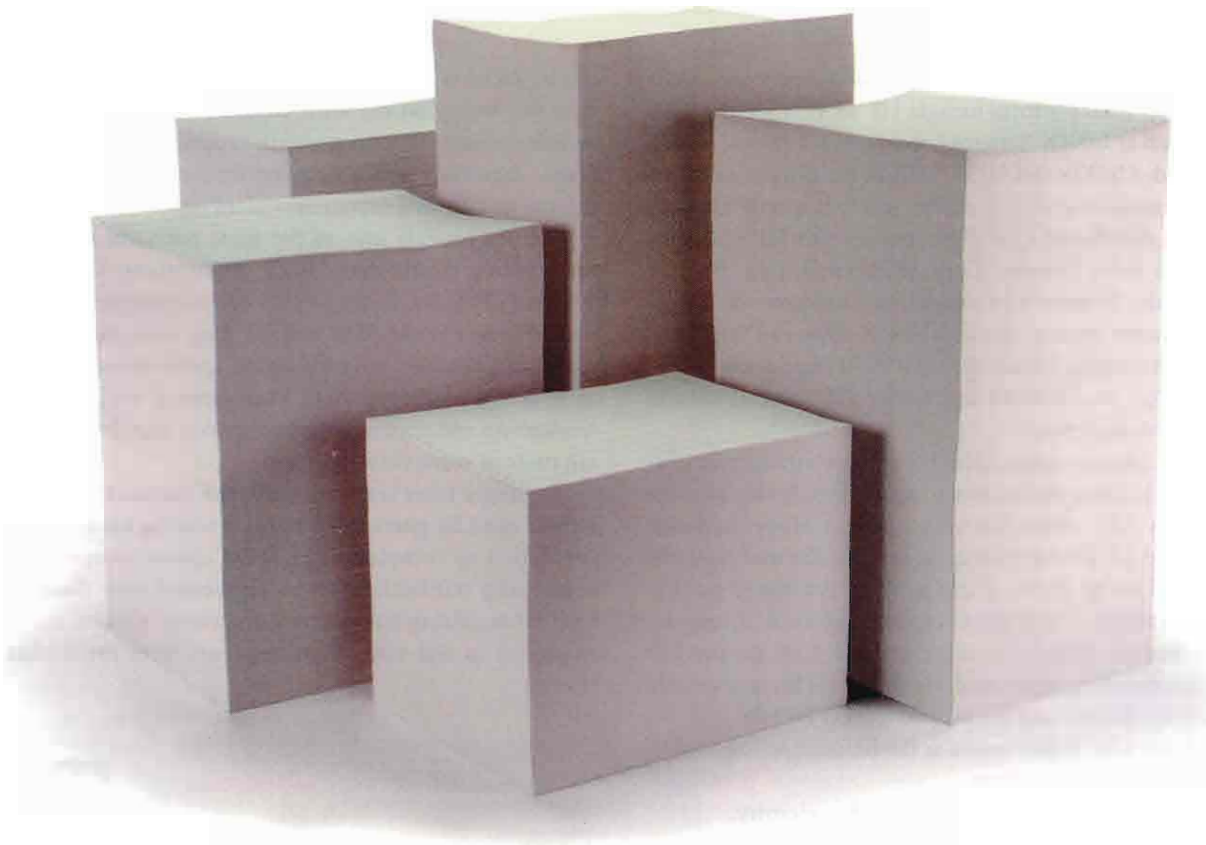
SHARE The Wealth

HP Encina/9000 Servers Provide OLTP For Business-Critical Applications

Feisal Mosleh
HP Distributed OLTP Product Manager

Until recently, the market for online transaction processing (OLTP) products has been dominated by mainframe-class vendors with proprietary solutions — most notably IBM's Customer Information Control Systems (CICS). But as OLTP-intensive companies in the banking, airline, catalog and telemarketing businesses migrate their applications and data onto multivendor platforms they are replacing mainframe-based OLTP software with client-server-oriented OLTP software in distributed environments.

In fact, the industry-wide OLTP application segment will be generating an estimated $20 billion annually in hardware and software revenue in this decade, according to research from The Standish Group International (South Yarmouth, Mass.). That alone is an appealing market, but even more tempting, is the potential of a larger market for reliable client-server OLTP solutions.



Are Your Reports Worth The Paper They're Printed On?

The cost of printing is more than just paper and toner. Time spent handling information becomes a significant part of the equation.

When you add it all up, Vista online report viewing empowers users to save natural resources and gives them faster, easier, more flexible access to data.

Vista, for MPE and HP/UX systems, supports and automates all phases of the electronic report management cycle.

Report distribution is simplified and enhanced by delivering files on-line to multiple users, confirming delivery and providing attachable "post-it" notes to specific data or entire files.

Rekeying is no longer necessary because information can be directly downloaded to DOS or Windows applications. And since Vista provides the most comprehensive indexing and search capabilities available, you'll never have problems locating the information you need.

Vista makes reporting worth it. Call Quest Software for more information 714-720-1434 or e-mail: info@quests.com

QUEST SOFTWARE

ONC/NFS

CIRCLE 175 ON READER CARD

Client-server OLTP platforms vying for support and available for the HP 9000 platform include HP's CICS for HP 9000 and others such as UNIX Systems Labs' (USL) Tuxedo, AT&T GIS' Top End, UniKix and VIS/TP from third-party vendors.

As the client-server OLTP market evolves it will naturally move toward distributed OLTP technology like HP's Encina/9000 products from Transarc Corp. (Pittsburgh, Pa.). Because it is built on the Distributed Computing Environment (DCE) and supports open system standards like X/Open's Distributed Transaction Processing Model, Encina/9000 (supported on HP 9000 Series 700 workstations and Series 800 servers) runs in multivendor environments.

As the data integrity engine, the HP Encina/9000 server provides logging, locking and recovery capabilities. It also includes X/Open's XA API which provides access to many databases. In a distributed OLTP environment, the HP Encina/9000 client is required on all nodes, allowing these systems to participate in the distributed two-phase commit protocol. Sitting on top of the Encina client and server and HP-UX are the HP Encina/9000 monitor, structured file server (SFS), recoverable queuing service (RQS), and the peer-to-peer (PPC) Executive and gateway. It also serves as the foundation for the CICS for HP 9000 monitor.

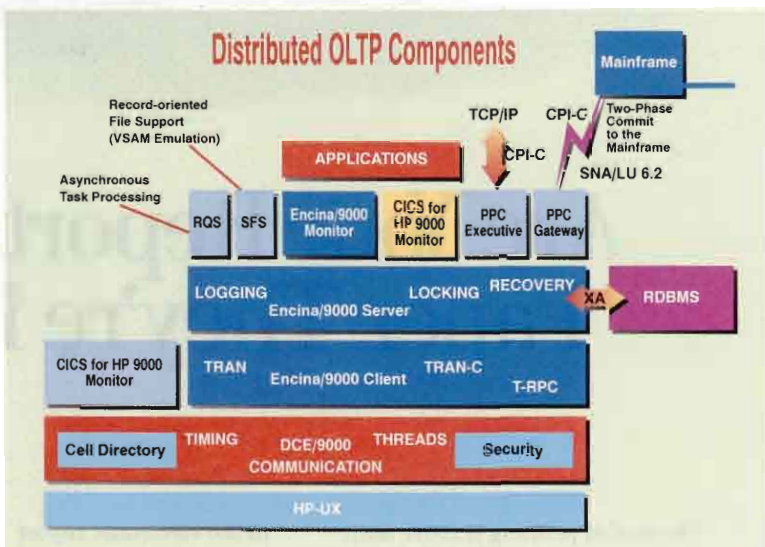
The HP Encina/9000 monitor provides security, configuration, set up and run-time administration, and hooks for integrating tools such as forms and high-level application development packages like 4GLs. The monitor also acts as the performance tuning vehicle, gathering Encina cell statistics, overseeing client-server binding, managing server fail-over and initiating performance or availability-driven server replication.

The HP Encina/9000 SFS is a record-oriented file system supporting X/Open ISAM and VSAM-like interfaces. The SFS is available separately or bundled with the HP Encina/9000 monitor, and provides full transaction integrity and log-based recovery to the ISAM and VSAM file system implementations. HP's RQS establishes a series of protected queues across the distributed system.

der is placed (a single transaction), it is stored in the queue for later dequeuing on the local UNIX computer and the remote mainframe system. This queuing capability assures fast and accurate data entry while delaying time-consuming portions of the transaction to a more convenient time.

Queues provide one of the most powerful tools available for building distributed OLTP applications. Consequently, Encina/9000's RQS can be used to: enqueue requests in real-time during the day that will be dequeued and processed at night; as a reliable buffer for online applications on either side of a WAN, shielding them from latency and failures; build workgroup and process-oriented systems that depend on moving units of work between states.

To ensure faster response times, the outcome of many transactions must be guaranteed without waiting for all steps of the transaction to complete. The RQS allows complex or time-consuming transactions to be segmented into discrete steps without sacrificing transactional guarantees. Critical data can be enqueued in real-time, then dequeued later for further processing.



Courtesy of Hewlett-Packard

Queuing Capabilities

HP'S IMPLEMENTATION of RQS provides advanced priority scheduling of network servers and the development of multitransaction applications tied together via the transactional queuing of data and requests as intermediate steps. In this manner, a complex computation can be decoupled and distributed across multiple applications. Each application may dequeue requests and data — with two-phase commit and recovery guarantees — then perform some aspect of the overall computation, then transactionally requeue requests or data for the next application step.

For example, catalog marketing companies and telemarketing firms take orders around the clock. With RQS, when an order is placed (a single transaction), it is stored in the queue for later dequeuing on the local UNIX computer and the remote mainframe system. This queuing capability assures fast and accurate data entry while delaying time-consuming portions of the transaction to a more convenient time.

For example, in telemarketing it often isn't critical that an order gets processed the moment it is received. What is important is that the keyboard response time is fast and that the order is logged without a doubt. With RQS, a telephone order can be placed in queue and processed at a more convenient time. Also, this adds flexibility in assigning priority to tasks that need the fastest service.

PPC Services

TO COMMUNICATE WITH mainframe systems using HP Encina/9000 PPC Services, three products must be configured to work together: the PPC Executive, the PPC gateway/SNA and the SNA Plus communication package. The PPC Execu-

After A Network Problem Threatened To Shut Down His Company's Mission-Critical Applications,

WHAT DID DAVE DO?

That's because there was really no reason to worry. Dave, like managers at more than 3,000 organizations around the world, knew he could depend on Unison Software's networked systems management solutions to keep not only his mission-critical applications running, but all his other processing as well. Unison's products were designed for distributed systems from the outset—redundant management platforms take over if there's a failure of the primary host or network links to the primary. Unison Maestro, Load Balancer and Express are reliable, commercial-strength workload management products for distributed computing. Across both the network and the enterprise. On all the most popular UNIX and open systems platforms. And the products are supported by Unison's nearly 10 years of experience helping companies manage demanding commercial processing environments. So if you'd rather have your managers going to lunch instead of going berserk, call Unison Software today.

675 Almanor Avenue
Sunnyvale, California 94086
(408) 245-3000

Unison SOFTWARE

811 Barton Springs Road
Austin, Texas 78704
(512) 478-0611

CIRCLE 499 ON READER CARD

tive is a library that supports peer-to-peer communications and two-phase commit transactions for PPC Executive applications. It allows systems in the Encina environment to communicate via the Common Programming Interface Communications (CPI-C) over TCP/IP.

The new HP Encina/9000 PPC gateway ensures data consistency between desktops with the vast repository of legacy data residing on computers that use the LU 6.2 protocol over SNA networks. The HP Encina/9000 PPC gateway provides a "bridge" between Encina's CPI-C over TCP/IP and LU 6.2 with Syncpoint level 2. The bridge is bi-directional and conversations can be initiated from either direction. This API access supports the SyncLevel 2 (SL 2) service aspects of the underlying LU 6.2 protocol and allows Encina applications to drive or be driven by CICS transactions.

HP DCE/9000 and HP Encina/9000 servers have a choice of OLTP monitor technologies which protect investments in CICS applications.

The LU 6.2 support is not tied to CICS, but will support any application on an SNA network that supports that protocol. HP is working with IBM to provide a CICS API layer on the HP Encina/9000 server. Thus, businesses investing in the HP DCE/9000 and HP Encina/9000 server components have a choice of OLTP monitor technologies which may protect investments in CICS applications and expertise.

Two-Phase Commit

The Encina SL 2 peer-to-peer gateway ensures transaction data integrity across an enterprise — including UNIX and mainframe systems — for OLTP and client-server applications. The key to this interoperability is HP Encina/9000's ability to perform two-phase commit which enables a single transaction to update multiple resource managers.

Two-phase commit protocols, a synchronization protocol ensuring that all participants joined in a transaction either all commit, or all abort, work done on behalf of a global transaction to make sure that all resources accessed by a transaction program are left in a consistent state even in the face of system failures. A transaction manager coordinates the two-phase commit by issuing, receiving and examining messages exchanged with subordinate transaction managers or directly with participating resource managers.

In an SL 2 transaction using the HP Encina/9000 gateway, all participants are polled about the transaction. If all vote yes, the transaction is committed at all stations. If for some reason, such as a power failure, the transaction does not take place at all stations, the peer-to-peer poll will acknowledge this and the transaction will be aborted. This ensures users that mission-critical business applications on LU 6.2-based mainframe systems can be integrated into open, distributed OLTP applications with no compromise in data integrity.

An example is a travel agent booking a client's trip. They might reserve an airplane ticket and an automobile in the destination city, but discover that there are no hotel rooms available. Because of the SL 2 capability of the HP/Encina system, the entire transaction would be aborted at the travel agent's office and on the mainframe, thus protecting the integrity of the transaction.

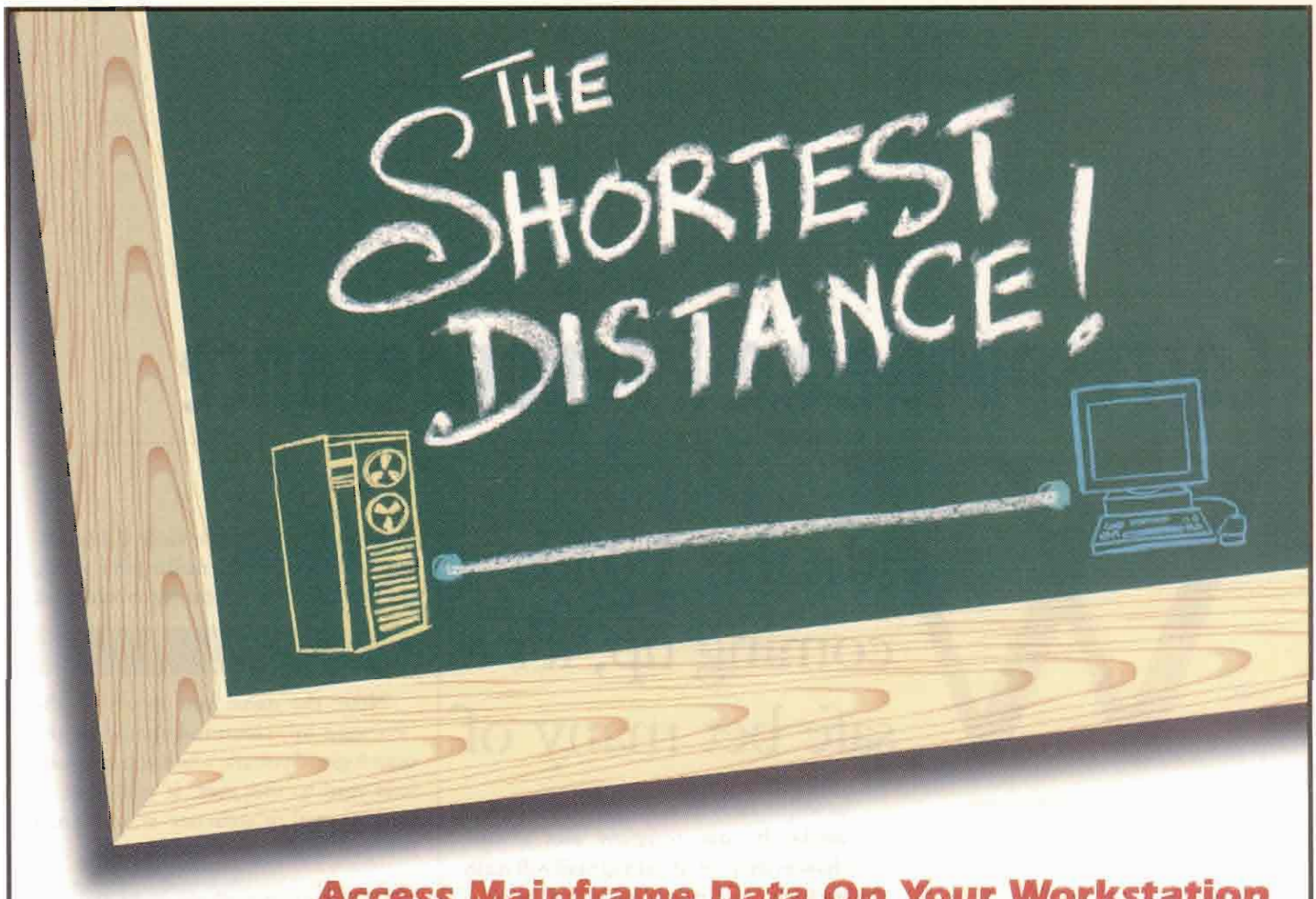
This SL 2 capability permits Encina/9000's two-phase commit protocols to be performed transparently with other Encina applications written in CPI-C and CPI-RR. The PPC gateway/SNA also supports SyncLevel SyncPoint, transparently bridging full transactional guarantees between open systems and the mainframe. For example, a single Encina/9000 transaction can update an RDBMS on a UNIX server as well as a CICS application on the mainframe.

Regardless of the transaction's success or failure, Encina/9000 orchestrates the actions on both machines to ensure transactional integrity. This capability of Encina/9000 is unique among open, distributed OLTP systems. Without two-phase commit support, it is difficult to ensure data integrity between open systems-based and mainframe-based applications.

Another Encina/9000 aspect is HP's Distributed Computing Administration Management (DCAM) environment. DCAM includes a GUI through the HP-UX System Administration Manager, a Command Line interface and one of the most complete set of tools, methodology and capabilities in the Encina marketplace. For developers of administration software, DCAM is easy to use and has a wide selection of tools and methodologies.

"Mainframe downsizing" is a challenging transition; especially daunting for those working in a distributed environment where two-way OLTP with existing mainframes is necessary. One hundred percent data integrity is necessary in ATM and other banking transactions, airline, car rental and hotel reservations, just-in-time manufacturing applications where components and finished goods are precisely controlled, and high-volume catalog and telemarketing operations. In all of these businesses, it is vital that a transaction be completed even if there is a system failure during the process. HP's Encina/9000 is the OLTP product family designed to address the integrity needs of business-critical applications.—*Feisal Mosleh is the HP Distributed OLTP product manager for the HP 9000.*

Would you like to continue to see articles on this topic?
Circle on reader card
yes 348 no 349



Access Mainframe Data On Your Workstation With Western Scientific Tape Drives!

TapeXpress

Using Overland Data's superior 9 and 18 track tape technology, Western Scientific provides you the link to over 300 million reels of half-inch tape data.

Our peripheral expertise allows you to gain access to the largest portable database in the world.

Simply plug our tape drives into the SCSI port on your Sun, HP, DEC, IBM RS/6000 or SGI workstation and bring mainframe data processing to your desktop.

The TapeXpress 18-track Tape Drive features:

- IBM 3480 and 3490 (IDRC) format compatibility and performance
- 512 KB cache buffer
- Sleek 8-inch form factor
- IBM compatible error correction for data integrity
- Optional Automatic Cartridge Loader (ACL) for high speed storage and retrieval of up to 2.2 GB
- Rackmount kit available
- One year warranty

The TapePro 9-track Tape Drive features:

- Front-loading, auto-threading reel-to-reel technology
- 1 MB cache buffer
- 1600, 3200 and 6250 bpi
- Two year warranty

Western Scientific is an authorized Overland Data distributor, specializing in UNIX Workstation Enhancement. We have been supplying satisfied customers with superior data-interchange products since 1978.

Regional Offices:
Irvine, 714-263-0303
Chatsworth, 818-773-8833
San Jose, 408-243-0168
Scottsdale, 602-229-1166
Albuquerque, 505-884-6699
Denver, 303-788-0878

Corporate Office:
4631 Viewridge Ave
San Diego, CA 92123
Tel: 619-565-6699
Fax: 619-565-6938

1-800-443-6699

EMail: info@wsm.COM

WESTERN SCIENTIFIC

Your No-Risk RISC Peripherals Company

CIRCLE 480 ON READER CARD

Correspondence Preponderance

With the holidays coming up, it's a safe bet many of us will be away from our offices for days or weeks. If your company uses E-mail, chances are your incoming mail will really stack up. And if you are lucky, none of those missed messages will be urgent. Using HP-UX, it is possible to forward your UNIX-based incoming mail to another person so urgent messages don't go without action. And, using the vacation utility, you can even notify the sender that you are out of town. These two capabilities can provide coverage for you while you are on vacation.

Part of the standard UNIX mail program, /bin/mail, can specify forwarding mail to other addresses. You specify to mail, and to mailx, that mail is to be forwarded to a different account by inserting a line at the beginning of your mail file. At some sites, this file might be in your home directory, but by default it is in the /usr/mail directory and has the same name as your login id. For example, my login is mbk, and my mail file is /usr/mail/mbk. This system stores my incoming mail in this file, and virtually all of the UNIX mailer programs access data in this file.

To enable forwarding, simply edit your mail file so the first line specifies the login name of the person to whom your mail is to be forwarded. For example, to forward your mail to john_smith, the first line of your mail file should read:

```
Forward to john_smith
```

Note: the name you specify in the "Forward to" command should be the same login id you use when you normally send mail to that user. If you want to forward mail to someone at a different site, you might use the statement:

```
Forward to mbk@netcom.com
```

If you want to forward your incoming mail to more than one person — for example, to your co-worker and your boss — simply specify multiple E-mail addresses, within quotes, separated by commas, in the "Forward to" statement:

```
Forward to "john_smith@hotdog.com, janet@calvin.co
```

Once you start forwarding this way, all of your incoming mail will be re-directed to the recipients you specify; none of your mail will remain in your in-box. However, when you do return, be sure to edit your mail file and remove the "Forward to" statement from the file or you will not receive any mail at all.

When I go out of town, I often forward my mail to my CompuServe or America Online accounts because I can access those services with a local phone call. That way, I am always up-to-date on my E-mail. The statement I use is:

```
Forward to "72466,723@compuserve.com, mbk@aol.com"
```

I see every message twice, but that is better than missing any message.

Like so many other features of UNIX, the power of forwarding mail comes with responsibility. For example, what would happen if you forward all your mail to your boss; and then, she leaves on holiday and forwards all her mail to you? If you guessed nightmares for your system mail administrator, you were right. UNIX will continue to bounce mail messages from you to your boss until your mail administrator kills the message or until one of you returns. Use caution when you forward mail, and make sure everyone on your forwarding list knows they will be receiving your mail.

VACATION TIME?

Another feature of HP-UX is the vacation utility, which lets you automatically respond to incoming mail with a message notifying others that you are away. The vacation program requires you to create a text file called .vacation.msg in your home directory. (The leading period in the filename makes it an invisible file when you do a normal file listing).

This file should contain the message you want sent to anyone who sends you E-mail during your absence. It should also contain the header information. A typical .vacation.msg file might be:

```
From: mbk@netcom.com
Subject: Out of the office
Precedence: bulk

I am out of the office from
December 15 through and
including January 5.

Miles Kehoe
```

Once you have created this file, create a .forward file, also in your home directory. This file specifies how the vacation utility will handle your incoming mail. Typically, it contains a line which pipes the incoming mail into the vacation program. A typical .forward file might include:

```
\mbk, "|vacation mbk"
```

The \mbk forces the mailer to send the message to your mailbox as well as replying to the sender with the vacation message file. If you omit the leading slash, you end up with mail being repeatedly sent to your mailbox, and responded to by the vacation program.

The remaining line in .forward directs the mail program to pipe the mail message through the vacation program. When vacation is invoked with a user name, it creates a reply based on your vacation message file and mails it to the original sender. Note that vacation responds only to mail where your login name is in the To: field or the cc: field. Vacation will never send a vacation message to any mail received from PostMaster, UUCP, MAILER or MAILER_DAEMON. Also, vacation won't reply to messages with the precedence of "bulk" or "junk."

If you are on one or more mailing lists, or if you use other accounts on your system, you can specify other account aliases by specifying **-a** in the .forward file followed by the alias. For example, if I want vacation to reply if I receive mail because I am in the support_user mail alias, the forward file would be:

```
\mbk, "|vacation -a support_user mbk
```

Once you have the .vacation.msg file and the .forward file in your home directory, start vacation forwarding with:

```
vacation -i
```

This creates the files .vacation.pag and .vacation.dir in your home directory, which will contain information about mail you received when you were away. When you receive mail, the sender will receive a copy of your .vacation.msg file.

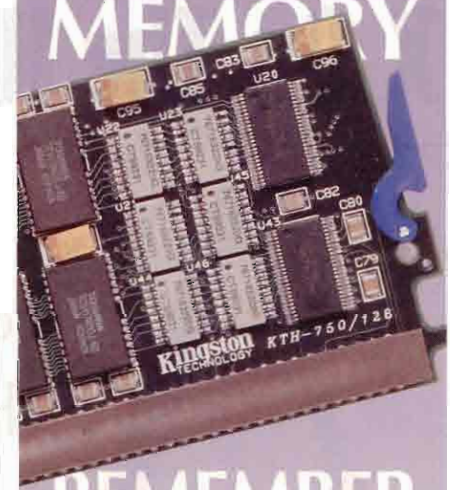
There are three things you should do after you start the vacation program: test, test and test. Send yourself a mail message to be sure you get the message and a copy of your vacation message. When you think it is working correctly, ask a friend to send you mail as well. Then, you can take off, knowing that anyone sending you E-mail will at least receive a reply saying you are away.

Finally, you can try combining vacation with forwarding in your E-mail file to make sure any urgent matters are handled.

Kehoe's Internet address:
kehoe@cardinal.com

Would you like to continue to see articles on this topic?
Circle on reader card
yes 310 no 309

FOR HEWLETT-PACKARD
MEMORY
MEMORY
MEMORY
MEMORY



REMEMBER

SPECTRUM
TRADING
COMPUTER ENHANCEMENT PRODUCTS

For all of your
HP upgrade needs.

...Offering a complete range of computer enhancement products with names you've come to respect. Spectrum Trading offers solutions for your memory and storage requirements, for Workstations, PC's and Printers. **Call today 800-655-4010**

SPECTRUM TRADING
Email: sales@spectrum-t.com
FAX: (408) 655-4019

FEATURING
Kingston TECHNOLOGY CORPORATION
THE INSIDE NAME IN UPGRADES

CIRCLE 273 ON READER CARD

Tim Cahoon

X On The HP 9000 Series 800

Are you making the transition to UNIX? Many companies are, and are doing quite well. Yet UNIX has one feature that seems to drive many on the IS staff crazy — a lack of boundaries.

If you are used to MPE/iX or even just plain old MPE V, there was some comfort in the boundaries the operating system presented to you. While you might be frustrated that certain things just couldn't be done, you also had a manual (or set of manuals) that explained every command you could do on the system. Even when you created commands using script files, there was still a finite amount you could do. Things were comfortable. Snug.

The HP 9000 Series 800 world is different. Rather than one person to one machine, you have from one to several hundred users on a single machine. Users are either connected via a serial line and a dumb terminal, a TCP/IP telnet connection or using an X terminal attached to the server. If you read the documentation for setting up X terminals, you will see that it written for Series 700 workstation users.

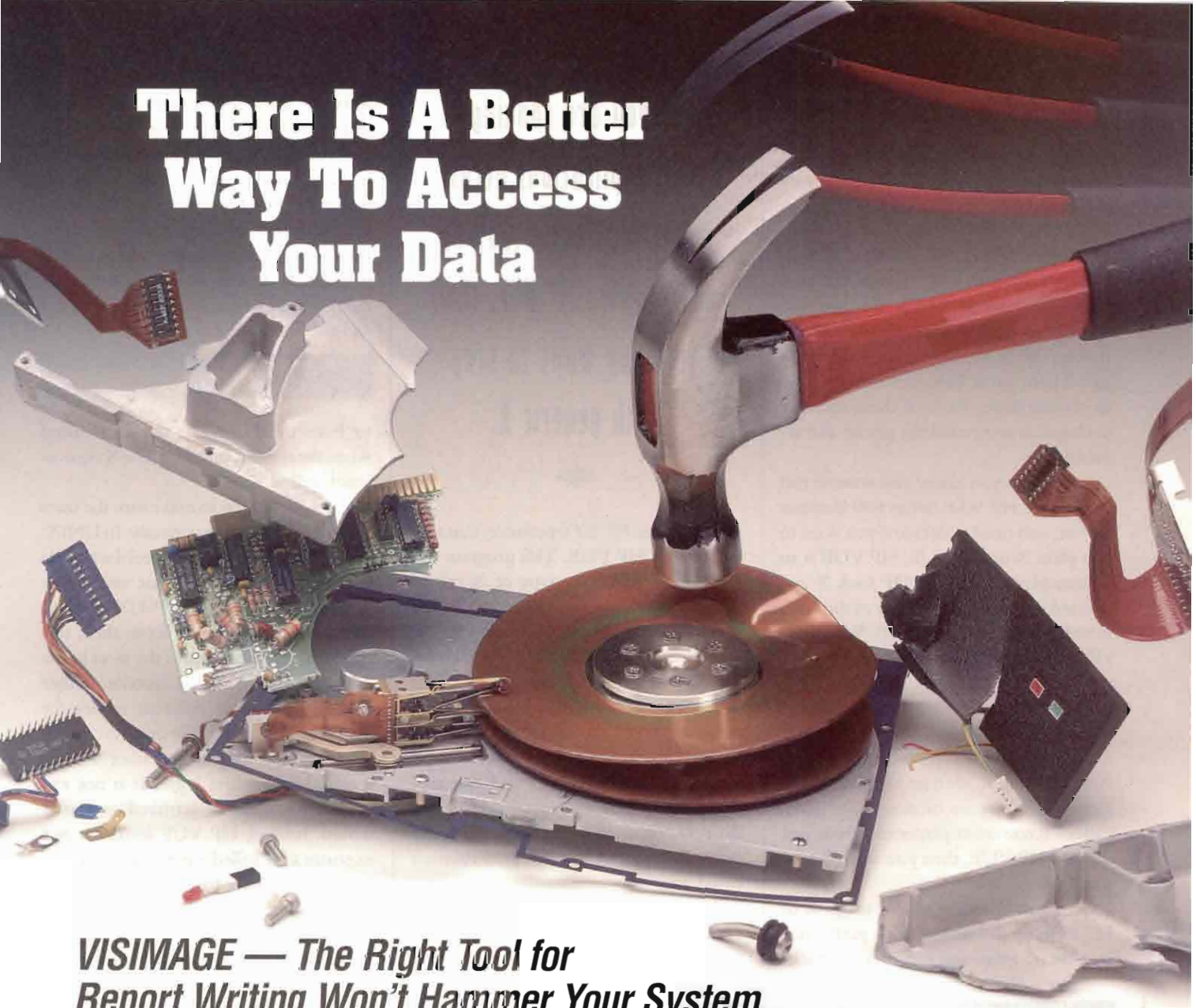
Business servers also have a dumb terminal for a console, not some fancy graphics monitor. To make things even more confusing, there seems to be 100 different ways to set up X terminals on a system.

That is a problem one reader had. They had purchased an HP 9000 Series 800 and later decided that having a few X terminals for the technical staff would make their life easier. However, setting up X to run on the HP 9000 Series 800 was difficult if not impossible by simply picking up the manual. But why use X terminals at all?

Using the X Windowing System gives UNIX users an environment somewhat similar to Microsoft Windows. Through a single login, each user gets an environment where they can have many different programs running, each in their own window. These programs can be terminal emulators, mail programs, business applications or system monitoring tools. Many programmers I know like X terminals because they can write programs in one window, run them in a second window and see the results in a third window.

Technical people like it because they can have their system and database monitors running and displaying data, while they are working on something else. X also provides greater ease of use because one login sets up the whole user environment. Contrast this with using telnet, which would require a separate login for each session or window.

The next point to consider is cost. X can be run on either dedicated X terminals or on a PC using X-based software. If your job requires a lot of heavy-duty graphics, then a dedicated X terminal is what you want. These devices are opti-


There Is A Better Way To Access Your Data

VISIMAGE — The Right Tool for Report Writing Won't Hammer Your System

Visimage, the original client-server report writer in the HP market, keeps getting better. Visimage now provides a Microsoft® Windows™ interface. Familiar mouse-driven icons empower users to select, report and download data in a controlled environment. Visimage is easy to set up and easy to use. Advanced reporting capabilities assure that users never outgrow the power of Visimage.

Our unique client-server technology minimizes resource demand through serial or network connections. Data remains on the host server, maintaining security and accuracy while eliminating potential network overloads. Users can schedule Visimage reports on the host that run independently of their PCs. Efficient data retrieval can be further enhanced by integration with HP third party indexing tools.

Choose Visimage, the right tool to access IMAGE, IMAGE/SQL, ALLBASE, ORACLE®, KSAM, C-ISAM® and flat files on your HP 3000 or HP 9000 computer.

HP, HP 3000, HP 9000, IMAGE, IMAGE/SQL, ALLBASE, and KSAM are products of Hewlett-Packard Company. MS-DOS is a registered trademark and Windows is a trademark of Microsoft Corporation. ORACLE is a registered trademark of Oracle Corporation. C-ISAM is a registered trademark of Informix Software, Inc. VISIMAGE PC and Visimage for Windows are trademarks of ARES, France.

Call now for your FREE Windows™ or MS-DOS® demo diskette!

HEWLETT PACKARD
Channel Partner

VITAL Soft
INCORPORATED

1-800-VITALSOFT
1153 Bordeaux Drive, Suite 101
Sunnyvale, CA 94089-1210 Fax: (408) 745-6681

CIRCLE 143 ON READER CARD

mized for the protocol and graphical applications. However if you are using an HP 9000 Series 800 Business Server, then you are probably just looking for something to make your life easier. In this case, PC X servers are for you. There are many companies selling this product. Walker Richer & Quinn (WRQ; Seattle, Wash.) has Reflection X which has received much praise, and Spry Inc. (Seattle, Wash.) makes AIR X which also is a good package. There are at least 10 more packages to choose from. Each of these software packages is competitively priced and affordable.

Now that you know you want to run X on your HP 9000 Series 800 Business Server, you need to decide if you want to run plain X or HP VUE. HP VUE is an enhanced version of X. HP took X and dressed it up by adding many of the same features found in Microsoft Windows. HP then gave it a pleasant graphical look-and-feel. HP VUE has a file manager, drag-and-drop printing, six different workspaces and numerous other features. If you have only have a few systems and want to set up X, then go with HP VUE. However if you are running your applications across other platforms that do not support HP VUE, then you may want to stay with generic X.

The next question is how to get X or HP VUE up and running. My preference is to set up a daemon process (i.e., background job in HP 3000 parlance) that runs either X or HP VUE. This program will listen for a particular type of X query, called XDMCP, coming from an X terminal looking for an X server on the network. Once your daemon process hears the request, it will then initiate a sequence of events that results in a login screen being displayed on the users X terminal screen. One thing to keep in mind is how the terminal is configured to do its queries. If you specify a broadcast query rather than one directed to a specific host, any system running an X or HP VUE daemon could respond.

If you are running your applications across other platforms that do not support HP VUE, then you may want to stay with generic X.

If you have a system that was configured at the factory using Instant Ignition, you may have to load the HP VUE or X software from your system tape or CD using UPDATE. Then to get HP VUE up and running as a daemon process, you need to modify the rc file in the etc directory. This file is executed whenever the system is booted up. In this script file, there is a section called localrc which is where you should put your system-specific startup commands. In this section just add the line:

```
/sr/vue/bin/vuelogin  daemon
```

to have the HP VUE daemon started when the system comes up. The X equivalent is called XDM.

The next step is to make sure the users environment is set up correctly. In UNIX, when someone logs on, a special script file is executed that sets up that users work environment. Because HP-UX users either use the Bourne or Korn shell, this special file can be found in the users home directory and is called .profile. Other UNIX shells have different names for their file. The .profile file only runs when a session is started from either a serial terminal or a telnet login. It is not executed when an X terminal session is started. Instead, HP VUE looks for and executes a file called .vueprofile, if found. So you don't have to maintain two separate files, it is possible to have the .vueprofile file execute the .profile file during login. For this to work correctly, some changes need to be done to the users .profile file. The file /user/vue/config/sys.vueprofile has a complete example of what do to make this work. After these changes are made, your users can either log onto the system via HP VUE or a dumb terminal and have the same session settings. Any changes to a user's work environment will now only require modification of the .profile file.

This should get you started on the road to X terminals. If you look at the HP VUE User's Guide, you will find plenty of files you can further tweak to make the system meet any additional needs.

Cahoon's Internet address:
cahoon@cardinal.com

What's Up (with the) Doc?

Stepping out into the UNIX world is like a butterfly coming out of its cocoon. After living in that small little world, it is quite a shock to see how big the real world really is. Then you take a look at the UNIX manual set and see just how many commands there really are. Later you come to realize that other people are constantly creating more commands all the time. Each one better than the last. Each one a techie's dream.

So, how do you know what is the best and correct way to do something? Many times you don't. What counts is that your solution gets the job done as quick as possible to meet your users' needs. Don't get frustrated because there is a thousand ways to do something. Just get the job done and enjoy the ride. When was the last time you got to be a pioneer?

One thing that adds to this frustration is the HP-UX documentation. It really must be updated to reflect the HP 9000 Series 800 Business Server environment. All of the documentation is written for the traditional UNIX user. Those users have their own workstations, with its own disk drive, its own graphics monitor and its own network connection. While they may use other servers to store data or run long batch jobs, most of the work was done on their own individual workstations.

Would you like to continue to see articles on this topic?
Circle on reader card
yes 306 no 305

Past. Present. Future.

Timeless Solutions from API International

Only from API International can you find a full array of products that will withstand the tests of time and technology.

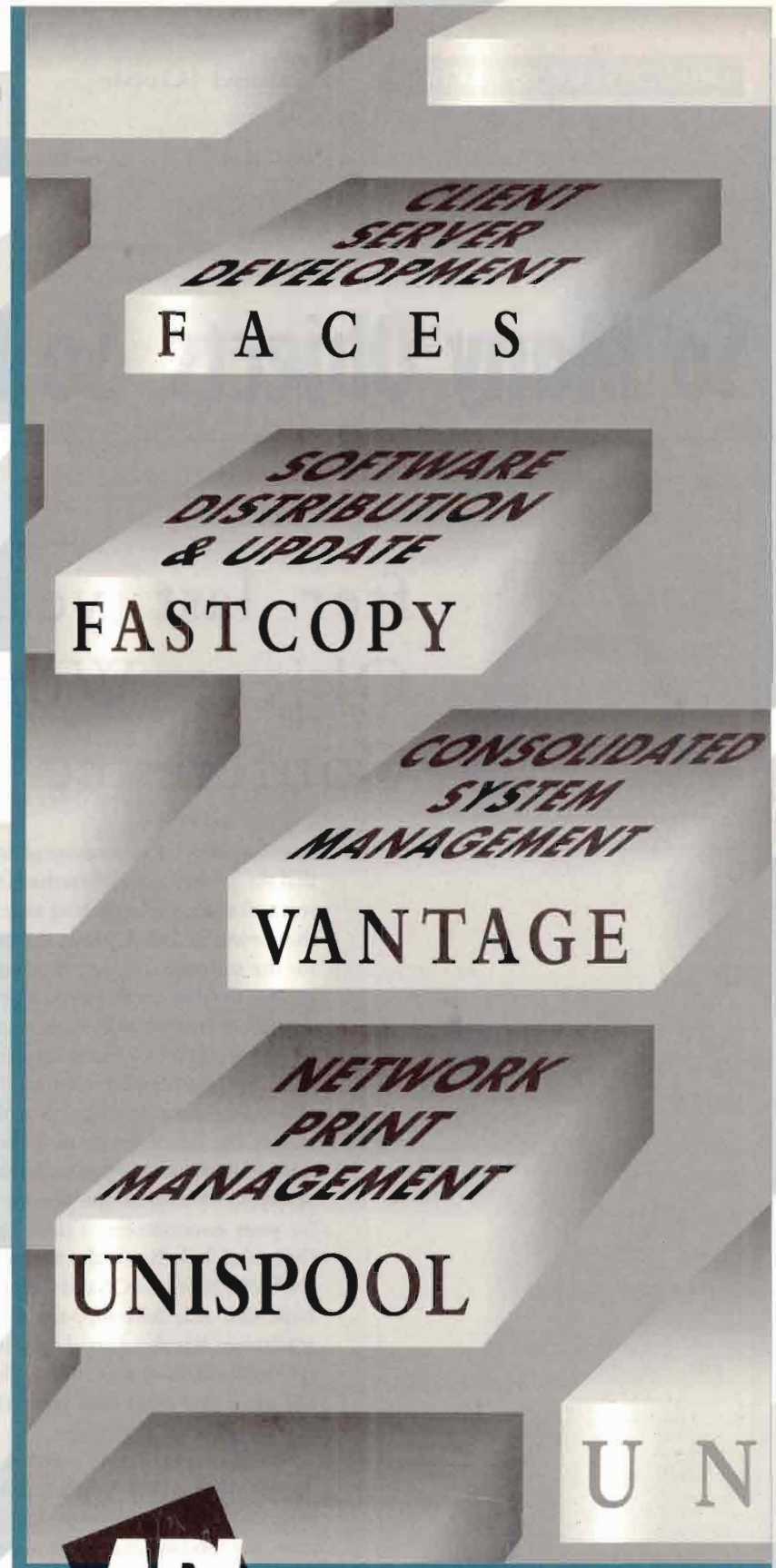
Flexibility to integrate your current technology investments without re-engineering.

Simple to install and learn, protecting your productivity and mission critical demands.

Durable to meet the automation changes and challenges of future advancements.

API International—here to stay and solve all your enterprise computing needs.

Discover how you can save with simple solutions from API International.



UNISPOOL is a trademark of Holland House bv

Call 512.280.4391.
Or, fax for more information
512.280.0309

API International

CIRCLE 297 ON READER CARD

Richard Riehle

So Many Objects, So Little Time

After last year's Object World Conference in San Francisco, I'm beginning to think that the proliferation of methods for object technology is beginning to resemble the Tower of Babel. Now, the problem for the software manager is going to be how to differentiate between object-oriented (OO) methods. By now, you should understand that OO technology does not automatically mean C++. In fact, "choice of programming language" is at the low end of the list of decisions to be made when migrating to object technology. In reality, C++ may be the poorest choice for your environment. Other language choices include Smalltalk, the new OO COBOL, Eiffel, CLOS and Objective C. Now that Ada fully supports OO programming, it is also a good option. Your OO method choices are just as plentiful, and more important than your selection of a programming language.

We had a variety of options in the "good old days" of Structured Analysis (SA) and Structured Design (SD). However, the fundamental notions common for all of those options were data flow diagrams, data dictionary and the mini-spec. Notation varied a little between Gane-Sarson and Yourdon/Constantine methods, but knowledge of one style made it easy to understand another. Derek Hatley and Imtiaz Pirbhai at Boeing added some powerful extensions to support real-time systems, but even these extensions remained faithful to the spirit of SA.

DECISIONS, DECISIONS

Decision-making about tools and methods is not as easy in the new world of object technology. OO analysis and OO design methods vary dramatically from one method to another. I recently saw a list that showed how each of the OO methodologists defined an object. It was amazing to see how widely they differed in their definitions. If the "experts" cannot agree on the definition of an object, how can a novice be expected to figure out where to get started?

There isn't much help from the CASE tool people. Rational Software Corp. (Santa Clara, Calif.) is supporting the Booch Method with its Rational/Rose and Rational/Apex tools; IDE's (San Francisco, Calif.) Software Through Pictures is moving from its OOSD method to support Rumbaugh, et al. Protosoft (Houston, Texas) is claiming support for a multiplicity of methods in Paradigm Plus, and Select Software (Birmingham, Ala.) has moved from SA to Rumbaugh's Object Modeling Technique (OMT).

Even Cadre Technology (Providence, R.I.) is now supporting OMT, but they have the good sense not to leave the customers for their earlier Teamwork product "high and dry." Ed Berard has

taken a different approach from all of the above, with a simple and concise notation which might be the right choice for many new users of OO technology.

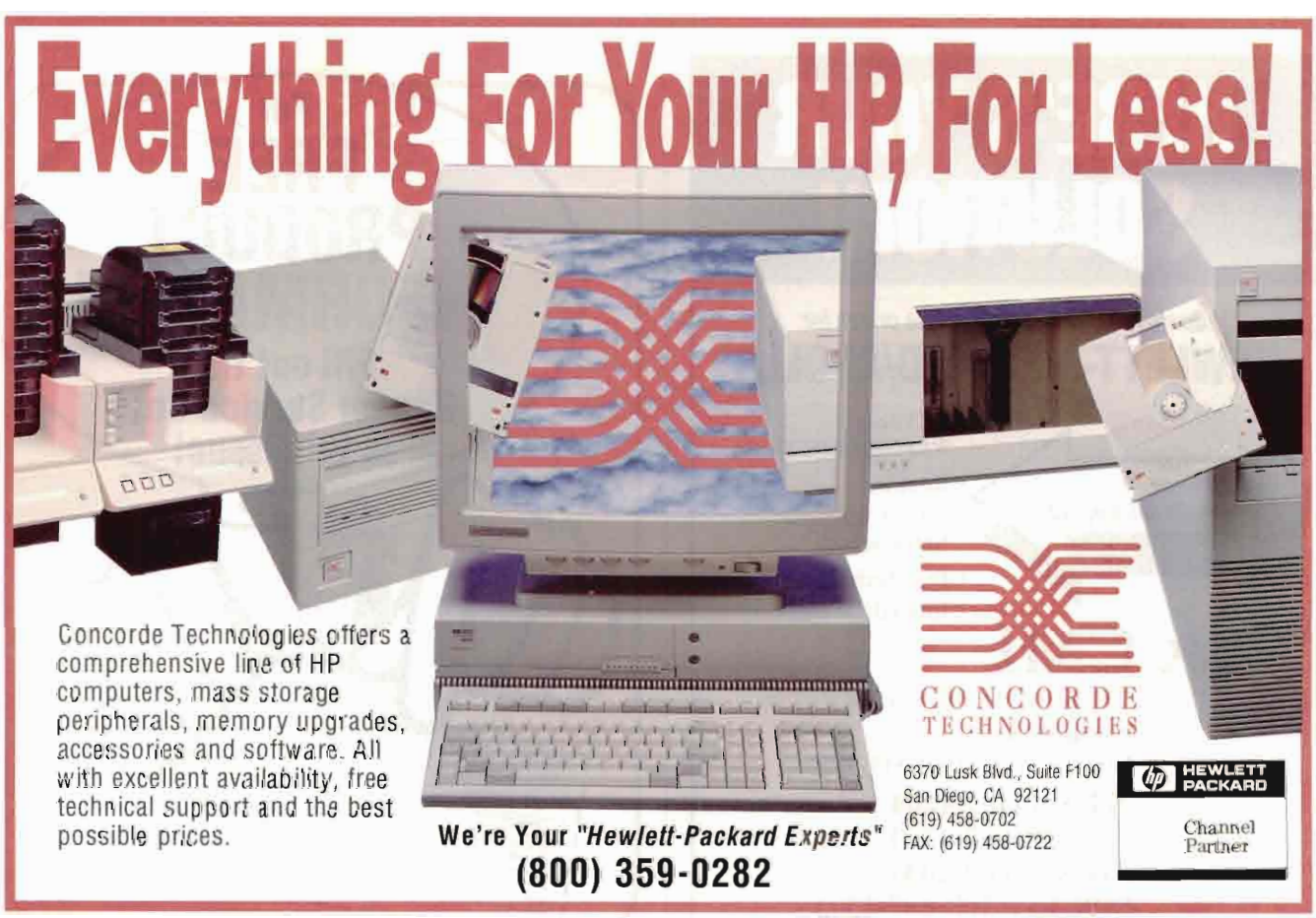
The criticisms of competing methods vary from, "It's only good for analysis, not design," to "There are too many different symbols to learn in that method" and "It is too much like the old SA/SD method instead of 'pure' OOD." For example, supporters of Rumbaugh's OMT method complain that the Booch method has become overburdened with symbols and fails to adequately support Booch's original notion of "levels of abstraction." Booch use method supporters suggest that OMT is not sufficiently complete to account for the subtleties required of real-world software design. And it seems that several CASE tool vendors have extended OMT to make it more robust and applicable to a wider range of environments.

Some CASE tool developers offer hybrid methods. PTech offers a hybridized tool which supports Ada and C++, and uses a method published by the ubiquitous James Martin. Lohara Software's ODDSEY tools combines Information Engineering with OMT into a new and unique method.

In all probability, any of the methods supported by CASE tools will work for you. But you will want to evaluate the method in terms of its applicability to your application domain. For example, Cadre's Teamwork product, using Buhr notation, has been used successfully for a wide variety of real-time embedded systems projects. Buhr notation may be too complex or just right for your application design. If you are evolving from SA, Rumbaugh's OMT may be appropriate. Some OO people feel OMT is an easier transition from SA. If you are doing an MIS application, you might consider the Coad/Yourdon or some variation on the method proposed by Martin. Some methods give better interoperability with relational database technology, and that would be an important consideration for a financial system.

Try to discover whether a method includes a graphical notation rich enough to express the kinds of software modeling you intend to do. At the other extreme, be sure you are not required to learn so many symbols that no one can later interpret your design and convert it into actual software. Because an OO design is a collection of related classes, try to determine how you might represent that collection in software. What are the associations between the classes? Does the notation support such associations? Can you represent inheritance? What about multiple inheritance? What about generic templates? If there is no convenient, or understandable, way to represent the many kinds of relationships between classes, you might be in trouble. Is there a way to represent multiple classes in a megaclass? Can you then show sensible relationships between these megaclasses?

Because comparatively few people actually have experience building OO systems, you may have to rely on a consultant to get



CIRCLE 232 ON READER CARD

started. Make sure you do not get someone who is simply selling a proprietary method. Determine whether the consultant is familiar with your application domain, and more than one or two approaches to OO technology. Will the consultant help you choose between competing methods? The most important responsibility of any consultant is to make complicated things simple. Can your OO consultant do that? Start by asking the consultant, "What is an object?" Can the consultant's definition easily be mapped to software? If not, say goodbye. Also, if you are more confused about OO technology after 15 minutes with the consultant, say ciao.

TRANSITION TO OO

Somewhere along the way, you must ask yourself why you are going to all the trouble of investigating object technology. Is it really any better than your current process? Maybe it would be better to simply continue with SA methods. If you are considering objects just so you can migrate from COBOL to C++, forget it. The transition from COBOL to C++ will undoubtedly introduce more problems than it will solve. If your reasons are more sophisticated, such as establishing a development process based on reusable software components, you can probably make a good case for object technology. If you are beginning to build software products that are larger than in the past, object technology also would be a good choice.

Don't start with a massive project. Start with a small project, using your best people under the guidance of a mentor who has experience with the chosen method and your application domain. Do not select an enterprise-critical application. Think "reuse" along the way. Chances are, patterns will emerge which represent generic solutions to problems that typify your environment. For example, certain file management routines might become abstract classes that can be applied later to larger projects.

TOOLS GALORE

CASE tool vendors are anxious to suck you into the gaping OO maw, and have set up attractive gimmicks to do so. I've gotten offers from CASE vendors who want me to try out their product on a one- to three-month trial basis. Some companies will send you a demo disk. Others offer trial basis tools. And if you ask, other vendors will send someone to your doorstep, almost before you put down the phone.

All you need to do now is figure out what kind of OO method, if any, you want to use. Hopefully, there will be some consensus someday, and like SA of yore, we only need to pick from competing notations rather than hack through a thicket of contending methods. The alternative is a continuing holy war between these OO methods, leaving the majority of us stranded in software limbo, waiting for some software messiah.

Riehle's Internet address:
riehle@cardinal.com

Would you like to continue to see articles on this topic?
Circle on reader card
yes 304 no 303

HERE'S YOUR SOLUTION!

Quality products at affordable prices for
HEWLETT-PACKARD/APOLLO®

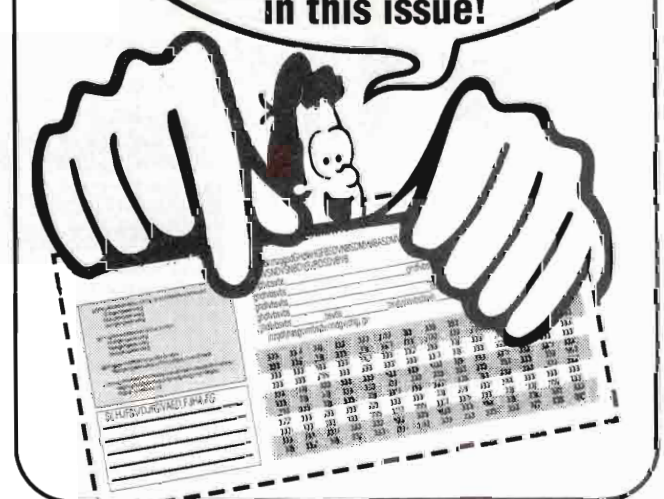
Workstations, Peripherals and Upgrades

- *NEW and REFURBISHED*
- Repairs
- 100% Customer Satisfaction
- Free Technical Support
- Immediate Delivery

CMI
Computer Marketing International, Inc.™
85 Flagship Drive
No. Andover, MA 01845 USA
Tel: 800-497-4264
508-687-3700
Fax: 508-689-2031
Int'l. Fax: 508-687-4395

CIRCLE 454 ON READER CARD

For FREE PRODUCT INFORMATION
Fill out the Reader Service Card in this issue!



John P. Burke

A SPOOK-y Replacement

Since the earliest days of the HP 3000, MPE has supported a basic print spooler. Spool files were not, however, "real" MPE files. They could only be manipulated by special MPE commands and by an odd utility called SPOOK. With release 2.1 of MPE XL, HP introduced a new, but still very basic, redesigned from-the-ground-up, SPOOK-free, Native Mode Spooler (NMS).

In our recent migration from a Classic HP 3000, my greatest challenge came in converting our procedures to operate with the NMS. What I found out should be of use to new and existing users of MPE/iX and the NMS.

Because SPOOK was eliminated from the NMS in favor of new commands and utilities, I was faced with the prospect of redoing many procedures. The two most critical were: a procedure that used SPOOK and a custom program to combine all the $STDLISTS from the previous night's processing into one file, stripping off any extraneous form feeds; and a series of procedures implemented through UDCs that took the output from a SPOOK **SHOW** command, piped it through a custom program applying selection criteria, reformatting and sorting the results, and displaying variants with the **SHOWOUT** command.

I was pleased with my new procedures. On one hand, I created a combined $STDLIST file that could be easily browsed online and printed only if necessary (and then only the relevant pages). Hundreds of pages of paper are saved daily and the custom program was eliminated. On the other hand, I still needed a special program (although I thought I could eliminate it with MPE/iX programming) to process the results of what now is a **LISTSPF** command. I was able to duplicate (and even expand on) the various display formats we used.

I do not miss SPOOK one bit. In what I believe was a misguided reaction to some prominent squeaky wheels, SPOOK has been resurrected (functionally) as SPIFF in MPE/iX 5.0. If you give the existing capabilities of MPE/iX and the NMS a chance, you probably will not need SPIFF.

Unfortunately, my users were not as happy with the NMS as I was. What is important to one organization may be inconsequential to another. And vice versa. What went wrong?

- There is a major difference in the way serial spooled printers operate versus HP-IB CIPER printers.
- The NMS does not give you any way to control the order in which spool files with equal priority (greater than the OUTFENCE) print.

If robust control and recovery of spool files is desired, you will not be happy hanging your system printers off a DTC

with a serial interface. To make matters worse, the sales force does not appear to be aware of the problems associated with serial printers.

Here's what happens: HP-IB printers will not report job completion until the last line or page is actually printed to paper. This allows the spooler to recover in the event of a power failure or paper jam between the time it transmits the last data of the spool file and the time that data is actually printed. Serial printers have no such safeguard. Once the data enters the maze of buffers between the spooler and the device, it is considered printed and the spool file is deleted (assuming no more copies remain to be printed and **SPSAVE** was not specified). Because many pages can be hung up in the MPE/iX buffers, we discovered the hard way that for critical printing tasks, the only safe alternative is **SPSAVE**.

The August 1994 issue of HP Advisor contained an article announcing "the HP-IB interfaces will not be offered on future HP 3000 platforms." Many types of devices are connected via HP-IB to the HP 3000. With disk and tape drives, the case is easily made that other interfaces are superior. What about printers? The recommended interface alternatives for future platforms are to "upgrade" to a serial interface (which is a downgrade in functionality) or "connect via LAN." The article neglects to point out that the NMS does not currently support LAN-connected printers. The bottom line, there is currently no alternative to HP-IB for robust printer recovery.

Print order. Sounds simple enough. My OUTFENCE is 10, I alter 10 spool files so that they have a priority of 11 and they physically print in the order in which I altered their priority. Right?

On the MPE/V spooler, yes. On the NMS, no. If you look hard, you will find buried in the NMS Reference Manual the following: "A spooled output device processes spool files first in the order of priority and then by the time the spool file entered the READY state." Simple. Easy to understand. And very inflexible.

A description of the algorithm used by the MPE V spooler runs to several pages in length. I've been told that a principle design goal for the NMS was to solve the round-robin problem that existed in the MPE V spooler. Using my example above, if some of the spool files were set up with multiple copies, the MPE V spooler would not normally print all copies of a file one after the other. Rather, it would print all first copies and then start printing all second copies and so on. This was understandably not desirable and was the number one complaint about the MPE V spooler. It turns out, there was a workaround but it was difficult to use and was not widely known. The NMS solves the round-robin "problem" (all copies of a spool file print together), but at the expense of flexibility in printer control.

We used the control available with the MPE V spooler to group printout by user, eliminating the need for banners and manual sorting, saving paper and manpower in the process. Not having this control is something every new user to MPE/iX needs to be aware of.

HP did the right thing in redesigning the spooler for MPE/iX from the ground up. For the most part, the NMS is a solid platform to build on. Missing are robust control of non-HP-IB printers, support for network printers, multiple print queues and print order control within a queue.

Burke's Internet address:
burkej@cardinal.com

Would you like to continue to see articles on this topic?
Circle on reader card
yes 308 no 307

Burke's Bits

- It was the worst of times, it was the best of times ... for the HP 3000. The INTEREX conference, the exhibitors and the HP computer user community have changed significantly in the space of just a few years. At INTEREX '91 in San Diego there were only a handful of exhibitors with products for the HP 9000 and HP-UX. This year, in Denver, there were just a handful of HP 3000-only exhibitors. The opening reception was co-sponsored (with HP) by two large software firms who are concentrating almost exclusively on the HP-UX portion of the market.

  So, why was it also the best of times? For starters, HP appears to be done apologizing for the HP 3000 and, in fact, pledged to vigorously promote it in the future. Even Wim Roelandts had some good things to say about the HP 3000 during his keynote address. Exhibitors were showing exciting new products. And finally, HP made numerous commitments to products and enhancements that will increase the functionality and interoperability of the HP 3000.
- ARPA Software Services will be bundled with FOS at no extra charge in the MPE/iX 5.0 "push" release (scheduled for Q1 1995). ARPA Services includes ftp and ThinLAN/iX (TCP/IP, Berkeley Sockets). This means MPE/iX will be on a more equal footing with HP-UX and other UNIX systems. HP also announced that host-based Telnet, a new product for the HP 3000, will be bundled into FOS when it becomes available in 1995.
- HP committed to integrated, sorted, sequential access and generic key search (B-trees) for IMAGE/SQL by Q4 1995. This will allow IMAGE/SQL to realize its potential as a database engine for SQL while retaining its formidable OLTP capabilities.
- DCE will come to MPE/iX in 1995 as a patch after the 5.0 "push" release. DCE is essential for the HP 3000 to be part of the enterprise computing networks of the future.
- HP will fill a major hole in MPE/iX spooler functionality with support for LAN printers in late 1995.
- One final (cautionary) note: the MPE/iX 5.0 "push" release contains an enhancement to VOLUTIL, called CONTIGVOL. It is intended to help the customer create contiguous free space on LDEV 1 for operating system updates. It is NOT a defragmentation utility (contact Bradmark or Lund Performance Solutions if you need such a utility). Furthermore, there is a Catch-22 with CONTIGVOL: it cannot be installed as a patch to a pre-5.0 system. You must (somehow) acquire enough contiguous disk space to install 5.0 before you can use the CONTIGVOL enhancement to VOLUTIL.

new Products

SOFTWARE

AVS Inc. Expands Toolmaster Line

Advanced Visual Systems Inc. (AVS) extended its Toolmaster product line with Toolmaster Xplore Widgets.

Toolmaster Xplore Widgets is a powerful set of three Motif-based widget libraries which contain more than 30 object-oriented, reusable graphics objects that incorporate Toolmaster's comprehensive graphing, plotting and contouring capabilities. The widgets allow programmers to easily add visualization and analysis capabilities to their applications without Xlib programming.

Toolmaster Xplore Widgets consists of: BaseXplore, a library of canvas, resource editor and control widgets that provide controls and interactive functionality useful in any visualization application, regardless of chart type; ChartXplore, a set of charting widgets and gadgets (windowless widgets) for display and manipulation of an unlimited number of XY datasets; and ContourXplore, which offers interactive display and analysis of scatter and gridded data of 2D, 3D and 4D surfaces.

Toolmaster Xplore Widgets is available on UNIX workstations from HP, DEC, Sun, IBM and Silicon Graphics, as well as for VMS. Pricing begins at $5,400.

Contact AVS Inc., 300 5th Ave., Waltham, MA 02154; (617) 890-4300.

Circle 400 on reader card

Agent Systems Announces Agent Transaction Manager 2.0

Agent Systems released its Agent Transaction Manager 2.0 UNIX-based software.

Agent Transaction Manager 2.0 enables transit operators of the self-service ticket vending machines and other revenue collection equipment to offer the convenience of credit/debit card sales to their customers.

The software is based on the standard UNIX multiuser, multitasking operating system. It can be hosted on computers ranging from 486- or Pentium-based microcomputers to high-end fault-tolerant Sun workstations.

Agent Transaction Manager uses the standard UNIX-based X windows GUI interface that simplifies training and use of its application.

Price begins at $20,000 and depends on the number of point-of-sale devices and level of support required.

Contact Agent Systems Inc., 1430 Regal Row, Ste., 360, Dallas, TX 75247; (214) 630-0400.

Circle 399 on reader card

ICS Inc. Introduces Widget EnhancementPak

Integrated Computer Solutions Inc. (ICS) introduced the ICS EnhancementPak for OSF/Motif, a collection of widgets that makes Motif applications easier to use for end-users, while greatly speeding GUI development for developers.

Building on the basic Motif toolkit, the EnhancementPak provides 16 additional widgets: Button Box, Color Selection, Combination Box, Internationalized Extended List, Font Selector, Hierarchy, Icon Box, Icon Button, Outline, Paned, Panner, Pixmap Editor, Porthole, Stretch, Toolbar and Tree.

The ICS EhancementPak is available on HP-UX, SunOS and Solaris, SGI IRIX, DEC OSF/1, as well as DEC VAX and OpenVMS platforms.

Contact ICS, 201 Broadway, Cambridge, MA 02139; (617) 621-0060.

Circle 398 on reader card

IEM Solution Provides Random Access Support

IEM Inc. released a composite solution of hardware and software that provides random access support of tape autofeeders for HP 3000 computers running MPE/iX and HP 9000 Series 700/800 computers running HP-UX.

IEM' controller and iemacc (IEM's tape loading software) provide random access for 4mm autofeeders from IEM, HP and ADDIC.

This solution provides: support for for future changes to HP-UX and MPE/iX revisions through the HP DAD driver; the autochanger drive and robotics can share one SCSI address; and an LCD human interface providing local diagnostics, access to robotics control from the front panel, automatic cleaning tape scheduling option, ability to report the amount of tape remaining and automatic loop back option.

Contact IEM, 1629 Blue Spruce Dr., Fort Collins, CO 80524; (303) 221-3005.

Circle 397 on reader card

Gallium Offers InterMAPics V4.2

Gallium Software Inc. announced InterMAPics Version 4.2, a software development environment for creating high-performance graphics-based display systems.

It lets application developers create a user interface capable of displaying real-time dynamic graphical information.

Enhancements include: development of a new InterMAPics runtime kernel resulting in performance increases; enhanced graphics visualization capabilities through the addition of a wide range of new X window support features; Ada language support for government and ATC application developers; user interface enhancements including pick lists and dialogue boxes; and optional mapping and GIS enhancements that will allow developers to tightly integrate a GUI with their application code.

InterMAPics 4.2 is available on Sun platforms. Support for HP, DEC Alpha, IBM RS/6000 and additional UNIX systems will be added later. A developer's license costs $20,000.

Contact Gallium Software Inc., 303 Moodie Dr., Ste. 4000, Nepean, ON K2H 9R4; (613) 721-0902.

Circle 396 on reader card

ASA Inc. Releases Hindsight-ASA 20/20

Advanced Software Automation Inc. (ASA) released their new quality and productivity online tool for developers — ASA 20/20.

Working with existing code, ASA 20/20: enhances a developer's understanding of the source code; helps them identify potential problems early in the development process; and facilitates communications among project team members and departments.

ASA 20/20 includes many tools that are accessible through one common GUI. Some features include: the flow charter, which automatically generates a function's flow chart with the click of a button; the module tester, which builds function driver and stubs to facilitate independent unit/module testing; and the report generator, which allows users to customize charts and reports.

Hindsight-ASA 20/20 is available for SunOS. Porting to Sun Solaris, HP and IBM will be available soon. Price is $950.

Contact ASA Inc., 3130A Coronado Dr., Santa Clara, CA 95054; (408) 492-1668.

Circle 395 on reader card

SES Ships C/S composer V1.2

SES introduced C/S composer Version 1.2, a decision support tool aimed at organizations designing, migrating or managing a client-server system.

Composer builds graphical, animated models that simulate client-server systems to provide the quantifiable, accurate information necessary for making informed decisions about design choices, budget priorities and feasibility of client-server systems. Composer can model client-server systems with heterogeneous networks, dynamically interactive workloads, and distributed databases and applications. Version 1.2 also supports parallel-processing representations, time-of-day workload specifications, multitiered applications, user-defined networks and processor scaling on a per-application basis.

Composer requires no programming. Information about a proposed client-server system design is entered into a spreadsheet style interface. Composer then builds a graphical, fully animated model of the system that shows data moving across the network. Users monitor system activity by selecting graphs and charts of statistics, such as response times, utilizations, queue lengths, disk space and CPU time, that update while the model is running. At the end of the model run, composer collects detailed statistics into a report for further analysis.

Price is $15,000.

Contact SES, 4301 Westbank Dr., Bldg. A, Austin, TX 78746; (512) 328-5544.

Circle 394 on reader card

ADIC's VLS Supported By NetWorker For UNIX

Advanced Digital Information Corp. (ADIC) announced that Legato Systems Inc. has included drivers for ADIC's Virtual Library Systems (VLS) line of automated storage libraries in its latest release of NetWorker software for UNIX environments.

NetWorker 4.0.2 for UNIX includes specific drivers that take advantage of the advanced features of ADIC's VLS products, such as dual-drive operation and stripping data across two drives for maximum data throughput.

Legato's NetWorker operates with the VLS libraries running under SunOS and Solaris, IBM AIX and SCO UNIX. The package includes a 10-user client bundle. Optional enablers for 10 to 50 clients are available. A graphical interface is provided under Motif and OPEN LOOK, providing point-and-click file selection for backup or restore operations.

UNIX workstations from HP, IBM, Sun, DEC and Silicon Graphics are supported. Client support for SCO UNIX 3.2 UnixWare, OS/2, NetWare servers and Windows also is available.

Contact ADIC, 14737 N.E. 87th St., P.O. Box 97057, Redmond, WA 98073; (206) 881-8004.

Circle 393 on reader card

Microlink Technologies Announces NetWizard

Microlink Technologies announced NetWizard, a TCP/IP file transfer software package that works with ftp and offers an easy-to-use GUI interface, encryption, access control, batch operation and firewall support in a single integrated package.

Features include: 100 percent compatibility with standard ftp; an enhanced user interface; X windows and TTY terminal support; DES encryption; built-in compression to reduce file transmission time; error detection algorithms; access control to protect the server by restricting access to one or more periods of time by any user or site; an auto-batch feature that allows you to map a local directory to a directory on a remote system; compatibility with firewalls; and HP 9000 Series 700 HP-UX 9.01, SunOS 4.1.x and Solaris 2.x support.

Contact Microlink Technologies Inc., 1260 Lake Blvd., Ste. 280, Davis, CA 95616; (916) 757-1180.

Circle 391 on reader card

IntelliCorp Delivers OMW For HP-UX

IntelliCorp delivered its object-oriented analysis and design tool, Object Management Workbench (OMW) for the HP-UX operating system.

OMW 1.1 is based on the Martin/Odell Object-Oriented Information Engineering methodology.

OMW diagrams and models are live and executable at every stage of the development process, providing immediate feedback to analysts and developers.

OMW costs $10,995 for a single license, with a diagram-only version available for $6,000.

Contact IntelliCorp, 1975 El Camino Real W., Ste. 101, Mountain View, CA 94040; (415) 965-5500.

Circle 390 on reader card

Rational Distributes Rogue Wave's OO Libraries

Rational Software Corp. and Rogue Wave Software announced that Rational will distribute Rogue Wave's line of class libaries and reusable components. In addition, Rogue Wave acquired the C++ Booch Components from Grady Booch but Rational will continue to distribute them. The C++ Booch Components are a library of reusable classes in C++ code.

Rational will distribute Rogue Wave's reusable components, which include general-purpose mathematical and GUI class libraries as well as C++ data structures and programming classes.

Contact Rational Software Corp., 2800 San Tomas Expwy., Santa Clara, CA 95051; (408) 496-3600.

Circle 392 on reader card

EasySpooler Offers EasyNet

EasySpooler announced EasyNet, a UNIX-based software that manages remote printers connected to any network using TCP/IP protocol. EasyNet schedules and manages print jobs on printers attached to any remote host on the network, without requiring users to log on to that host.

EasyNet allows EasySpooler to provide users with a menu-driven interface. EasySpooler can interrupt and restart a print job according to page number and provide safe recovery of printed files on remote printers. Other capabilities include easy forms control, simple start and restart procedures and menu-driven "trash can."

It supports the following UNIX systems: HP, IBM, Sun, SCO, AT&T, Data General

and Unisys. Price is $995 for the first license and $100 for each additional license.

Contact EasySpooler, 5327 N. Central Expwy., Dallas, TX 75205; (214) 522-2324.

Circle 389 on reader card

Devcom Provides FaxFX For UNIX

Devcom Mid-America Inc. announced FaxFX c/s, the client-server enhancement to the FaxFX Fax Management Software. FaxFX c/s allows organizations with UNIX-based servers (HP, IBM, NCR, Sun, SCO, UnixWare) the ability to send faxes from a variety of workstations (clients) including Microsoft Windows and Windows NT, OS/2, Macintosh and UNIX.

Clients can request a single fax transmission or use phone books for fast broadcasts. Files located on the client machine will transparently move to the UNIX server and combine with server-based documents for a single request. Users can receive, view, print and route faxes as well.

Contact Devcom Mid-America Inc., 2603 W. 22nd St., Ste. 23, Oak Brook, IL 60521; (708) 574-3600.

Circle 388 on reader card

ESD Releases FAST-EDY V2.0

Eifrid Systems Development (ESD) released version 2.0 of its FAST-EDY (Edit Data Yourself) software product. FAST-EDY is a file/record/data utility tool for HP 3000 Spectrum class computers. It gives quick access to IMAGE, KSAM and MPE file data.

FAST-EDY is a native mode utility that gives users complete control and dynamic access to data in a block mode interface. It has full screen edit capability, positional data search and replacement capability, key or search item change capability, file browsing functions and record READ, WRITE, UPDATE and DELETE commands.

The product is distributed with a full function version (FAST-EDY) and a read-only version (FAST-RDY).

Price is $1,995 for each file utility, or $5,000 for all three.

Contact ESD, P.O. Box 1221, Carpinteria, CA 93014; (800) 929-3310.

Circle 387 on reader card

OPS Unveils Productivity Series

Onion Peel Software (OPS) unveiled a suite of productivity tools for the HP OpenView platform. The Productivity Series for HP OpenView enhances and extends the HP OpenView network and system management environment.

The Productivity Series allows advanced map navigation, object management, process monitoring, reporting and graphical MIB manipulation.

The Productivity Suite consists of the following modules: Tool Bar, Object Parking Lot, MibTree and Report Writer.

Cost is $1,295 for the bundle.

Contact OPS, 10829 W. Bridgford Dr., Raleigh, NC 27606; (919) 362-7638.

Circle 385 on reader card

Cornerstone Software Introduces Piccolo

Cornerstone Software announced Piccolo, which provides a multithreaded "backbone" architecture on which to build applications as peer-to-peer or client-server without concern of the protocol or platform in use.

Piccolo offers a peer-to-peer subsystem that allows users to design and build applications across multiple platforms. Features include: bi-directional client-server; simultaneous connections; multiple applications on various platforms; same API for all platforms and protocols; interprocess communications; no waited and non-blocking physical I/Os; and unsolicited messages.

Supported platforms include IBM RS/6000 AIX, HP 9000 Series 700 HP-UX, OS/2, SCO UNIX, Sun Solaris, Tandem Guardian, and Microsoft Windows and Windows NT.

Contact Cornerstone Software Inc., 11 Trafalgar Sq., Nashua, NH 03063; (603) 595-7480.

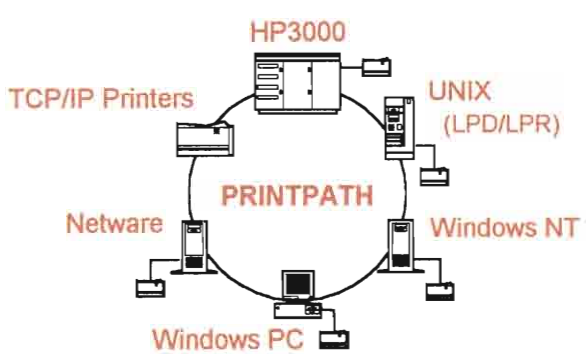
Circle 384 on reader card

TransEra Provides HTBasic For Windows

TransEra released HTBasic for Windows which combines effortless programming of HP-style BASIC with the advanced features of the multitasking Windows environment. HTBasic for Windows makes it easy to port HP BASIC code to the Windows environment from HP workstations and vice versa.

HTBasic for Windows is deigned to run under Windows 95 or Windows 3.1 and is

JUST PRINT IT!



RAC CONSULTING (206) 357-9572
BOX 10099, OLYMPIA, WA. 98502 Fax (206) 352-8453

Join the HP3000 users who DO print it, anywhere on the network!

RAC's PRINTPATH is the complete network printing solution for your HP3000. All popular TCP/IP printer interfaces and network operating systems are supported. Includes full error detection and recovery for reliable delivery and full printer control, such as file delete/skip, suspend, resume (anywhere in the file) and special forms support.

PRINTPATH fully integrates your HP3000 with lan printers, UNIX systems, Netware/Lan Manager print queues, Windows Clients/servers and any LPD/LPR device. HP3000 output can be delivered to any of your network printers and HP3000 printers become network printing resources.

The best news is the low cost of all this functionality! The five year cost of PRINTPATH ownership is so low, there is NO reason to wait any longer...

Get PRINTPATH and JUST PRINT IT!

CIRCLE 451 ON READER CARD

THE
TOTAL
SOLUTION
sales, service, support

On-time service, on-line equipment.
Black River takes the risk and worry out of ordering, implementation and maintenance.
You're assured:
- Full line of new and previously owned, refurbished 9000, 3000 and 1000.
- Technically trained maintenance team.
- Free installation
- Nationwide service.

Call 216-365-9950 or fax 216-365-3916 for more information.

BLACK RIVER
COMPUTERS
THE TOTAL SOLUTION
sales, service, support
7630 RACE ROAD • NORTH RIDGEVILLE, OHIO 44039
216-365-9950

CIRCLE 171 ON READER CARD

"HP Professional is different from other HP publications because it provides me with higher level information and that's important."

James Burton, IS Manager
Boise Cascade

HP Professional
215.643.8000 FAX 215.643.8099

implemented with 32-bit code. HTBasic for Windows is file compatible with DOS, PC, DOS 386/486, HP 9000 Series 700 and Sun SPARCstation versions of HTBasic.

It supports most IEEE-488 interface cards. And, multiple IEEE-488 boards can be used at the same time by loading the appropriate device drivers.

HTBasic provides the RMB integrated program development environment including syntax-sensitive, full-screen editor, and interactive execution and debugging statements. It offers easy-to-use HP-style data acquisition and RS-232 instrument control statements, complete HP-style screen, plotter and printer graphics, SCPI compatibility and HP-GL plotter support.

Price is $925.

Contact TransEra, 345 E. 800 South, Orem, UT 84058; (801) 224-6550.

Circle 372 on reader card

ESI/Technologies Launches EMIS 8.0

ESI/Technologies announced version 8.0 of its Enterprise Management Information System (EMIS), ESI's family of fully-integrated manufacturing, distribution and financial applications. EMIS 8.0 features the advanced functionality of event-triggered requirements planning. Other key enhancements include Activity-based Cost Management, EIS and Dynamic Finite Scheduling.

The system delivers concurrent, continually updated information throughout the enterprise, enabling users to respond rapidly to change. By accessing transaction logic, the system learns frequently used input patterns. It also uses dialog boxes for archiving selection and flexibility, plus a global on and off "help" function.

EMIS is available on Oracle 7.0 and most major platforms including HP 9000s. The EMIS modules can be purchased individually or as a fully-integrated system. Prices range from $80,000 to $600,000, depending on modules purchased and number of users.

Contact ESI/Technologies Inc., Rand Bldg., 7th Fl., Buffalo, NY 14203; (716) 852-8000.

Circle 371 on reader card

W. Quinn Associates Announces Q*file

W. Quinn Associates shipped version 1.1 of their comprehensive file management software, Q*file, on the major UNIX platforms — HP, SunOS, IBM AIX, Ultrix, OSF/1, Solaris, and for Motif and character cell terminals.

The software maintains the same PC-tree look-and-feel for each platform in order to eliminate the retraining time associated with moving between differing operating systems.

Q*file includes: a feature set that targets security, performance, user support, disk space and system analysis; comprehensive tool set for file and disk management; pull-down menuing, keystroke shortcuts and a graphical interface that speed speed up the UNIX command line approach; support for major UNIX platforms as well as OpenVMS; and advanced features for effective crisis management.

Q*file UNIX is priced at $295 per seat, Motif or character.

Contact W. Quinn Associates Inc., 1835 Alexander Bell Dr., Ste. 330, Reston, VA 22091; (703) 758-0727.

Circle 370 on reader card

HARDWARE

KSC Introduces Grand Interconnect

KinecticSystems Corp. (KSC) introduced the Grand Interconnect, which interfaces VXI to VME, EISA and PCI; can perform remote distributed data acquisition; uses a fiber-optic serial highway; and performs high-speed data transfer (up to 120 MHz and throughput of up to 10 Mbps).

The Grand Interconnect is a high-throughput, low-latency highly deterministic I/O channel designed for high-performance, distributed data acquisition applications.

The Interconnect supports up to 126 I/O chassis. Each VXI Slot 0 controller includes local "scan list" capability and also provides data buffering.

Contact KSC, 900 N. State St., Lockport, IL 60441; (815) 838-0005.

Circle 383 on reader card

Aurora Increases Networking Functionality

Aurora Technologies introduced a series of eight-port, high-performance ISA/EISA asynchronous terminal and synchronous communications servers, the latest in a line of serial networking products for the HP 9000 Series 700 workstations.

The I/O cards optimize network, system and application performance by employing dedicated RISC communications controllers, extended RAM buffers and flow-control processing to offload CPU workload and network traffic. The products support baud rates to 115.2 Kbps async and 128 Kbps sync, all full-duplex. The series delivers three levels of workstation expansion: the 801A is designed for standard local area terminal and peripheral connectivity; the 801AX adds extended RAM buffers for data security and higher throughput; and the 801A+ provides

high-speed WAN routing and bridging with the reliability and security of synchronous and asynchronous data communications.

Price is $699 for the 801A, $1,099 for the 801AX and $1,995 for the 801A+.
Contact Aurora Technologies, 176 Second Ave., Waltham, MA 02154; (617) 290-4800.

Circle 379 on reader card

Maxoptix NWorks Expands MaxLyb Jukebox Offering

Maxoptix NWorks announced that it will sell versions of a new offering of high-end Maxoptix MaxLyb optical jukeboxes that are certified for plug-and-play compatibility with Avail Systems Corp.'s NetSpace Hierarchical Storage Management (HSM) software.

Maxoptix' 60, 120 and 180 GB MaxLyb jukeboxes will be packaged with special Avail software to ensure their compatibility with Avail's NetSpace software.

The MaxLyb systems are based on Maxoptix T3-1304, 1.3 GB multifunction rewritable optical disk drives. With their high rotational spindle speed (up to 4,800 rpm) and large, 4 MB read/write cache buffer, T3-1304 drives have seek times under 19 ms, average access times under 26 ms and maximum sustained read performance of 2.2 Mbps. The jukeboxes feature built-in diagnostics and are backed by autochanger reliability specifications of 400,000 mean swaps between failure (MSBF) for Models 6.5, 13 and 26, and 1 million MSBF for the higher-capacity models.
Contact Maxoptix Corp., 2520 Junction Ave., San Jose, CA 95134; (408) 954-9700.

Circle 382 on reader card

Concorde Introduces SCSI-2 Floppy Drives

Concorde Technologies Inc. introduced a family of external 1.4 MB 3.5-inch SCSI-2 floppy drives designed for use with the HP 9000 family of computers. The drives support 2HD and 2DD floppy formats and are compatible with most major HP-UX software applications.

Concorde's new SCSI-2 floppy drives consist of three basic versions: a single 1.4 MB, 3.5-inch drive model which costs $795, a dual 1.4 MB, 3.5-inch drive model which costs $1,495, and an expandable unit that includes a single floppy drive and an expansion bay that can be upgraded with a hard disk, a CD-ROM drive, or a DAT, 8mm or QIC tape drive.
Contact Concorde Technologies Inc., 6370 Lusk Blvd., Ste. F100, San Diego, CA 92121; (619) 458-0702.

Circle 381 on reader card

Megahertz Extends Mobile Data Products

Megahertz Corp. announced the Megahertz MobileLAN, a PCMCIA-based remote access server. Designed to provide easy dial-in network access for mobile computer users, Megahertz' eight-port remote access server is a PCMCIA-based server that supports NetWare (IPX) and UNIX (TCP/IP).

MobileLAN allows users to act as a node on their local network from a remote location, interfacing just as they would in the office.

The rack-mountable communications server will include the eight-port server hardware, GUI management software based on Windows and SNMP, a command-mode telnet or asynchronous interface, and client software for DOS and Windows. The server also supports remote control software.

MobileLAN costs $3,299. Populated with Megahertz 14,400 bps PCMCIA modems, the price is $5,691 or $711 per port.
Contact Megahertz, 605 N. 5600 W., P.O. Box 16020, Salt Lake City, UT 84116; (801) 320-7000.

Circle 380 on reader card

Network Appliance Delivers FASware Release 2

Network Appliance Corp. announced the availability of FASware Release 2, which provides enhancements for managing the FAServer NFS file server appliance, or filer.

This release allows online expansion of the file system. One of FASware Release 2's hardware control features is "hot swap" support for the FAServer 1400 rack-mounted system. Because hot swap allows disk drives, fans and power supplies to be added or replaced quickly, without shutting down the filer, system administrators can perform expansion and maintenance on the filer without interrupting NFS file service.

FASware Release 2 also allows administrators to manage disk storage availability by setting limits or quotas on the use of the filers disk space.

Other features include: support for Domain Name Service (DNS); a TCP/IP protocol for discovering and maintaining network resource information distributed among multiple network name servers; syslogd (system message log daemon) that enables system messages to be sent to appropriate log files or users, depending on the priority of each message and the system facility from which it originates; and a routed (routing daemon) feature that manages up-to-date routing information used to direct the sending and forwarding of packets over the Ethernet.

IEEE 488.2
for Your
HP Series 700
Workstation

Low-Cost EISA Plug-In Board for HP Series 700 Models 715, 725, and above

- Highest performance
  - More than 1.3 Mbytes/s (IEEE 488.1)
  - More than 5.5 Mbytes/s (HS488)

External Ethernet Controller for All Models (including 712)

- Uses built-in Ethernet port – no slot required
- Share GPIB peripherals among several workstations

Both hardware products include industry-standard NI-488.2M™ software for guaranteed software portability to future platforms.

Call for your FREE GPIB brochure
(800) 433-3488
(U.S. and Canada)

NATIONAL INSTRUMENTS
The Software is the Instrument

6504 Bridge Point Parkway
Austin, TX 78730-5039
Tel: (512) 794-0100
95 (800) 010 0793 (Mexico)
Fax: (512) 794-8411

Branch Offices:
Australia 03 879 9422 • Austria 0662 435986
Belgium 02 757 00 20 • Canada 519 622 9310 • Denmark 45 76 26 00
Finland 90 527 2321 • France 1 48 14 24 24 • Germany 089 741 31 30
Italy 02 48301892 • Japan 03 3788 1921 • Netherlands 03480 33466
Norway 32 848400 • Spain 91 640 0085 • Sweden 08 730 49 70
Switzerland 056 20 51 51 • U.K. 0635 523545

© Copyright 1994 National Instruments Corporation. All rights reserved. Product and company names listed are trademarks or trade names of their respective companies.

CIRCLE 242 ON READER CARD

Contact Network Appliance, 295 N. Bernardo Ave., Mountain View, CA 95054; (415) 428-5100.

Circle 376 on reader card

SBE Adds Ethernet Options

SBE Inc. added 10BaseT and 10Base5 (AUI) Ethernet options to its four- or eight-port serial VME board. The 25 MHz Motorola 68EN360 (QUICC) chip serves as a processor and communications controller for four ports of serial data communications, or three ports of serial and one 10 Mbps Ethernet port. A 15-pin connector on the front panel or a P2 paddle board allows access to conventional 10Base5 networks. Alternatively, an RJ-45 connector on the front panel provides access to 10BaseT networks.

The Ethernet option allows LAN access for network management, network downloading, LAN to WAN bridging and other applications that make the VCOM-54E a versatile network resource.

The VCOM-54 is available with a single QUICC for four-channel applications or with two QUICCs for eight ports.

Host drivers are available for HP-UX, HP-RT and UNIX systems.

Prices range from $1,600 to $1,920.

Contact SBE Inc., 4550 Norris Canyon Rd., San Ramon, CA 94583; (510) 355-2000.

Circle 378 on reader card

ATTO's SCSI Expander Supports Online Storage

ATTO Technology introduced full 16-bit SCSI support for the ATTO SCSI Expander. The SCSI Expander supports up to 105 SCSI devices on a single SCSI adapter, using only one SCSI port on the workstation. It targets storage-intensive applications such as digital video, CD-ROM servers, imaging stations and file servers that demand high online SCSI storage capacity with fast data transfer rates.

The SCSI Expander uses logical unit numbers (LUNs), which are a subset of the SCSI bus IDs. Through LUN addressing, it supports seven standard devices at each SCSI bus ID.

It can be designed with two independent SCSI buses (host bus and device bus) which can be configured as either Narrow (8-bit) or WIDE (16-bit) SCSI-2. The SCSI Expander also is available in either single-ended or differential SCSI.

Contact ATTO Technology Inc., Audubon Technology Park, 40 Hazelwood Dr., #106, Amherst, NY 14228; (716) 691-1999.

Circle 377 on reader card

dataDisc Supplies dataDisc CDR4x

dataDisc Inc. announced dataDisc CDR4x quadruple-speed CD-ROM recorder. The full-height SCSI unit works on PC, Mac or UNIX platforms. It is bundled with dataDisc DiscMaker Premastering/Mastering software, SCSI card, SCSI cable and 10 blank disks.

Disk formatting includes CD-ROM, (Orange Book, standard CD-ROM recordable), CD-Multisession and CD-DA (Red Book Audio — play on your home stereo CD). Users also can upgrade to DiscMaker Multimedia to add CD-I, CD-ROM XA and CD-TX.

A standard CDR4x DiscMaker bundle for the PC and Macintosh costs $5,995, and for

OUR 14th YEAR

QUALITY HP WORKSTATIONS - WITHOUT THE HP PRICE

RENT · LEASE · BUY

Immediate Delivery On Most Items

- 700 SERIES: Models 710, 715/50, 715/75, 735, 735/125 712/60, 712/80
- X-STATIONS: ENVIZEX, C270X
- All 300, 400T and 400E Series
- Memory, Features & Disc Upgrades for all Workstations
- CPU Upgrades: 715/50, 715/75, 735, 735/125, 425, 380, 360

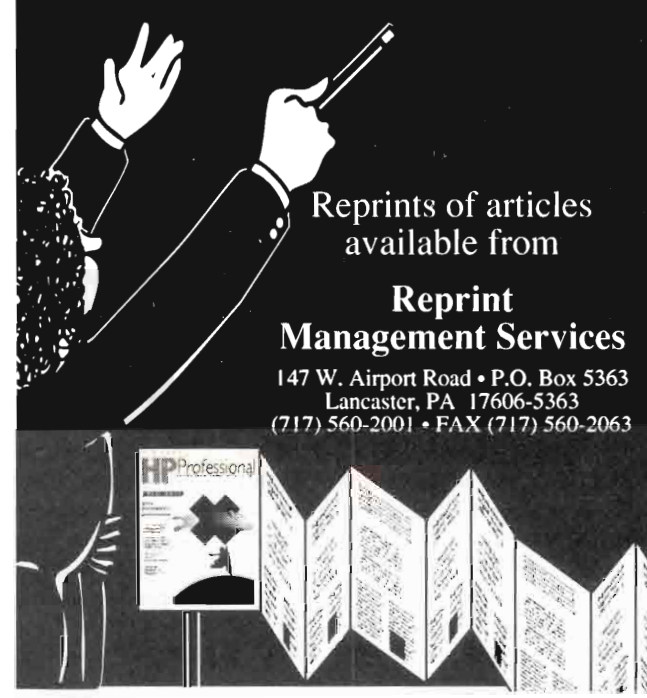
More Than 1500 Satisfied Customers Throughout The USA and Worldwide

For technical info, specs or pricing call Mordy or Carol

C.S.U. Industries, Inc.
207 Rockaway Turnpike, Lawrence, NY 11559
(516) 239-4310 FAX (516) 239-8374

CIRCLE 213 ON READER CARD

The Right One for a Repeat Performance



Reprints of articles available from

Reprint Management Services

147 W. Airport Road • P.O. Box 5363
Lancaster, PA 17606-5363
(717) 560-2001 • FAX (717) 560-2063

UNIX costs $7,495. The CDR4x Multimedia DiscMaker bundle costs $6,495.
Contact dataDisc Inc., Rte. 3, Box 1108, Gainesville, VA 22065; (703) 347-2111.

Circle 375 on reader card

DPS 2500 Incorporates POWERLogic Circuit Monitors

Square D announced that the self-contained, mobile DPS 2500 power distribution cabinets include POWERLogic circuit monitors and standard K-Factor transfers. DPS 2500 cabinets protect electronic equipment from damage, are easy to install and relocate, prevent overheating and interference, and provide instant analysis of power status or usage.

DPS 2500 models range from 15 to 225 kVA, with up to four panelboards. One or more panelboards can be used to filter out damaging noise and distributed power to critical loads in offices.

The microprocessor-based POWERLogic circuit monitor captures, analyzes, displays and communicates vital information about the quality of power being distributed to electronic equipment. This information includes true RMS measurement of voltage, current, power factor, K-Factor, frequency, watt-hours, var-hours, demand current and demand power.

K-Factor transformers step down higher voltages to 208/120 Vac, attenuate electrical noise, minimize voltage distortion and trap harmonic currents.
Contact Square D, 1660 Scenic Ave., Costa Mesa, CA 92626; (714) 557-1636.

Circle 374 on reader card

The DPS 2500 contains POWERLogic circuit monitors and standard K-Factor transformers.

Redundant scsiTerminal Server Guards Against Downtime

Central Data Corp. introduced the Redundant scsiTerminal Server. It provides eight fully-redundant serial ports for connecting modems, printers, terminals or other RS-232 devices. It connects to the UNIX host via the SCSI bus, without consuming any system card slots. The ST-8008 is compatible with UNIX systems from HP, IBM, Sun, DEC and Silicon Graphics.

The ST-8008 can connect two separate UNIX hosts. If one host fails, the second host can take control of all eight ports. It also provides a power fail switch-over mode in case one of its scsiTerminal Servers loses power.

If more than eight redundant serial ports are required, users can stack multiple ST-8008 units, daisy-chaining them together on the SCSI bus.

The ST-8008 costs $2,995.
Contact Central Data Corp., 1602 Newton Dr., Champaign, IL 61821; (217) 359-8010.

Circle 373 on reader card

CIRCLE 293 ON READER CARD

Reader Information

This month's issue contains many advertisements for hardware and software products available for your HP systems. Your investment in these products today could mean a more lucrative future for your company. Use the information below to learn more about the advertisers' offerings, then use the reader information card to initiate your direct link to valuable information about these advertisers' products.

ARTECON INC.
CIRCLE 242
Artecon is a leading systems integrator and manufacturer of value-added hardware and software products for the UNIX marketplace. Product lines include: Opticals, Removables, Backups, Storage and Accessories.
Call (800) USA-ARTE, FAX (619) 931-5527.

AVNET COMPUTER GROUP
CIRCLE 129
Avnet Computer Group (ACG), a division of the Avnet, Inc. is one of America's leading suppliers and distributors of networked multivendor computer systems. Avnet Computer is uniquely qualified to serve computer end users of mid to large size systems at all stages of selection, design, installation and service. **Call us at (800) 218-9116.**

BERING INDUSTRIES
CIRCLE 105
Removable mass storage solutions, including hard disk drives magneto-optical erasable drives, and high-capacity tape backup for HP 3000/9000/1000 computers.
Call (800) 237-4641, (408) 379-6900.

BRADMARK TECHNOLOGIES INC.
CIRCLE 108
Your total HP 3000/IMAGE database solution that includes: DBGENERAL, the most complete general-purpose database utility available in the HP 3000 market. And SUPERDEX, the fully compatible indexing package that provides unprecedented data retrieval speed and flexability. Both are reasons why Bradmark is committed to provide premier data management solutions.
Call (800) ASK-BRAD.

CAMINTONN CORP.
CIRCLE 294
100% compatible memory for HP 9000, IBM RS/6000, Sun SPARCstations and other workstations.
Call (800) 843-8336.

COMPUTER MARKETING INTERNATIONAL INC.
CIRCLE 454
Independent distributor of new and refurbished HP Apollo workstations and peripherals. We provide in-house technical support and depot repair services. We are committed to providing 100% customer satisfaction on every order. **Call 800-497-4CMI.**

CONCORDE TECHNOLOGIES
CIRCLE 232
Broad line of HP mass storage (disk, tape, optical) and RAM memory upgrades for HP, Apollo, DEC, SUN, RS/6000 and Silicon Graphics computers. Best prices, availability, warranty and support. **Call 1-800-359-0282 for complete information and pricing.**

HEWLETT-PACKARD COMPANY
Access the experts in accounting, manufacturing and imaging free of charge and learn about Next Generation Applications for the HP 3000 Series. See your special invitation to HP's **"You've got client/server right where you want it"** audio symposia in this issue of HP Professional or **Call 1-800-224-HP3K now to register.**

IEM INC.
CIRCLE 122
IEM offers affordable solutions for the HP environment, including 4mm and 8mm tape drives, autofeeders and carousels, QIC tape drives, optical drives (WORM, MOD, Multifunction and CD-ROM), fixed Winchester drives, floppy disk drives and combination drives. Most IEM products are available with an HP-IB or SCSI interface for HP 1000, 3000 and 9000 computers. IEM offers software solutions, including automated backup and archiving.
Call (303) 221-3005 or (800) 321-4671.

INFORMATION BUILDERS INC.
CIRCLE 247
4GL/DBMS for HP MPE/XL and HP-UX systems offering application development, reporting and decision support. Supported on all major platforms.
Call (212) 736-4433.

KINGSTON TECHNOLOGY CORP.
CIRCLE 281
Kingston Technology designs and manufactures memory upgrades for PCs, laptops, workstations and laser printers. The Kingston product line also features mass storage subsystems and processor upgrades.
Call (800) 835-2545, FAX (714) 435-2699.

M.B. FOSTER ASSOCIATES LTD.
CIRCLE 155
DataExpress, the #1 End-User Computing Environment and report writer. EDI Windows, translation software. Reflection and the Network Series.
Call (800) ANSWERS, FAX (613) 448-2588.

MINISOFT INC.
CIRCLE 472
Minisoft 92 for DOS and Windows providing HP terminal emulation and LAN connectivity for just $129. **Call (800) 682-0200.**

NEWPORT DIGITAL CORP.
CIRCLE 246
Accelerator cards for HP 9000 Series 200 plus HP 310 and HP 320. Ten-fold performance improvement. **Call (714) 730-3644.**

R SQUARED/VANGARD TECHNOLOGY
CIRCLE 112
Serving the UNIX environment, R Squared offers a complete line of add-on peripherals for SUN, SGI, IBM and HP workstations, including high-capacity disk and tape drive systems and optical libraries. R Squared provides a value-added, UNIX-compatible product to increase storage capacity and decrease access time. All products are backed by R Squared's experienced, factory-trained technical support and service staff.

Vangard Technology provides a broad spectrum of data management solutions for the open, client/server environment, ranging from mass storage subsystems to networking and data communications products to fully integrated, turnkey systems featuring direct access archival storage and hierarchical storage management.
Please call (800) 777-3478 or FAX 303-799-9297 for more information.

QUEST SOFTWARE
CIRCLE 268
The only complete HP 3000 solution for
1) High-speed network file and database access.
2) IMAGE, KSAM and MPE file shadowing.
3) Low overhead and network spooling.
Call (714) 720-1434.

TRYONICS INC.
CIRCLE 477
Tryonics Inc. is a provider of quality remanufactured HP Apollo, Apollo Domain series workstations, spare parts, network and software consulting services.
Call (603) 427-6850.

UNISON SOFTWARE INC.
CIRCLE 499
Unison-Tymlabs is a supplier of networked systems management solutions for both UNIX and MPE. Product areas include workload management, storage management, print automation and desktop integration.
Call (408) 245-3000.

VITALSOFT
CIRCLE 143
Try Visimage, the original client-server report writer for HP computers. Quickly become productive in a Windows or DOS client environment. HP server processing offers immediate access to all your system data, subject only to limitations set by the system manager. **Call (800) VITALSOFT for free demo.**

WRQ (WALKER RICHER & QUINN)
CIRCLE 263
Makers of Reflection Series Software. HP terminal emulation for PCs and Macintoshes.
Call (800) 872-2829.

WESTERN SCIENTIFIC MARKETING INC.
CIRCLE 480
Western Scientific offers a line of high-performance peripherals to upgrade and enhance your Sun, HP, Silicon Graphics, DEC, IBM RS/6000 and Novell workstations. We use quality components from premier suppliers such as Seagate, HP, DEC, IBM, Conner/Archive, Exabyte, Tatung Overland Data/Cipher and Adic. We configure, integrate and test innovative disk, tape optical, RAID, jukebox and memory subsystems to meet your application requirements.
Call (800) 443-6699.

WHITE PINE SOFTWARE INC.
CIRCLE 476
Delivering two firsts: eXodus for Macintosh with native PowerPC support and eXodus for Windows 5.5 with Microsoft's latest UI, Windows 4.0.
Call (800) 241-PINE.

HP Professional
1300 Virginia Dr., Ste. 400
Fort Washington, PA 19034
(215) 643-8000 FAX (215) 643-8099

PASS THE WORD — SAY YOU SAW IT IN HP PROFESSIONAL

*The publisher does not assume any liability for errors and omissions.

PRODUCTshowcase

Datasys

Hewlett-Packard

BUY ■ SELL ■ LEASE ■ TRADE

- SYSTEMS
- UPGRADES
- MEMORY
- PERIPHERALS

1-800-DATASYS

Corporate Headquarters
Dallas, Texas

(214) 931-9195 (214) 931-9619 Fax
ATLANTA • BOSTON • DALLAS • OKLAHOMA CITY
PHILADELPHIA • SAN FRANCISCO

CIRCLE 484 ON READER CARD

HEWLETT-PACKARD

BUY SELL RENT REPAIR

9000 1000 3000 TEST

MEMORY - PLOTTERS - PRINTERS
DISC DRIVES - WORKSTATIONS - DATA ACQUISITION

TSA

THE RIGHT EQUIPMENT. RIGHT NOW.
2040 West Sam Houston Parkway N. • Houston, Texas 77043

1-800-422-4872

713/935-1500 FAX 713/935-1555

CIRCLE 228 ON READER CARD

NORCO COMPUTER SYSTEMS, INC.

Hewlett-Packard Quality at a NorCo Price

1000 • 3000 • 9000 • 250

BUY—SELL TRADE—LEASE

Processors, Peripherals and Systems

21337 Drake Road
Cleveland, OH 44136-6620
FAX:216-572-0636
216-572-4040 1-800-892-1920
(Outside Ohio)

CIRCLE 221 ON READER CARD

HEWLETT-PACKARD

1000 • 3000 • 9000

BUY • SELL • RENT • LEASE

MAINTENANCE

PROCESSORS • PERIPHERALS • SYSTEMS

EURODATA INC.

(613) 745-0921

Fax: (613) 745-1172

2574 Sheffield Road, Ottawa, Canada K1B 3V7

CIRCLE 283 ON READER CARD

WORKSTATIONS

Get more for your money from a full service supplier with free tech support and an inventory *unmatched* in the industry.

- Depot repair
- Advance exchanges
- Crash kits & spares
- Hardware sales - Used - Remanufactured - Custom configurations
- Board level to complete systems

•Systems •Monitors •Drives
•Printers •Keyboards
•Power Supplies
•Network Products

HEWLETT PACKARD
apollo
digital
NeXT

Sales & Service Support since 1978

CRISIS

1.408.270.1100 International & in CA
800.726.0726 • FAX 408.270.1183
crisis@netcom.com

CIRCLE 211 ON READER CARD

BUY • SELL • TRADE

COMPLETE HP SYSTEMS AVAILABLE

ALL PERIPHERALS

All items in stock — immediate delivery
All warranted to qualify for manufacturer's maintenance.

ConAm Corporation

Canada/US 800-926-6264
California 310-419-2200
FAX 310-419-2275

CDLA

RENT • LEASE • MAINTENANCE

CIRCLE 210 ON READER CARD

AMTEK Since 1981

BUY ■ SELL ■ SERVICE ■ TRADE
RENT ■ LEASE

Novell Authorized Service Center

1-800-765-0331

Los Angeles ■ Dallas/Ft. Worth ■ Baltimore

CIRCLE 206 ON READER CARD

Allon Computer, Inc.

Quality, Integrity, Reliability
Since 1989

Buying and Selling HP 1000/ 3000/9000 Terminals, Plotters, Disc Drives, PCs

1-800-808-0851

Fax: 813-724-6567
Direct Dail: 813-724-6566

CIRCLE 251 ON READER CARD

TRILOGIC

GREAT PRICES AND DISCOUNTS TO 30%

With Trilogic's trade up program, get significant discounts.
Buy any series 700/800
Get credit on Sun SPAC stations, DEC stations, SGT workstations.

Call for Details
1-800-346-2933
Fax 412-745-5950

CIRCLE 223 ON READER CARD

PRODUCTshowcase

I/O Data Systems, Inc.

Buy - Sell - Lease - Trade
HEWLETT-PACKARD
Systems. Workstations
Peripherals. Solutions

HEWLETT-PACKARD Channel Partner

(216) 835-2211
27378 W. Oviatt
Bay Village, OH 44140
FAX: (216) 835-0220

CIRCLE 272 ON READER CARD

HEWLETT-PACKARD
HP WORKSTATIONS
FOR LESS SSS THAN X-TERMINALS!

HP 710 Workstation with:	HP 710 Workstation with:
19" Color Monitor	19" Color Monitor
420MB Disc	420MB Disc
8MB RAM	16MB RAM
Keyboard	Keyboard
3-Button Mouse	3-Button Mouse
$1895	$2295

Add 8MB RAM $495 · Add 16MB RAM $795
Add Additional 420MB Disc $495 · Substitute 1GB Disc for 420MB $795

LIMITED TIME OFFERS • BUY WHILE SUPPLY LASTS
90 DAY WARRANTY

1-800-422-4872
713/935-1500 Fax 713/935-1555 Email:info@tsa.com
TSA
2040 West Sam Houston Parkway N. • Houston, Texas 77043

CIRCLE 293 ON READER CARD

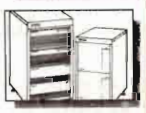
Paying High Prices for Workstations?

Save Money with ECI.

CIRCLE 205 ON READER CARD

OUR 14TH YEAR

QUALITY HP EQUIPMENT WITHOUT THE HP PRICE



DON'T UPGRADE YOUR HP SYSTEM UNTIL YOU GET A SECOND OPINION FROM THE SECOND SOURCE FOR HEWLETT-PACKARD 1000-3000-9000 EQUIPMENT

Consult with us about cost-saving alternatives
- Complete Configurations
- Individual CPUs-Peripherals
- Memory Upgrades and Feature Enhancements
- Classic and Spectrum Equipment

WE BUY
Highest Prices Paid

WE SELL
*All Items Sold Are Guaranteed for HP Maintenance
*Short and Long Term Leases Available

WE TRADE
Over 1000 satisfied Hewlett-Packard users are our customer references throughout the United States, Canada, Europe, and the Far East.

C.S.U. Industries Inc.
207 Rockaway Turnpike Lawrence, NY 11559
Ask for Mordi: (516) 239-4310
FAX (516) 239-8374

CIRCLE 158 ON READER CARD

HEWLETT PACKARD
Depot Repair

- Expert Depot Repair
- 5 Day Turnaround
- Emergency Exchange Program

BLACK RIVER COMPUTERS

1-800-837-0061
216-365-9950 Ohio
216-365-3916 FAX

CIRCLE 154 ON READER CARD

715 system
Grayscale bundle, 19" monitor, 16MB RAM, one 525 internal SCSI II disk HP-UX 9.0.....$ 4,400

735 CRX system
Color 2D/3D, 19" monitor, 32MB RAM and one 1GB SCSI II disk.....$18,500

755 CRX system
Color 2D/3D, 24-plane double buffered CRX graphics with accelerator and Z-buffer, 19" monitor, 64MB RAM, one 2GB SCSI II disk.....$29,500

800-977-9808

7500 W. Mississippi
2nd Flr.
Lakewood, CO 80226

ECI EQUIPMENT CONSULTING INCORPORATED

CIRCLE 217 ON READER CARD

The HyPoint Advantage . . .
INVENTORY

"Specializing in Full Line of HP 3000 Products"

Buy ■ Sell ■ *Trade* ■ Lease

HyPoint Technology
600 Ken Mar Drive
Cleveland, OH 44147

1-800-231-5500
216-526-0323

CIRCLE 491 ON READER CARD

SHERLOCK
Systems & Solutions

Sensible Solutions To The Mysteries Of Your Hardware Requirements

Solutions ... Not Just Answers

We inventory a large line of CPU'S and peripherals.
MPE • MPE-XL • UNIX
Buy • Sell • Trade • Lease

CALL
1-800-827-6804
FAX
216-848-4515

CIRCLE 295 ON READER CARD

TRILOGIC

Get the Hottest Prices on the market today

HP's AdvanceStack Hubs

For more information & pricing CALL:

PHONE (800) 346-2933
FAX (412) 745-5950

HP Re-Marketing Specialists Since 1978

9000

WE BUY AND SELL:

700, 400 & 300 WORKSTATIONS
MASS STORAGE
MONITORS
PLOTTERS

MONTEREY BAY COMMUNICATIONS

Tel: 408-429-6144
Fax: 408-429-1918

CIRCLE 229 ON READER CARD

ADAGER

The Adapter/Manager for IMAGE/SQL Databases obsoleted the need for database reloads back in 1978 and became the de facto standard for HP3000 systems worldwide.

Adager

Sun Valley, Idaho 83353-0030 U.S.A.
Toll-free from Canada and the USA:
Tel 800 533-7346 Fax 800 247-7346
From other parts of the world:
Tel 208 726-9100 Fax 247-8191

CIRCLE 121 ON READER CARD

The "HP Experts" for Over 25 Years!

HEWLETT PACKARD
Channel Partner

Migration assistance with new HP hardware, system benchmarking, software testing, conversions, system rentals, outsourcing, and disaster recovery services.

Computer Solutions, Inc.
201-672-6000

CIRCLE 209 ON READER CARD

TUNE INTO HP
Pre-owned Equipment

3000 Peripherals 9000

BUY SELL TRADE

WORKSTATIONS
CPUs
DISC & TAPE DRIVES
TERMINALS & PRINTERS
3000/9000 MEMORY

Lynne Company

(Phone #) 805-489-1564
(Fax) 805-481-3799

CIRCLE 219 ON READER CARD

HEWLETT-PACKARD 9000
IT'S OUR SPECIALTY.

PRINTERS
LaserJets
DeskJets
Rugged Writers

PLOTTERS
DraftPros
DraftMasters
Electrostatics
DesignJet

WORKSTATIONS
Series 200, 300, 400, 700

We offer large discounts, outstanding service and immediate delivery. Call us before you buy a printer or plotter!

TED DASHER & ASSOCIATES

4117 2nd Avenue South
Birmingham, AL 35222
(205) 591-4747 or (800) 638-4833
Fax: (205) 591-1108

CIRCLE 233 ON READER CARD

HARBORSIDE COMPUTER MARKETING

Buy/Sell/Lease All HEWLETT PACKARD!

Harborside Marketing, Inc.
1010-A Park Court
Safety Harbor, FL 34695
813-799-2009
FAX 813-791-6699

CIRCLE 215 ON READER CARD

HP 3000

Buy — Sell — Trade
Hewlett Packard Equipment

CALL
713-466-9455
(Fax) 713-466-9454

Surety Systems

7044 Empire Central
Houston, TX 77040

CIRCLE 226 ON READER CARD

DISCOUNTS TO 90%
BUY • SELL • RENT
LEASE • TRADE

Unique - Special - Vintage
Obsolete - Scarce - Rare
Refurbished - Hard-to-Find

HP 1000 • 3000 • 9000
AND TEST EQUIPMENT

Free surface shipping!

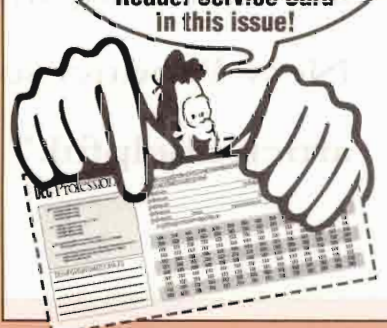
Call 509-662-9039

ELECTRONIC SERVICES, INC.
FAX 509-662-8271

Since 1973

CIRCLE 212 ON READER CARD

For FREE PRODUCT INFORMATION
Fill out the Reader Service Card in this issue!



CIRCLE 226 ON READER CARD

CONSULTANT showcase

ENTRUST YOUR SOLID REPUTATION TO OURS.

WTW, a leader in systems integration and information consulting to many Fortune 500 companies is seeking highly-qualified professionals to work with us in solving business problems through technical solutions.

Apply your experience in:

- HP3000 COBOL
- X-Windows/MOTIF
- HP9000 HP-UX
- Telephony/CTI
- ChemLMS LAB/UX
- Powerhouse
- Speedware
- ASK MANMAN
- ORACLE/SYBASE
- PowerBuilder

Send resumes to:

WTW INFORMATION TECHNOLOGY CONSULTING

WESSON, TAYLOR, WELLS AND ASSOCIATES, INC.
P.O. Box 12274–HPP94
Research Triangle Park, NC 27709-2274
(919) 941-0081 or (800) 833-2894
Fax (919) 941-0082 • CSERVE 73321, 3536
An Equal Opportunity Employer

CIRCLE 201 ON READER CARD

THE HP PLACEMENT SPECIALISTS

INFOTECH
SEARCH GROUP, LTD.

✦ EXPERIENCED PROFESSIONALS WITH A PROVEN TRACK RECORD OF SUCCESS IN PLACING HP TALENT

NED POOLE
BRIAN DONOHUE
910-538-0123
FAX# 910-538-0126
PO BOX 2195, BURLINGTON NC 27216-2195

"PROFESSIONALS SERVING PROFESSIONALS"

CIRCLE 109 ON READER CARD

HP CAREERS NATIONWIDE

EMPLOYMENT MARKET IS STRONG!!!
Many opportunities for those with the following skills:

- ❑ MPE or UNIX Systems Management
- ❑ POWERBUILDER, UNIFACE
- ❑ SYBASE / ORACLE / INFORMIX
- ❑ ASK, AMAPS, BOSS, MOMS
- ❑ Networking - LAN, WAN
- ❑ C, C++, Progress
- ❑ COBOL, SPEEDWARE, POWERHOUSE

Call - Amos & Associates

Diane Amos, C.P.C.
633-B Chapel Hill Road
Burlington, N.C. 27215
(910) 222-0231
FAX: (910) 222-1214

CIRCLE 204 ON READER CARD

INFORMATION

Size: 1/9 page — 2 3/16" x 2 3/4"

Rates:

1 time:	$550	6 times:	$440
3 times:	$495	12 times:	$385

COLOR NOW AVAILABLE **$100**

- Typesetting and composition available.
- Camera ready mechanical required.

For more information call:
Lisa Merck (708) 655-0100

"HP Professional always has articles on the latest in computing technology. I especially find the New Product section useful and the UNIX articles helpful."

Ferris Mahadeen, Chief Engineer,
Aimco Technology
(215) 643-8000 FAX (215) 643-8099

HP Professional

ADVERTISERS INDEX

Reader Service Number		Page
485	Advanced Archival Products	SUPPLEMENT
286	API International	45
242	Artecon	COVER 2
105	Bering Technology, Inc.	SUPPLEMENT
171	Black River Computers	54
108	Bradmark Technologies, Inc.	23
294	Camintonn Corporation	6
257	Co Comp Inc.	8
454	Computer Marketing International	48
232	Concorde Technologies	47
232	Concorde Technologies	SUPPLEMENT
205	CSU Industries	56
240	Dataram Corp.	6
192	FutureSoft	29
	Hewlett Packard	SUPPLEMENT
149	IBM	12,13
122	IEM, Inc	2
122	IEM, Inc.	SUPPLEMENT
247	Information Builders, Inc.	21
218	Insignia Solutions Inc.	11
270	Kingston Technology Corp.	1
463	Lawson Software	COVER 3
168	M.B. Foster Associates	19
472	MiniSoft, Inc.	8
244	National Instruments	55
246	Newport Digital Corporation	9
268	Quest Software	35
451	RAC Consulting	53
273	Spectrum Trading	41
214	Texas ISA, Inc.	33
290	TransEra Corporation	31
477	Tryonics Inc.	25
137	Technical & Scientific Applications (TSA)	57
499	Unison/Tymlabs	37
112	Vangard Technology	SUPPLEMENT
143	Vital Soft Incorporated	43
263	Walker Richer & Quinn Inc	COVER 4
194	Western Scientific	39
298	White Pine Software	4
253	Workstation Solutions	SUPPLEMENT

UNIX is a registered trademark of AT&T in the U.S.A. and in other countries.
MS-DOS is a trademark of Microsoft Corp.
Macintosh is a trademark of Apple Computer Inc.
X Window System is a trademark of MIT.
Windows is a registered trademark of Microsoft Corp.
Windows NT is a registered trademark of Microsoft Corp.
NetWare is a registered trademark of Novell Inc.

ADVERTISING SALES OFFICES

Leslie Ringe, Publisher
(215) 643-8070

EASTERN CANADA, NEW ENGLAND, MIDWEST & SOUTH
(617) 861-1994
Alonna Doucette, Regional Sales Manager
238 Bedford St., Ste. 3
Lexington, MA 02173
FAX (617) 861-7707

MID-ATLANTIC & SOUTHEAST
(401) 351-0274
Edward Marecki, Regional Sales Manager
One Richmond Square
Providence, RI 02906
FAX (401) 351-0276

NORTHERN CALIFORNIA, NORTHWEST, WESTERN CANADA
(415) 873-3368
Judy Courtney, Regional Sales Manager
903 Sneath Ln., Ste. 220
San Bruno, CA 94066
FAX (415) 873-6608

SOUTHERN CALIFORNIA & SOUTHWEST
(714) 974-0555
Karin Altonaga, Regional Sales Manager
446 S. Anaheim Hills Rd., Ste. 161
Anaheim Hills, CA 92807
FAX (714) 974-6853

INTERNATIONAL
(215) 643-8070
Leslie Ringe, Regional Sales Manager
1300 Virginia Dr., Ste. 400
Fort Washington, PA 19034
FAX (215) 643-8099

Cheryl DeMaioribus, Marketing Services Manager
James Solomon, Card Deck Manager
Cathy Dodies, List Rental Manager

1300 Virginia Dr., Ste. 400
Fort Washington, PA 19034
(215) 643-8000 FAX (215) 643-8099

To Manage Or Not To Manage

For Some, Holding A Management Position Can Lead To Burnout

According to a recent survey, about 50 percent of us think the best jobs to have are the ones with the words "director" or "manager" in the title. Well, those may be nifty jobs alright, but the number of people who can thrive in the management pressure-cooker number far fewer than 50 percent.

Of course, it's downright un-American and anti-capitalist if you don't want want to be a manager. You know, "The Boss." "The Big Cheese." "A-Number One." Well, there's a saying that you should be careful what you wish for, because you just might get it.

I've seen a lot of stories about job-related stress and burnout among computer jockeys lately. Invariably, they tell of some IS manager who chucks their career to open a bakery or become a whitewater rafting guide. Programmers may get singed around the edges, but you have to be the boss to really burn out. Think about that before bucking too hard for that big promotion.

The closest I came to a flame-out was in 1989. After a major career crisis, I decided to give up on the rat race in computers for a career selling real estate.

My strengths are learning new stuff, debugging, coding and working with end-users. So what did I do? I followed my ego instead of my gut. I busted my ass to become a manager, so I could shuffle paper and get yelled at. No wonder I flamed.

But as it turned out, I really wanted to leave management behind, not computers. I found myself coding for fun instead of profit, and then I got a call to do some consulting work. Then I was recruited by another outfit for a real job and I could feel the bug bite again. I am a computer jockey, and I will always be a computer jockey.

Thank God, I didn't get the real job. It was a high-pressure management situation. If I'd taken it, I'd probably be selling corn from a roadside stand by now.

But I did keep on with the consulting work, and then embarked on what passes for my writing career. Before I knew what had happened, I was running with the rodents again. But this time, I was having fun and I still am.

Computers are a calling. Computer jockeys are born and not made. So deep down you've got this obsessive/compulsive streak that got you hooked into this biz in the first place, and it won't go away.

With a couple of exceptions, I think most of my bosses wish they had stayed programmers. They might not admit it publicly, but the signs are all there. Just because your ego says you should be the head honcho, doesn't mean the rest of you will put up with it.

So, here's a little quiz for all you managers and manager wannabes. Take it and tally up the score:

1. I like to
- a) yell at my computer
- b) yell at other people
- c) get yelled at

2. I code
- a) for fun
- b) for fun and money
- c) for money

3. If I went back to school, I'd go to
- a) Starfleet Academy
- b) MIT
- c) Harvard

4. The last time I got drunk, I
- a) got a body part pierced
- b) was on my expense account
- c) was on a salesman's expense account

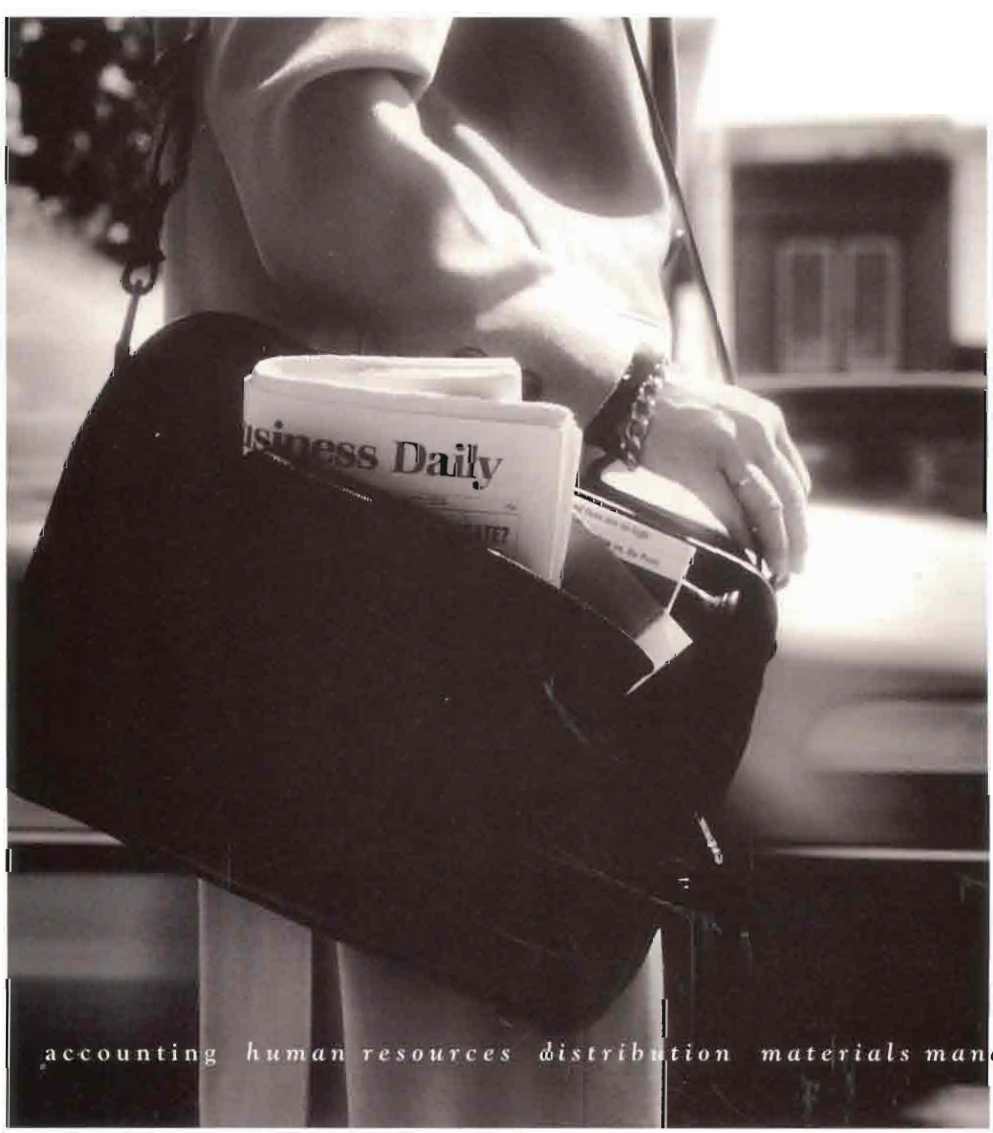
5) On my next vacation, I'll
- a) go to Sturgis on my Harley
- b) play golf at Hilton Head
- c) learn my kids' names

Give yourself 5 points for C answers. Take away 5 points for As and get zero for the Bs. If your score is less than zero,there's no denying it you're a computer jockey. If they'll put up with you, you should stay right where you are. A score of 1 though 20 means you've got management potential, so be careful and don't blame me if you decide to quit and open a flower shop. A score of 20 or more means you're it, the "Big Kahoona."

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

"top scores in six areas"

Computerworld Buyers' Satisfaction Scorecard



Of our 1900 clients worldwide, an impressive number are now up and running with Lawson client/server open enterprise solutions. On SYBASE,® ORACLE® and INFORMIX®

According to *Computerworld's* Guide to Client/Server Financial Software, an even more impressive number give us top scores in all six categories: *Responsiveness of Service, Ease of Use, Overall Reliability, Reporting Capabilities, Interfacing with Other Applications and Quality of Support.* In fact, Lawson was *highest in overall satisfaction* of all the companies surveyed.

Call us at 1-800-477-1357 extension 838, and find out why.

accounting *human resources* *distribution* *materials management*

LAWSON Software

©1994 Lawson Software. SYBASE, ORACLE and INFORMIX are registered trademarks of their respective owners.

CIRCLE 463 ON READER CARD

PC connectivity?

Reflection makes it child's play.

If connecting PCs to minicomputers, mainframes, and servers has you puzzled, choose Reflection® and Reflection Network Series® software from WRQ.

No other software vendor offers such a complete solution to integrate personal computers with HP 3000, HP 9000, VAX/VMS, UNIX, and IBM systems. Reflection provides the most precise terminal emulation for text and graphics, fast file transfer, a versatile command language, and more—for DOS, Windows, and Macintosh platforms. Reflection also offers a reliable PC X server. All backed by a solid company with exceptional technical support.

If you want to run host and server applications at the same time, add the Reflection Network Series. Run NS/VT, LAT, Telnet, and TCP/IP concurrently with LAN protocols from a single PC, over Ethernet or Token-Ring networks. The Reflection Network Series also includes support for Berkeley Sockets, NetBIOS, and NetIPC—yet it takes remarkably little memory.

Putting all the pieces together can be challenging. So avoid the mind games. True genius is simplicity.

Whether you need basic PC-to-host connections, links to multiple hosts and LANs, or you're moving to the world of X, there's one obvious solution: Reflection.

To solve your connectivity problems call

800-92NETWORK

In Europe, call +31.70.375.11.00

Outside Europe, call 206.217.7100

CIRCLE 263 ON READER CARD

WRQ Reflection

Making PC Connections Count

Walker Richer & Quinn, Inc. / 1500 Dexter Avenue North, Seattle, Washington 98109 / FAX: 206.217.0293 / Buitenhof 47, 2513 AH Den Haag, The Netherlands / FAX: +31.70.356.12.44
Reflection and Reflection Network Series are registered trademarks of Walker Richer & Quinn, Inc. All other trademarks are the property of their respective holders.