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JULY 1999

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WINDOWS NT

Is NT Clustering A Good Idea?

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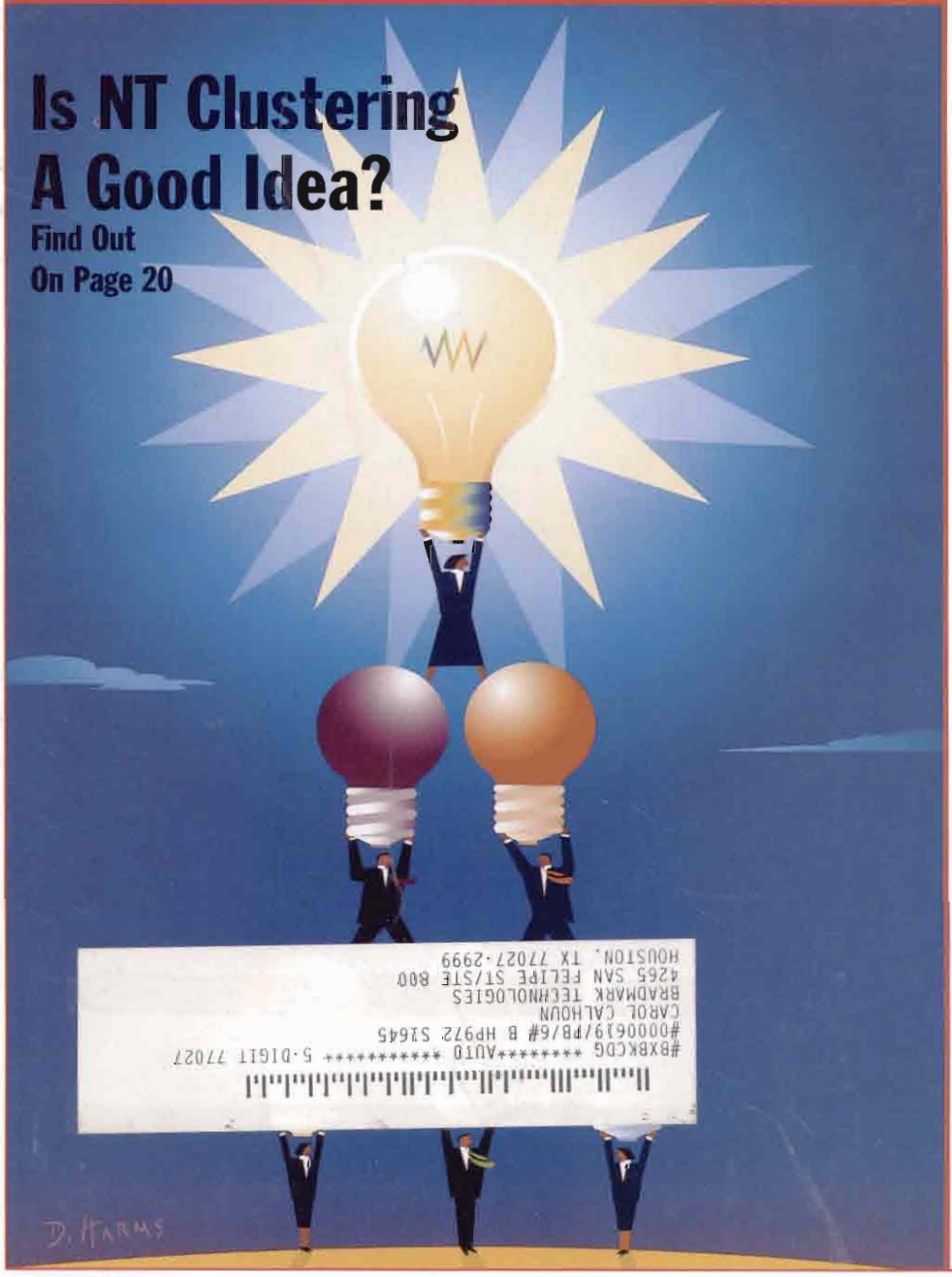

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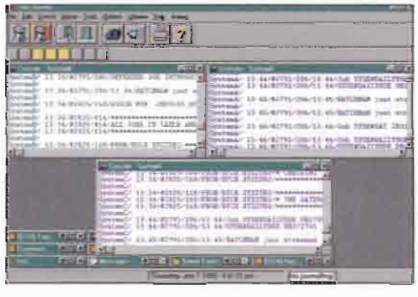

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CORRECTION

In June, we incorrectly reported that Ignite-UX was "previously a $595 add-on." Ignite-UX, however, has been freely available to HP-UX licensees since 1997. It is also available at www.software.hp.com.

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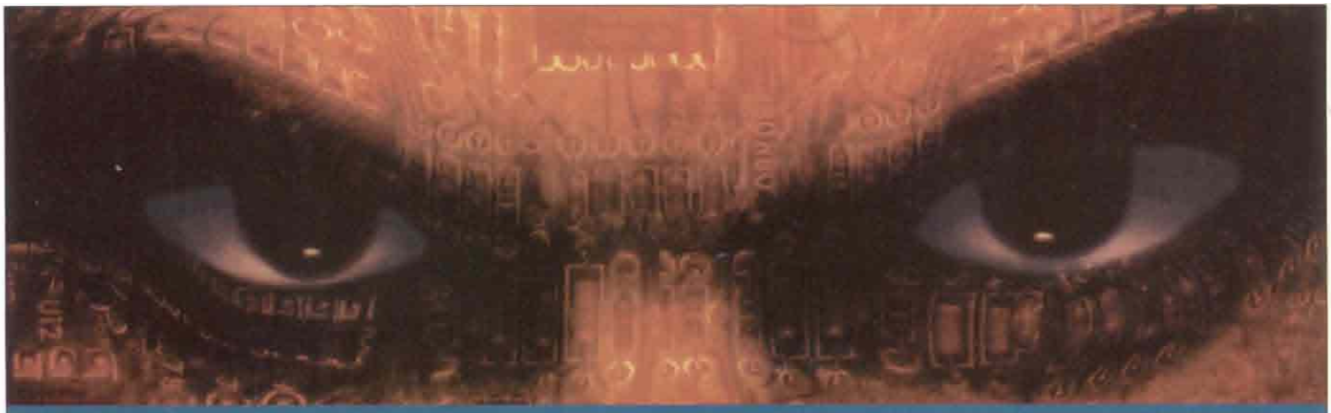

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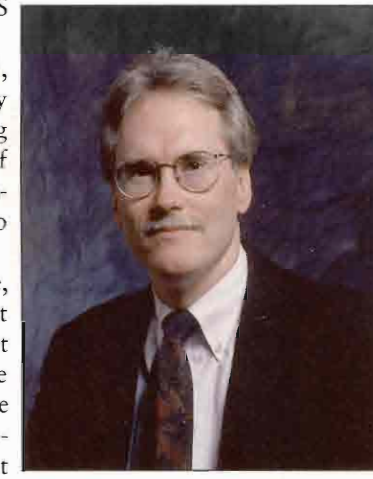
Day In, Day Out

Presidents have a Day. Saint Patrick has a Day. The American flag has a Day. Laborers have a Day. Mothers and fathers and grandparents have a Day. Then there's a Day for secretaries, valentines and bosses. Now, while waiting with bated breath for Editor's Day, here comes a Day to recognize IS professionals.

In case you missed the e-mails, ties and flowers, (what do you get for the IT professional who has everything?), the day came and went, with little fanfare, on June 21, 1999. Don't blame HP, sponsors of the first-ever — drum-roll, please — National IS Appreciation Day.



Only a day away?

The day before the official start of PC Expo, HP corporate execs, Neal Martini, senior VP and GM of HP's Commercial LaserJet Business Unit and Tony DiCairano, area sales manager for the North Atlantic Region, were on hand, along with Michael Miller, editor-in-chief of PC Magazine, Carolyn G. Rose, CEO of HyCurve, Inc., Alan P. Hald, cofounder of MicroAge and Marianne Grogan, president of Intelliquest Information Group, at the Grand Hyatt in New York City to commemorate the event.

Vice-President, Al Gore, famous Internet inventor, and presidential candidate, sent his warmest and fuzziest wishes in a letter (printed on recycled paper) that read in part, "The entrepreneurial spirit and ethic of hard work and diligence that have driven your success are examples to the world of the values that make America the nation of hope and opportunity for all." And did you take the National Appreciation Day Challenge? Apparently more than 8,500 IS professionals answered the National Appreciation Day Trivia Challenge question: "In what year did HP introduce the first HP LaserJet printer?" But nearly half didn't come up with the answer of 1984. For shame. For shame.

More interesting were several findings presented from the TechnoPulse Survey, a joint undertaking between HP and Intelliquest Information Group (Austin, Texas). More than 75% of IS professionals feel their jobs are essential (31%) or important (46%). However, respondents generally believe that their fellow non-IS professionals underestimate their value, predicting that 30% would say it would be business as usual (7%) or that work efficiency would be slowed only somewhat (23%) if the IS department went on strike. Perhaps an IS Appreciation Day is just the prescription to cure those Information Age Blues.

But I found it more than curious that HP IS Appreciation Day was sponsored by Carolyn Ticknor's LaserJet Imaging Systems, the group responsible for HP's printing, multi-function and imaging products. So I found myself asking, "Where's the Internet Software Business Unit (ISBU) responsible for E-Services? Where are the HP representatives from the HP 3000, HP 9000 and NetServer divisions? Aren't they an important part of the IS Appreciation equation?"

Although well-intentioned, the event seemed to miss the point of HP's own rhetoric which is to "gather IS professionals, technology leaders and market innovators to explore the issues raised by HP's TechnoPulse survey and to evaluate the future of the technology industry." HP's Enterprise Computer Organization (which houses HP servers and software) missed an especially important synergistic moment to present a unified front with their peripheral counterparts. Consequently, HP National IS Appreciation Day, which HP would like to see become an annual occurrence, seemed like nothing more than a shill for HP's very well-known peripheral products.

If the new-all-computer half of Hewlett-Packard (the only half with a name at the moment) wishes to put their compartmentalized and decentralized past behind it, they'll have to work harder at communicating amongst themselves and their disparate divisions to establish a freshly-minted mind share among their most important audience.

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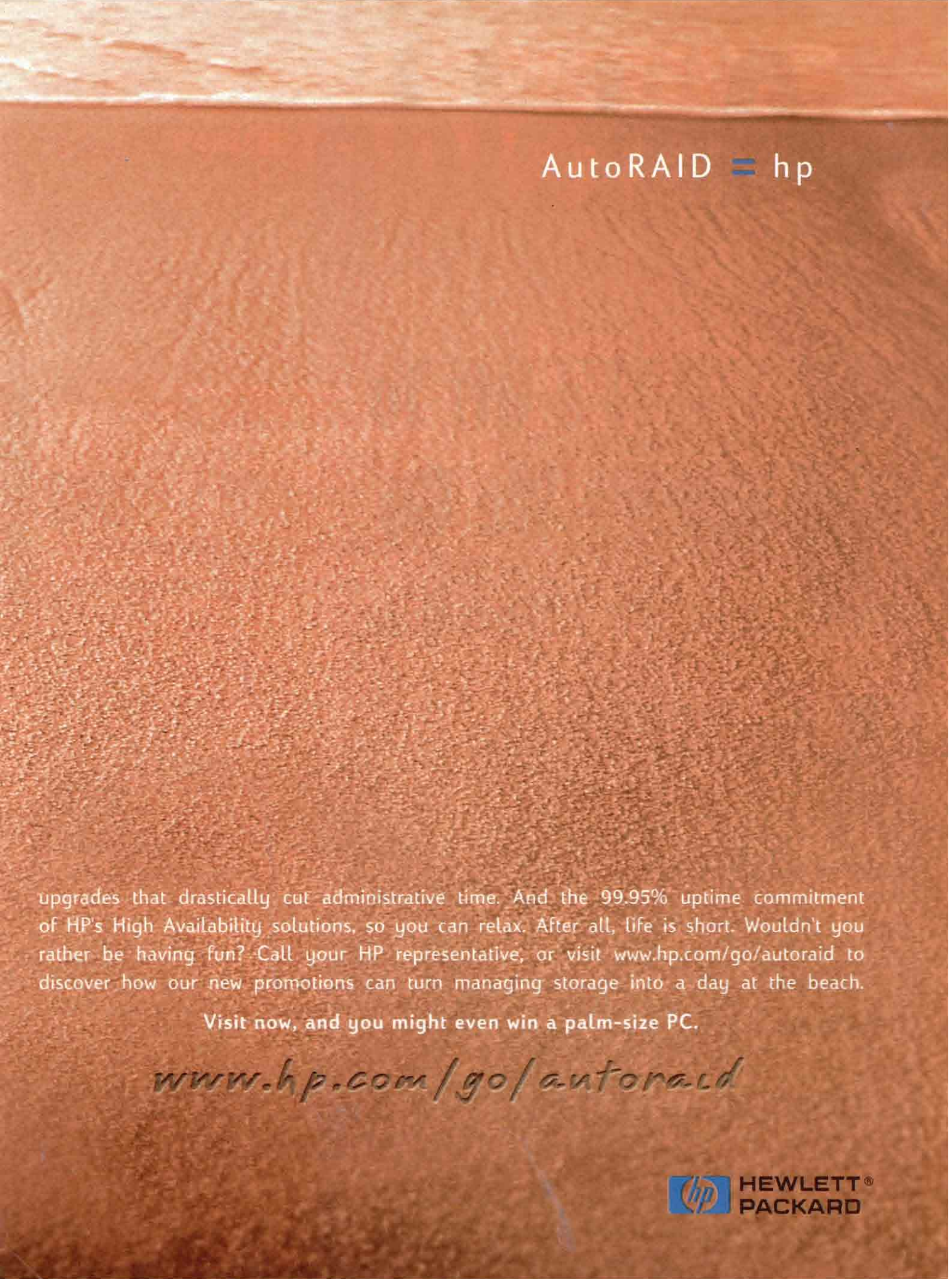
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The soon to emerge evolutionary standard, PCI-X, will push that limit to 1GB per second, using the same form factor and bus architecture as PCI.

The realization of that limit has led to the formation of two separate and competing organizations that both want to push I/O standards forward. The *Next Generation I/O Forum* (NGIO) was formed primarily by Intel, Sun Microsystems, Dell and Hitachi. Next came the *Future I/O Alliance* formed by HP, IBM, Compaq, 3Com and Adaptec.

"They're fundamentally trying to solve the same issues," says James Gruener, managing director of Windows 2000 platforms at Aberdeen Group (Boston, Mass.). "The big difference will be in their implementations."

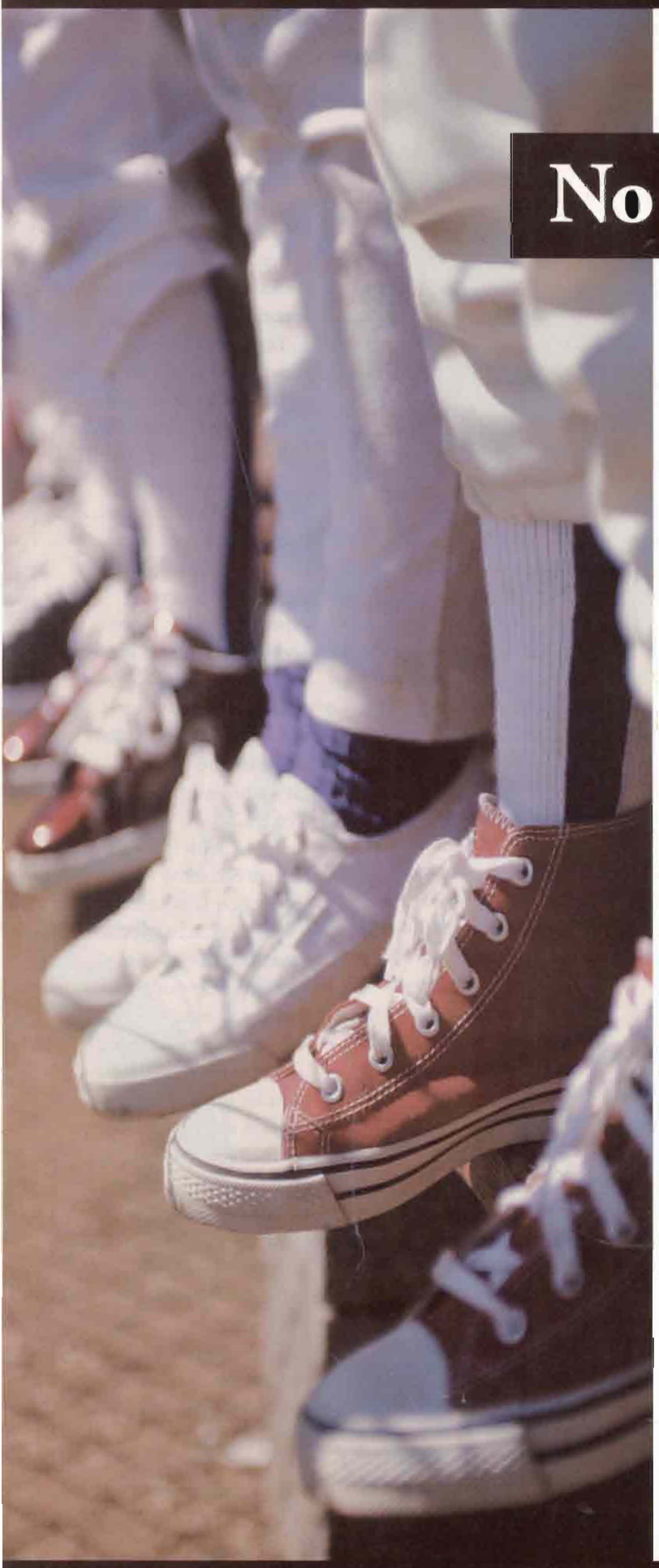
Both organizations are promoting a decentralized approach to I/O where one unit will be predominantly CPUs and another an I/O unit. A switched-fabric architecture will connect the two boxes. "The battle comes down to who controls the box," says Gruener. A switched-based, point-to-point architecture will require manufacturers and ISVs to incorporate different form factors and software models into their products.

"It's a revolutionary step to get revolutionary benefits," says Scott Emo, a technical marketing manager at HP, speaking for the Future I/O Alliance. "We expect to offer two thousand MB per second to start with and it's designed to double and quadruple that."

BYE BYE PCI

"PCI is not going to meet the need of enterprise class server requirements," says Charles Andres of Sun Microsystems, acting as marketing communications manager for the NGIO. "Because of the latency and slow error detection inherent in PCI, PCI-X won't meet those needs either." Andres adds that NGIO's initial specification should provide 2.5GB per second per channel and will be designed for multiple channels.

"In five to 10 years we'll see requirements in the one terabyte per sec-



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ond range. We want to make it scalable – start at low cost and ramp up as requirements demand it," he adds.

"You have no standards when there are two standards. If I was a customer today, I would sit and wait," says Gruener. As to the possible industry repercussions of competing standards, Gruener sees the additional costs of maintaining two different R&D efforts translating into "significant additional end-user cost over time."

RAGING BULL

Rick Lacroix, public relation program manager at storage vendor EMC says there is a precedent for a wait-and-see attitude. "Back two years ago when the SSA [Serial Storage Architecture] Fibre channel argument was raging, we said 'Whatever our customers want is what we're going to deliver.' I think that's the same type of attitude that we're going to have on these types of future I/O discussions.

"We're working with all the organizations, taking a look at the technical requirements and issues and we'll see what the market's going to go to."

The principals agree. "We think it's appropriate to find common ground to ... find a high speed interconnect structure," says Andres. "It's obviously much better for the industry to standardize on one."

"Of course there's a benefit in coming together," says Emo. "One standard is better at the end of the day."

As to what expertise each group brings to the effort, Gruener says, "The attraction of Intel is that they provide a standardized environment that is commodity-based. Multiple vendors can co-exist on the same network. And the NGIO has the advantage in being the first to market. But that doesn't mean it will be the better of the two products."

Andres adds that Sun's involvement with the NGIO began with the corporate opinion that the industry "should standardize on a serial fabric architecture [for I/O] and the NGIO's specification seemed to be farther along."

As to the Future I/O Alliance, Gruener says, "IBM has done switched fabric before, HP has plenty of enterprise experience and Compaq has the R&D money. [They] are all great assets to have."

NO BIGGIE

The NGIO expects to see products based on its standards sometime in 2000, the Future I/O Alliance probably a year later. "We expect to have a full spec by year-end 1999 and prototype products throughout 2000," says Emo. Commenting on trailing NGIO's more aggressive timeline, he adds, "Standards last 10 to 15 years. Six months difference is not a big deal to customers."

The NGIO spec is "out for final review now," says Andres, adding that the plans are to have the final specification around mid-year. "Companies should show proof of concept product rollouts by mid-year. Our goal is to have products by mid-2000."

"Standards last 10 to 15 years. Six months difference is not a big deal to customers."

A SPEC UNDER THE MICROSCOPE

At a May 24 press event, the Future I/O announced that Cisco Systems has joined the forum as its sixth promoter, that a pre-release specification was ready for partner review and that it was broadening its specification to allow Future I/O packets to encapsulate Internet Protocol version 6 (IPv6) packets.

"We gave people a heads-up and to let them make some comments," says William Lee, a technical marketing manager for HP. "We wanted to get them ready for the voting process in the Fall." The voting process takes place as the group nears the expected final release of v1.0 of the specification in December 1999.

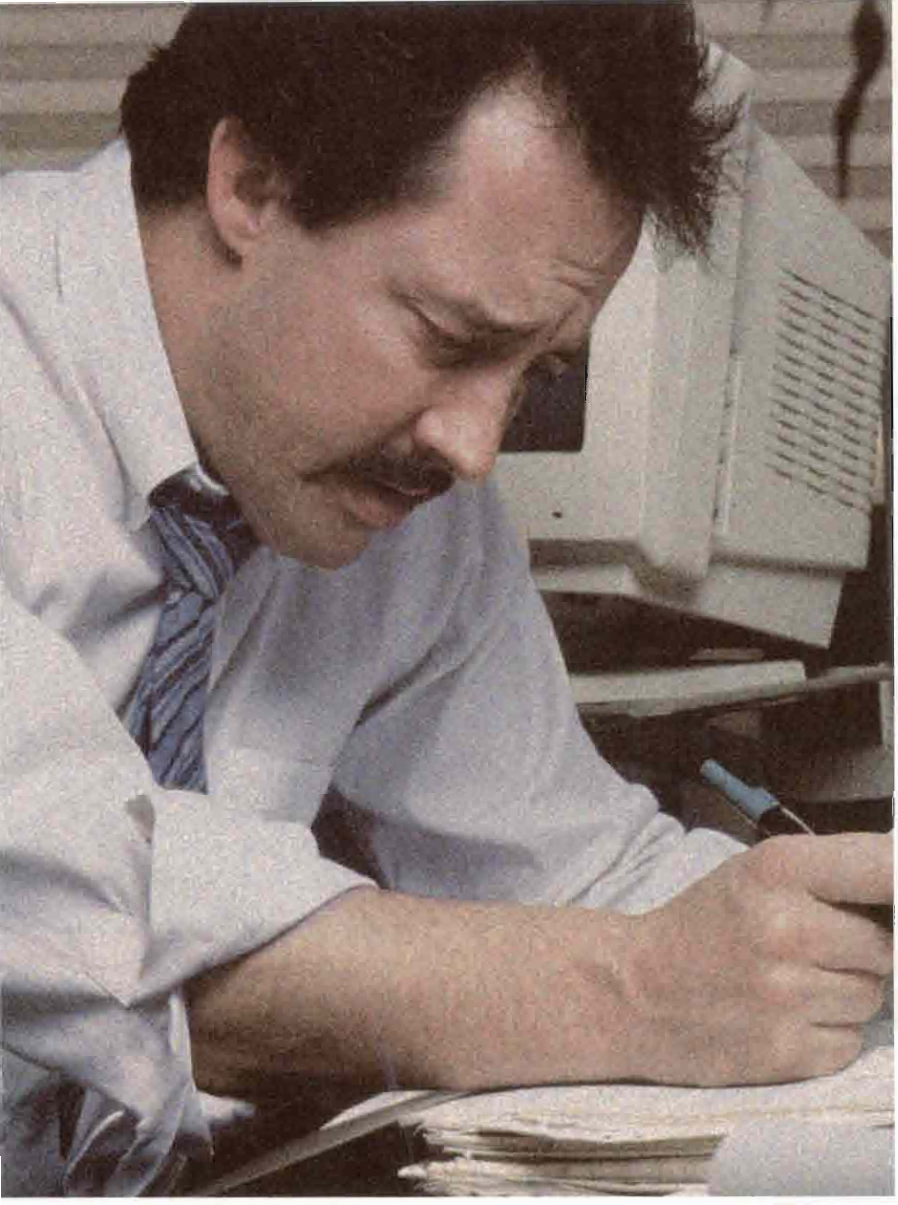
Lee characterized the inclusion of Cisco as "very valuable," because it owns approximately an 80% share of the router market. Cisco's support also eases the group's inclusion of IPv6 technology into its specification.

Lee points to several benefits the group hopes to realize from the inclusion of IPv6. First, it provides 128-bit addressing, "which allows us to virtually address unlimited nodes. A [Future I/O] network can be huge." Second, it provides an "auto-config aspect," that lets a new node, once inserted onto the network, auto-define a unique address for itself and broadcast it to other nodes on the network. "It's a hot plug-and-play concept."

Third, with IPv6, routers can sense when a connection fails and can reroute traffic to bypass the failing device. "It makes the network more secure and available."

The business case for adapting IPv6, says Lee, includes the ability to leverage existing technology (IPv4) such as common tools, management and conceptual models, thereby reducing TCO. "It will let companies use the Internet as the main backbone. They won't have to dedicate lines anymore. They can use the Internet to transport data at Internet speed."

— Ken Deats, Associate Editor



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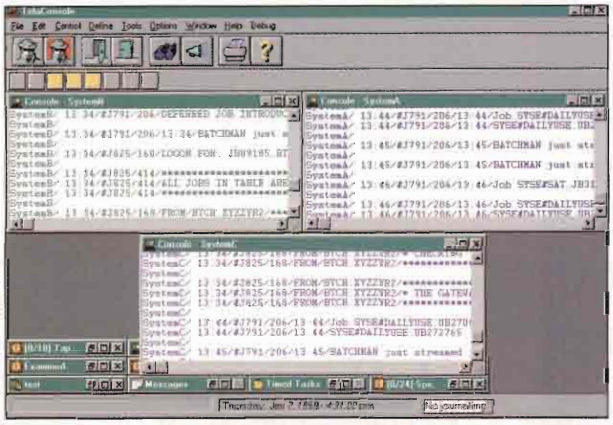

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By definition, mission critical applications must continue to function uninterrupted. To help HP-UX administrators ensure adequate detection and response to system and application problems — even if they occur during off-peak or other understaffed hours — Telamon Inc. (Oakland, Calif.) has released TelAlert 4.06, an event notification and management tool.

TelAlert automatically alerts support personnel to problems as they occur and provides the capability for them to respond and correct such problems from remote locations.

"You want to be able to control applications and systems remotely, so that using any two-way telephone, for example, people can come back through TelAlert and execute any sort of application that they want," explains Guy Smith, Telamon's director of marketing.

TelAlert 4.06 includes the ability to actively manage the content and rotation schedules of message signboards and supports queues of up to 255 messages. Support for e-mail notification has been improved in TelAlert 4.06 with the introduction of direct SMTP, which enables TelAlert users with SMTP servers to rout messages through e-mail and specify customizable header fields.

TelAlert can issue notification requests with different priority levels, which can in turn determine when and how — by pager, voicemail, e-mail, phone call — a message is delivered. In this model, an HP-UX administrator can choose to have low priority messages routed directly to e-mail, while high-priority messages can be dispatched via phone call.

But it's TelAlert's stability and scalability that makes it a worthwhile product choice for most HP-UX environments, says Heman Choy, a vice president with systems integrators and consultancy Technology Solutions Co. (Toronto, Ont., Can.), whose firm managed the implementation of TelAlert for the Canadian subsidiary of a notable U.S. IT giant.

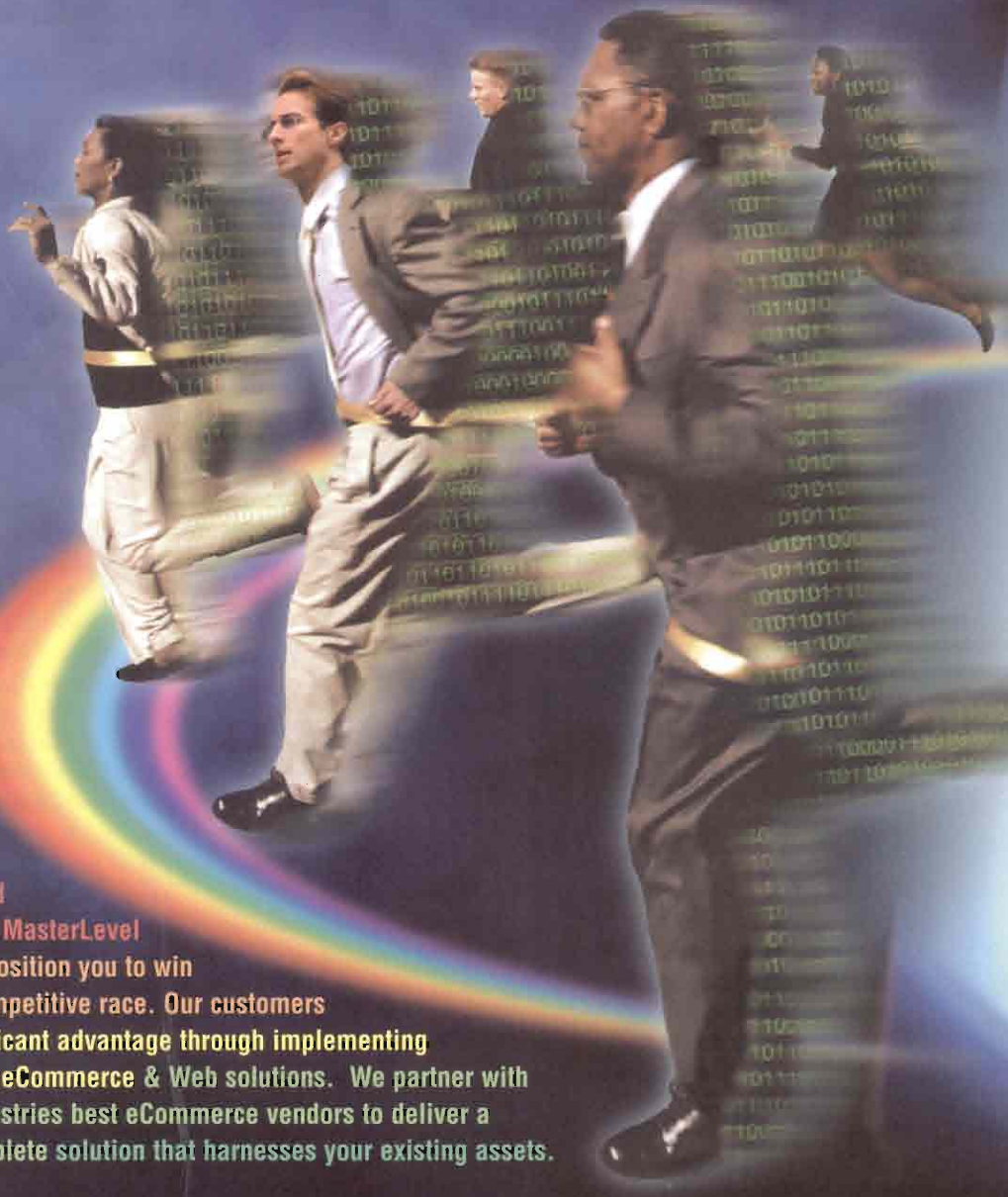
"They were using other paging software that was very unstable and did not have the throughput that they needed," Choy indicates. "TelAlert's great in that regard: It's very stable, and for the last year and a half it's never been shut down, not even for periodic refreshing or other maintenance."

Choy evaluated several other solutions from a number of vendors. But ultimately chose to implement TelAlert. "It performed very well during the stress testing The programming interface is very simple and intuitive and the product itself is designed very intelligently so it's very easy to use," says Choy.

He adds that TelAlert's robustness represents a marked improvement over the reliability of the legacy paging system that it replaced. "It actually helped solve their problem because we needed it to replace the previous product specifically to resolve stability problems And throughput limitations. and it has exceeded our expectations on both counts."

Stephen Swoyer,
Contributing Author

>Are You Competing in the Digital Economy?



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Some analysts estimate that a business loses more than $35,000 for each hour its database-dependent Enterprise Resource Planning (ERP) applications are not functioning.

The fact is that databases contain much of the information businesses need to be successful in today's competitive markets. Take away that information, even for an hour, and a business suffers serious consequences.

That's why Precise Software Solutions developed Precise/Pulse!, a performance management utility that proactively monitors the performance of Oracle 7.2.2 or newer database applications. When Precise/Pulse! detects an inefficiency in the database application, it sends a warning message to the database administrator, who then has time to address the inefficiency before it causes a bottleneck, shuts down the database and wreaks havoc with the entire network.

In order to catch these performance leaks before they inundate the network with real problems, Precise/Pulse! monitors the non-productive wait states (including wait for I/O, wait for lock, wait for remote database, wait for MTS and wait for internal database operation) of a network's applications.

If it detects an inordinate amount of waits, it sends an electronic alert message to the e-mail inbox or pager of the designated database administrator. It also logs the alert message in HP OpenView or other SNMP-compliant network management application.

In addition to its more than 140 predefined monitoring parameters, Precise/Pulse! can be customized to monitor user-defined performance parameters as well. Performance parameters can be set by SQL statements, such as the number of full table scans on large tables or the percentage of sorts performed in memory; database design, such as tables with chained rows or indices with wasted space due to logical deletes; and database, such as the ratio of recursive calls to all other calls or the amount of memory currently allocated to all sessions.

It should be pointed out that Precise/Pulse! is a monitoring application and just alerts database administrators to the existence of performance leaks. It does not provide detailed information about the location or causes of the performance inefficiencies it detects. Businesses who wish to create a complete performance-tuning environment must combine Precise/Pulse! with a separate performance tuning application, such as Precise/SQL from Precise Software Solutions.

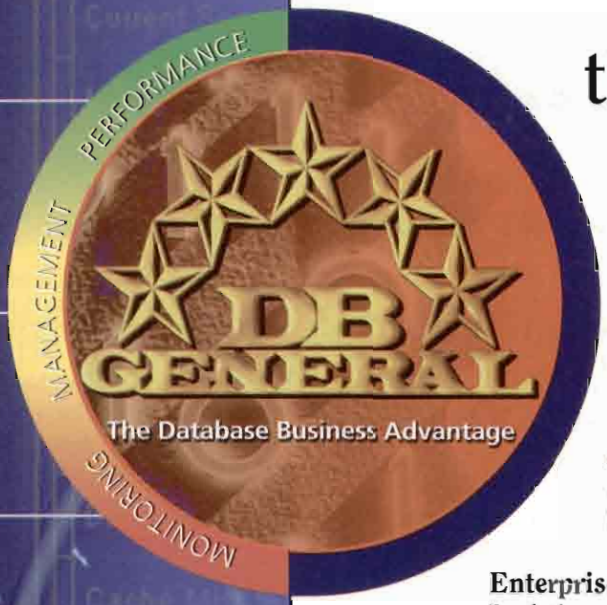
A performance tuning application allows database administrators to locate database inefficiencies, pinpoint problem areas and correct the inefficiencies by changing SQL statements and database objects.

Precise/Pulse! runs on IBM AIX 4.1 or newer, Sun Solaris 2.4 or newer, HP-UX 10.0 or newer, Sequent Dynix 4.2 or newer, Digital Unix 4.0 or newer, and Windows NT 4.0 servers running Oracle 7.2.2 or newer.

— Jeff Dodd, Contributing Author

A company's survival in today's business climate may well boil down to one vital question...

"Can Your Company Stay Competitive *Without* the Availability of Mission-Critical Data?"



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Planning For A Peaceful Coexistence

Mixing and Managing Windows NT and UNIX in the Enterprise.

THERE'S BEEN NO SHORTAGE of articles, seminars, products and discussions focused on one or more technical component of Windows NT-UNIX integration. What has been missing, thus far, is a roadmap that companies can use to establish meaningful metrics for NT-UNIX coexistence. Until now.

Chris Wood

Interestingly enough, the prevailing industry opinions regarding Windows NT and UNIX have remained relatively unchanged. Ignoring vendor viewpoints and other vested interests, these opinions can be summarized as follows:

- UNIX is more robust — and will likely remain more robust — than NT in terms of performance, capacity, scalability and stability.
- NT is improving and has achieved levels sufficient for growing numbers of workgroup, departmental, divisional and some corporate-wide uses. Moreover, NT is the primary development platform for many application vendors.

IT managers embarking on mixed UNIX/NT projects would be wise to give some thought to what should be done in either category. The motivation for doing so is to address proactively (or maybe reactively) each of the following Integration Drivers.

Storage

How can I share storage between NT and UNIX systems?
How can I consolidate storage (i.e., use a single storage array for all my NT and UNIX needs)?
How can I backup and restore files for a mixed environment?
Is there a single backup/restore solution that can be used for both NT and UNIX?
What are my storage availability options such as RAID, triple mirroring, remote mirroring?

Printing

How can I print from NT to UNIX-based printers and vice-versa?
How can I consolidate my printers, for example, to reduce the number of physical print queues and/or print servers?

Database

How will my UNIX-based applications access my NT-based databases and vice-versa?
How do I determine which operating system best runs the database product I'm interested in?
Is there any way to reduce the number of different databases I'm currently running?

Remote Application Display

How can I use remote application schemes — such as X-Windows, Citrix — to reduce network bandwidth and simplify desktop asset management?

Messaging/E-mail

How do I integrate my corporate e-mail system (e.g., HP OpenMail) with my departmental e-mail servers (e.g., Microsoft Exchange)? How would I migrate from one to the other?

Internet/Web

What are the Internet components needed for my E-commerce initiative (Web servers, storefront software, transaction monitors, Web traffic managers, etc.)?
What is the best platform for these components?

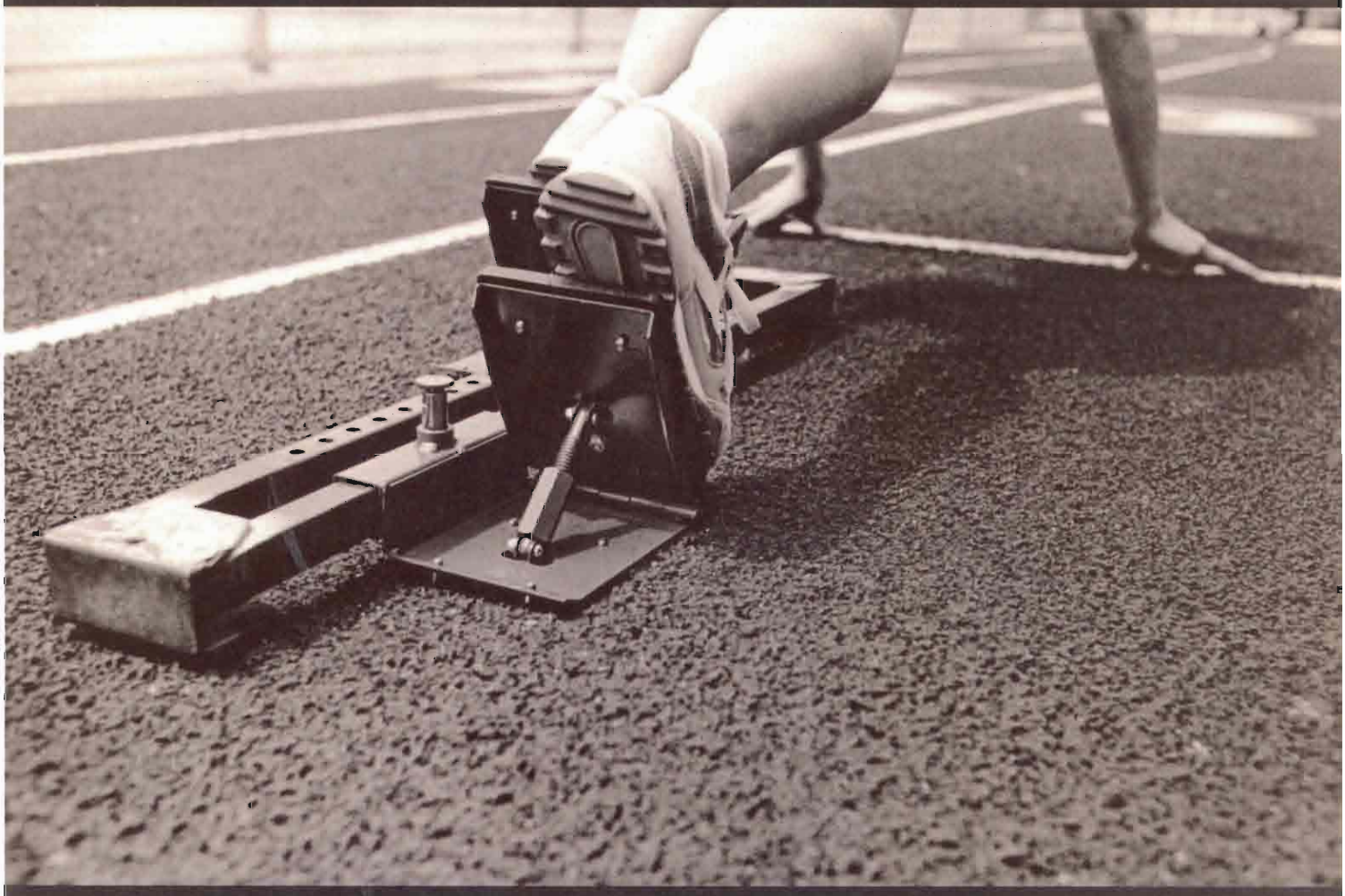
Middleware

Is there any way for my company to exploit object technology (object request brokers, transaction monitors)?
Which framework/broker should I use, e.g., something CORBA-based or DCOM?
Do I have to choose or can I bridge the two?

Job Scheduling

Does a department or enterprise-wide job scheduling capability exist for NT and UNIX, or do I have to address with custom-batch scripts?

A competitive world offers two possibilities.
You can lose. Or, if you want to win, you can change.
—L.C. Thurow



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Security

How can I most effectively deal with security issues such as authentication and authorization, given that NT and UNIX each has its own unique approaches and requirements?

Monitoring & Management Frameworks (for all the above)

How can I establish a single monitoring and management framework that covers both NT and UNIX?

Given the time, energy and money required to establish this framework (if one truly exists), should I make the investment?

If your NT/UNIX coexistence needs are substantial, engaging in a formal "NT/UNIX Coexistence Assessment" is probably very justified. The deliverables from this assessment should include models of where you are now; where you want to be and a detailed roadmap that describes how to get there.

HP's Colliance program, along with its OpenView and Enterprise Desktop Management Services (EDMS) suites, covers most, if not all, of the above integration categories. For example, a manufacturing company decides to deploy SAP as their mission-critical, company-wide ERP solution. They bite the bullet and invest a lot of time with the notorious SAP-sizing questionnaire. They quickly realize that, given their requirements, UNIX is the only real game in town — and opt for clustered HP 9000 database and application servers.

They come to the simultaneous conclusion that for "specialty" servers such as reporting, Web and remote access systems, NT is more than up to the task — and opt for HP NetServers for those purposes. This example is becoming more the rule than the exception. The aforementioned company is fully exploiting the respective power and cost effectiveness of UNIX and NT.

Most companies that have NT and UNIX integration requirements started out as UNIX shops that decided to add NT. This is a very established and easy to understand phenomenon. NT has lots of momentum with software vendors and is usually cost-effective.

A newer and growing trend is those companies that start out with NT and decide to replace or augment them with UNIX systems. An example that explains this tendency is a small- or medium-sized company running Oracle applications on NT but was "jolted" by a spurt of acquisitions that required support for 500 concurrent users instead of the 300 being nicely served by NT. Fortunately, the company was able to protect their investment by re-deploying the NT systems as application, e-mail and file/print servers.

Past predictions about the demise of UNIX under the crushing onslaught of Microsoft's Windows 2000 Server are a thing of the past. While NT has made inroads into the enterprise, UNIX shipments have continued to grow, albeit more slowly than the still relatively new Microsoft server operating system. According to the latest market figures from Dataquest, UNIX shipped over 425,000 units last year vs. NT's 1.3 million. Conversely, it probably comes as no surprise that vendor rev-

FORKS IN THE UNIX/NT ROADMAP

Theoretically, all IT actions should be driven by business needs. In practice it can sometimes be difficult to stick to this principle. Despite this, the questions, *"How does this impact an identifiable business need?"* and, *"How can I measure this impact?"* should be asked of all NT-UNIX implementations.

NT and/or UNIX?: Numerous factors need to be considered when selecting NT or UNIX or both. Things like application availability, support staff availability and background, acquisition costs, total cost of ownership, performance, capacity, scalability, resiliency and ease of management are but a few of the considerations.

Application Selection: Business needs, not operating systems, should dictate application (and database) selection.

Server/OS Selection: Now it's time to select the operating system — NT or UNIX or both!

Integration Drivers: Whether or not you think they apply, make sure you learn about all available integration drivers listed in this article as a starting point.

Scrutinize: Make sure you understand each of these integration drivers and what, if any, potential near-term or long-term benefits they bring.

Review Costs: Be careful! Sometimes the ultimate cost of implementing an NT-UNIX integration capability will exceed any derived benefits. On the other hand, biting the bullet and establishing an integration feature now (single sign-on, for example) may be a good idea even if the true benefits are not realized until later.

Implement: Use your own resources or external solution providers if necessary.

—C.W.

If your NT/UNIX coexistence needs are substantial, engaging in a formal "NT/UNIX Coexistence Assessment" is probably very justified. The deliverables from this assessment should include models of where you are now; where you want to be and a detailed roadmap that describes how to get there.

enues generated from sales of UNIX-based systems are, on average, significantly greater than NT. Other operating systems like NetWare, OS/400 and MVS will not vanish, but aren't expected to do much more than hold their own relatively small market shares.

In a nutshell, the server operating system landscape is now — and will continue to be — mostly comprised of high volumes of low to midrange NT systems and smaller volumes of higher-end UNIX-based systems. All UNIX systems vendors have plans for porting UNIX to Merced, anticipating what many believe will be strong customer interest in running UNIX on a 64-bit Intel CPU. If anything, UNIX's value has increased as its performance, capacity and reliability characteristics have attracted users building larger-scale ERP, supply chain management, business intelligence and around-the-clock E-commerce storefronts.

If you're not running NT and UNIX, you probably will be soon enough. So it pays to investigate where you can "glue" them together in order to maximize efficiencies and minimize complexity.

— Chris Wood is the alliance manager for Forsythe Solutions Group (Skokie, Ill.), the largest nationwide reseller of Hewlett-Packard computing equipment for the past three years.

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Putting Some *Luster* On NT Clusters

Ryan Maley

Clustering products for Windows NT platforms are available in several varieties, offered from Microsoft as well as other vendors. Microsoft's products are centered on Windows NT Server Enterprise Edition, which offers SMP capabilities for up to 32 processors. The Enterprise Edition is comprised of Microsoft Cluster Server (MSCS) and Windows NT Load Balancing Service (WLBS).

Introduced in 1997, MSCS has been available as a system service in NT Enterprise Edition. MSCS allows the creation of two-node, share nothing clusters. The cluster appears as a single server to network client machines. Any applications or data files installed on the cluster are referred to as resources. These resources run on only one server at a time but can be configured for *failover* (a process by which the operation of the resource is moved from one server to another in the event of a failure).

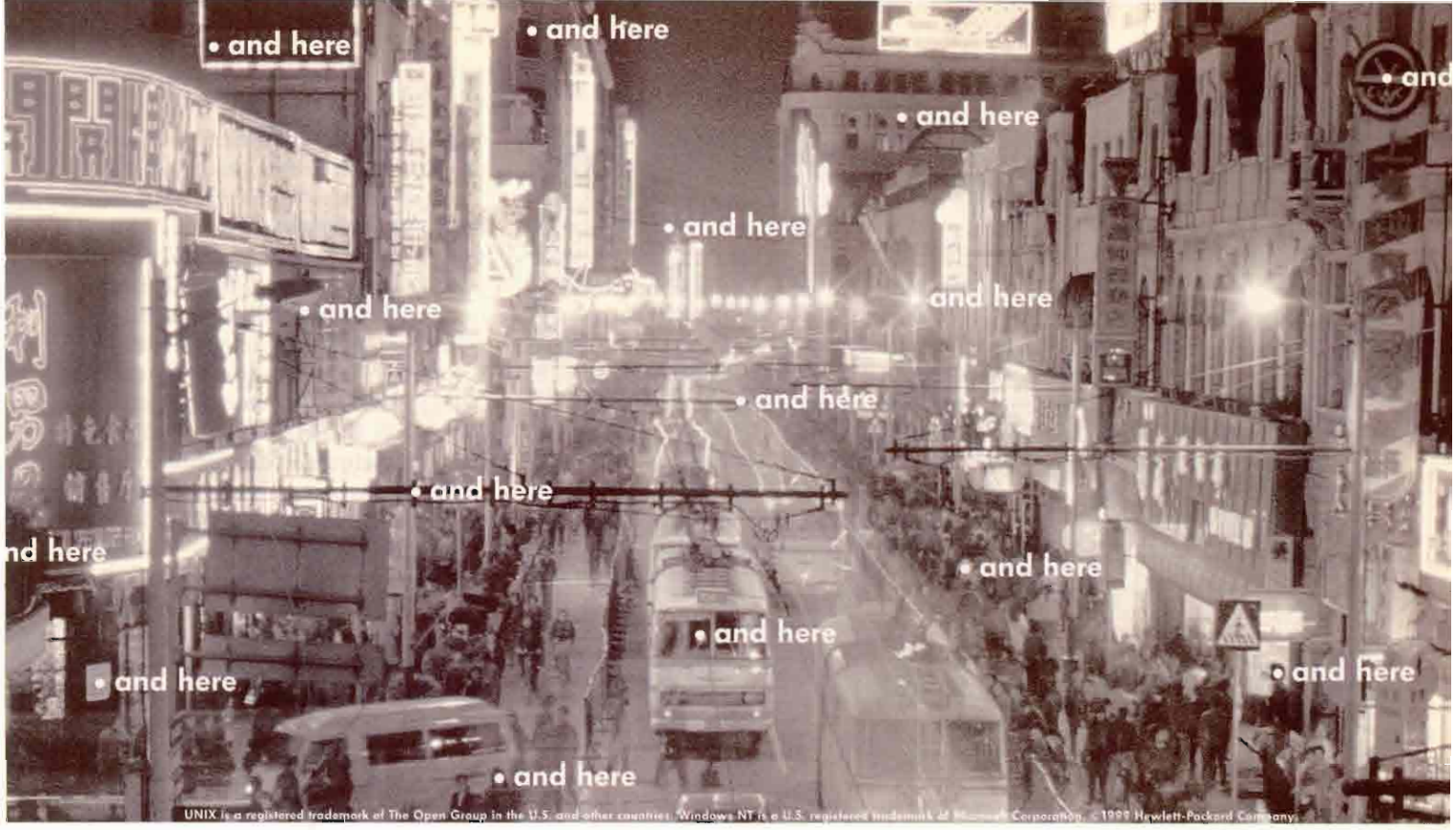
If At First You Don't Succeed

Resources can be organized into groups and entire groups can failover as well. When a specific resource is requested, MSCS routes the request to the server operating the resource.

An MSCS cluster consists of servers, common storage and networking. The servers must be single or multiple Intel Pentium (minimum 90MHz) or Compaq Alpha processor-based (Intel and Alpha processors cannot be mixed in the same cluster).

Each server requires a minimum of 64MB of RAM. Each server must be connected to a shared, external SCSI bus that is separate from the bus containing the system disk. The SCSI adapters must be PCI. All resources configured for failover must reside on disks on this common bus. To provide maximum protection from hardware failure, storage on the common bus should be hardware RAID-based to eliminate the disks as a point of failure. Two PCI network cards should be used in each server: one to connect to the organization's network, the other to create a private network between the two cluster systems.

So how does MSCS provide high availability? The servers in the cluster constantly check available resources by sending messages called "heartbeats." The heartbeats check all resources on both servers. If an application resource has failed but the server is still functioning, MSCS tries to restart the application. If the appli-



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cation will not restart or the server has failed, MSCS moves the application's resources and restarts it on the second server. Because both servers are constantly checking each other, discovery of failed resources and initialization of the failover usually takes place within 10 seconds. The amount of actual time to failover depends on the application. As an example, according to Microsoft, failover of SQL Server usually occurs in less than one minute.

Failover occurs automatically. Because the cluster appears as a single server to clients, client computers do not have to be configured in any special way to use the cluster or handle a failover. Whether or not the client actually notices the failover depends on the nature of the application. For instance, delivering Web pages is state-less. That is, the connection is not maintained and communication is discrete and independent. So if the failover occurs between requests to the server, the client may not notice. If the failover occurs during the request, the client may receive a "Server Unavailable" message. Once the failover is complete, the client will be able to get pages again. Hitting the refresh button on the browser is all that's necessary to actually get the requested page. Of course, the client may wonder what happened.

If the application maintains a state, a new logon may be required after a failover. This is dependent on the application. For instance, an application such as SQL Server may cache the user id and password and be able to re-establish the connection without the user doing anything at all. If the application is not cluster aware, it probably doesn't have this capability.

Something To Failback On

Once a failure is corrected, no manual intervention is required for *failback* to occur. Failback is the process of returning resources to their default server. For instance, assume Server A has experienced a hardware failure and Server B has assumed all operation of resources in the cluster. Once Server A is repaired, it's rebooted and rejoins the cluster. It communicates with Server B and initiates failback, bringing back the resources it usually hosts, resuming operations.

The second clustering component on Windows NT Enterprise Server is WLBS. It has support for any IP-based service such as Web or FTP servers. It supports the clustering of

A CLUSTER OF OTHER CLUSTERING PRODUCTS

There are non-Microsoft clustering and cluster management products for Windows NT. "Some providing far more nodes and far more capability than Microsoft," says Harvey Hindin, senior research analyst for D.H. Brown Associates. "They just got tired of waiting for Windows 2000," he chuckles. Here's a sample of some of them.

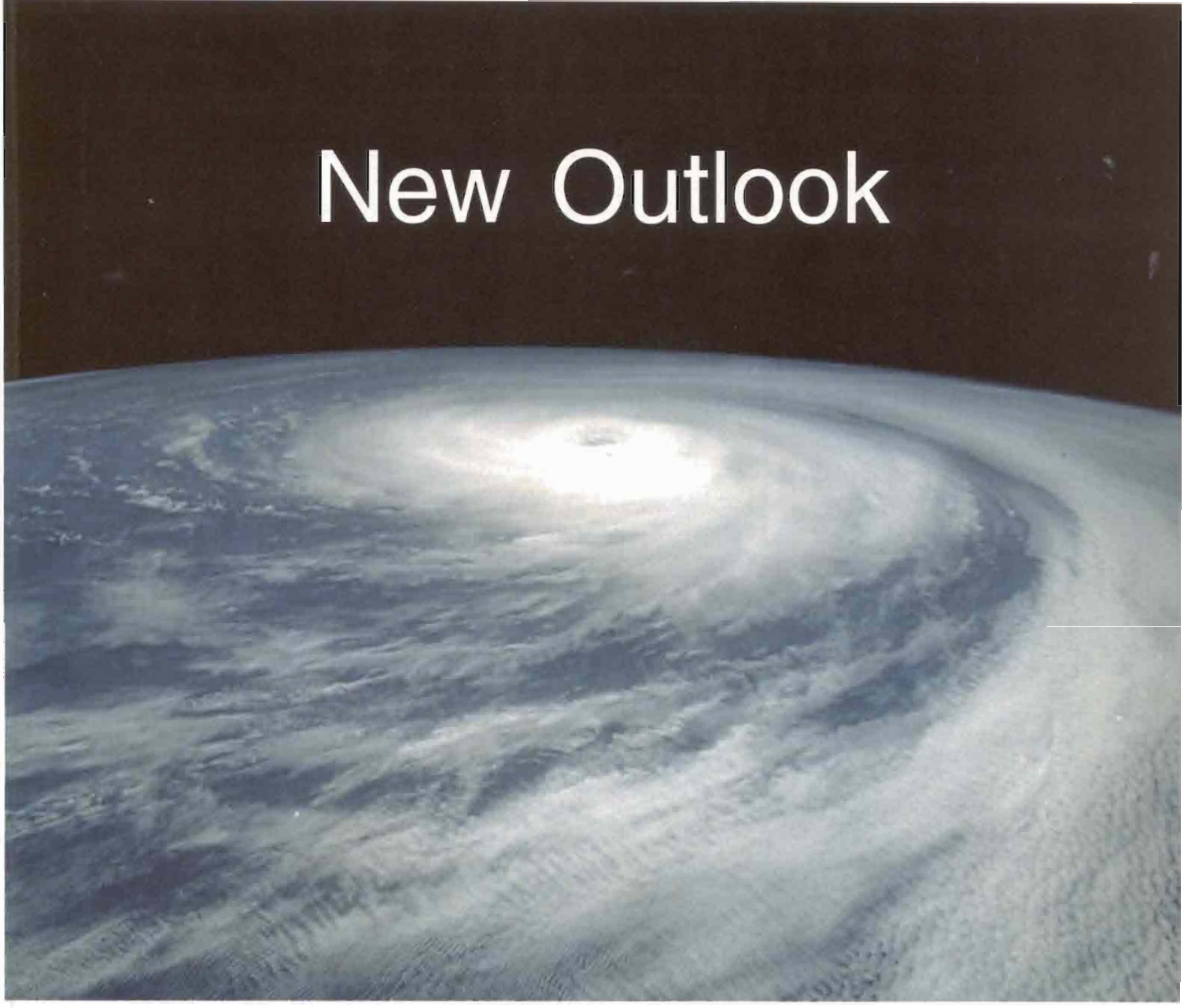
Marathon (Boxborough, Mass.; www.marathontechnologies.com): HP and Marathon Technologies Corporation have just announced a deal that will offer Marathon's Endurance Assured Availability non-stop array with HP NetServers. The Endurance system is designed to provide 99.999% uptime and Marathon has offered a $250,000 warranty against data loss with some of their products. "This is not really clustering," says Hinden, "but multiple servers." HP is expected to announce several configurations bundled with service and support options.

IBM: "IBM is about to announce enhancements so that Cluster Server will work with up to eight nodes," says Hinden. The announcement will be centered on IBM Netfinity hardware. The product is expected to include features such as hot-swap PCI hardware. IBM currently offers two-node Netfinity packages bundled with support and performance guarantees. The Netfinity Availability Extensions will sit on top of MSCS and offer cluster management software featuring administration capabilities and tracing and logging services.

Vinca Corporation (Orem, Utah; www.vinca.com): Co-Standby Server for NT (see *HP Professional's* Product Watch, May 1999) provides a shared nothing cluster of two nodes. The systems in the cluster communicate via a "bi-directional mirroring process" which keeps the data on both servers current and in-sync. If a system fails, the other system takes over. With mirroring solutions such as Vinca, some data loss may occur if a failover occurs before the mirroring process is complete. It does provide a more secure backup than MSCS by keeping a second copy of the data available. Vinca also has versions of Co-Standy server for Novell NetWare and IBM Warp Server.

NuView, Inc. (Houston, Texas; www.nuview.com): ClusterX 2.0 is due for release this month. The company claims it's the "first and only cluster management solution to integrate the management of both Microsoft MSCS- and WLBS-based technologies." ClusterX provides a single console to manage both current Microsoft cluster technologies. The single interface allows not only control and configuration, but performance reporting and audit logs to monitor cluster activity.

— R.M.



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up to 32 servers using the shared nothing model. As in MSCS, the cluster appears as a single server to its clients. WLBS is different from MSCS in that many servers in the cluster can offer the same resource. When a request comes in under MSCS clustering, the request is routed to the server that controls the resource because only one MSCS server can offer the resource at a time. When a request comes into a WLBS cluster, the request is routed out to a server based on the traffic in the cluster. Servers may be designated to handle a certain percentage of the requests or they may divide the workload evenly. This is load balancing.

By providing the identical service from multiple systems in the cluster, WLBS provides true availability and scalability for many applications. When one system in the cluster goes down, traffic is automatically directed to the servers still operating. When more users need to be serviced, add a system to the cluster.

WLBS runs as a device driver under NT. It uses an algorithm to determine how to divide the workload. Each node in the cluster runs the algorithm independently so the load balancing is not dependent on a single system and not subject to a single point of failure. The workload is distributed statistically rather than dynamically. In other words, the workload is divided among servers based on parameters set by the system administrator, not by dynamically adjusting the load based on how busy each server in the cluster actually is. Workload can be distributed evenly or more powerful servers can be given a higher percentage of the work.

WLBS communicates within the cluster in a fashion similar to MSCS. In WLBS, the process is called *convergence*. A heartbeat is broadcast once a second by each server to all the servers in the cluster. If a server does not respond to five consecutive heartbeats, convergence begins. During the convergence process, the heartbeats are sent out twice a second. Each server communicates with all the other servers until they agree on the status of the cluster. This is necessary because WLBS runs on each and every

COMING TO TERMS WITH CLUSTERING

A cluster is any set of independent, whole computers that work together as a single resource and appear as a single computer to end-users. In general, clusters are used to address two specific computing problems: availability and scalability.

Let Me Take You Higher

Availability refers to the amount of time a system is available for clients. A database is a great thing when it's running, but useless if it's not. By keeping the database available, orders can be taken, customers can be serviced, etc. In the past, only a few systems were considered critical or were only considered critical during normal business hours. Now, as new systems and applications become central to organizations, it's more important than ever for them to be *highly available.*

Availability is usually defined as a percentage of uptime. A particular vendor may guarantee uptime at 99.5% or 99.9%. This may not seem like a large difference, but based on continuous operation of 24 hours a day, 365 days per year, the difference is quite large. Because the cost of downtime is so high, even a single hour of downtime may be unacceptable.

Availability	Downtime per Year
99.000%	87 hours 36 minutes
99.5%	43 hours 48 minutes
99.9%	8 hours 46 minutes
99.95%	4 hours 23 minutes
99.99%	53 minutes
99.999%	5 minutes

Scaling New Heights

Scalability refers to the ability to provide more computing services transparently. When the hits on your Web site reach an all time high and performance begins to degrade, what do you do? You can upgrade or replace your Web server with more powerful hardware, which requires bringing the server down. Depending on the nature of your site, bringing a server down could mean lots of lost revenue.

Clusters address scalability by allowing the addition of capacity without interrupting the delivery of service. This approach offers a large benefit: You don't have to forecast demand accurately. If your usage prediction is low, you can add another system to a cluster. As demand increases, you can incrementally add smaller systems to meet the demand. Without a cluster, you must either be very accurate in your demand forecast or make up-front commitments to larger, more expensive servers with headroom.

— R.M.

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SQL/Non-SQL Datatypes	✓
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WINDOWS NT LOAD BALANCING SERVICE — ON BALANCE, GOOD ENOUGH

The Windows NT Load Balancing Service (WLBS) is part of Windows NT 4.0 Enterprise Edition. It's not included on the distribution disk, but is available from Microsoft at www.microsoft.com/ntserver.

Installation of Enterprise Edition is annoying, but not difficult. The package comes with four CDs. Two contain Enterprise Edition, one contains Service Pack (SP) 4 and the last contains the Windows NT Option Pack. Microsoft continues to offer SPs instead of integrated version releases of the operating system.

This forces several steps during installation. I had to install NT. When the system rebooted, I was told to continue with the installation by installing SP 3. After installing SP 3 and rebooting, I had to install any Enterprise Edition Components, such as MSCS. After the third installation and reboot, I had an operating system. To get the latest version of Internet Information Server, I had to install the option pack, which also required that I install Internet Explorer 4.01. All told I had four (or was it five?) reboots. I didn't even bother with SP 4.

Installation Is Simple

After downloading WLBS, installation is simple. The download file is slightly less than 2MB. It installs from the *Control Panel, Network* option as a network adapter in about two minutes. I installed WLBS on a cluster of four machines, two Intel and two Alpha. Each machine had a single 10Base-100 Ethernet network interface card that carried both the regular network traffic and the WLBS convergence traffic.

Configuration of WLBS is done on a single *Properties* screen (see page 27) with three sections: *Cluster Parameters, Host Parameters* and *Port Rules*. In Cluster Parameters, the primary IP address of the cluster is set. This is a virtual address used by clients to access the cluster. All the systems in the cluster must be set to the same primary IP address. In Cluster Parameters, you can also enable remote control of WLBS so other machines on the network can remotely manage the cluster.

In Host Parameters, the system's unique IP address is assigned. A checkbox makes the system an active member of the cluster or removes it from the cluster. You can also assign a host priority. Each system in the WLBS cluster must have a unique host priority. By default, cluster traffic is handled by the host with highest priority. The priority also controls which systems are first to pick up the traffic when a system goes down.

Port Rules Rule

Port Rules allow you to configure how specific TCP/IP services are to be handled by the cluster. This is done by configuring the ports (80 for Web services, 21 for FTP, etc.) individually. There are several options for directing the traffic. Multiple hosts can handle the individual port, with each host sharing the load equally or more powerful servers can be assigned a higher percentage. The port traffic can also be directed to a single host in the cluster. For instance, FTP traffic is low, so it will be directed to a single host and the others will be free to serve Web pages. You can also disable the port in the cluster.

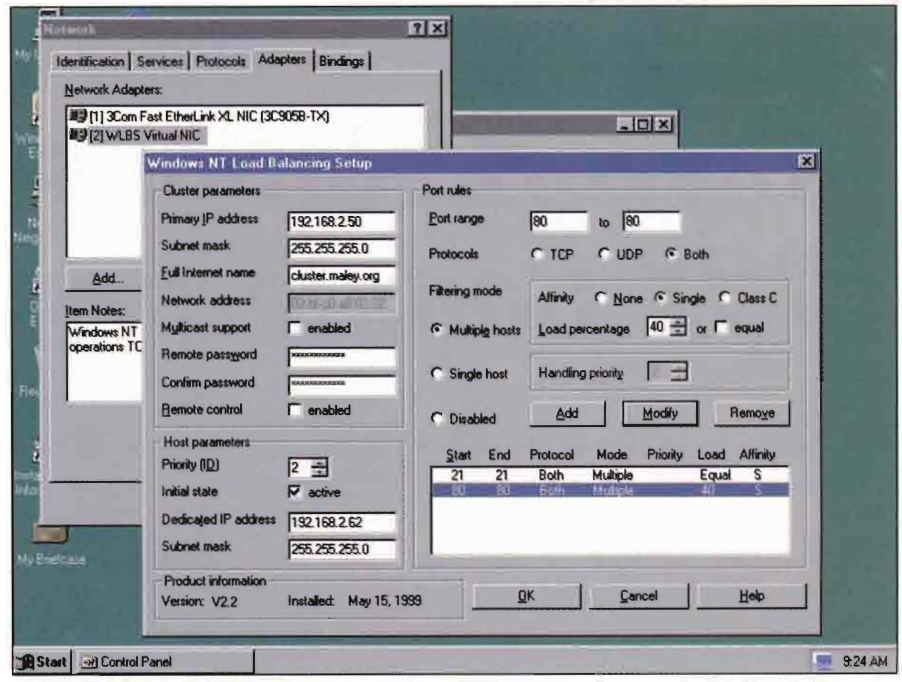
After the initial configuration, WLBS is low maintenance. I configured the cluster as an FTP and Web server. As I brought the last system in, the convergence process took eight seconds. The different platforms (Intel and Alpha) worked together very well. As I disconnected one machine, the failure was detected and the systems reconverged in 11 seconds. I tested the failover using a script that demanded refreshed Web pages via a browser. As the system "failed" (was unplugged) there was a noticeable pause, which I didn't think was unusual, given the sometimes choppy performance of the Web.

I was generally satisfied with WLBS, but the system is noticeably lacking in management tools. There's no place to see which systems are participating or what the traffic is like. You can determine the participation by checking the Event Viewer. A message is logged at each convergence, listing the host in the cluster. Hardly an optimum solution. I couldn't find any Performance Monitor counters or objects relating to WLBS. A glaring error, the lack of management tools may be a function of the relative newness of the product and hopefully will be corrected in subsequent releases, but for quick, no frills clustering, WLBS does the job.

— R.M.

server in the cluster and they must each have consistent information. This convergence process takes place when the cluster first starts or when systems enter or leave the cluster. No services are interrupted during convergence. The convergence messages and heartbeats are approximately 1.5KB and consume little bandwidth. In fact, no special or dedicated network interface is required. The convergence process takes place on the same interface as all other network traffic.

WLBS is ideal for Web servers and similar Internet applications. As a Web site becomes popular, it may experience rapid growth. If the site is run with a WLBS cluster, it's easy to add new capacity by adding new systems. Because they are standard NT systems, not even requiring a second network interface card, they can be added very cost effectively.



The NT Load Balancing Properties Screen. The FTP service is load balanced equally and the Web service load is 40%.

Application Equilibrium

Component Load Balancing (CLB) is a new Microsoft clustering technology that will be included in Windows 2000, (a k a Windows NT 5.0), and will provide application clustering through Component Object Model (COM) components. CLB is scheduled for inclusion in the *Advanced Server* and *Data Center* versions of Windows 2000. Advanced Server will support two-node MSCS clusters and Data Center will support four-node MSCS clusters.

CLB enables applications built using COM components to be distributed across a group of servers. Microsoft is positioning CLB as middleware that will provide high-availability features to systems such as Internet Information Server with Active Server Page applications. CLB will function like WLBS by providing load balancing. However, it goes one step further and is able to dynamically load balance by checking a server's performance through such measures as object response time and CPU load. The CLB model features a CLB routing server that handles requests from clients.

The routing server determines which node in the cluster is best able to fulfill the request and communicates this information to the client. The client then communicates directly with the specific server, leaving the routing server free to handle more requests and perform load balancing. In the event one of the servers in the cluster fails, the CLB routing server starts the COM component on another server in the cluster.

Cluster Muster

It may be difficult to immediately see how these various clustering technologies can be used together. "Cluster Server [MSCS] provides high availability and data integrity," say Kevin Briody, Microsoft's product manager for clustering and load balancing. Briody says that Cluster Server was primarily designed to secure data. The focus of WLBS is scalability. "It's a function of how they were designed. Load Balancing is an NT device driver. It has no way to know a database is running as a separate instance on another machine."

Briody describes a "two-tier approach" to clustering. "Web servers will be clusters for e-commerce using WLBS. Database servers will be clustered with MSCS." In the first tier, WLBS provides high scalability and availability for Web servers sending pages to users. As actual transactions occur, MSCS can insure database integrity by providing a server failover to a common disk storage system.

Briody believes the future is actually in a three-tier system. "NT 4 just has two technologies. Windows 2000 will provide a third tier." CLB will provide clustering for application services such as Microsoft Transaction Server. The three-tier approach will provide organizations with the ability to provide systems that are not subject to single points of failure and can grow to match the Internet's explosive growth.

Clusters are not necessarily the perfect solution to all your problems. Clusters cannot protect against things such as power failures. As systems become more and more critical, even the short failover times with current clustering technology can mean serious data loss. But Microsoft and others are investing heavily in cluster technology that they hope will drive NT further into the enterprise.

— Ryan Maley (ryan@maley.org) is a Microsoft Certified Systems Engineer and author of HP Professional's On The Server Side *column.*

PC Workstations Outflank UNIX Counterparts

HP Opens A Window Or Two Into The PC Workstation Market.

As UNIX workstations descend from the peaks of technical computing, Windows NT is scaling the heights. Industry watchers say they'll meet in the middle soon. So, what is the state of the NT workstation market? Who does HP see as its major competition? And, what does the future hold?

HP Visualize Personal Workstations are making an impact in the Windows NT technical computing market for design engineers, scientists and artists.

Ken Deats

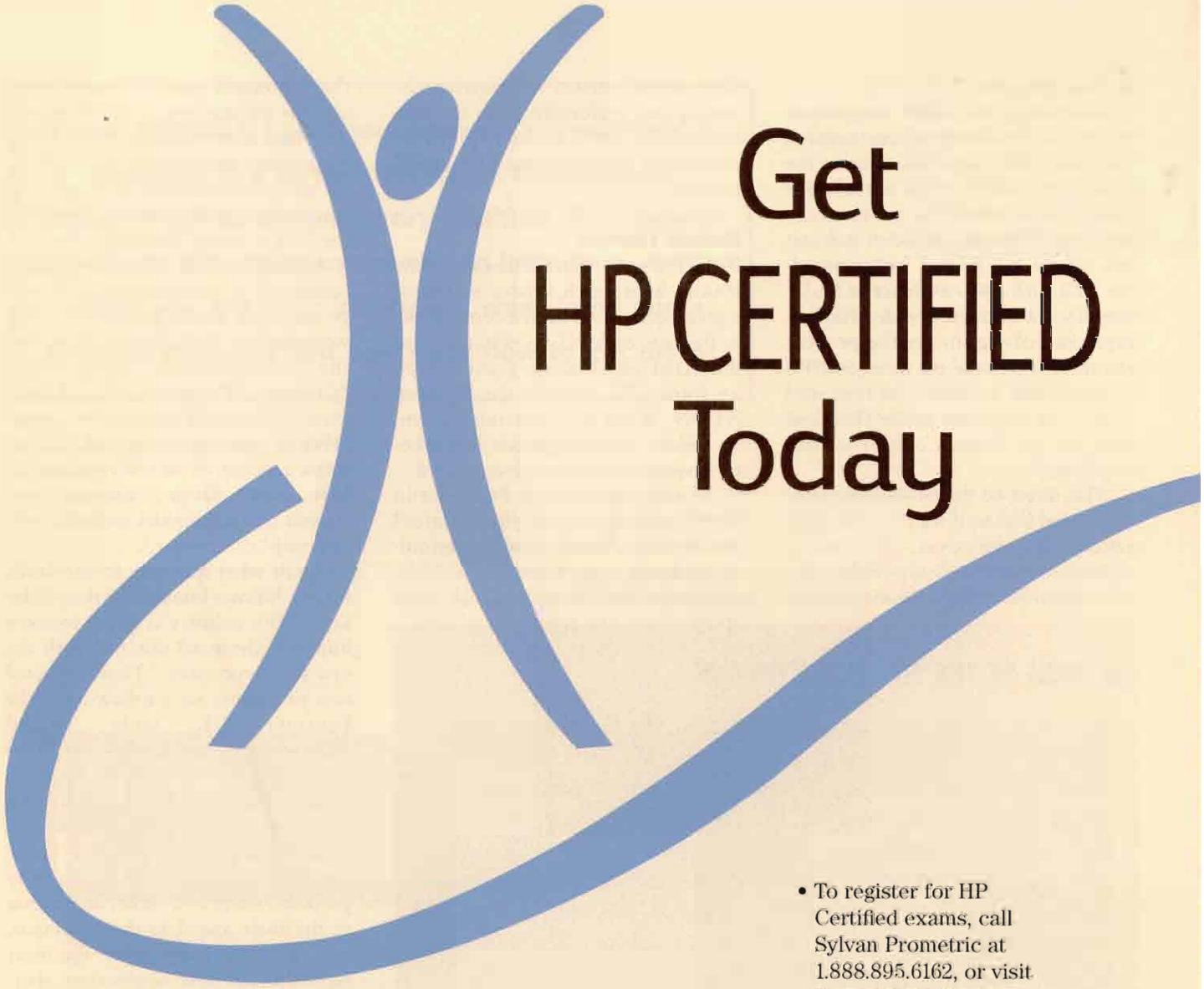
"The UNIX [workstation] market peaked about two years ago," says Scott Elder, a product marketing manager for HP Visualize workstations. "It's in decline now and the erosion is happening predominantly through NT."

Elder says that 90% of HP's customers are "welcoming NT into their PA-RISC environment," in some capacity, and technical users are no different than run of the mill administrative users. They want a single system to run their mission-critical graphic as well as administrative applications. They need less expertise to maintain NT workstations, which lowers their TCO and they have more vendors to choose from.

He adds that smaller companies, with just one or two applications on their networks, are generally much faster to add NT workstations into their mix. "As more [graphic] applications port to NT, small shops make the move easier. Large shops ... have to have all their applications ported before they move."

Elder says that HP differentiates the segments of its NT workstation marketing strategy by segmenting the product lines and the sales approach for each category. At the lower end, he says that the Kayak and Brio workstations are "similar to what IBM and Compaq are offering and our channel strategy meets the need for them."

At the higher end, in the P- and X-class workstations, the approach is one that does not just focus on the product but involves the channel as well. "We can market directly through distributors or focused resellers that are identical in capabilities as our HP-UX resellers. They're just focused on the technical market arena. You don't see IBM, Compaq



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or Dell doing that."

In assessing the major competitors he sees in head-to-head competition every day, Elder sees SGI as being the closest to follow HP's model. But because SGI, which has traditionally been a UNIX-only provider, has just entered the NT market with its models 320 and 540, at least initially they'll want to create a wider distribution channel just to get the product out there. As to the big three on HP's radar screen — IBM, Compaq and Dell — he says that while IBM and Dell can sell direct, Compaq is "still wavering."

This direct to the public approach, has served Dell well for PCs. "In large enterprises, however, Dell rarely makes the short list," says Elder. The perception in those accounts is that Dell doesn't invest in boosting the quality and performance for the mission-critical applications required by companies such as Ford or General Motors.

Breaking Tradition

Unlike its more traditional UNIX cousin, where each vendor maintains a proprietary hold on the components in the box, each NT workstation vendor starts on common ground: with an Intel CPU, usually the Pentium XEON. What differentiates them, says Elder, is the approach each takes to the graphics subsystem employed.

"Every Intel-based PC can run Excel and Word. With technical workstations, there's more opportunity for things to go wrong between the application and the system." He adds that customers want ISVs to say what systems are certified to run their software and how well they run it. "The quality and performance of the graphics subsystem matters. It's important to maintain good relationships with the ISVs to assure these customers."

HP's Visualize subsystem, while comprised of industry standard components, is available only on HP workstations. "HP chose to make that the differentiator," says Elder. "Compaq, IBM and Dell each integrate off-the-shelf commodity components so there's no value add. SGI has its own memory controller, which is a very custom design. That puts constraints on the graphics [software you can run]."

As to what the near future holds for the NT workstation market, Elder says, "The industry is going to see a bump in the road this fall with the new Intel processors." Those expected new processors are a follow-up to the Pentium III, code named "Coppermine" and a follow-up to the Xeon, code named "Cascade."

Elder sees the Cascade focusing more on multi-process technology, making it more attractive as a "high-performance server chip." But the proposed integrated cache, able to run at the same speed as the processor, will make the Coppermine the front runner as the new workstation standard. "We think customers will be very satisfied with Coppermine and Xeon will be a smaller percentage of workstation sales.

"HP's focus will be to take [Visualize] graphics as seen today and move them forward transparent to the applications and how to deliver better application performance at the system level," he adds.

And, in keeping with the trend towards open systems, Elder says to look for Linux on Visualize workstations this year. "The big gap is still application availability. But Linux is finding its place in certain areas." He says that home grown Linux graphics applications are starting to appear and some others are porting to Linux more reliably than to NT. ◆

A LOOK AT THE NT MARKETPLACE

We asked Jay Moore, senior analyst for the Aberdeen Group (Boston, Mass.) for his thoughts on the players in the NT workstation marketplace:

HP — I'm a little bullish on HP now. Their strategy of combining Kayak and HP-UX together [as one unit] in Ft. Collins, Colo. is a very good move. And they're starting to assimilate NT to folks who depend on performance.

Compaq — Management problems have decimated the workstation division and it will take some time for the merger [with DEC] to wash out. The product line is in a bit of a rut. Customers see the Alpha as a server but not as a viable workstation. They're in a market gray zone: Low-price customers choose Dell and high-end customers choose HP and IBM.

Dell — They took the [NT workstation] market by storm. They said 'We'll get the best performing boards, slap them together and sell them cheaply.' Workstation customers see themselves as being above the PC community, but when push comes to shove, they're still looking for the cheapest box.

IBM — Customers on the RS/6000 are glad to see the IntelliStation. They've made some deals with important board suppliers. They talked about application performance long before anyone else and they present a complete story.

SGI — The market is still evaluating their NT technology. Their box is locked out and you have to buy proprietary RAM. They have to build more of a product line and they're committed to doing it.

Sun — There's no value for Sun to go to NT. They'd rather be the vendor customers think of for Internet servers.

—K.D.

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Know-it-all In A Shell

HAVE YOU EVER HAD THE MISFORTUNE of spending some time in the company of a know-it-all? If so, you'll probably hate the feature of the tcsh we're discussing this month.

The tcsh has a built in spell-correct feature used for fixing what has been typed at the command line. It's rather like holding a conversation with a know-it-all. The bad thing is that sometimes the tcsh is right. For example, if you were to type:

```
srot file
```

the shell responds with:

```
CORRECT>sort file (y|n|e|a)?
```

In this case the shell was right — the command **sort** was misspelled. The reply choices are as follows: y means accept the correction and run the proposed command; n means refuse the correction and run the command as typed; e means to drop into the command line editor so you can correct the command; and a means abort the command.

SO FAR, SO GOOD

So far this seems like a good feature. The problems only arise when a know-it-all is wrong. For example, if you type:

```
sort names > names1
```

in a directory where only the file *names* exists, tcsh will think you mistyped the second argument (it always thinks that arguments are existing files) and will respond with:

```
CORRECT>sort names > names (y|n|e|a)?
```

which is certainly *NOT* what you want.

Doing this would cause the file *names* to be destroyed because you cannot re-direct output into the same file you're reading from. So in this case, the spell correct feature was wrong. The command was correct as typed: You want the sorted contents of *names* to be saved in a new file called *names1*.

Fred Mallett
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For these reasons, many people do not like the spell correct feature of the tcsh. Luckily, the authors of tcsh took this into account. Spell correct is turned off by default. To enable it, the variable named *correct* must be set to *cmd* or *all*:

```
set correct=cmd
```

If it's set as shown above, only commands and not arguments will be checked.

PROMPTNESS COUNTS

Most C shell users are aware that the variable *prompt* can be used to customize the shell prompt. The tcsh allows for several special strings in the *prompt* variable. Like the csh, tcsh allows for the \! sequence which inserts the current command number. In the tcsh, this can also be written as %h which does not need the backslash escape. Where it differs from the csh is in the following characters:

```
%t   current time
%B   bold
%S   inverse video
%~%          current directory
%M   full hostname
%%   print a %
```

There are many more listed in the man page, but these are the most commonly used. Here's an example of a rather obnoxious but informative tcsh prompt setting:

```
set prompt='{%h}%B%t %M %b%~%%% '
```

which might result in a prompt something like:

```
{34}08:36 swift.famecc.com /disc/users/fredm%
```

where the time would keep changing and both the time and the hostname would be in bold text. Note that the **%b** in the prompt string turns off the bold font.

The tcsh has many variables unknown to the csh. Some are used to control functions unique to the tcsh, like *correct*. There are also many variables automatically set by the tcsh, some of which can be quite useful when writing startup files. For example, the variable *HOST* is set to the name of the host and the variable *HOSTTYPE* is set to machine type, using a pre-defined symbolic name

like *hp9000s800*. There are many more new variables listed in the tcsh man page.

PLAYING THE WILDCARD

To those who know regular expressions, the csh has a limitation in its filename wildcards. The character class wildcard does not permit exclusion ranges. In tcsh it does. For example, the wildcard test[1-3] means match filenames *test1*, *test2* and *test3*. In tcsh you can use a wildcard such as test[^1-3] which means match *test* followed by any single character that is not a 1,2, or 3. It would match *test4*, or *testa*, but it would NOT match *test1*. This is very similar to most implementations of regular expressions, as well as the korn shell.

Something that the tcsh does that I have not seen implemented before in shell wildcards is a "negated match." If you use a ^ as the first character in a wildcard it means negate the match (note that ^ as the first character in a character class is different, as described above).

Here is an example of a negated wildcard:

```
^test[4-8]
```

This will match all names in the current directory beginning with *test* and ending with 4,5,6,7 or 8 (except names starting with a period). In other words, an ^ as the first character means, "Match everything except what this wildcard matches." Many people have trouble using this feature because they make the attempt with something like ^test. This will not work because ^test is not a wildcard. You can trick the shell by writing something like ^tes[t] which will match everything but the file named *test*, because it's now a wildcard.

Here is an illustration:

```
% ls
testa testb testc
% rm ^testa
rm: ^testa non-existent
% rm ^test[a]
% ls
testb testc
```

Many people do not like the spell correct feature of the tcsh. Luckily, the authors of tcsh took this into account.

I guess the developers of tcsh were thinking, "Since we enhanced everything else, we might as well enhance some commands also." So they did.

For starters, korn shell users are used to using cd to change back to the previous working directory. You can use that command in tcsh also. Another way the cd command was enhanced is with the special alias called *cwdcmd*. If you set an alias by that name, it will automatically be called after every cd command. For example, if you set it with:

```
alias cwdcmd 'ls -F'
```

every time you change directories, the ls -F command will be issued.

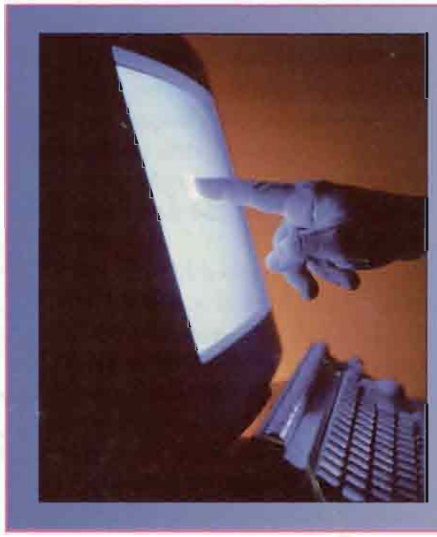
XTREME PSEUDONYM

There is an example in the tcsh man page that shows how to use this alias to change the xterm title to reflect your current directory, except they neglected to mention how to get the escape character into the alias.

The example above is interesting in that if you issue ls -F in a tcsh, there is really a built-in version of ls -F that is run instead of the usual ls command. It's actually more like ls -aF, except that it would be faster since it's built-in and it also includes more symbols. For example, if a soft link points to a file, it prints an @ suffix, (like ls). If a soft link points to a directory, it uses a > suffix on that name. A & suffix means the soft link is broken (points to a non-existent name). And there is also an enhanced built in whereis command.

To take advantage of the many goodies in the tcsh, you need to set several special variables, aliases (like *correct* and *cwdcmd*) and issue tcsh only commands (like bindkey). If you put them directly in your csh startup file, they might cause errors, or be ignored. The most common method people use is to put tcsh special startup commands in the *.tcshrc* file and have that file source as the usual *.cshrc* startup file for the "usual" aliases and variable settings. Another method is to maintain a separate *.cshrc* file for csh, and make your *.tcshrc* startup file self contained for tcsh. Remember that if the tcsh does not find a *.tcshrc* startup file, it will run the *.cshrc* startup file.

— There is much more to the tcsh that we have not covered. A good book on the subject is "Using csh & tcsh" by Paul DuBois, published by O'Reilly and Associates, 1995, www.oreilly.com.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The ABCs Of WBEM And XML

BMC, Cisco, Compaq, Intel and Microsoft founded the WBEM Forum in 1996. Shortly thereafter, they were joined by HP, IBM and others. As you can imagine, getting a group like this to agree on standards was nearly impossible. In addition to creating the standards, the group needed them to be widely accepted and used. To that end, about a year ago, the WBEM Forum transitioned to the Distributed Management Task Force (DMTF). Its mission is to unify various management initiatives and provide manageability standards and technologies.

Charles T. Hebert
charles@southernview.com

REIGNING STANDARDS

One of the first standards under the WBEM umbrella was the Common Information Model or CIM. The DMTF defines CIM as a conceptual information model for describing management that is not bound to a particular implementation. This should allow for the interchange of management information between systems and applications. The communications can be between "agent to manager" and "manager to manager."

So in a fully CIM-compliant world, it would be possible to build applications using management data from a variety of sources and different management systems, such as HP OpenView, Microsoft Systems Management Server (SMS), Tivoli Management and Compaq Insight Manager. The management data would be collected, stored and analyzed using a common format (CIM). This would then allow users to develop their own custom managers accessing information collected by an off-the-shelf polling solution written in CIM-compliant systems. On the other hand, software companies, using CIM, could quickly develop manager and agent technology.

Are you with me so far?

SIMPLER DESCRIPTIONS

Another emerging technology that will leverage WBEM is the EXtensible Markup Language (XML). A subset of the Standardized Generalized Markup Language (SGML), XML is a markup language used for representing structured data in a textual form. One of the main goals of XML is to keep the descriptive power of SGML while removing its complexity. XML is similar to HTML, but whereas HTML is used to convey graphical information *about* a document, XML is used to represent structured data *in* a document. XML should give us the ability to access CIM data easily over the Web.

WBEM is backed by more than 70 major vendors today. Watch for HP, IBM/Tivoli, Compaq and Microsoft to come out with new products this year. Microsoft will be including WBEM in Windows 2000 and in their latest versions of SMS. HP and Computer Associates are actively supporting WBEM in their new management architectures. Unfortunately, most of these initial tools, though based on standards, will be pretty limited. Time is what these products need. Time will evolve the products, mature and refine the standards and give developers time to catch up with expectations.

Can WBEM help me today? No, but give it a few years.

— Charles Hebert is President of Southernview Technologies, Inc. (Atlanta, Ga.).

RELEVANT WEB SITES

WBEM Information From HP
www.hp.com/toptools
www.hp.com/desktop/manage
www.hp.com/netserver/products/management

Microsoft's Contribution to WBEM
www.microsoft.com/management/WBEM

Microsoft's Contribution to XML
msdn.microsoft.com/xml

The Web-Based Enterprise Management Forum
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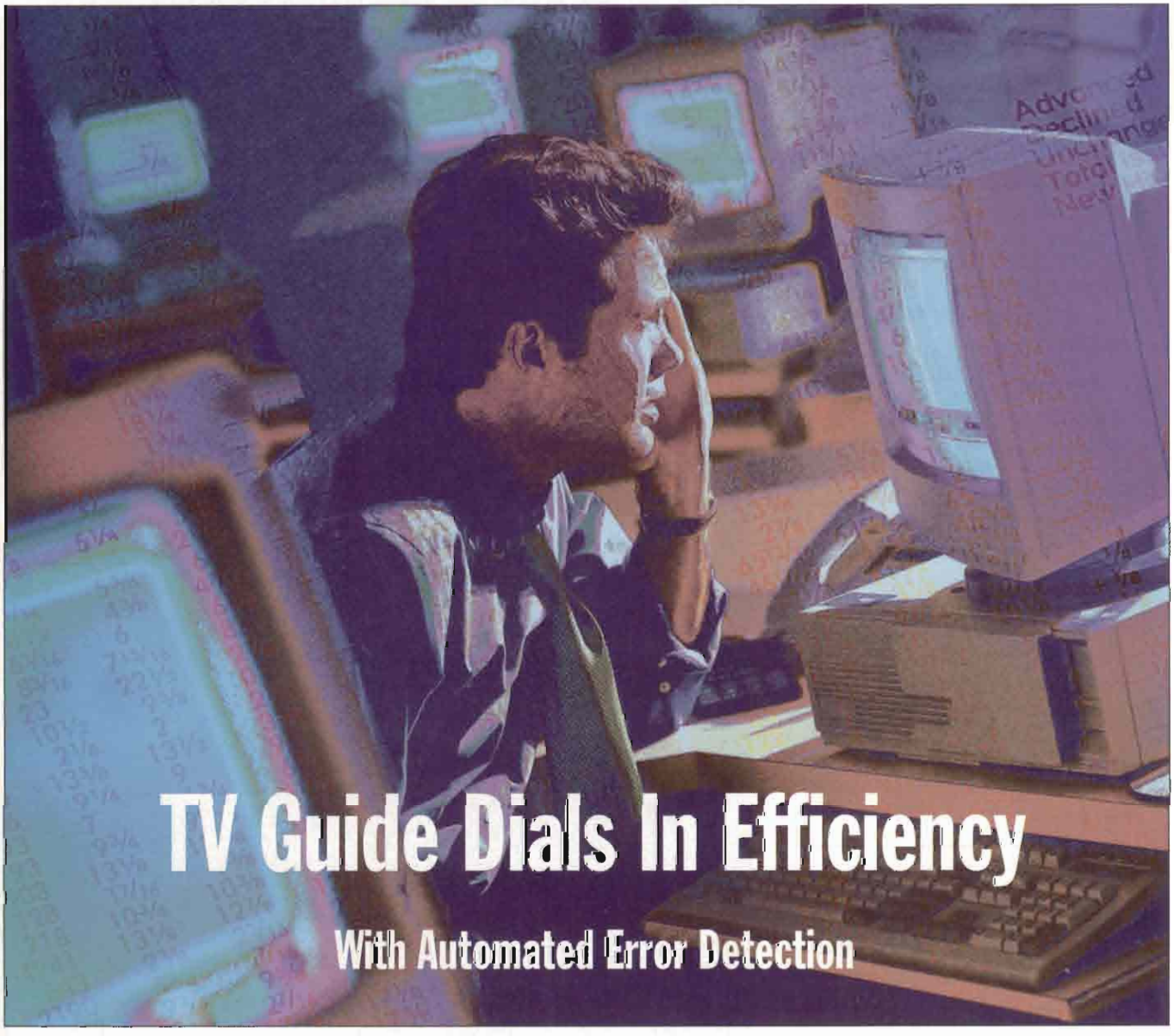
SPECIAL SECTION

Anyone who manually monitors standard lists ($STDLIST) on HP3000s to check for errors and abort messages knows how time-consuming it is. Every time a program is run, a $STDLIST is generated that provides a complete history of that job: how long it ran, the user who ran it, what accounts it ran on, various statistics involved in the process, and most importantly, error or job-abort messages. In a manual operation, each $STDLIST is printed out and the operators go through them line-by-line to locate the various warning, error and abort notations that signify a problem. When as many as 1,000 jobs per day are run, manual reviews and handling can become a full-time activity for several staff members.



TV Guide Dials In Efficiency

With Automated Error Detection

Phil Anthony

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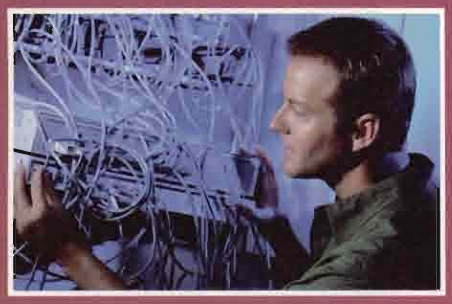
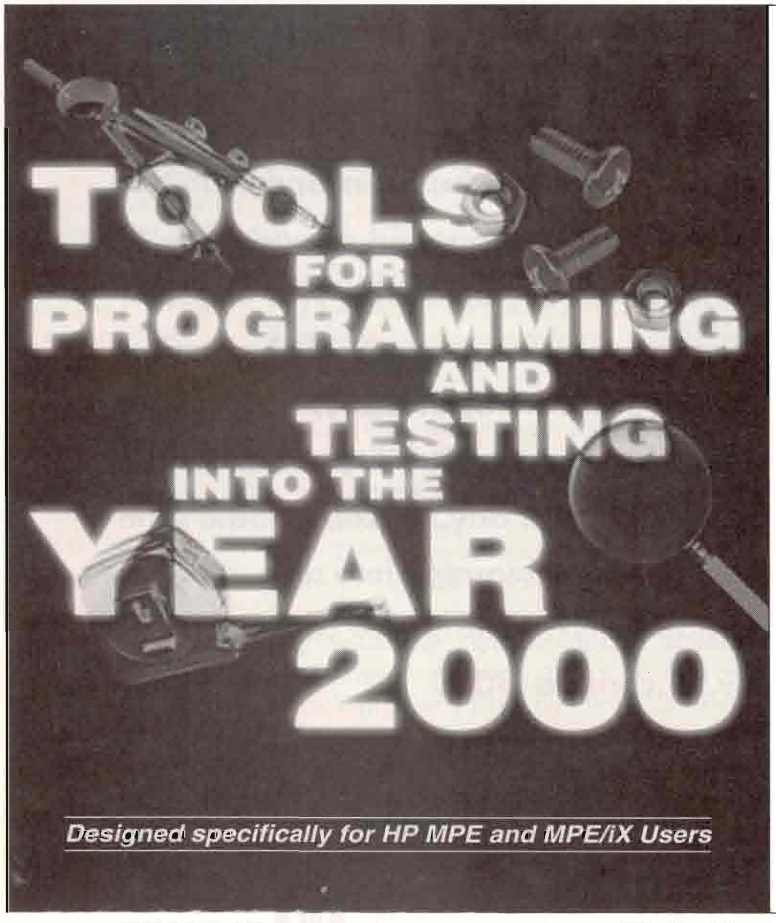


While data center staff must always react to notification of error messages, through automation they can respond much more quickly than before. This translates into more time being available for upgrading the overall capabilities of the data center.

Further, because batch processing is normally conducted after close of business, considerable night-shift resources must be invested in manually monitoring $STDLISTs. Typically, the machines have a multitude of vital off-hours transactions occurring, including daily, weekly and monthly reports. It's up to the night-shift operators to make sure these jobs run as planned, reacting to problems and working with on-call resources to resolve them before business resumes in the morning.

During the past ten years, TV Guide, Inc. (Tulsa, Okla.), formerly United Video Satellite Group, has grown from more than 200 to over 1,500 people, placing tremendous demands on the enterprise data center. In the early days, when we only required a few systems and had a low user count, the data center was run by six people, who were dedicated to reviewing job streams and handling error and abort messages manually. To assist with the time-consuming task, we made use of a contributed library utility known as SLEEPER (contributed library programs are



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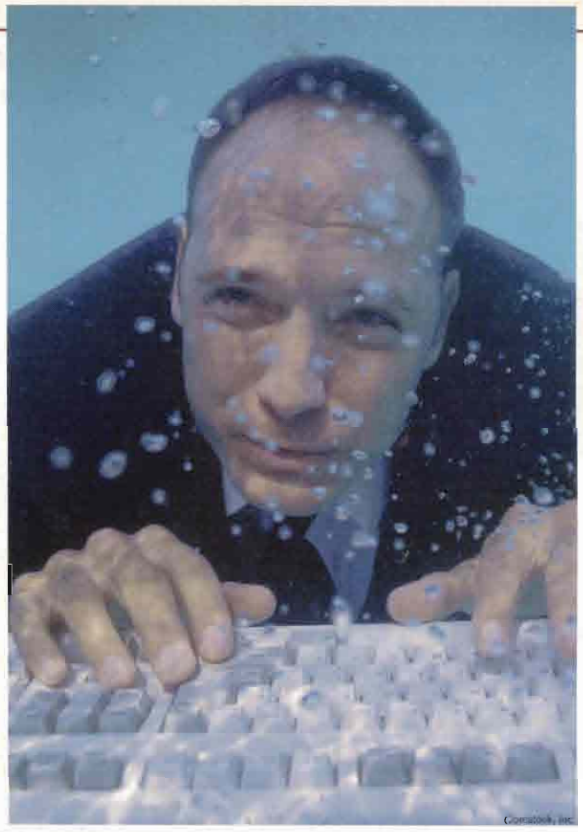

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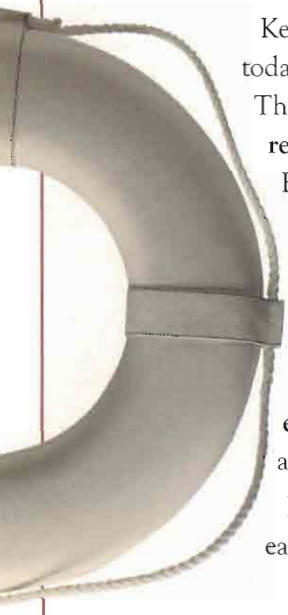

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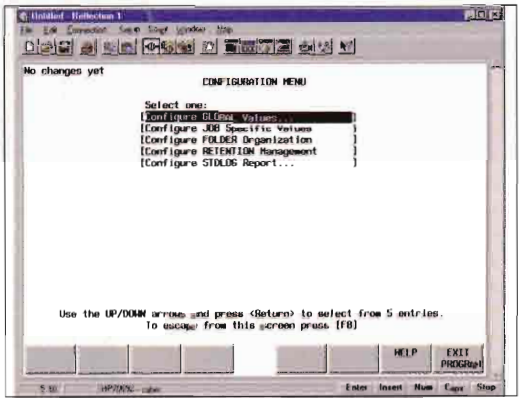
written by the HP user community and supplied via tapes to members of the Interex user group). SLEEPER could handle fairly simple scheduling routines, but it had no ability to store and recall job listings. Consequently, the operators devoted many long hours to keeping the job stream flowing.

With the rapid expansion of the company, the data center has undergone significant change. Today, 11 HP 3000s operate 24x7. We handle a wide range of jobs, such as call center, back-office, information services, satellite programming, sales reports, customer statistics, corporate sales figures, month-end reporting, cash receipts and weekly reporting. The environment is primarily online and most batch jobs are scheduled for evening processing. Two 969/320s and one 959/300 support our call center back-office system; a 987 and a 978 support our communications link to satellite up-link facilities and six other 9x7s and 9x8s support a variety of other functions, including development efforts. These systems are continuously monitored from a centralized data center staff by shifts of two operators.

Yet, despite the wide array of tasks being performed across the enterprise and the 750% expansion in the number of TV Guide users, the entire data center staff consists of only eight people split into three shifts (which is a 30% increase over the last decade). With so few personnel available, how is it possible to keep up with day-to-day demands?

Several years ago we introduced a software program known as *JobRescue* from Nobix, Inc. (Pleasanton, Calif.) to automate the error and abort message reporting process. *JobRescue* is a HP 3000 job management utility that automatically detects errors, exceptions and abort messages. It eliminates the need for manual review of $STDLISTs, significantly streamlining batch processing operations.

JobRescue is pre-configured to trap job messages and, once running, acts as an unattended batch job, tracking job performance statistics for easy analysis to help data center operations flow more efficiently. As jobs log off, the program automatically examines each $STDLIST and multiple $STDLISTs can also be processed simultaneously. Additionally, it automatically compresses $STDLISTs, saves them to disk and makes them available online, eliminating fear of lost or misplaced information.



Manual review of $STDLISTs generated from thousands of daily jobs is a full-time activity. Nobix's JobRescue acts as an unattended batch job, tracing job statistics for easy analysis.

There are many benefits to such a system beyond the reduction of personnel levels, including lower printing and storage costs, return of investment in two to three months and improving data center efficiency. With hundreds of jobs running daily, printing and archiving costs can mount up. Printing is virtually eliminated as operators no longer have to search hard copy for error messages. And with the records available online, archiving is automatically handled.

Additionally, while data center staff must always react to notification of error messages, through automation they can respond much more quickly than before. This translates

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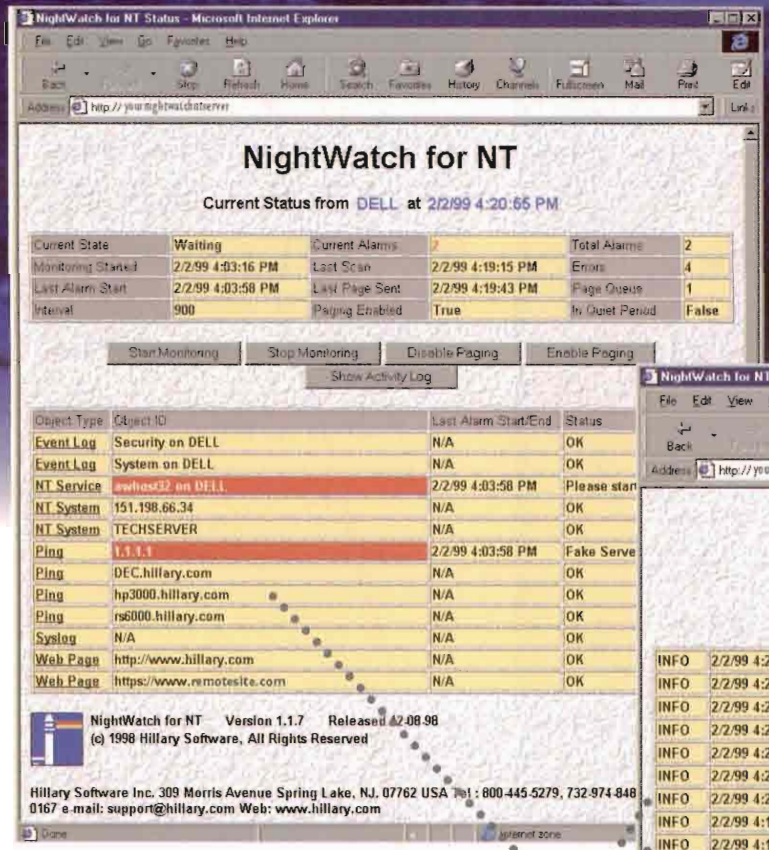

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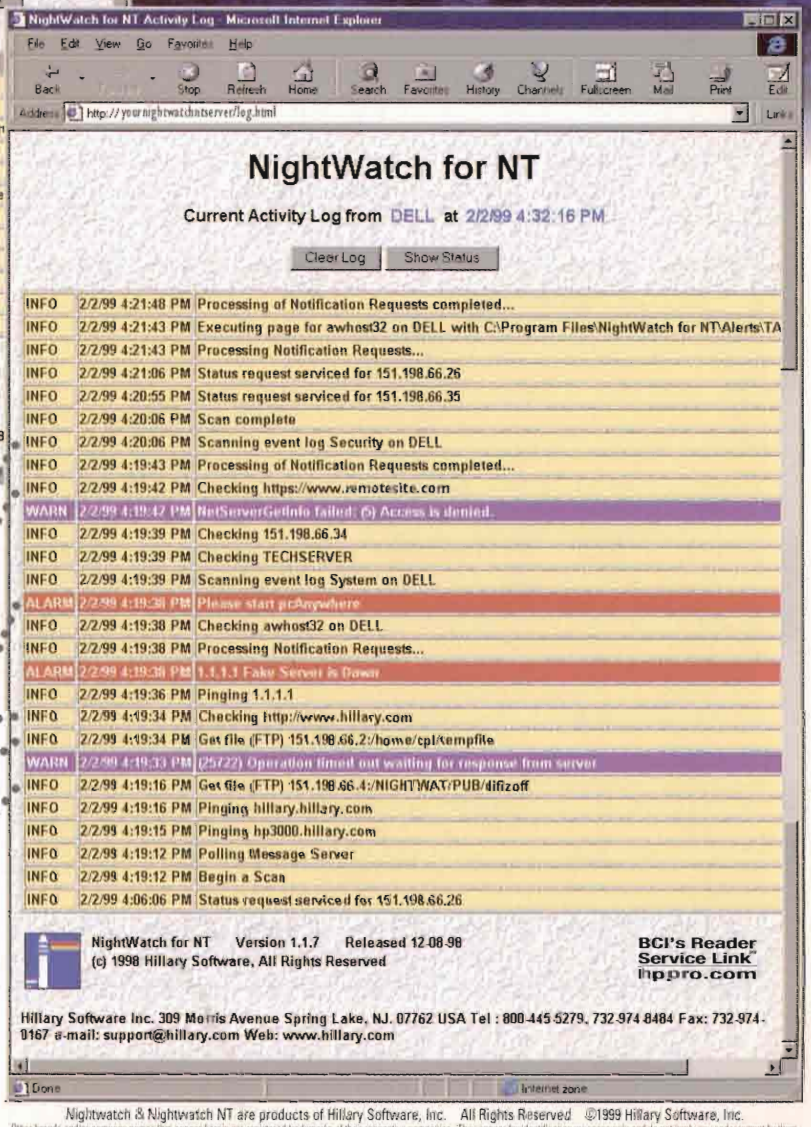

Are my DEC, HP3000 and IBM RS6000 servers up and running? ..... YES NO

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When as many as 1,000 jobs per day are run, manual reviews and handling of $STDLISTs can become a full-time activity for several staff members.

into more time being available for upgrading the overall capabilities of the data center. Operators are now able to invest time into productive tasks such as tape management and reporting as well as event logging and notification. For TV Guide, though, the primary benefit of *JobRescue* is quality control. System management and IS staff are free to enter the system at a high-level to quickly locate the reasons why a program failed. This way, we are able to isolate the exact problem in a job stream in a timely manner and are more proactive in accomplishing our IT goals.

The globalization of the business world has made competition fiercer than ever, making every increase in efficiency count. Those who are still printing out $STDLISTs and checking errors/aborts manually, are absorbing time and money that could be better spent in assuring the future survival of the organization.

— Phil Anthony is director, System Resources at TV Guide, Inc., a global diversified media and communications company that markets and distributes to over 100 million cable and satellite homes in the United States every week.

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The Informix JDBC 2.0 Driver is a Java (type 4) technology-based implementation of Sun's JDBC 2.0 specification. It enables Java applications to access the Informix Dynamic Server with Universal Data Option. Informix Embedded SQLJ allows application developers to embed SQL statements directly in Java technology-based programs. In addition to the data types defined in the JDBC 2.0 specification, Informix has added support for its Opaque types, which enables customers to define their own custom data types according to their individual business needs.

Contact Informix Corp., Menlo Park, CA at (650) 926-6300.

Report Interface Designer

Report Interface Designer 2.0 is a component-based Windows development utility that simplifies the use of Seagate Crystal Reports. Refining search criteria is done with Linked SQL Controls, which links multiple controls with a master. The Professional edition includes sort criteria controls using the TSortParam component, which permits multiple sorting levels bound to user-selectable criteria dialog controls. Also in the Professional edition is client-side Parameter Sets that allow users to re-use report criteria with no coding. The Standard Edition is $79, Professional Edition is $295, and Enterprise Edition starts at $2,475 for a 25-user single-server license.

Contact TRI-I Engineering, Inc., Cheyenne, WY at (888) 551-3500.

Adonix X3 ERP

Designed for middle market companies, Adonix X3 ERP system includes modules for sales order management; purchasing and inventory control; warehousing and quality control; manufacturing planning and execution and finance, budgeting and analytical accounting. It handles multinational transactions, including finance, taxation, import/export, languages and currencies and accommodates different distribution and manufacturing processes at multiple locations. Adonix X3 runs on Windows NT and UNIX with Oracle and SQL Server databases. Users interact with the system through Windows NT, Windows 95/98 and Internet Browser software with standard GUI.

Contact Adonix, Pittsburgh, PA at (412) 963-6770.

DESKTOPS AND SERVERS

Winterm 5355SE

The browser-based Wyse Winterm 5355SE thin client is powered by the 200MHz MediaGX processor from National Semiconductor, features the Wyse Navigation browser and is standard with 15 terminal emulations. It features plug-and-play functionality with most popular network management tools, local booting standard and a multi-windowing, multi-sessioning user interface.

It includes 10/100BaseT Ethernet, TCP/IP, PPP and DHCP networking, two serial, one parallel and two USB ports, 32-bit Cardbus, keyboard, mouse and support for standard monitors form nine to 21 inches and above. Retail price is expected to be $839.

Contact Wyse Technology, San Jose, CA at (800) GET-WYSE.

Telesto3

The PREMIO Telesto3 is a network ready PC featuring a compact case and highly integrated system with the 400MHz Intel Celeron processor with 128K cache, bundled with a 15" digital LCD panel (14.1" viewable) and a DFP port or Digital Flat Panel port. Standard features include 64 MB SDRAM, 6.4GB hard drive, 40X mobile CD-ROM drive (DVD accessible) and onboard Intel 10/100base-T/TX LAN. The Telesto3 includes onboard Creative Labs PCI sound and ATI RAGE XL 4MB SGRAM video. It sells for $1,619.

Contact Premio Computer, City of Industry, CA at (800) 677-6477.

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F-Secure Workstation Suite 4.0

F-Secure Workstation integrates F-Secure products Anti-Virus, VPN+ and FileCrypto to provide anti-virus and encryption technology in one product. It is a software-only product that requires no input at the actual workstation and no end-user configuration. It supports standard SNMP network management, integrates with Microsoft Systems Management Server and includes optional support for enterprise management products. It ships with F-Secure Administrator, a Java-based graphical console for managing security policies. Encryption is done at the IP level using a key length of 128 bits. It supports RSA, 3DES and Blowfish algorithms. Pricing starts at $99 per seat for a 100-user license.

Contact Data Fellows, San Jose, CA at (408) 938-6700.

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The LANSTREAM2000 combines terminal/remote access server capability, integrated hub functionality and Ethernet LAN connectivity in a single turnkey platform. It's available in 16 serial and eight Hub port or eight serial and 16 Hub port versions. The JETSTREAM4000 is an eight port terminal/access server. It offers a built-in parallel port for printer connection and can also provide IP-based dial-access to LAN resources via serial-attached modems. Both come with software for remote management and configuration across the Internet. The LANSTREAM2000 starts at $1,695 for the 16 serial and eight hub port version, JETSTREAM4000 starts at $1,095.

Contact Perle Specialix, Campbell, CA at (408) 378-7919.

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url: www.hp.com/cgi-bin/toptools/index.cgi

WAN OSS

HP and Cisco Systems have jointly developed a solution for provisioning and managing asynchronous transfer mode (ATM) and Frame Relay circuits. The new solution — a wide area network (WAN) Operations Support System (OSS) offering end-to-end deployment and operations support for WAN services — is targeted to help service providers reduce costs and increase revenues generated by their ATM and Frame Relay networks.

url: www.hp.com/ovc

PRINTING

JetSend Mobile Printing

JetSend Mobile Printing Solution is a no-cost downloadable utility that enables handheld PCs running Windows CE to send print jobs to any JetSend/IR-enabled printer without drivers, producing print jobs up to 10 times faster than conventional methods. Print jobs are transmitted wirelessly via infrared technology. When both the printer and the handheld PC have JetSend installed, they can exchange information.

url: www.jetsend.hp.com

LaserJet 4050

The HP LaserJet 4050 prints at speeds of up to 17 ppm at 1,200 dpi. Networked with a 10/100 BaseTX HP JetDirect 600N EIO print server, it integrates into all Ethernet environments. It contains a 133MHz RISC processor, 8MB of memory in the base model and 16MB in the network model. Features include kiosk printing, a mail-folding feature and envelope feeder and walkup wireless printing for mobile users.

Estimated prices are: LaserJet 4050, $1,099; LaserJet 4050T $1,249; LaserJet 4050N $1,415; LaserJet 4050TN $1,599; LaserJet 4050se, $1,149.

STORAGE

DVD+RW Drives

HP's new HP DVD Writer 3100i drive reads and writes to DVD+RW discs, which have 3.0GB of storage capacity. The HP DVD Writer 3100i can also read DVD-ROM, DVD movie, CD-RW, CD-Recordable (CD-R), CD-ROM and CD audio. The new drive uses disc media, similar to a CDs. At approximately $30 per DVD+RW disc, the cost per MB is less than a penny. The expected price is $699.

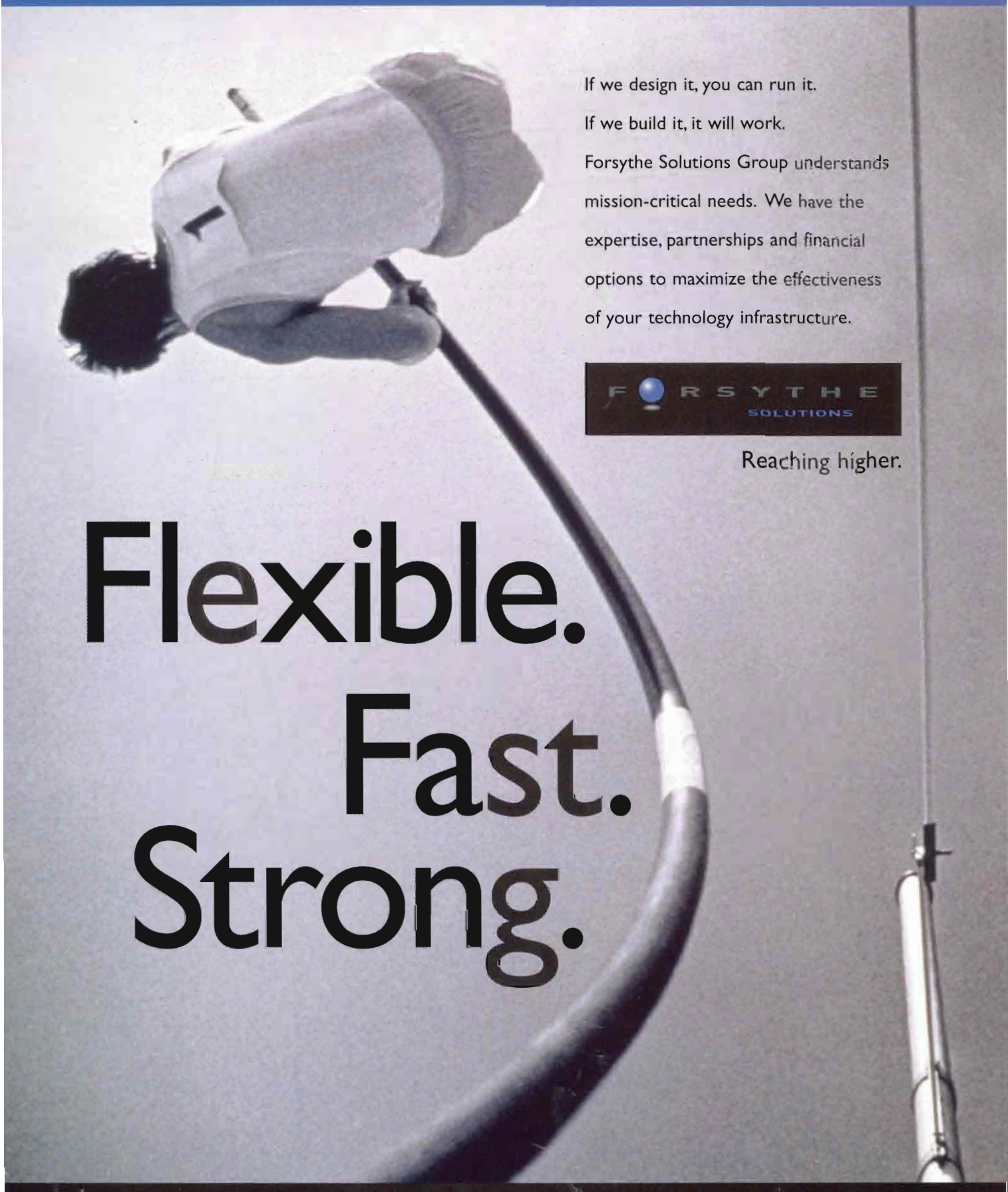
WORKSTATIONS

Visualize Workstations

The B1000 is an entry-level graphics workstation for 2-D or 3-D designs for $9,888. The C3000 speeds virtual prototyping and integrated circuit design for $13,763. And the J5000 is a dual-processor deskside graphics workstation for compute-intensive workloads for $22,636. Each runs the PA-8500 RISC processor.

The NT-based P550 Personal Workstation with HP VISUALIZE fx4+ graphics, a Pentium III Xeon 500MHz processor and Wildcat 4000 3-D graphics starts at $3,375

url: www.hp.com/go/visualize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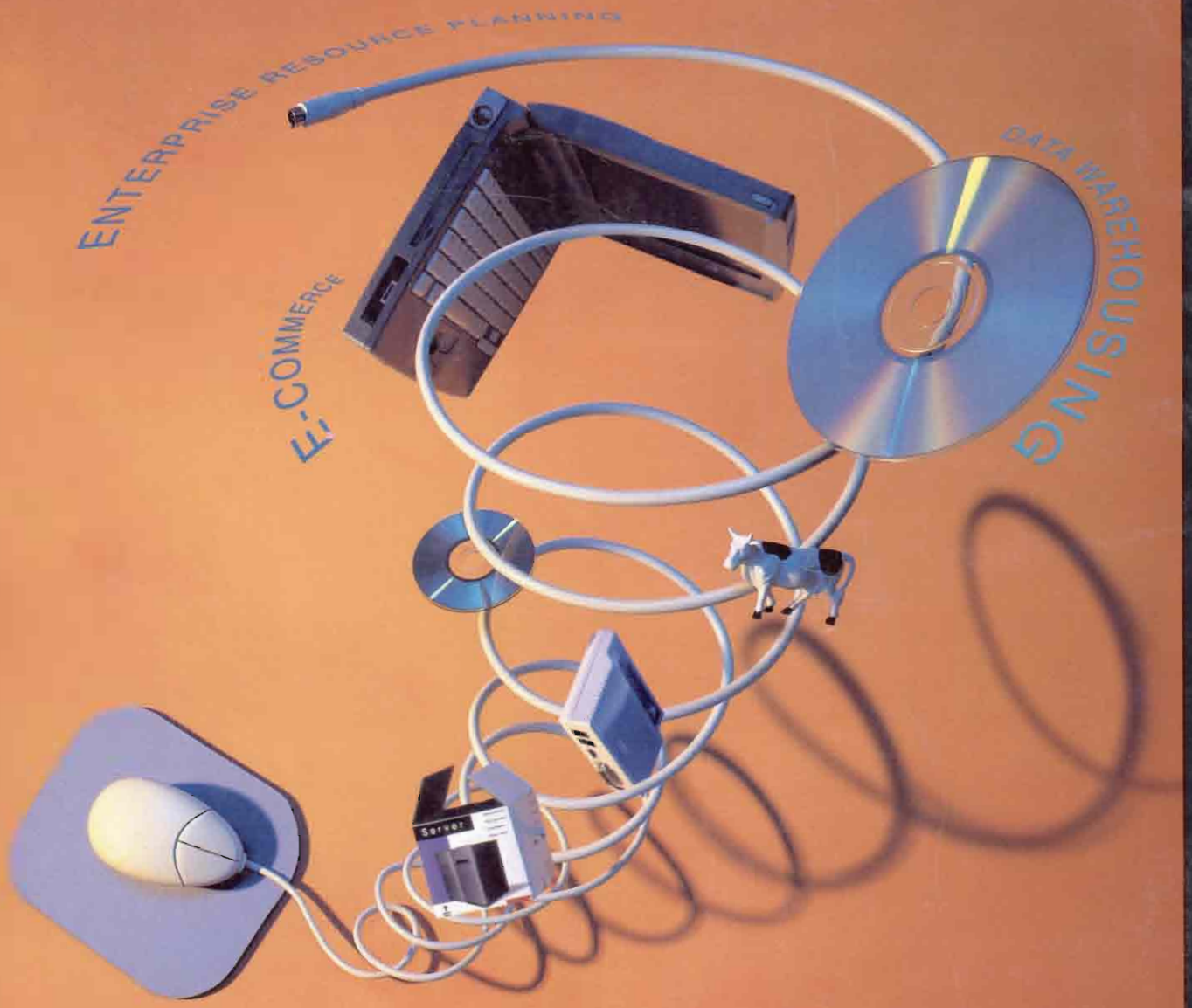

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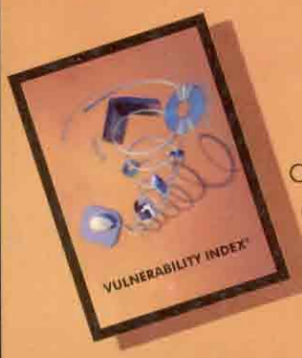

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