

HP

OCTOBER 1996

Professional

**Building Client-
Server Applications
On The HP 3000,
PART 3 PAGE 29**

**MES, ERP, MMI
And SCADA:**

The Fab Four Of Manufacturing Software

**Making Cents
Of Manufacturing**

PAGE 26



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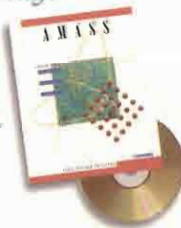
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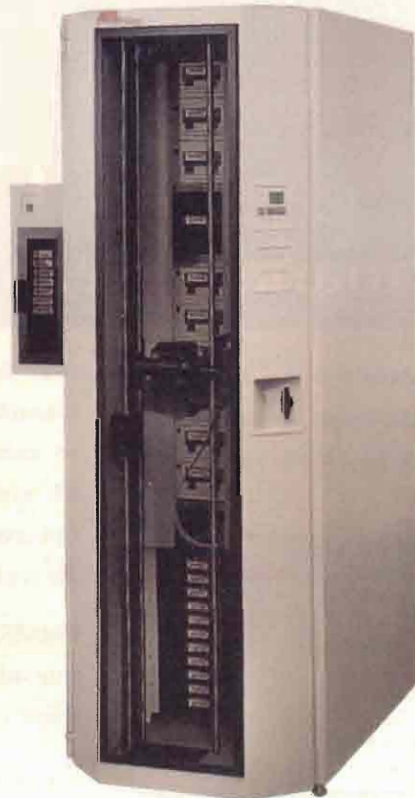
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Some people hear the word manufacturing and think smoke stacks and greasy factories. Most people fail to connect manufacturing and leading edge information systems technology. And when you talk about manufacturing, you are talking about three types of systems: MES, ERP and MMI. But how do you build the perfect solution, while making cents of manufacturing?

A White Paper: Building Client-Server Applications on the HP 3000, PART 3

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By Rohan Hall

In August, we introduced the "notion" of client-server on the HP 3000 by explaining the elements of the server as well as defining client-server computing. Last month, we provided a look at the client including hardware, programming software and networking requirements. This month, Part 3 concludes the series with a focus on performance, security and outsourcing.

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Immediate availability of HP's B-class workstation, HP expands C-class workstation product line; HP increases system performance with its 64-bit PA-8000 CPU; HP introduces VirtualVault software granting secure Web access; 75 percent of CIOs indicate that they'll pursue business opportunities via the Internet; HP, Digital, Lexis-Nexis and the Open Group join forces; and HP reduces prices of OmniBook notebooks. 10

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Cover photo by Joseph Drinas/The Image Bank

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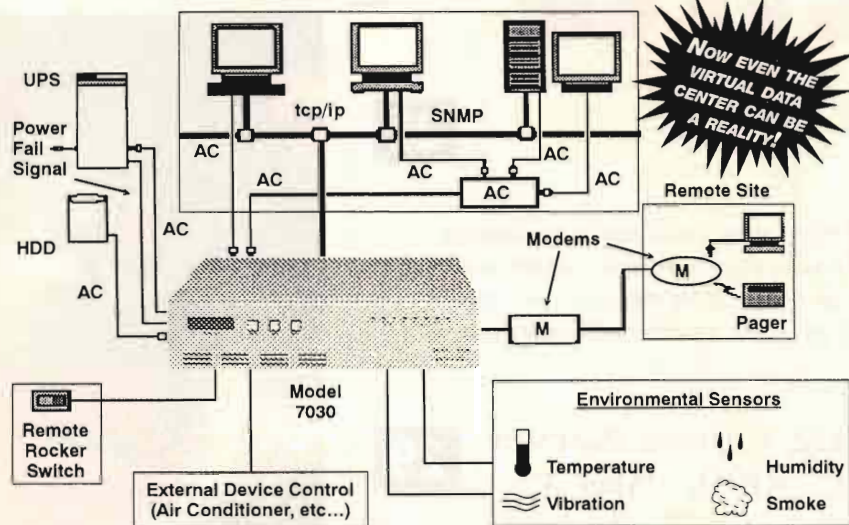
HP PROFESSIONAL ISSN 0896-145X is published monthly by Cardinal Business Media Inc., 12000 Virginia Dr., Ste. 400, Fort Washington, PA 19034. Subscriptions are complimentary for qualified U.S. and Canadian sites. For reprints, contact Reprint Management Services, 505 E. Airport Rd., Lancaster, PA 17602; (717) 566-2001, FAX (717) 566-2063. Periodicals postage paid at Fort Washington, PA 19034, and additional mailing offices. **US POSTMASTER:** Send all correspondence and address changes to HP PROFESSIONAL, P.O. Box 3055, Northbrook, IL 60065. **COPYRIGHT** © 1996 by Cardinal Business Media Inc. **CANADIAN POSTMASTER:** Send all correspondence and address changes to Cardinal Business Media, C/O N.E.I., P.O. Box 44, RPO Rockwood Mill, Mississauga, ON L4Z 9Z9. 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. Third class enclosure in this version of HP Professional.

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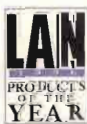
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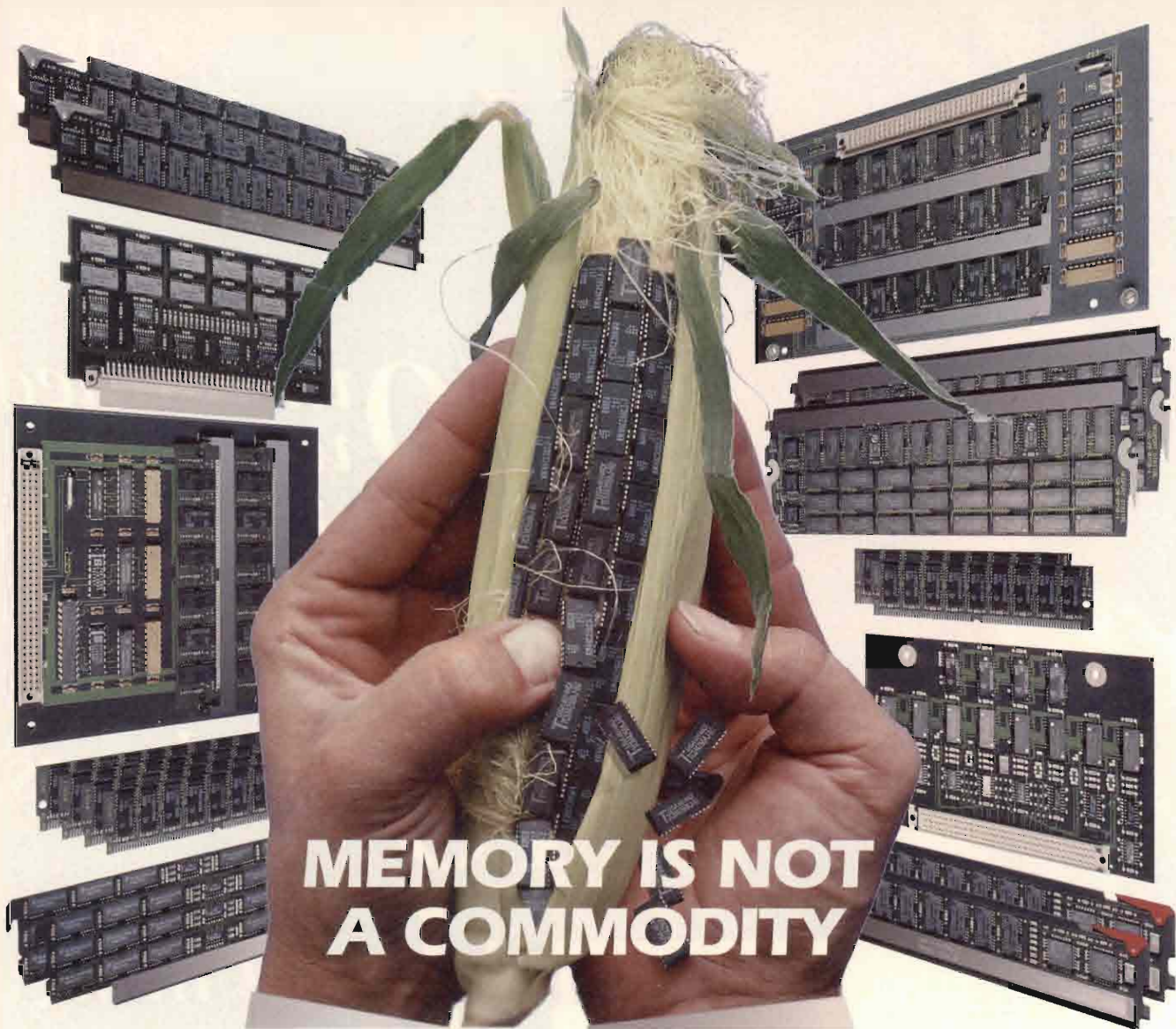
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The Future Ain't What It Used To Be

During the past three years, I've listened to HP 3000 users complain — about HP, about HP's sales support, about HP's service and especially about the future, or possible lack thereof, of the HP 3000. And they voice their complaints with a fervor that goes beyond "It is my right to." Rather, they see it as their moral duty and social obligation to tell Lew Platt how to run the company. However, let anyone else criticize the HP 3000 and report on or even mention HP 3000 alternatives, and they get their feathers ruffled, to say the least. They remind me of my fellow Philadelphia sports fans, who bash the hell out of the home team; but if someone from New York, New Jersey or Delaware dares to do the same, the fists will be flying.

But it's time for HP 3000 shops to stop viewing HP's commitments to the HP 9000, HP-UX and Windows NT as an affront. In fact, it's time to start exploiting these technologies as an asset to the installed HP 3000. Or as Harry Sterling, general manager for HP's Commercial Systems Division, warns *HP Professional* readers in an exclusive interview, "Don't get hung up on the technology. HP 3000 users must change their frame of reference. The 3000 is not the center of the universe. They need to see UNIX and NT as advantages and not threats."

Sterling predicts that as Windows NT moves into the IT spotlight, pushing UNIX users further out of center stage, some HP-UX users will someday share these same feelings of lost glory that their HP 3000 brethren now experience.

Sterling also divided the HP 3000 community into three categories: the strictly HP 3000 shop which is diminishing as customers install Windows NT servers. These customers must accept that technology no longer exists for technology's sake, but rather for solution's sake. Then, there is the group who is surrounding or supplementing their HP 3000 core with UNIX or Windows NT. This segment makes up about half the installed base. Finally, there are the renegades who are replacing their HP 3000s. But this roll over is about a three- to four-year process and doesn't happen over a magic weekend.

The loyalty, although sometimes fanatical, of HP 3000 users is commendable, to a point. Who can really blame them? All they want is a good, reliable system — like a mythical car that only needs gas. No oil changes, no shock replacements or brake jobs. Just fill the tank with low test for 89 cents a gallon and go. And that's the HP 3000. You didn't even have to tune it up.

So why is HP "switching" its system strategies? Maybe they aren't making money selling just gas. Or, is it the result of planned obsolescence? I don't think so, especially in an industry that changes as quickly as ours. Or maybe the changes themselves have been planned all along since ENIAC? Maybe there is a car that runs on water. . . or maybe it's just paranoia.

But are the loyal, "die-hard" HP 3000 users really concerned that the "most robust" system will go away? Or are they worried about their jobs? If your company is financially stable and your system is doing the job, then don't worry. Be happy. You're one of the lucky few. Otherwise, maybe it's time to expand your skills and if you're not ready to accept, then at least listen to the alternatives available and seriously consider them.

Even your friendly mechanic, who's had his corner garage forever, has his favorite wrenches that he'll never give up. But he still upgrades his operation with current training, new tools and more efficient methods of repairing and tuning today's vehicles. And although he has a diagnostic computer in the corner of the shop, he still dreams of rebuilding that 440 Hemi with a six-pack and no mufflers.





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LETTERS

FULL OF VIM

Thanks for [Fred Mallett's] article on **vim**. We put it on our HP-UX machine and it's great! Your readers might want to know that there is a "vi Lovers Home Page" on the Web (www.cs.vu.nl/%7Etmgil/vi.html) that covers **vi** and its many flavors. That's where we found links to **vim**.

*Mick Donna
Lead Software Engineer
Cincom*

NOT SOMETHING YOU SEE EVERYDAY

[Charlie Simpson's] July editorial was accurate, timely and well written. I'm delighted [he] presented this theme (employment in the Information Age) in a techie mag. It's so important, yet most magazines would stick to their narrow focus and rely on a general business pub to cover it, but you didn't shirk your responsibility. For instance, how many techies read general business magazines? Not a whole lot, so many, many people wouldn't have benefited from this dialogue. Bravo!

*Kevin Stumpf
Quarry Communications*

ON THE LINE

It's great to see you join the Web movement. I'm already making heavy use of [other] free Web-published journals, and find advantages in being able to store and organize my past reading on my hard drive. I know I'll be a frequent visitor.

I'm glad to see you making available past columns and feature stories. What will really make *HP Professional's Web Edition* a useful tool is archival of ALL material combined with a full-text search engine.

Thanks, and keep up the good work.

*Dave Burch, Senior Programmer/Analyst
Franciscan Health System of the Ohio Valley*

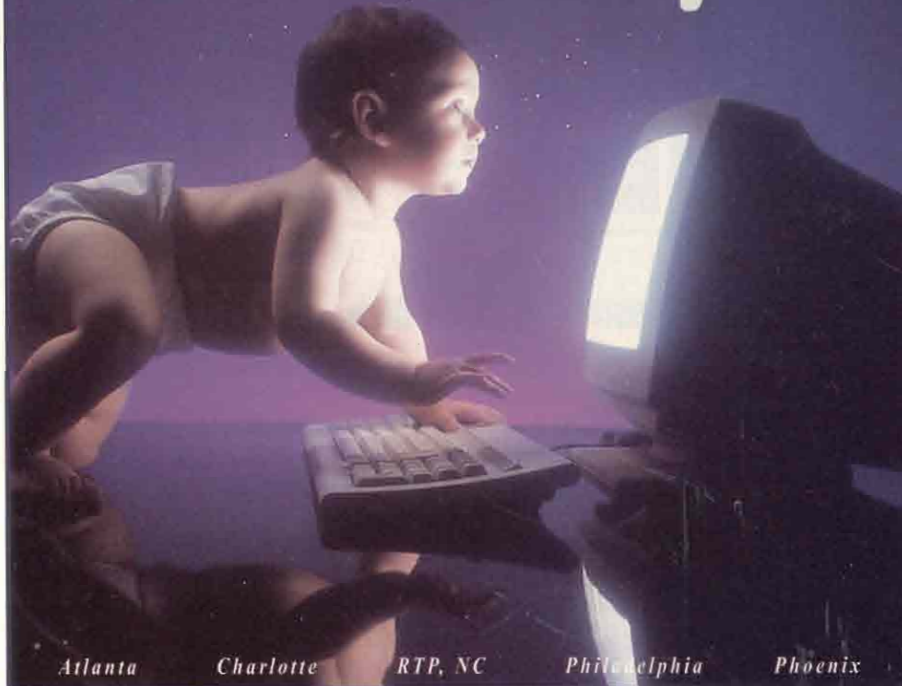
While we currently have no plans for archiving all of our content, we will be implementing a full-text search engine very soon. In the meantime, thanks for the encouraging words. — Eds.

OFF AND RUNNING

I enjoyed [Fred Mallett's "Start Me Up" article], and in fact copied it for several of my co-workers.

*John Pape
Hewlett-Packard*

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INDUSTRY WATCH

George A. Thompson

HP DROPS PRICES ON NOTEBOOK PCs BY UP TO 15 PERCENT

HP dropped its U.S. list prices as much as 15 percent on the HP OmniBook 5500 notebook PC series, its full-featured Pentium-based notebook PCs.

HP also reduced pricing on hard drive and memory expansion module accessories for the HP OmniBook 5500 notebook PC series. Hard disk drive prices have been lowered from 36 percent to 45 percent. RAM expansion module price reductions range from 36 percent to 41 percent.

"For under \$3,000, customers can get HP's reliability and the powerful Pentium/PCI performance that the HP OmniBook 5500 notebook PC delivers," maintains Andrew Zaremba, product marketing manager at HP's Mobile Computing Division.

Street prices are expected to start at \$2,840 for the HP OmniBook 5500 CS 5/100 notebook PC model 810, a 100 MHz Pentium-based system with an 810 MB hard drive and an 11.3-inch viewable-image passive-matrix display.

Street prices for a 133 MHz Pentium-based system are expected to start at \$4,840 for the HP OmniBook 5500 CT 5/133 notebook PC model 1350, which includes a 1.35 GB hard drive and a 12.1-inch viewable-image active-matrix display.

Today's price reductions follow HP's July 9th price cuts of up to 17 percent on the HP OmniBook 5500 notebook PC series.

HP VAULTS OVER INTERNET FIREWALLS

HP introduced its VirtualVault software which grants Web access to internal and external clients for critical

TO "B" OR NOT TO "B"

With the introduction and immediate availability of their B-class workstation, there's no question in HP's mind. Using 132 MHz and 160 MHz versions of HP's PA-7300LC CPU, the Model B132L (starting at \$10,840) and B160L (starting at \$16,840) are the newest additions to HP's Visualize workstation product line. HP also expanded its C-class workstation product line with the addition of the Model C160L (starting at \$19,840) using a 160 MHz version of the PA-7300LC.

Like the new B-class workstations, the new C-class model uses a 128 KB on-chip cache with a 1 MB off-chip cache (optional in the B132L). All B- and C-class models include two (on the B-class models) and four (on the C160L) PCI, EISA and GSC slots. As the entry level system, the B-class models' RAM is expandable to 768 MB and Fast Wide SCSI support is optional, whereas RAM is expandable to 1 GB and Fast Wide SCSI support is standard in the C160. Both B- and C-class Visualize workstations include an integrated Visualize-EG graphics subsystem. HP's Visualize-8, Visualize-24 and Visualize-IVX also are supported.



applications while safeguarding proprietary information assets. Part of HP's Praesidium enterprise security framework, the VirtualVault addresses the weak link in corporate security by providing a security gateway to the enterprise and granting selective access to sensitive-designated information. HP is touting the Praesidium framework as "the first comprehensive security solu-

tion that enables electronic transactions end-to-end without compromising the integrity of internal computing environments."

VirtualVault provides data partitioning and least privilege (no root) to ensure a more secure environment for Web applications. Currently, Security First Network Bank (SFNB; Atlanta, Ga.) and Huntington National Bank

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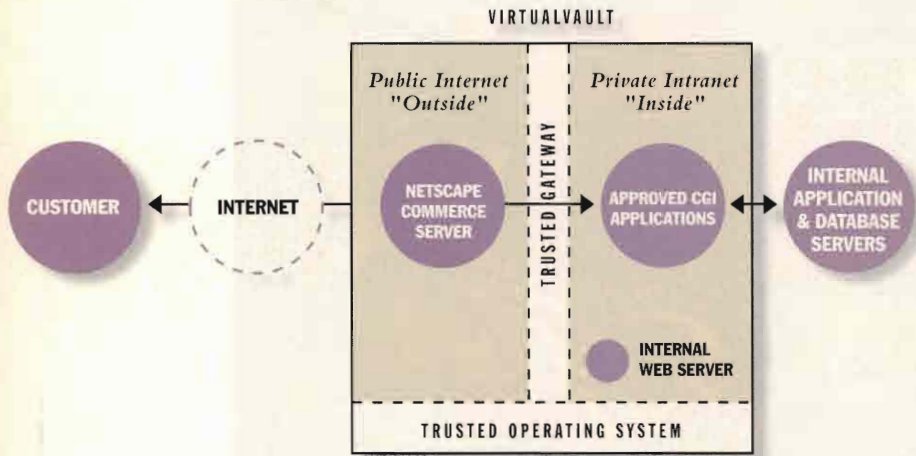
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(Columbus, Ohio) use HP's VirtualVault solution for their customers who rely on the Internet to transfer funds, pay bills and perform other banking transactions.

At the foundation of VirtualVault is a trusted operating system (co-developed with SecureWare) that exceeds strict U.S. government B1 and European E3 standards and has been used in military agencies' computer networks. All electronic transactions bound for sensitive internal applications must travel through



Courtesy of HP

VirtualVault's trusted gateway, which acts as a safeguard against users and applications gaining unauthorized access to information or systems and provides support for VirtualVault administration (see diagram). Administration of the Web server and the operating system is simplified through a browser-based interface. VirtualVault also incorporates a Netscape Web server to handle external Web requests.

VirtualVault is available worldwide immediately. But it takes money to get into the vault: a single copy costs \$75,000, two to five VirtualVault licenses cost \$65,000 each, and six or more copies cost \$45,000.

PUMPING UP THE PA-8000 VOLUME

HP is also increasing the performance in several of its systems by dropping in its 64-bit PA-8000 CPU:

- **Model J280**

The newest member of HP's Visualize technical deskside series (starting at \$38,500) is a 160 MHz uniprocessor SMP-enabled box that, according to HP claims, outperforms Sun's 200 MHz SPARC-based Ultra 2 system. Features include up to 2 GB of RAM, up to 8 GB of mass storage, 5 EISA/GSC slots and multidisplay support.

- **HP Exemplar D-, K- and S-Class Technical Servers**

Not to be confused with HP's commercial UNIX servers, the newest

members of HP's Exemplar series (acquired in HP's acquisition of Convex Computer last year) are two-CPU (D-class), four-CPU (K-class) and 16-CPU (S-class) SMP-enabled servers based on PA-8000 CPUs.

- **HP Exemplar X-Class Server**

The Exemplar X-class system is also based on the PA-8000 CPU. Unlike its D-, K and S-class cousins above, however, a single SMP-enabled X-class box can use up to 64 CPUs and is scalable to 512 CPUs (eight boxes). Using a cache coherent NUMA architecture, with a 64 GBps system bandwidth, 4 GBps interconnect bandwidth and an 8 GBps I/O bandwidth, the X-class (starting at \$718,000 for a 16 CPU-based system) should be categorized as a supercomputer.

WHERE OBJECTS ARE THE SUBJECT

HP, Digital, Lexis-Nexis and the Open Group are partners in a new collaborative project to integrate HP's widely accepted Object-Oriented Distributed Computing Environment (OODCE) technology with the latest release of the Distributed Computing Environment (DCE). OODCE-based applications will retain DCE's key features — portability, interoperability, security and location independence — while being independent of an object model. Consequently, DCE users who have also committed to using CORBA from the Object Management Group or Microsoft's COM/OLE will be able to use the pending technology within their distributed computing architectures.

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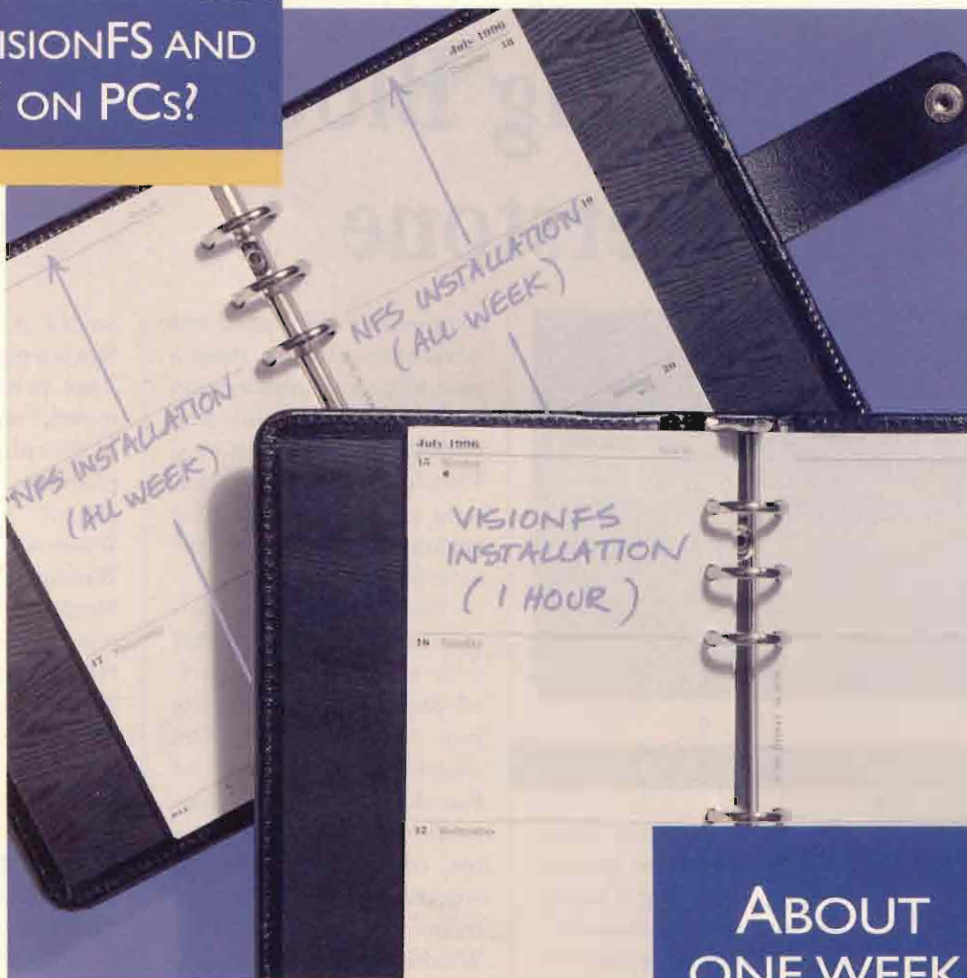
“Don't get hung up on technology.”

— Harry Sterling, general manager for HP's Commercial Systems Division, when addressing HP 3000 users' concerns of no longer being at the center of the HP galaxy.

SECURITY ON THE NET: WHAT? ME WORRY?!

Despite all the security risks posed by the Internet, 75 percent of 1,000 CIOs surveyed by RHI Consulting (Menlo Park, Calif.) indicated that they'll pursue business opportunity and everyday transactions via the Internet. “Executives recognize the potential security risks associated with using the Internet, modems, e-mail and even internal networks, but the convenience and efficiency that these technologies afford is overriding most of their concerns,” said Greg Scileppi, executive director of RHI.

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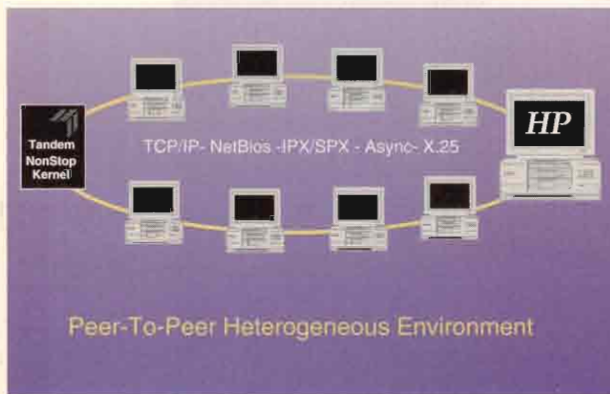
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Three Building Blocks From Cornerstone



PICCOLO

- ▶ API provides the developer with 15 functional calls in five functional groups
- ▶ Supports Apple Open 7.5, OS/2, Windows, Windows 95, Windows NT, Tandem NonStop Kernel, HP-UX, SCO and Solaris 2.1
- ▶ Supported protocols include NETBIOS, TCP/IP and IPC

Cornerstone Software Inc.

11 Trafalgar Square
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tel: (603) 595-7480
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CIRCLE 351 ON READER CARD

Multiplatform development is quickly becoming a necessary part of many businesses. Many companies either run HPs alongside Suns and IBMs, or do business with other companies that run similar heterogeneous systems. In such situations, users on different platforms need to be able to communicate with each other quickly and effectively, with minimum difficulty.

For those businesses facing such problems with multiplatform development, Cornerstone Software (Nashua, N.H.) has created Piccolo, a message-oriented middleware product that integrates multiple systems and allows transport across any of the Piccolo-supported platforms and protocols. Piccolo is

symmetrical, distributed and heterogeneous, creating a peer-to-peer communication environment. By providing transport between platforms, Piccolo allows peer applications to deliver data to other applications and execute the same functionality.

The secret to Piccolo's success is the fact that its API is the same across all supported platforms. To illustrate how such a configuration simplifies operation of Piccolo, Karim Raad, Cornerstone's marketing director, offers a hypothetical scenario, "If a programmer learns the Piccolo API on Windows NT, and then two weeks later wants to develop something on an HP box, he will find that the Piccolo API is identical to the API he learned on NT. The HP API will work exactly the same way it worked on NT."

Piccolo gives application developers a transport-independent, bi-directional data pipe that can be used to link two applications anywhere on a network. Each connection Piccolo opens to an object is considered to be a pipeline to that object.

The API provides the developer with 15 functional calls in five functional groups. According to Raad, "A pipeOpen [function call] on

an NT is a pipeOpen on a Sun is a pipeOpen on an HP. They all have the same parameters," says Raad.

Piccolo supports many platforms, including Apple (Open 7.5 OS), OS/2, Windows, Windows 95 and Windows NT, and Tandem NonStop Kernel. UNIX systems supported include the HP 9000 workstations, SCO/Intel and Solaris 2.1/SPARC. Supported protocols include NETBIOS, TCP/IP and IPC.

Cornerstone is also introducing Tx/Piccolo and DynaAccess, two products designed to be used with Piccolo that allow even greater transaction capability across protocols and platforms.

Tx/Piccolo is a transaction layer that runs on top of Piccolo and adds X/Open's XATMI API. When using the XATMI API, the user also can use two additional facilities: X/Open's TX API and compatible Transaction Monitor (TxM).

Finally, DynaAccess executes on top of Tx/Piccolo, and offers SQL or Enscribe access to Tandem's Nonstop SQL or Enscribe's database with Microsoft's ODBC.

—David Acord,
Contributing Author

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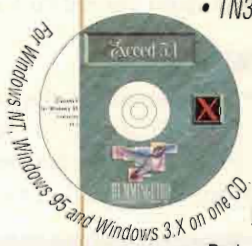
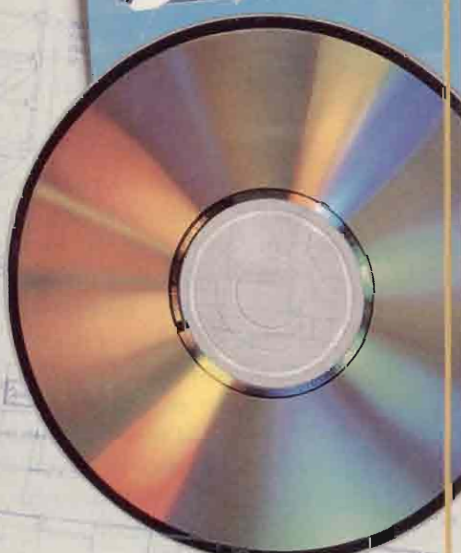
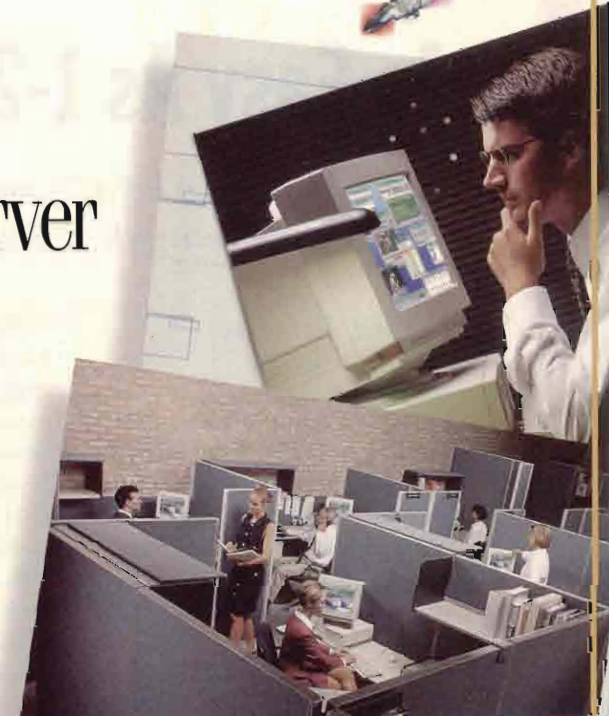
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As Easy As 1-2-3Com

Air Products And Chemicals Inc. Redesigns Its Corporate Backbone Network Using High-Speed 3Com Switches.

David Brisson

Air Products and Chemicals Inc.'s (Trexlerstown, Pa.) 3Com-based LAN emerged from a strategic decision to gain competitive advantage by improving access to business-critical applications, such as customer service, order processing, Internet access and e-mail. Installed across Air Products' eight-building campus, 3Com's (Santa Clara, Calif.) scalable switched network architecture is accelerating and safeguarding communications at the firm's headquarters, where financial, sales, credit, inventory and manufacturing data reside on more than 200 servers.

The LANplex switches, supported by 3Com's Transcend network management system, allow more than 7,000 Trexlerstown and worldwide users to access corporate information. Offsite communications come from 80 U.S. locations, plus plants in Europe and Mexico, are critical to Air Products' daily operations. The chassis-based LANplexes' modularity also enables Air Products to easily add ports to handle network growth, which in 1994 alone exceeded 20 percent.

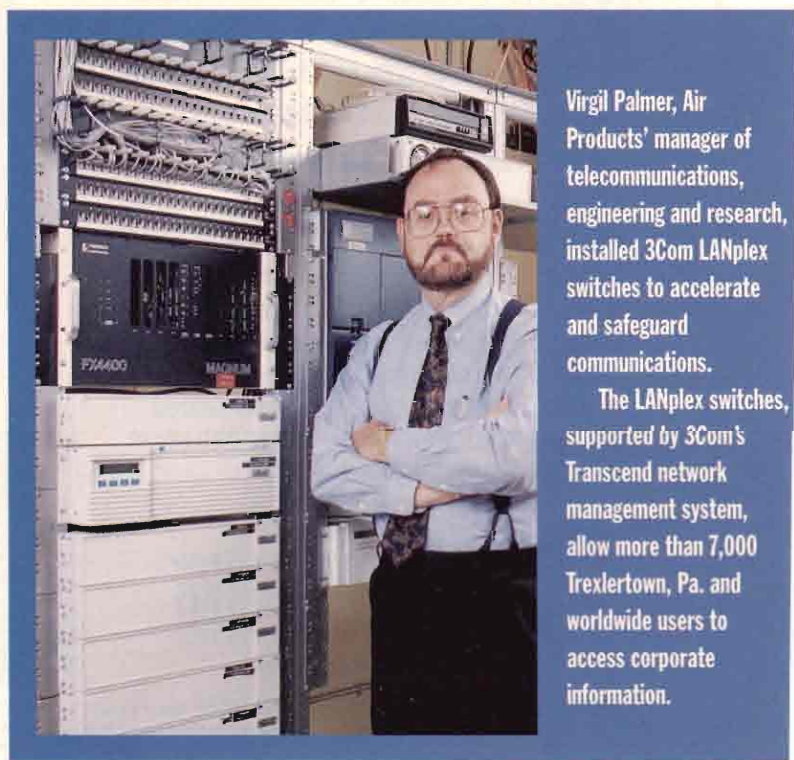
Air Products originally used Ethernet hubs to handle communications on its FDDI corporate backbone, but began experiencing performance degradation as campus and worldwide users skyrocketed from 1992 through 1994. "Large Ethernet segments

collided in a major struggle for bandwidth on our backbone, triggering bottlenecks and often causing network devices to 'stream,'" says Virgil Palmer, Air Products' manager of telecommunications, engineering and research. "Low-speed 10 MB links to our servers significantly slowed response times for our worldwide users and we needed a faster, more stable architecture to move our data." To remove these bottlenecks, Air Products required a proven switching architecture able to support multiplatform devices, segment the network into smaller workgroups and satisfy the firm's continuous need for bandwidth.

"Air Products' communications infrastructure depends on the speed and flexibility of our client-server network to handle increasing users and devices," says Palmer. "3Com's LANplex technology is a proven architecture that gives us the stability and responsiveness we need to satisfy our installed base and support our growth. Through Transcend, we can proactively manage 3Com equipment and maximize up time across our network."

IN A NUTSHELL

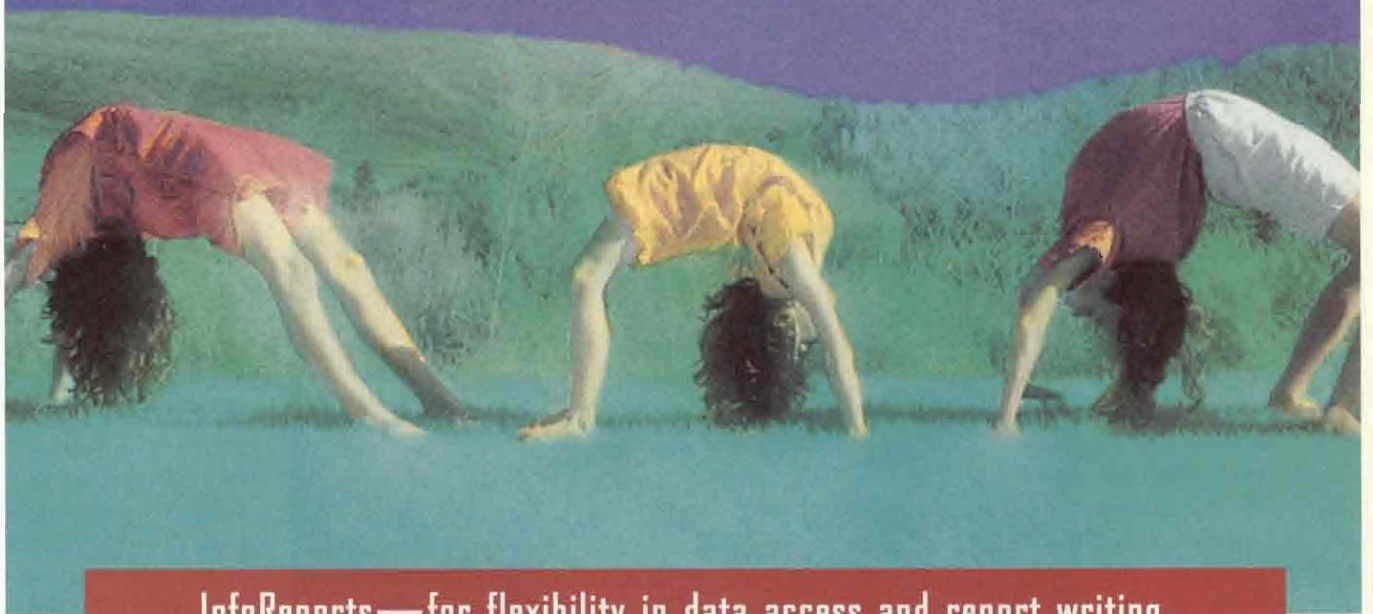
After an extensive market study, the firm obtained 10 3Com LANplex 6000 switches and 17 LANplex 2500 switches to scale



Virgil Palmer, Air Products' manager of telecommunications, engineering and research, installed 3Com LANplex switches to accelerate and safeguard communications.

The LANplex switches, supported by 3Com's Transcend network management system, allow more than 7,000 Trexlerstown, Pa. and worldwide users to access corporate information.

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up their network performance. "The other vendors' products we looked at were not yet ready for general availability," says Palmer. Deployed this past June and July, the LANplex 6000s are delivering high-speed switching for all on-campus applications, and for WAN users across the United States, Europe and Mexico. Using a three-tiered architecture, Air Products' new network consists of server farms driven by LANplex 6000s at the data center level. The LANplex 6000s are connected to LANplex 2500s at the departmental level. The LANplex 2500s feed information to and from hubs at the workgroup level.

Having used 3Com's NetBuilder II routers for wide area connectivity between its corporate campus and European plants since 1993, Air Products selected the chassis-based LANplex systems for three major reasons: their proven Ethernet-to-FDDI switching architecture, enabling the firm to reorganize its corporate LAN into multiple high performance segments; their modularity, permitting the firm to flexibly handle network growth of industry-standard TCP/IP devices, which in turn allowed the firm to flexibly add equipment to handle network growth; and the LANplexes' ability to be managed using Transcend within HP OpenView — Air Products' core management system.

"The LANplexes allowed us to take our Ethernet hubs off our FDDI backbone and to replace them with powerful switches on a new fiber ring with no bottlenecks" said Palmer. "Their 100 MB Ethernet-to-FDDI speed is a major performance asset and their modularity allows us to continuously subnetwork our LAN." Focused on gaining competitive advantage, Air Products also is using the 3Com-based backbone network to support new applications, such as the firm's toll-free Order Entry telephone service.

Using the new system, customer service representatives in Trexlertown can now rapidly process orders while the customer is on the phone. Once the order is placed, the representative, in roughly two seconds, can access the required servers to post that customer's credit history, product availability, and a shipping and delivery date. "The system is extremely fast and allows us to dramatically improve the speed and quality of our customer service as well as our ability to generate revenue," said Palmer.

AROUND THE WORLD

With the new high-speed 3Com backbone, plants in the United Kingdom, France, Belgium, Holland and The Czech Republic using 3Com NetBuilder II routers can access Air Products' corporate campus servers without delay. Should a European plant need a credit authorization or

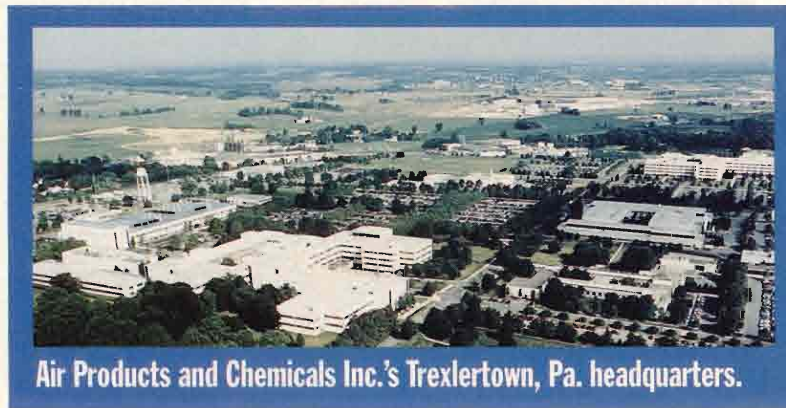
routers on a frame relay network; those in Europe and Mexico enter the corporate LAN using 3Com's NetBuilder II routers. On-campus communications go from users' desktops to a shared media Ethernet hub linked to a LANplex 2500 via a dedicated switched Ethernet line in a wiring closet. The LANplex 2500 delivers the message across the FDDI backbone to a LANplex 6000 in a network control center. The LANplex 6000's dedicated switched Ethernet port sends the communication to the appropriate servers, which return it to the LANplex 6000 and ultimately to users' PCs or workstations. During each transaction, the Transcend network running under HP OpenView manages the performance of all 3Com equipment.

Today, the 3Com based LAN is divided into 30 segments supporting 4,200 campus staff on 6,000 nodes, most of which use 3Com's Ethernet network interface cards. The campus LAN services more than 2,000 U.S. general business and bandwidth-intensive CAD/CAM and R&D users, plus 300 European employees at gas and chemical plants, and roughly 30 employees at a single chemical plant in Mexico. It also supports 200 Microsoft Windows NT, OS/2, UNIX, Compaq Proliant and Dell PC servers.

In the future, Air Products plans to use the LANplexes' SmartAgents to set and monitor network performance thresholds and the LANplex roving analysis port for remote monitoring (RMON) to gather statistics on all 3Com equipment. Air Products will further explore using the LANplexes' virtual networking capabilities, enabling campus workgroups to access any network service, as well as ATM. "We're taking a very flexible approach," says Palmer.

3Com can be reached at 5400 Bayfront Plaza, P.O. Box 58145, Santa Clara, CA 95052; (800) 638-3266; www.3com.com.

—David Brisson, Contributing Author



Air Products and Chemicals Inc.'s Trexlertown, Pa. headquarters.

inventory check for a new order, for instance, the communication goes to Air Products' European headquarters in Hershham, England, also equipped with a stackable NetBuilder II. The NetBuilder II sends the message across Air Products' WAN, via a trans-Atlantic Ethernet link, to a NetBuilder II at Trexlertown. The request then goes across the FDDI backbone to a LANplex 6000. The LANplex sends the message to the appropriate server, which retrieves and returns data to the LANplex for delivery to Europe. In the United States, 80 plants are linked to the LANplex-based corporate backbone by previously installed routers.

Transactions from off-site U.S. users are sent to the LANplexes through

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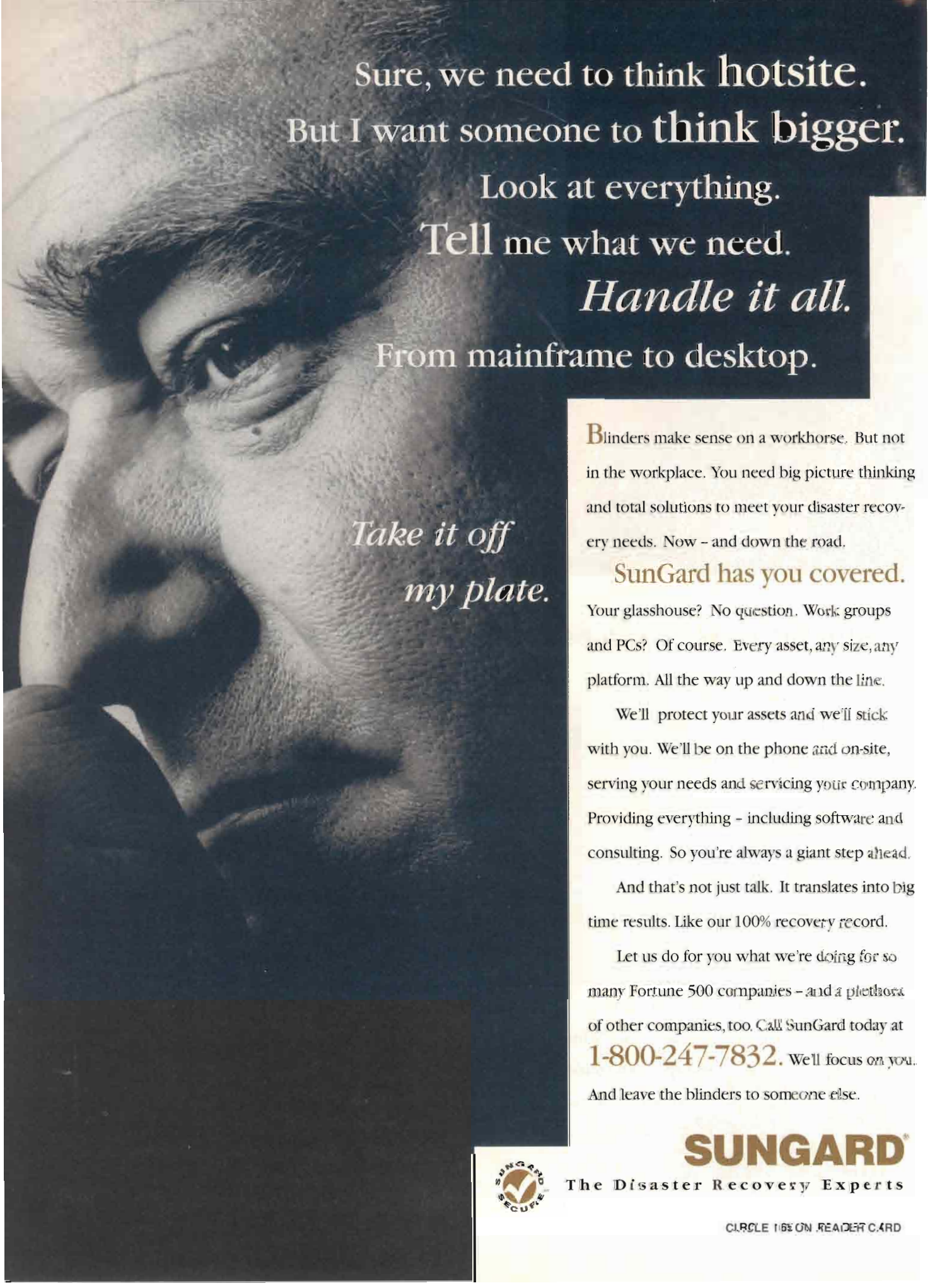


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Jon William Toigo



According to Ralph J. Proulx, executive vice president for ESI/Technologies (Buffalo, N.Y.), most people don't automatically connect the dots between manufacturing and leading edge information systems technology.

"Some people hear the word manufacturing and think smoke stacks and greasy factories. They don't expect manufacturing companies to be dealing with brand new technologies, but they are very leading — if not bleeding — edge."

ESI/Technologies offers an integrated suite of 48 manufacturing, distribution and financial software subsystems called eMIS/2000 for use by large manufacturing companies. The solution capitalizes on the latest computer-aided systems engineering (CASE) and rapid application development (RAD) technologies for client-server applications development from Oracle Corp., as well as the Oracle RDBMS.

Bill Swanton, who serves as the director of research for plant management at Advanced Manufacturing Research (AMR; Boston, Mass.), agrees. He has tracked the application of technology to manufacturing for more than a decade and possesses a view from the shop floor.

"When you talk about manufacturing, you are basically talking about three types of systems: materials resource planning (MRP) — which has evolved into enterprise resource planning (ERP); manufacturing execution systems (MES) — the software that handles the execution of the ERP plan; and process management software, such as man-machine integration (MMI), and supervisory control and data acquisition software (SCADA), that controls actual processes or reports cell-level activities back to higher level processes."

Acquisitions of these software systems for manufacturing totalled more than \$1.5 billion, according to Swanton. And the appetite of corporations for cutting edge technology to support continuous and discrete manufacturing operations appears to be growing.

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BUILDING A WAY

THE MRP EVOLUTION

Swanton sees an evolution of manufacturing technology on several levels. "Over the past few years, MRP, which was simply the planning of materials for manufacturing, has evolved into ERP, a client-server application with a global focus across the enterprise. ERP focuses on financials, customer order management and even human resources now, rather than looking exclusively at materials availability."

However, he concedes that the term enterprise resource planning was "practically invented to describe SAP, Baan, PeopleSoft and others who decided to extend their client-server applications to manufacturing processes." Udo Edeleman, director of the Process Manufacturing Industry Business Unit for SAP (Wayne, Pa.) acknowledges this fact. "We have been in the manufacturing software business for 12 to 15 years, so we have a long history. But we delivered manufacturing as part of our R/3 product about three years ago. Initially, we supported discrete manufacturing. We expanded support for repetitive manufacturing with their very specific ways of planning and executing. Finally, support for process manufacturing has been added in the latest release of R/3."

The objective, says Edelman, is to tightly integrate ERP with other business functions as well as with shop floor management and cell-management programs such as SCADA.

Adds PeopleSoft Inc. (Pleasanton, Calif.) Director of ERP Product Strategy Robert McKelligan, "Manufacturing companies are now looking for a vertically-focused package solution with a flexible architecture to close the gap between information systems and business processes. The companies we talk to want an enterprise solution that will encompass the shop floor and laboratory and even the engineering department. This kind of integration is being done to reduce inventories. Companies can't afford large inventories, so they are using technology to shrink the lifecycle and increase the velocity of resources through the supply chain."

McKelligan sees tremendous opportunities resulting from the release of PeopleSoft's manufacturing product line in late 1996, "We believe that [an enterprise client-server approach to manufacturing] will make it easier to demonstrate a return on technology investments. The more data you have, the better you can demonstrate bottom line improvements."

Does the invasion of the client-server application giants frighten existing players in the MRP/ERP market? A resounding "Nay!" comes from John Cingari, vice president of marketing at Datalogix International Inc. (Valhalla, N.Y.), and Paul Merlo, CEO at ROI Systems (Minneapolis, Minn.).

ROI Systems is an established player in the MRP/ERP systems arena with nearly 20 years of market presence. Its MANAGE 2000 product provides an integrated, client-server approach to ERP. According to Merlo, "Our products have evolved from the inward-looking, planning-based MRP and MRP II systems to the more outward-looking ERP products of today."

Merlo is confident that the current generation of ERP software offered by companies such as his are competitive with anything SAP or PeopleSoft can field, "We offer a fully-integrated system with an integral document management capability to support the manufacturing process from end-to-end. We provide integration with shop floor management systems, such as those from Peak Technologies. We have also implemented full electronic data interchange (EDI) support to enable our system to communicate with customer and business partner systems."

Support for UNIX and Windows NT clients, as well as Intel and RISC-based server platforms from HP, IBM and Digital, provide a solution to meet client demands and to manage vendor supplies. For example, ROI recently rolled out a Service Management System with all of the features of a standalone call handling system "to automate the manufacturer's helpdesk, field service operation and internal service system. Additional modules will include dispatching and scheduling, problem diagnosis, project summary

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status and customer electronic access.

At Datalogix, Cingari takes an equally casual demeanor in the face of new rivals. He states that more than 15 years in the process manufacturing industry has made his company a peer of SAP. The company's flagship product, Global Enterprise Manufacturing Management System (GEMMS), using UNIX-based servers, relational databases and Windows-based clients, is designed for multinational enterprises that need to manage multiple plants and distribution centers across different countries, languages and currencies.

Datalogix also offers Computer Integrated Manufacturing for Process (CIMPRO), now in its fifth major enhancement since its initial release in 1983, to meet the needs of small- to medium-size process manufacturers. In addition to client-server, Datalogix is also capitalizing on the technologies of electronic commerce and the Web. The company has established best-of-breed alliances with several leading technology companies, including Oracle — "a strategic partner with 15 percent equity investment in Datalogix," Cingari says. "We market our product as Oracle-GEMMS abroad." Oracle's Web server technology factors into the Datalogix directions for its ERP product.

"We are looking at using the World Wide Web to transmit purchase orders to suppliers in a secured transaction. We will also use Oracle browser technology to enable a customer to inquire about order status and to obtain detailed information on order processing. The effect will be a reduced time to market and improved customer service. Expect an electronic commerce-enabled application by year's end," maintains Cingari.

MES: FORWARD OR BACKWARD MOVEMENT?

If ERP systems are evolving into enterprisewide manufacturing planning tools, a somewhat less clear movement is occurring in the field of MES. AMR's Swanton recalls the origins of MES applications. "Somewhere between the decision to make stuff, which is the purpose of MRP and ERP, and the actual doing of tasks to make stuff, there is the execution of the plan itself. A short time ago, this consisted of manual processes. You had to schedule tasks, perform quality assurance, implement a program of maintenance management, track work orders, record results — it was very paper intensive. Over a 10-year peri-

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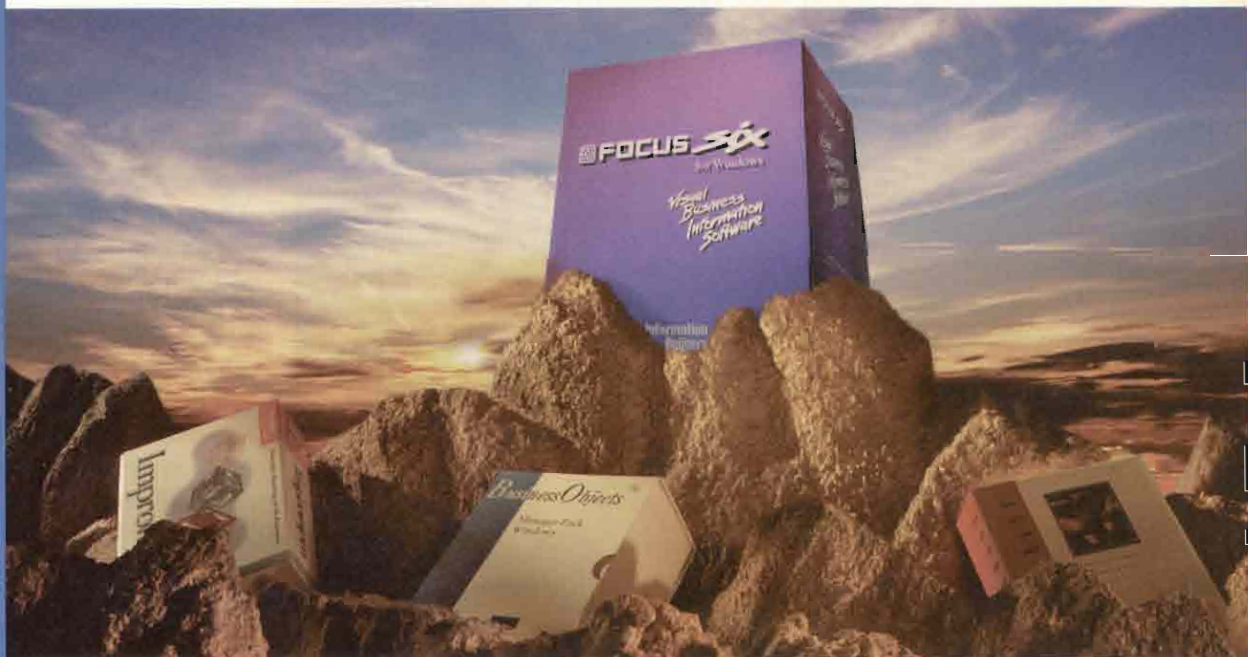
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od, many of these shop floor management functions were computerized in bits and pieces. In 1990, we began to see the rise of integrated solutions which we called Manufacturing Execution Systems (MES).”

That term, and the software it described, caught on. Manufacturing

companies consumed nearly \$1.5 billion in manufacturing software and services in 1995. “This number included shop floor visualization products and point solutions, but it also included \$115 million in MES.”

Today, observes Bill Hakanson, executive director of the Manufac-

turing Execution Systems Association (MESA International; Pittsburgh, Pa.), an association of 31 vendors of MES products, “the MES market remains small. The seat price is high and it is a challenge to implement a comprehensive MES.”

Part of the problem is that no single MES vendor has all of the components that everyone needs. Mixing and matching components from different vendors is a daunting task because components run on different platforms under different operating system environments. As a result, MES entails high integration costs.

This problem may be resolved as more MES vendors design their products to take advantage of Windows NT Object Linking and Embedding (OLE) technology. Del Friedrichs, product manager for Workplace Software at Jobscope Corp. (Greenville, S.C.), certainly thinks so. Friedrichs developed numerous shop floor management applications over the years, and has experienced firsthand the difficulties with integrating the components of multiple vendors. He recalls that the emergence of UNIX was hailed as the equalizer of products, guaranteeing their interoperability. That prophecy failed to produce results.

“Last year, Microsoft took over this field with NT and OLE. OLE is nothing short of a revolutionary capability. Our product, Workplace for Manufacturing, is a component-based OLE technology for providing work order tracking in discrete product manufacturing, and demand schedule-based tracking in continuous flow manufacturing. Customers can select the components they need and integrate them through OLE for a complete shop-level management solution. The components are reusable. We also provide interfaces for sophisticated data exchange with popular MRP/ERP systems. We are also looking at interfacing the MES with cell-level systems.”

New modularity and integrability may position MES for growth, or it may lead to the co-opting of MES functionality by ERP vendors and others. Writing in the AMR's Report on

MAKING CENTS OF MANUFACTURING ENVIRONMENTS

Manufacturers are forced to examine and replace company financial management systems as fast as they finish manufacturing system upgrades. Customers, competition and, in many cases, penurious corporate parents are demanding that manufacturers drive costs out of their products and processes. Just-in-time inventory planning and process de-bottlenecking are great. But management is demanding to know, for example, where the out-of-variance costs are hiding — not just for last month, but for last week, possibly last night and in some cases in the last hour.

For this degree of decision support, financial management systems must be up to the challenge of efficiently capturing, storing and revealing the costs associated with the allied manufacturing events and processes. The legacy accounting systems that were either home grown, purchased years ago from the outside as standalone systems or, most likely, originally packaged with the old manufacturing systems present a set of obstacles to effective decision support that include:

- **Weak reporting tools** (good, easy reporting is not just for end-users, but for IS as well).
- **Slow posting and retrieval of data** (timeliness of data is critical for effective analysis).
- **Limited and difficult access to transactional data** (a productivity-killer for IS staffs).
- **Inability to adapt to new business processes** (which will change with better reporting).
- **Unaccommodating charts of accounting structure that can't alternate dimensions and hierarchies** (users always find different ways to view and summarize data).
- **Lack of built-in functionality and tools that facilitate interfacing and integration with third-party system databases** (probably the most important requirement).

To overcome these obstacles, many IS managers are moving to client-server financial management applications. However, moving to client-server computing and keeping your investment in your HP 3000 is not a mutually exclusive predicament. Best-of-breed solutions for integrated financial management systems or individual accounting system modules are available for the workhorse HP 3000. Some are even on par with the multimillion dollar, enterprisewide, single vendor products on the market and can be integrated with your best-of-breed manufacturing implementation.

So if you are implementing a best-in-class solution for your manufacturing systems, be prepared to implement a best-in-class financial management system. Both will help you move your whole enterprise to best-in-class.

— Scott Lutz, *Manager-Marketing & Business Development,*
Mitchell Humphrey & Co.

Manufacturing this past April, Swanton pointed out that the MES vendor community's adoption of general purpose software technologies like Windows NT and OLE was a positive trend. However, the report cautioned that, controls vendors (vendors of SCADA-level devices) and ERP vendors would likely act to expand their products to claim upper- and lower-level functionality of what is currently MES.

CHANGE IS ALL AROUND

One thing is for certain to Jim Mosakowski, marketing manager for HP's Manufacturing Industries Business Unit, "Manufacturing companies are very much on the cutting edge of technology. One of our customers, Boeing, is a good example. We are working with them to integrate design and manufacturing processes [to reduce their costs and development timeframes and to increase their productivity.] Hardcore durable goods manufacturing

companies have reached a point where automation alone will not allow them to compete. They must synchronize the enterprise."

According to Mosakowski, HP services and products are offered to meet the four requirements for successful enterprise level solutions. "We believe that the four requirements are the customer's understanding of its strategic business processes, an understanding of its application architecture requirements, a solid information architecture and a sound technology infrastructure."

Mosakowski defines the information architecture as the glue that holds applications together, "Companies need to define the information needs of their business units, determine who owns the information and how it will be shared. We can assist the customers through our Industry Solution Centers, in taking their business process definitions and creating an information model.

For assistance on developing business process models, HP directs cus-

tomers to Big Six firms, says Mosakowski. For guidance on selecting application architectures, Mosakowski carefully adopts an honest broker position, "We have many Channel Partners. Some affiliations, such as SAP, have dedicated support services within HP. But, we work with all solutions and we are not exclusive to any one Channel Partner."


Whatever vision comes to mind when one thinks of manufacturing, the dependence of this industry on strategic information systems technology cannot be questioned. Here, as in other industries, the goal is to increase performance while reducing costs. To that end, manufacturing companies, like their peers in other industries, may find themselves on the bleeding edge.


—Jon William Toigo is an independent writer and consultant specializing in business automation solutions. He can be reached at jtoigo@intnet.net or www.intnet.net/public/dolphin.


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PAPER:

Building Client-Server Applications On The HP 3000

PART 3

R o h a n H a l l

Editors Note: In August, Part 1 of Building Client-Server Applications On The HP 3000 introduced the "notion" of client-server on the HP 3000 by explaining the elements of the server as well as defining client-server computing. Last month, Part 2 offered a look at the client including hardware, programming software and networking requirements. This month, Part 3 concludes the series with a focus on performance, security and outsourcing.

4 Although a client-server application brings a great deal of value to most environments, if the application is not well designed, a degradation in system performance is very likely. Some issues that affect performance are: database access; communication strategy and network speed; number of user accesses; and client capability.

► Database Access

The database access issues that are currently faced by host-based applications users, for example, COBOL and Powerhouse, remain the same for users in the client-server environment. A keyed read to a database usually outperforms a serial read to the same database. Serial reads to large datasets, especially where data from that read creates links to other databases, can be potential disasters. Today's power users find it intolerable to wait more than one minute for data. Even worse, in some of these cases, a read can last hours. Therefore, part of the design strategy should be to

predict what types of retrievals will be the most prevalent and to structure the application to perform these searches using keyed access wherever possible or else optimized serial reads.

► Communication Strategy and Network Speed

The communication strategy and network speed also greatly impact performance. In cases where searches retrieve a large amount of information, the network should be able to quickly handle the transfer of this data. Many applications today allow users to select data from the server, download it to a PC database or flat file and import it into PC-based applications. Network bottlenecks and data transfer speed are serious concerns that affect the performance of client-server applications. An efficient network is necessary to deliver the performance needed to satisfy the user community.

► Number of User Accesses

The number of users accessing the database was and is still a

factor in performance. This can be less of an issue, however, if the kinds of access and retrievals are properly managed by the client application. If more keyed and less serial accesses are made to the database, then the net effect on performance will be negligible. Additionally, based on the installation,

access this data? Under what circumstances should this access be allowed? What type of access should be granted? How can this be best managed?

By the very nature of how they access the server system, client-server applications can create additional security problems. Imagine an environment

in which a user has an icon set up on his PC in which a click of this icon connects to the server and downloads financial data to his Microsoft Excel spreadsheet. There was no need for a "Hello" logon for that user. Therefore, the question is how this can be managed to allow the user the simplicity and flexibility they expect from such an application, yet still provide the security needed for any production system. The answer to this question must be decided in the design stage of the application.

mance and data access. A copy of the live data should therefore be moved to a test environment where this prototype can access it without the possibility of harm or security risks. This test environment should duplicate the production environment as closely as possible.

An effective prototype should prove that the application can handle the primary concerns of the planned project. Some of these issues may be: communications between client and host; data access speed (with real data); access across datasets or databases; and security issues. Each environment and application will have different issues that are important to them.

The prototype should *prove that the software can handle these issues*. Be aware, however, that while a demo is usually free, a prototype usually is not. Nevertheless, the cost of a vendor developing a prototype application is minor in comparison to the cost of learning that the application is a failure after months of development effort.

Prototyping as well as the presentation of this technology to management also should be a service provided by experienced consultants.

CONSULTANTS

Consultants experienced with developing HP 3000-based client-server applications can be included in the design stage of the project, where his knowledge can be of strategic benefit. Where the current staff usually knows the specific pieces of the client-server technology, the consultant should be knowledgeable about the entire implementation. Programming, communication and debugging issues that would typically be very time consuming issues should be streamlined from this person's experience in developing similar projects. Wherever the need arises to educate the staff or project team regarding any piece of this technology, the consultant also should provide this service.

Because this is a specific technology, the consultant should have experience building client-server applications on

To avoid what could be a very costly mistake, it is recommended that prototypes be used in deciding whether or not to purchase a certain product.

if son processes are used instead of actual sessions, this can also positively affect performance.

► Client Capability

Client capability has to do with the power of the client computer and rarely affects performance of the server. Imagine retrieving data from an accounts receivable database in which a customer number is passed to the host along with a date range. This query retrieves 150 records from the server within seconds. Because of the limitation of the client, however, it takes three minutes to display this data. The user has no idea why he had to wait. He only knows that this same request would take 10 seconds with his terminal. To the user, this application is a failure.

A slow and sluggish client-server application can mean failure to the entire project. Users who are accustomed to retrieving data in seconds via Powerhouse Quick Screen and HP View screens will not wait minutes for the same information on a GUI screen. The client must be able to accept the data retrieved, process it and output it in a timely manner to the user. The total response time in these applications should *always be within several seconds*. One minute is too long. And 30 seconds is inefficient.

SECURITY

Security is always an issue in developing new applications: Who should

in which a user has an icon set up on his PC in which a click of this icon connects to the server and downloads financial data to his Microsoft Excel spreadsheet. There was no need for a "Hello" logon for that user. Therefore, the question is how this can be managed to allow the user the simplicity and flexibility they expect from such an application, yet still provide the security needed for any production system. The answer to this question must be decided in the design stage of the application.

EFFECTIVE DEMONSTRATIONS AND PROTOTYPES

A demo is typically a situation in which a salesperson is able to set up a controlled environment in which the best features of his product are shown. This, in effect, proves that his product will do what he claims it does. Wrong! Demos mean very little in this specific area of systems development. An application that connects to an HP 3000 and retrieves data to a GUI screen says nothing about a similar application in a production environment. To avoid what could be a very costly mistake, it is recommended that prototypes be used in deciding whether or not to purchase a certain product.

A prototype is an application written to access current production data, *even if that data is in a test environment*. The data should *not be a scaled-down version of the live data* because one measure of a client-server project is perfor-

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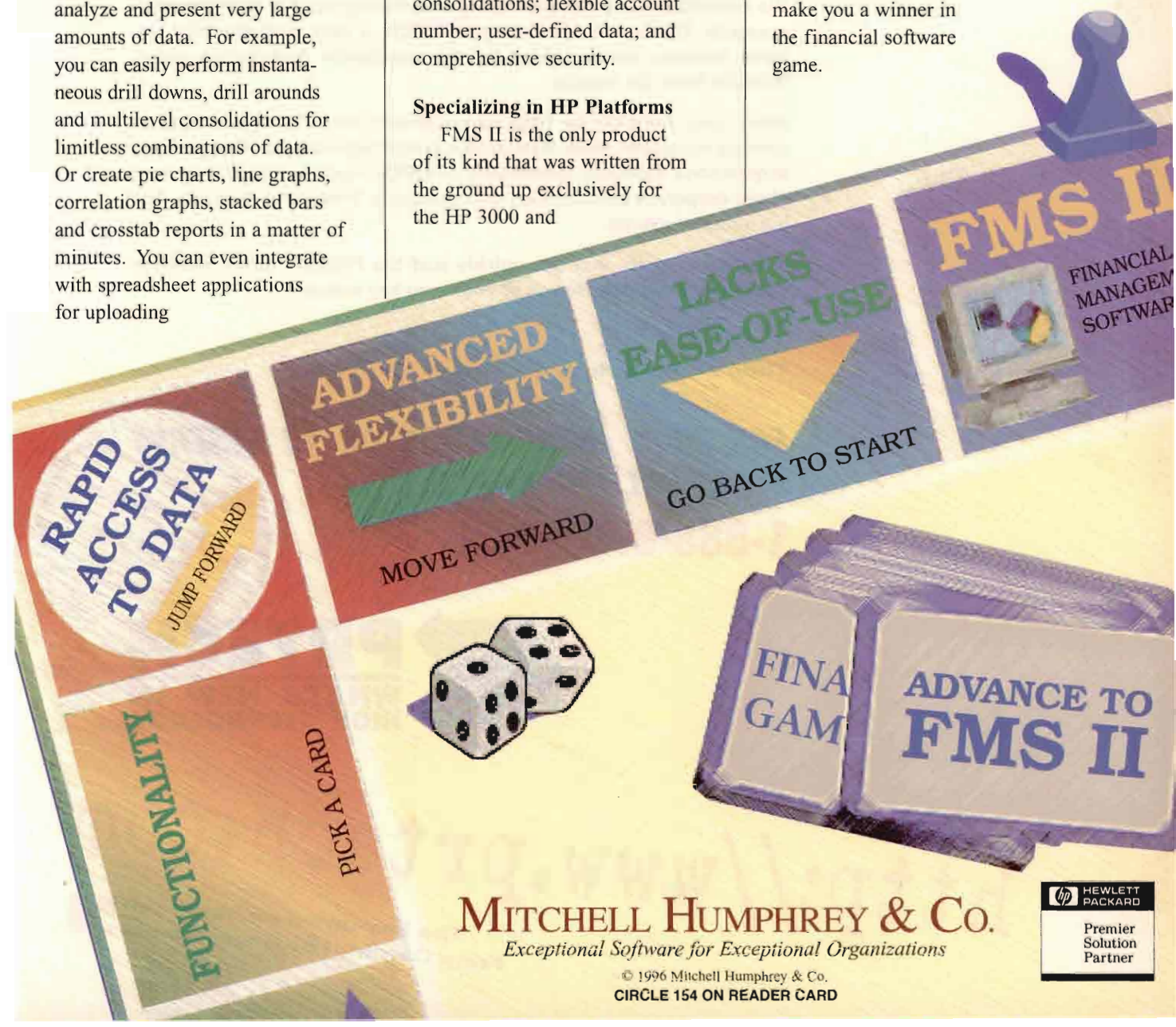
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HP 3000 systems using IMAGE databases with PC clients. After all, a good UNIX client-server developer is not necessarily a good MPE client-server developer. The UNIX developer may know how to best access relational databases, but may not be knowledgeable about accessing or linking network databases such as IMAGE. The client side of the equation may be very similar, but each server has its own idiosyncrasies that need to be taken into consideration.

IT'S AN UP THING

Client-server applications are the new wave of systems development and offers many advantages that were never before available. Users now have the capability to retrieve data with the click of a button without help from IT groups. Data can be viewed in various graphic forms by users without the knowledge of programming. Best of all, this can all be done within seconds.

IT groups also benefit by receiving fewer service requests and performing less "baby-sitting" of the user community.

Higher approval ratings from the user group usually follows an effective implementation of a client-server project. Training effort of the user community is negligible if common Windows standards are used in this development effort. The challenges also increase, however, for the IT community. The need to know more about communications and client tools is growing. This need can be achieved by retraining staff or adding new staff. Retraining can be minimal if the current platform is retained and the knowledge needed for the client tool can be leveraged from past experiences.

Like any project, a client-server project needs lots of planning. Part of this planning should include the development of a prototype to prove that the expected results can be achieved by the product and development team. Prototypes can be developed by the

product vendor, the IT team or an outside consultant who specializes in this type of application development. In the end, the final product should yield higher productivity, better user satisfaction and a feeling of a job well done.

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About the Author:

Rohan Hall is a software consultant and co-founder of Hall, Wynter and Associates. He has developed various legacy and client-server applications on MPE/iX, UNIX, VAX/VMS, Data General, Microsoft Windows and DOS systems. He has over 12 years of experience in various areas of systems development. He has worked with Hewlett-Packard, Lockheed/Martin, Hughes Aircraft and Cognos Corp.

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Left To Your Own Devices, What Would You Do?

Using commands that accept device files as an argument can be a lot like life. You never

know what you're gonna get. The carousel tape device? Or a chocolate covered caramel? Will the DAT tape drive be at `/dev/rmt/0m`? Or is that the big machine with whirling reels of tape? Will `/dev/dsk/c0t2d0` mount the CD-ROM? Or is it at address 3? There are a couple ways to find out. But only your sys-admin knows for sure. So much of this column is directed to operators and system administrators.

JIVE TALKIN'

For a UNIX system to "talk" to an attached device, it must know two things: first, the language the device talks; and second, the address of the device. A device file has all this information encoded into it. An `ls -l` of a device file will show this information, it will look something like this:

```
205 0x003000 /dev/rmt/0m
```

The `205` means that the file `0m` is for an "stape" type device (the language), the `0X003000` is where the device is attached (hardware address of SCSI address 3). This is from HP-UX 10.2 on a Model 705 workstation with a DAT tape player. In order to "talk" to this device, the device driver for the device type must be configured into the kernel. You can get a list of device drivers configured into the kernel with the `lsdev` command. For the example above, I can be sure that the stape

device is configured in with the following command:

```
# lsdev | grep 205 205 -1 stape tape
```

This shows that the major number of 205 (from `/dev/rmt/0m`) is for a character device (`-1` means no block device required) of driver type stape, which is of the class "tape." Classes of devices are listed in the directory `/usr/conf/master.d` on HP-UX 10.x, and in `/etc/master` on HP-UX 9.x.

So, the kernel must have the proper software driver configured into it (using SAM or some other method) in order to talk to a device. Many commands require a device file (**mount**, **tar**). The device file supplies the needed information about which driver to use, and the physical hardware address of the device.

Often, you can look and see that a device is attached physically, but do not know what address it is set to or what device file to use. That is where some more device configuration commands come in handy. Because the device file `/dev/rmt/0m` is very commonly used for a tape drive, you would often start with that device file. Here is a command that will decode the funny numbers for you, if you want to see what device a device file points to:

```
# lssf /dev/rmt/0m
stape card instance 0 SCSI target 3 SCSI LUN 0
at&t best density available at address 2/0/1.3.0
/dev/rmt/0m
# lssf c0t3d0BESTbn
stape card instance 0 SCSI target 3 SCSI LUN 0
berkeley no rewind best density available at address 2
/0/1.3.0 c0t3d0BESTb
```

So the `lssf` command lists the drive, and hardware address to which a device file points. In the previous example, we see that it is a SCSI tape drive. Using the file `0m`, we get AT&T type blocking. Using the file `c0t3d0BESTbn`, we get Berkeley blocking on the tape and no rewind. There are several more device files that all control this same device, each with a slightly different configuration of capabilities for the device. If we see that there is a device attached, but are not sure if the system is aware of it, use the `ioscan` command:

# ioscan	H/W Path	Class	Description
0		graphics	bc Graphics
2		ba	Core I/O Adapter
2/0/1		ext_bus	Built-in SCSI
2/0/1.3		target	
2/0/1.3.0		tape	HP HP35470A
2/0/1.6		target	
2/0/1.6.0		disk	SEAGATE ST31230N
2/0/2		lan	Built-in LAN
2/0/3		hil	Built-in HIL
2/0/4		tty	Built-in RS-232C
2/0/5		tty	Built-in RS-232C
2/0/6		ext_bus	Built-in Parallel
2/0/8		audio	Built-in Audio
8		processor	Processor
9		memory	Memory

Because the tape device is listed, now maybe we want to know what device files (if any) have been created to talk to it, so we use these options:

```
# ioscan -C tape -fnu
```

The output of this command can be rather long, so we did not show it for tapes, as there are many device files, all are listed. The `-C` option means show me devices of class "tape." The `fn` options meant full listing (`-f`), with

pathnames (-n) of device files. The **u** option says only show "useable" devices. In other words, those with drivers bound into the kernel.

SERVING THE SAME BUT DIFFERENT

The **ioscan** command is a bit different on Series 800 servers versus Series 700 workstations at HP-UX 9.0 less options on the 700s, but was merged at HP-UX 10. In other words, the Series 700s do not allow some options that the 800s do, like reading from the kernel. The difference is shown in the man page. On the 800s and HP-UX 10.x, you can use the **-k** option to say "show me kernel structures, not hardware." You also can add a device file to the end of the command line to only look at that device:

```
# ioscan /dev/rmt/0m
H/W Path Class Description
-----
2/0/1.3.0 tape HP HP35470A
```

In addition, there are options (**-M**, **-H**) that can be used to bind drivers to hardware that was not available at boot time. This is a big plus on server systems that cause grief if they are shut-down, but a bit beyond this introduction level discussion for now.

So, let's suppose that a driver for a device type is listed in the kernel (as shown by **lsdev** or **ioscan -k**), but there does not seem to be a device file for it. This could be due to the file having been deleted, or the device not being attached at installation time. You could use the manual command **mknod**, or use SAM. Another method, which can often be simpler, is to use the **insf** command, which stands for INstall Special Files. One of the good uses for this command is if you suspect that the pseudo ttys, existing devices or terminal device files are corrupt (or deleted). Running **insf** with the **-e** option will re-create them:

```
# rm /dev/console
# insf -e
insf: Installing special files...
# ls /dev/console
/dev/console
#
```

The drawback is that it only creates device files for "recognized" devices, meaning only products that are sold by HP. The **mksf** command does not have that problem. Here is an example on HP-UX 10.20 of an aftermarket SCSI disk being attached, with no device file created yet. First, I use **ioscan** to find the hardware path:

```
# ls /dev/dsk
c0t2d0 c0t5d0 c0t6d0
# ioscan -C disk
H/W Path Class Description
-----
2/0/1.5.0 disk MICROP 1588-15MB1057404
2/0/1.6.0 disk SEAGATE ST31230N
```

Next, I list **/dev/dsk** to see if there is a device file for address 5 (the naming convention shows device files exist for address 2 and 6).

```
# ls /dev/dsk
c0t2d0 c0t6d0
```

Next, issue the **mksf** command for the class of disk (**-C**), and the needed hardware address (**-H**) from the output of the **ioscan** command:

```
# mksf -C disk -H 2/0/1.5.0
```

Now an **ls** command shows that the **mksf** command created the proper named device files.

```
# ls /dev/dsk
c0t2d0 c0t5d0 c0t6d0
# ls /dev/rdisk
c0t2d0 c0t5d0 c0t6d0
```

Oh, so simple. Yessiree, if only life were indeed as simple as system administration.

—Just after writing this column, Fred was again caught and convicted of taking happy pills. See if you can bring him down with your sobering questions directed to frederm@aol.com.

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The Voices Of Experience

For the past few months, I've filled this space in *HP Professional* with the analysis of several new

network and systems management technologies, commenting on HP's new in-roads into Windows NT-based management, Web-based management, distributed management and event correlation. But the best in-context-analysis comes from customers who must somehow force-fit a shrinkwrapped package into a unique networking environment and prove its worth, or lack thereof. So, let's reach into the mailbag and pull out a few Frequently Asked Questions (FAQs).

Most of these FAQs are composites of multiple questions I've received, or that were sent to *HP Professional* or other various HP OpenView public mailing lists concerned with network and systems management.

Q. I've heard HP OpenView described as a product for managing TCP/IP communication devices. But where I really need help is in tracking the performance of my servers and client-server applications. Can HP OpenView help with that too?

A. Many people use the general term HP OpenView when referring to Network Node Manager (NNM), the TCP/IP network management product. Actually, NNM is but one of many products in the HP OpenView family. NNM can indeed be customized to monitor servers and applications by virtue of the extensible agent technology bundled into the product (this feature is also now bun-

dled into in every copy of the HP-UX operating system.)

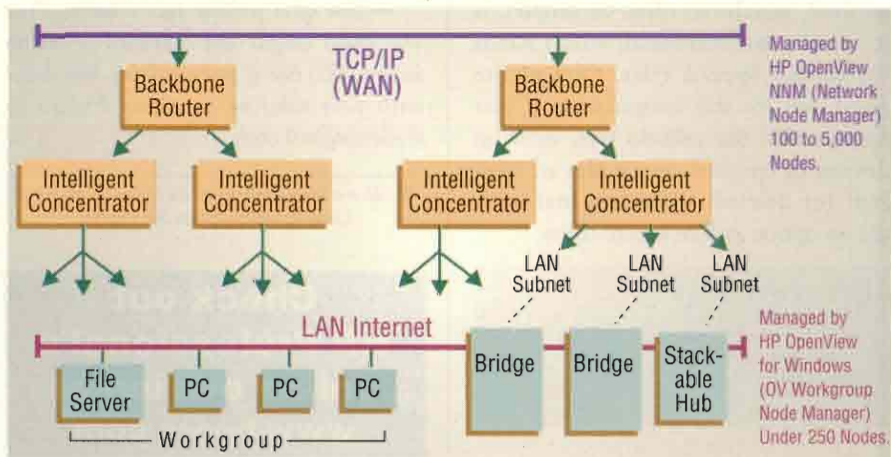
But there are other HP OpenView products specifically targeted for tracking server and application status and performance, such as IT/Operations (IT/O; formerly OperationsCenter), IT/Administration (formerly AdminCenter) and MeasureWare (a combination of HP's PerfView product plus extensions). At the risk of further confusion, I should mention that IT/O now includes NNM in a bundled package. IT/O operators are assigned their own IP map upon logon (an NNM feature), although the main screen (Event Browser) has the IT/O look-and-feel, rather than NNM.

Q. Why doesn't HP provide support for Banyan Vines and other protocol besides TCP/IP? I have heard that NNM can now support IPX/SNA

discovery. Why not others, if HP wants OpenView to be truly "open"? I don't like the idea of loading dual protocol stacks simply to manage my network.

A. NNM's support for Novell NetWare's IPX protocol and IBM's SNA protocols are actually applications developed by Peregrine Systems (Carlsbad, Calif.), a third-party vendor, and resold by HP. Additional third-party applications for managing IPX and SNA networks are available from other vendors in addition to Peregrine. Since HP OpenView's introduction in 1990, HP has maintained that many NNM extensions such as multiprotocol support are the responsibility of third-party developers. HP also maintains that NNM is "open" because it supports APIs that permit such extensions (although the development work isn't always easy).

Today there are also third-party applications for managing Digital DECnet systems, IBM AS/400 systems, as well as proxy agents and toolkits for numerous specialized cases. I would tend to suspect that the reason why a third-party developer hasn't



stepped up to the challenge of creating a Vines management application is simply because the market demand is not great enough to make it a profitable endeavor.

Q. *I've heard that many third-party HP OpenView applications, such as Bay Optivity, CiscoWorks and Seagate NerveCenter, won't work with the latest version of HP OpenView NNM. Is this true? What can customers do about it?*

A. NNM 4.1 supports a new feature called on-demand submaps that enhance performance by storing submaps in persistent memory only if an administrator configures NNM to do so on a submap-by-submap basis. Modifying submap configuration files can be tedious and, in the case of some third-party applications, almost impossible depending on product packaging.

Unfortunately, many third-party applications require their submaps to be in persistent memory in order to function properly. Several NNM appli-

cation providers have already started shipping fixes for this problem, and more are expected to follow suit.

Q. *Where can I obtain the Web interface upgrade to HP OpenView NNM?*

A. At present, this feature, called OVww comes in the form of an unsupported patch, made available to members of the HP OpenView User's Forum (OV Forum.) There is a patch available for both HP-UX and Solaris. The software provides a read-only interface to NNM maps, events and SNMP MIBs. For more information, send inquiries to ovwww@cnd.hp.com.

FOR THE ASKING

While new products and releases always generate excitement, never forget that upgrades aren't all that automatic. Customers who want to keep pace with new technology must be prepared to endure some pain. And

while HP OpenView is an umbrella product addressing many areas of network and systems management, *it is not a turnkey solution* for managing every protocol, device, system and application that may be lurking in your organization's IT gestalt. You've got to expect do so some tweaking and cobbling to fashion a solution appropriate

HP OpenView isn't for managing every protocol, device, system and application that may be lurking in your organization.

to your unique network. At the same time, HP OpenView is a great starting point — arguably one of the most popular in the market — and the best way to jump start your implementation is to ask questions.

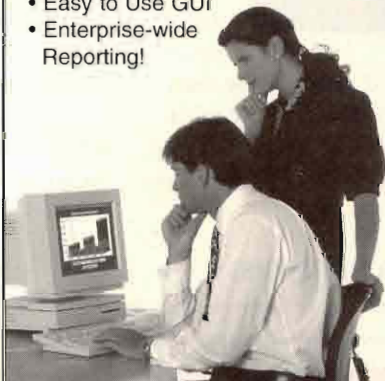
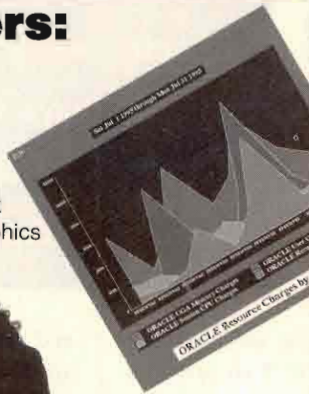
— *Do you want more FAQs from Jill? Drop your frequently asked questions about system and network management to jill@int.snm.com.*

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Bright Ideas For The Web

Vinton Cerf, often called the “Father of the Internet,” likes to charm anyone within earshot

with the prediction that light bulbs and microwaves will soon have Internet addresses. He persuasively suggests that soon it'll be possible to use the Internet to monitor and manage resources like electrical consumption. I've heard Vint say this at least twice now. And I always seem to be sitting next to a beleaguered network manager who responds, “Great, I have enough trouble managing my network without having to worry about the office refrigerators and radios.”

AS SIMPLE AS SNMP

Internet network management is built upon the Simple Network Management Protocol (SNMP). SNMP is a set of related Internet standards that provides three crucial functions: identifying those things in the network that need to be managed; identifying the information that needs to be reported for each managed object; and the mechanism for communication with any managed object. SNMP is a mature widely used group of technologies. A good source for further information is at: snmp.cs.utwente.nl.

Most modern network management platforms depend on high-powered workstations that collect and organize information from network connected computers, routers, switches and hubs. The best of these management platforms, for instance HP's OpenView, are able to display a graphic representa-

tion of a managed device and allow a user to click on a part of it, say a port, to display its status. Hmm. The network management workstation renders an image and then the operator can click on any part of it to get further information.

Think about it: Isn't that exactly how Web browsers work? Managing networks through Web browsers will have some significant advantages compared with traditional network management stations. Network managers will not be tied to a specific management station; they can manage the network from anywhere they can run a browser. Browsers also will support enterprise network management information integrated with vendor Web sites and technical information.

While the word “browser” seems to imply read-only activities, it doesn't have to mean one-way communication. A link on a page could activate a script that runs a diagnostic on the selected device. The script could even mail the results to the network manager or a third-party providing remote network support. Better yet, the script could automatically format a new Web

page with the results, as well as suggestions for further action.

One company, Advent Network Management (Matawan, N.J.), has taken this idea a step further by providing a set of Java classes, the basic building blocks of Java programs, for SNMP. These classes allow network programmers to develop portable SNMP applications that execute over the Internet. See www.adventnet.com/snmp_api.html for a description of the classes. A Web browser can use Java applets to deploy active agents that discover changes to network topology, process SNMP alerts and launch other

management applications.

You don't have to push the envelope to build network management applications using the Web. Indiana University has assembled a series of simple Perl scripts that poll SNMP agents on routers, hubs and switches. The results are then collected, sorted by error rates

and displayed by the browser. Another application combines scripts that execute router diagnostics with links to vendor-developed router configuration Web pages.

TO BEAT THE BAND

Instead of fighting the growing trend toward Web-based network management interfaces, HP has jumped on the bandwagon. This past July, HP announced an alliance with Netscape Communications with the goal of pro-

While “browser” implies read-only activities, it doesn't have to mean one-way communication.

**Network managers
won't be tied to one
management station,
they can manage the
network from
anywhere they can run
a Web browser.**

viding Web server management tools as well as Web-based front ends to existing HP OpenView applications. HP also has submitted a proposal to the Internet's standards setting body, the Internet Engineering Task Force (IETF), that details a new mechanism for transmitting network management information using the Web's native HTTP transport protocol.

Web-based network management provides an open, industry-standard window on proprietary network devices and databases. By using a common interface to management information, vendors can now supplement the fundamental details of a network's health with abundant information and tools that make enterprise network management more productive, better automated and more widely available. No specialized network management is required to install, monitor and manage the network.

Combining the ease-of-use of the Web browser with the growing use of SNMP means that more than traditional devices come under the purview of enterprise network management. The day might not be far off where Vint Cerf's vision comes true: I'm browsing my company's home page when suddenly an alert appears. I left the kitchen light on at home and it just burned out.

—Got any bright Web-based ideas? Let Mark know at 73740.1101@compuserve.com.

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new Products

SOFTWARE

Vital Inc. Releases CRISP Version 5

Vital Inc. released version 5 of CRISP, a cross-platform programming text editor for X Windows, Windows and character-based environments.

CRISP V5's colorization mechanism has been revamped, making it easier to add colorizer definitions for specialized languages. Dynamic colorization and printing is supported for over 50 languages including Java, HTML, ARC, VHDL and Verilog.

CRISP V5 is available on: HP-UX, Sun Solaris (SPARC, Intel), IBM RS/6000, SGI, Digital (Alpha, Ultrix), Linux, LynxOS, CRAY, Data General, SCO UNIX, UnixWare, Windows-NT, Windows 95 and Windows 3.1. Prices range from \$149.99 on Linux, \$249.99 on Windows, and \$349.99 on UNIX.

Contact Vital Inc., 4109 Candlewyck Dr., Plano, TX 75024; (214) 491-6907; info@vital.com; www.vital.com.

Circle 400 on reader card

NetManage Introduces ChameleonNFS/X

NetManage announced ChameleonNFS/X, a cross-Windows host and server access client. ChameleonNFS/X, part of the new Chameleon ATX product family also announced, is targeted at cross-Windows desktop users who need to access NFS and FTP servers or to access all points addressable UNIX applications.

ChameleonNFS/X integrates NFS, FTP, LPR, LPD, X server, TN3270E, TN5250 and the full complement of telnet emulation, including VT340 and VT420, all into a comprehensive product easily accessed utilizing the new GO! intranet single point of integration.

ChameleonNFS/X includes NetManage's ActiveX Controls, including http, HTML, SMTP, POP, ftp and WinSock,

along with numerous Visual Basic and Borland Delphi scripting tools.

ChameleonNFS/X is available for Window, Windows 95 and Windows NT for \$400.

Contact NetManage, 10725 N. De Anza Blvd., Cupertino, CA 95014; (408) 973-7171; info@netmanage.com; www.netmanage.com.

Circle 399 on reader card

Hummingbird Delivers Exceed Version 5.1

Hummingbird Communications Ltd. announced Exceed Version 5.1, a multi-platform PC X connectivity suite. Exceed PC X servers enable Windows NT, Windows 95 and Windows 3.x-based PCs to access and display mission-critical applications from UNIX/X-, VMS-, Ultrix- and OSF/1-based computer systems. Version 5.1 includes an optimized OLE and

DDE-compliant telnet client with an expanded range of terminal emulations, a new ftp client that enables drag-and-drop of entire file directories, a TN5250 client that provides comprehensive terminal model emulation support and the Columbus Lite Internet/intranet applications suite which includes a Web browser, e-mail, NetBook and Network News client.

Single copy price is \$545.

Contact Hummingbird Communications Ltd., 1 Sparks Ave., N. York, ON M2H 2W1; (416) 496-2200; sales@hummingbird.com; www.hummingbird.com.

Circle 394 on reader card

NetCarta Releases WebMapper 1.1

NetCarta Corp. shipped its NetCarta WebMapper 1.1 content management software for UNIX Web servers.

NetCarta WebMapper generates HTML-formatted reports that reveal the size of the site, what is linked to and from the objects in the site, the objects on the site without links (orphaned files) as well as those with broken links. HTML reports can be viewed by any browser and distributed freely.

NetCarta WebMapper 1.1 supports HP-UX 9.05, SGI Irix 6.2 and Sun Solaris 2.5. It supports http server programs including Apache 1.1, NCSA 3.0A, Netscape Commerce Server 1.12, Netscape Fasttrack 2.0 and Open Market Secure WebServer

New From HP

Printer Management Support For Windows NT —

HP announced advanced printer management support for Windows NT via HP JetAdmin for Windows NT software. The new software allows for the easy installation of printers, one-step printer setup, complete remote printer management and diagnostics, and in-depth printer status feedback for any printer connected to Windows NT 3.51 and 4.0 networks via an HP JetDirect print server. Other features include TCP/IP with Dynamic Host Configuration Protocol (DHCP) support as well as support for IPX/SPX.

JetAdmin for Windows NT software is available free of charge through HP's ftp site (boi.external.hp.com), over the Web (www.hp.com) or HP Distribution at (970) 339-7009.

DMS-Compliant HP OpenMail — HP announced plans to make its HP OpenMail messaging solution compliant with the U.S. DoD's Defense Messaging System (DMS) guidelines in 1997. HP OpenMail is a client-server, open-messaging application based on the X.400 standard. By having the message-transfer agent and message store reside on the same server, OpenMail can support up to 5,000 users per server. DMS guidelines are required for federal contracts involving messaging solutions and are designed to replace and standardize all messaging systems in the DoD over a 20-year period.

For more information, contact your local sales office or call (800) 533-1333.

2.0; and Netscape Navigator, Microsoft Internet Explorer and Spyglass Enhanced Mosaic. NetCarta WebMapper 1.1 for UNIX costs \$999.

Contact NetCarta Corp., 5617 Scotts Valley Dr., Ste. 100, Scotts Valley, CA 95066; (408) 461-8271; info@netcarta.com; www.netcarta.com.

Circle 390 on reader card

LMT Releases BasketTrader

Leading Market Technologies (LMT) released BasketTrader, a comprehensive system for creating, pricing, testing and running simulations on baskets of financial instruments. The product is a standalone solution, built by LMT using XPL (a high-level language for processing numerical time series and matrices) and EXPO (a decision support worksheet used for rapid display, analysis and management of financial data) as a development platform. BasketTrader also provides high-quality, real-time graphic feedback on the performance of financial instruments and simulations to leverage users' decision making.

Price for single copy licenses is \$9,000 for UNIX, Windows and Windows NT platforms.

Contact LMT, One Kendall Square, Bldg. 100, Cambridge, MA 02139; (617) 494-4747; www.lmt-expo.com.

Circle 398 on reader card

Reflection X Bundles With OpenView IT/Administration

WRQ announced an agreement with HP to bundle Reflection X, its PC X server software, with HP's centralized systems management software, HP OpenView IT/Administration for Workgroups. Under the agreement, Reflection X will be available to ship with IT/Administration for Workgroups to assist customers in managing mixed environments of HP-UX, Windows NT servers, Novell NetWare and PC desktops. With this package, IS managers can use Reflection X on their PC to run applications residing on HP 9000 UNIX-based enterprise servers to manage their mixed environment.

Contact WRQ, 1500 Dexter Ave. N, Seattle, WA 98109; (800) 872-2829; info@wrq.com; www.wrq.com.

Circle 396 on reader card

EAI And HP Preview Contoura

Engineering Animation Inc. (EAI) and HP announced Contoura, an industrial design software product that helps industrial

designers visualize concepts in three dimensions. A surface-based modeler, Contoura bridges the gap between physical sketches and digital models in an accessible, clear and straightforward environment. EAI is developing Contoura on HP VISUALIZE workstations.

Contact EAI, ISU Research Park, 2321 N. Loop Dr., Ames, IA 50010; (515) 296-9908; www.eai.com.

Circle 393 on reader card

HARDWARE

Garrett Communications Unveils Connectivity Solutions

Garrett Communications unveiled a trio of products that support 100 Mbps Fast Ethernet and 10 Mbps Ethernet LANs.

The Magnum 8000E series of Stackable Hubs supports 100 Mbps Fast Ethernet LANs and provides three levels of cascading in a shared Fast Ethernet collision domain.

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new products

The Magnum 5016E Switching Hub maximizes traffic capacity and performance on small- to medium-sized networks by allowing high-speed access to servers. It also enables other heavily accessed devices to realize the full power of switched Ethernet connections.

The Magnum 300ES Two-port Switch provides a simple and economical method to connect 10 Mbps and 100 Mbps Ethernet segments, or two Fast Ethernet segments.

Contact Garrett Communications, 48531 Warm Springs Blvd., Fremont, CA 94539; (510) 438-9071; mkty@garrettcom.com; www.garrettcom.com.

Circle 388 on reader card

Phonetics Inc. Adds Data Remote

Phonetics Inc. announced the addition of Data Remote, which produces and communicates reports from remote equipment. It can attach to data loggers, chart recorders, network servers, phone systems, computers or any device with an RS-232

output port, and give you instant reporting capability over standard phone lines. Data Remote also has two alarm functions — an inactivity alarm and alarm keyword detection.

Contact Phonetics Inc., 901 Tryens Rd., Aston, PA 19014; (610) 558-2700; sales@phonetics-monitoring.com; www.phonetics-monitoring.com.

Circle 382 on reader card

CPI Produces New UPS

Computer Power Inc. (CPI) announced the availability of their new 5kVA UPS, which provides 20 VAC and 48 VDC output. The UPS is designed for applications in which battery backup by AC and DC power is required. The system battery charger also can be used to recharge a customer-owned separate 48 VDC battery system. Price is \$9,500 for a single unit.

Contact CPI, 124 W. Main St., High Bridge, NJ 08829; (800) 526-5088; cpi@computerpower.com; www.computerpower.com.

Circle 384 on reader card

Mitsumi Ships FX600 6X CD-ROM

Mitsumi Electronics Corp. shipped their new internal FX600 6X CD-ROM drives. The FX600 offers a data transfer rate of 900 KBps, 180 ms average access time and 128 KB built-in memory buffer. The FX600 comes in a standard half-height 5.25-inch form factor, which can be mounted either vertically or horizontally, and features a caddyless CD power tray for easy end-user operation. The FX600 supports the ATAPI IDE interface and is fully plug-and-play compatible with Windows 95 and OS/2 Warp.

Price is \$249.

Contact Mitsumi Electronics Corp., 6210 N. Beltline Rd., Ste. 170, Irving, TX 75063; (214) 550-7300; www.mitsumi.com.

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1. Publication Title	2. Publication Number	3. Filing Date
RF Professional	0100-0000	12/19/98
4. Issue Frequency	5. Number of Issues Published Annually	6. Annual Subscription Price
Monthly	12	\$10.00

7. Complete Mailing Address of Known Office of Publication (Street, City, County, State, and ZIP+4) (Do not leave blank)

Cardinal Business Media, Inc., 1300 Virginia Dr., Suite 400, Ft. Washington, PA 19034

8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Do not leave blank)

Cardinal Business Media, Inc., 1300 Virginia Dr., Suite 400, Ft. Washington, PA 19034

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)

Lawlis Blodig, 1300 Virginia Dr., Suite 400, Ft. Washington, PA 19034

10. Owner (Do not leave blank)

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11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box.

None

12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rate. The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes: (Check one)

13. Publication Title

14. Issue Date for Circulation Data Below

15. Extent and Nature of Circulation

a. Total No. Copies (Net Press Run)	31276	32730
b. Paid or Requested Circulation (1) Sales Through Dealers and Carriers, Street Vendors, and Counter Sales (Not Mailed)	1451	1489
c. Paid or Requested Circulation (2) Outside the Mails (Carriers or Other Means)	25566	24520
d. Total Paid or Requested Circulation	27017	26009
e. Free Distribution by Mail (1) Sales Through Dealers, Carriers, Street Vendors, and Counter Sales (Not Mailed)	5061	5363
f. Free Distribution Outside the Mail (2) Sales in Other Mails	70	70
g. Total Free Distribution (Sum of 15e and 15f)	5131	5433
h. Total Distribution (Sum of 15d and 15g)	32148	31442
i. Copies Not Distributed (1) Office Use, Leftovers, Spoiled	1128	1488
j. Return from News Agents	0	0
k. Total (Sum of 15h, 15i, and 15j)	33276	32930
Percent Paid or Requested Circulation (15d / 15k x 100)	81.2	83.3

16. Publication Title

17. Issue Date for Circulation Data Below

18. Extent and Nature of Circulation

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Geoffrey James
Author of
*Business Wisdom
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When HP was founded in 1939, conventional business wisdom held that well-run corporations were “machines” and good executives ran them “by the numbers.” It was “good business” to pay employees as little as possible, reducing them in the process to faceless, replaceable cogs. The late Dave Packard, one of HP’s founding fathers, never bought into that way of thinking. Packard and co-founder Bill Hewlett, believed that a company could be more productive if employees benefited from the company’s success. So, rather than building a corporate machine, Packard created a community of individuals bound by a deep sense of mutual respect. As a result, HP has avoided the centralization and bureaucracy that goes hand-in-hand with the business thinking prevalent today.

During the research for my new book, *Business Wisdom of the Electronic Elite* (Times Business Books, 1996), I investigated the corporate cultures of some of the most successful companies in the computer industry: HP, Compaq, Sun, Silicon Graphics, Microsoft and Dell, among others. All have cultures that were modeled, often consciously, on HP’s. That should come as no surprise. Of all the computer vendors around before the microprocessor revolution of the early 1980s, only HP has adapted smoothly.

Erstwhile industry leaders like Digital, IBM, Data General and Wang have struggled and stumbled through layoffs and financial losses. Those companies — unlike HP — were burdened with traditional, authoritarian, command-and-control corporate cultures, which simply couldn’t move quickly enough to take advantage of new opportunities. In fact, those companies are today trying to shed their old cultures, trying — with varying levels of success — to become more like HP.

The consistent, long-term growth of HP provides abundant proof that the best way to compete in today’s fast-paced business world is to create a corporate culture that values freedom, initiative

and fun rather than obedience, conformity and fear. This new way of thinking naturally led to new management techniques — some of which have been widely adopted, even outside the computer industry. For example, in the past, many companies insisted that managers be treated with exaggerated respect. It was “Yes, Sir.” “No, Sir.” “Right away, SIR.” Employees curried favor rather than speak the truth. At HP, that was never the case. The founders were, by their own insistence — “Dave” and “Bill” to their employees. Relations between managers and employees were casual and communicative. An unusual and original idea back in 1939.

Another HP management practice that’s widely emulated today is “management by objective.” Long before business schools even figured out there was such a thing, Dave and Bill were instructing HP managers to set objectives, but give employees the freedom to choose how those objectives were to be accomplished. By contrast, in organizations that have very rigid structures and autocratic control, top management tells employees *exactly how things should be done*. Individuals aren’t trusted and their motives are automatically suspected.

Fortunately, such organizations are less common today than they were in the past, partly because HP — and companies that have emulated its culture — have shown the business world that there *is a better way*. HP’s decentralized, product-focused culture is a model for success in fast-moving markets. Thus, Dave Packard’s wisdom has had an impact far beyond the confines of HP. And that’s a legacy truly worthy of respect.

— Geoffrey James’ *Business Wisdom of the Electronic Elite* lists the 34 key strategies that high-tech leaders use to make their organizations responsive and flexible. He can be reached at GeoffJames@aol.com or (603) 465-2589.



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