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APRIL 1998

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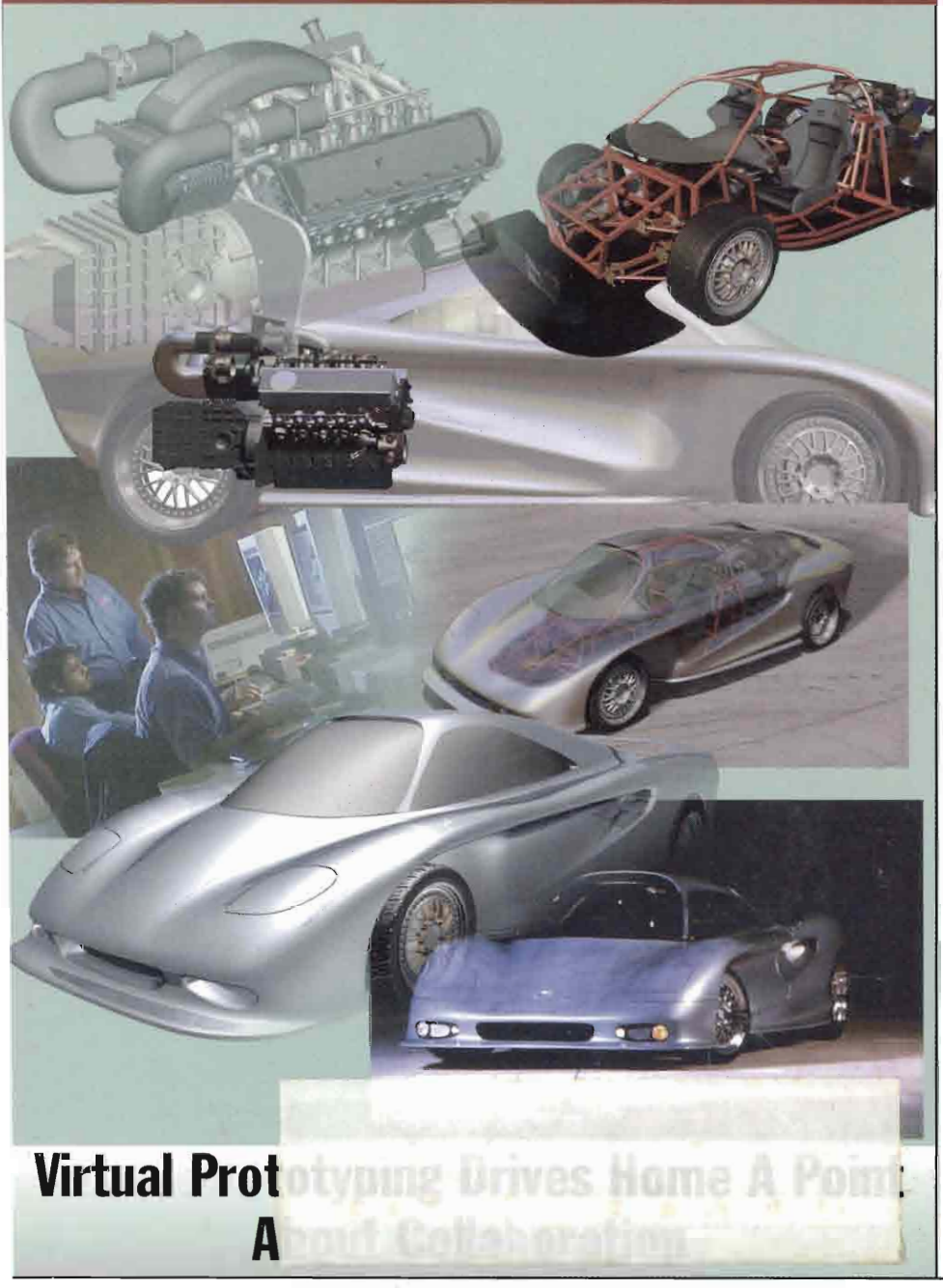
ENTERPRISE DESKTOPS AND SERVERS



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Adapt Or Die

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You know you have to face it. Sooner or later, it's going to have an impact on your life, perhaps when you least expect it.

I'm talking about COLLABORATION. In management circles these days, "collaboration" is way cool. So why does management talk about collaboration and then set IT departments on a collision course with the latest techno-fads? Why do IT departments treat users like they came from a leper colony? That's not collaboration, that's a prescription for corporate collapse. Then again, talk is cheap.

ONE IS THE LONLIEST NUMBER

Do you think collaboration flies in the face of our rugged, individual American style? Could there have been a Microsoft without Bill Gates *and* Paul Allen? Could there have been an Apple without Steve Jobs *and* Steve Wozniak? And of course, what's Hewlett *without* Packard?

HP, a decentralized company where there are no individual offices, is perhaps the first American organization to not only champion collaboration but to turn it into a business strategy. You can see it in their MC^2 strategy of uniting all their business units — measurement, communications and computers.

And where it really provides value for its customers is in HP's vendor partnerships. However, at first glance, these "co-opetitive" relationships seem at odds. For example, HP's OpenView competes with CA's Unicenter, but CA is also an HP partner. And HP's March Java announcements (one about embedded systems and one about its UNIX systems) seemingly put HP in conflict with not only Sun, but with itself. In the age of decentralized collaboration, all's fair — love and war is easy by comparison.

IT TAKES A GLOBAL VILLAGE

Mark Gerisch, the man behind our cover story this month, is sold on the idea of collaboration. As a designer of specialty automobiles, Gerisch epitomizes the go-against-the-grain individual. But, by nature Gerisch didn't totally embrace the idea of collaborative engineering. "You hear the horror stories," he confided. But his advice for the collaboratively-challenged is to worry less about the technology and more about the people. Gerisch put it bluntly: "You need to say, if there isn't anybody here that's on board with me, than jump ship now, because we don't want you around like an anchor."

Ok, in a large company it's not that easy. As management guru Tom Peters described in his *Forbes ASAP* editorial (February 23, 1998):

> *In front of me are 150 managers, representing the top teams of 15 "autonomous" divisions in a decentralized $3 billion organization. Of the 150 execs, 144 are between the ages of 48 and 59. Of the 144, 137 are OWMs—Old White Males. And of the 137 OWMs, 133 are wearing the traditional off-site garb: polyester lime-green golf-pants. It should come as no surprise that their products and services are anything but D-I-S-T-I-N-C-T-I-V-E in CHARACTER AND PERSONALITY.*

Does that sound like *your organization*? If so, you better get help soon. Peters says "true decentralization" calls for "relatively loose reins." In other words, decentralization and collaboration rests on trust, not technology. But how many CEO and IT managers are ready and willing to trust their employees?

Tell me at *thompsonga@hppro.com.*

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Desired State Management

Jim Black
Sr. VP of Engineering
Boole & Babbage

IT has become a critical success factor in the product or service of most companies. In fact, for many companies today IT essentially is their service or product. So information systems availability and response time are now valid measurements of business performance.

Availability of what and response-time as perceived by whom have become complicated questions. In the case of availability, rather than just one mainframe, now there are multiple servers controlling the information processes as well as the underlying network that connects servers and the end-user clients. Moreover, business applications have been re-architected into multiple tiers. So which response time is most meaningful? And who's responsible?

WHAT SHOULD BE DONE

The complexity of IT has increased to the point where business policies cannot be expressed to a few people who can translate them into parallel computing tasks. Assuming there is a way to measure true end-to-end availability and response time, the flip side of the problem is how to manage these two variables. The principles are quite simple, but the complexity makes it impossible for any human being to accomplish this in real-time, much less do it consistently. The most obvious thing to do is to put a computer-based system in charge which provides capacity and speed. But unfortunately, that still leaves the question "what should be done" unanswered.

Luckily there is hope on the horizon if *Desired State Management* lives up to its promise. Desired State Management attempts to eliminate human involvement and the intermediate steps between setting business policies and translating them into goals and workload parameters. Business goals must be set in service level terms. For example, the order-entry system is targeted at 99.995 percent availability between 6:00 a.m. and 6:00 p.m. on workdays, with response times exceeding one second at the 90th percentile. Although most companies are establishing service-level agreements they are having difficulty measuring them in meaningful ways.

PROXY AGENTS

Because the availability and response time parameters have to be translated for the end-user, a Desired State Management system will have proxy agents which can capture the overall performance characteristics as an end-user would perceive them. However, in order to manage the system, it must also be able to measure and correlate the performance of the intervening elements involved in the application.

These may involve servers, operating systems, database systems and networks. Some of those parts will have sophisticated management systems built-in and some will have little or none. A Desired State Manager must be able to accommodate all of these combinations and either work with the native systems or provide substitutes where no management system is available. Desired State Management systems are still in their infancy. Defining business policies and allowing the system to translate them into intermediate workload goals are the next natural extension.

The success of a Desired State Management system lies in its ability to correlate measurements it receives from "heartbeats" ticking on working systems, notification of thresholds being exceeded and exception reports from componemts in distress. It must take action to ensure that the policy it is trying to enforce is achieved. Consequently, it is not enough for the Desired State System to measure — it must manage as well.

AT PRESS

New Kayak Workstations

HP recently announced five new Kayak workstation models all based on Intel's latest 333MHz Pentium II processor.

The list includes a desktop model Kayak XA with 64MB RAM, 6.4GB ATA hard disk; a minitower XA with the same specifications; a minitower XA with an Ultra Wide SCSI ATA hard disk; an XU model with 64MB RAM, 4.5GB 10,000 rpm Ultra Wide SCSI hard disk; and an XW model with 128MB SDRAM, 4.5GB 10,000 rpm Ultra Wide SCSI hard disk and HP VISUALIZE fx4 OpenGL graphics.

HP is positioning the XA model as the ideal entry-level workstation for budget-conscious business and technical users who have a need to perform computing-intensive tasks like financial modeling, simple CAD and software development. The mid-level XU system is geared for more expert technical users like design engineers and multimedia authors.

Bundled with VISUALIZE fx4 graphics software, the XW system is expected to provide the ultimate in 3D-graphics performance. This combination recently was awarded the OpenGL Performance Characterization's distinction of being the fastest NT graphics system available (see last month's News & Views).

Street pricing for the new line of workstations (excluding monitors), is expected to range from $2,670 for the entry-level desktop XA, to $10,900 for the higher-end XW. All were expected to start shipping after March 1.

In related news, HP is shipping their new version of TopTools, a Web browser-based PC management application, pre-installed on all Vectras and Kayaks.

Based on Desktop Management Interface (DMI) and SNMP standards, TopTools allows IT managers to actively search and centrally manage selected groups of PCs and perform functions like remote power-up and software distribution. DMI information allows those managers to pinpoint PCs by operating system, BIOS level or installed system drivers, simplifying labor-intensive tasks like BIOS, memory or operating system upgrades.

The newest TopTools version is expected after April 1, and can be downloaded from www.hp.com/go/toptools.

OPENVIEW UNIVERSE EXPANDS

Intensifying the competition in the rapidly-growing systems management wars, HP, at last month's OpenView Universe show in Boston, unleashed a horde of OpenView product offerings all intended to lengthen the reach of their IT service-management strategy.

"HP is committed to IT service-management solutions that will redefine how businesses use and take advantage of their enterprise information systems," says Lew Platt, HP's president and CEO. "OpenView is the cornerstone of our strategy."

Announcements at the show included:

MeasureWare Service Reporter - a service-metrics tool that provides Web-based, real-time reporting of consolidated critical metrics from the distributed environment, documenting performance against service-level agreements.

Firehunter - a service-management tool designed specifically for Internet Service Providers.

A new version of IT Service Manager - tighter integration with IT/Operations and Network Node Manager that will, in the event of service disruption, provide help-desk personnel with more in-depth network infrastructure component information.

Expansion of the NetMetrix family - includes data-collection probes that support ATM and E1 networks along with new features added to the T1 and V-series probes.

Integration of AssetView 3.0 - provide customers with cost analysis capabilities and total cost-of-ownership data for PCs, servers and network devices, and enable provisioning of services to users at agreed-upon service levels and cost targets.

Integration of ManageX 3.0 - acquired from NuView, Inc., ManageX will provide for Windows NT environments the same level of enterprise systems-management abilities previously available only for UNIX.

These announcements come on the heels of the March shipment of the new release of OpenView Professional Suite, a bundle of 13 applications that manage all elements of small-to-medium size LANs.

One significant enhancement to the suite is Action Manager, a tool that allows for automated action to be taken for user-specified events, like running a backup procedure for a "disk full" alarm. Another is the inclusion of TopTools 2.5, which provides inventory, configuration, security and performance management capability for any Desktop Management Interface 2.0-compliant PCs.

Finally, the suite includes Zero Administration Client, from Network Associates. This product gives customers centralized software distribution, metering and licensing capabilities.

Running Into Potholes...

On Your Road to NT and UNIX Connectivity?

Running into trouble trying to integrate your UNIX and Windows NT network? TotalNET Advanced Server (TAS) software will smooth the rough road ahead.

TAS enables UNIX computers to become NT file, print and application servers. Setting up and using TAS is quick and easy, thanks to intuitive, browser-based installation and graphical configuration wizards. No additional software is necessary on the NT workstation!

NT File/Print/Application Services: NT users access files and printers residing on UNIX servers using normal NT functions. TAS also enables NT users to access NT applications stored on a UNIX server.

Common File System: Data and applications are stored in a central TAS-based server where NT and UNIX users can easily access the same data.

Transparent to the NT Desktop: The TAS server is seen by NT users as a PC server, so users do not need to know UNIX to access resources on that server. No retraining is involved.

Scalability: TAS provides file/print/application services to thousands of NT and PC workstations.

Is your current solution steering you down the wrong road? Upgrade to TAS and save substantial time and money. Call today for details!

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PC WEEK LABS ANALYST'S CHOICE TAS 5.0 June 2, 1997

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HP SMARTENS UP ISPS

At Spring Internet World last month HP announced the OpenView Smart Internet suite, part of their OpenView Internet Service Management Program (see last month's News & Views). The suite includes two new modules, Smart Internet Usage and Smart Internet Assurance.

Smart Internet Usage will help Internet Service Providers (ISPs) develop a comprehensive understanding of their subscribers' Internet usage. This knowledge, in turn, will help ISPs improve services and develop more profitable, usage-based pricing and billing business models.

"With Smart Internet Usage, ISPs not only can manage their subscribers' usage, but they also can bill subscribers the same way that electric companies do, by the actual amount of service used," said Bernard Guidon, HP vice president and general manager for the Telecom Business Unit. "Smart Internet Usage can help ISPs manage costs and increase revenues."

Smart Internet Assurance will help ISPs manage their service performance and make diagnosing subscriber problems easier. These capabilities allow ISPs to optimize their system and network resources to improve service delivery and resolve customer problems faster.

"As subscriber levels increase, managing Internet services such as Web access and e-mail becomes a tremendous challenge for ISPs," said Dushyant Sukhija, marketing manager of HP's Internet Infrastructure Operation. "Our Smart Internet Assurance products help ISPs monitor and manage their Internet services to meet this challenge and to deliver high-quality service to their subscribers."

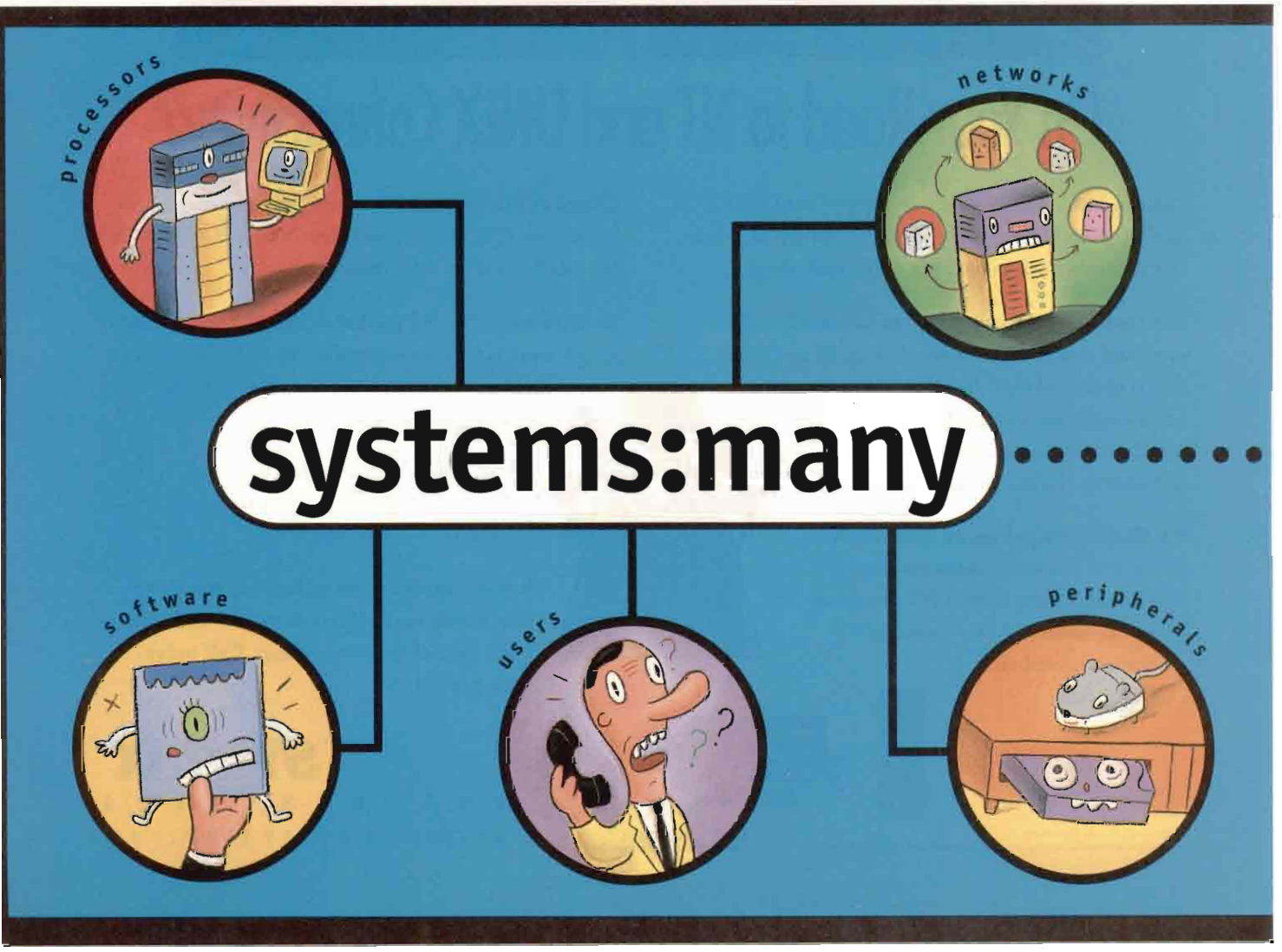
Australia-based telecom provider, Telstra Multimedia has already taken advantage of Smart Internet Usage to implement usage-based billing, without which their Internet-access service would have to rely solely on monthly subscription revenues. Usage-based billing allows Telstra to capture the costs associated with downloading content that could not be included before in a basic monthly statement.

HP Smart Internet Usage is expected to be available later this spring.

OMNIBACK GROWS MORE OMNIPOTENT

HP last month announced OpenView OmniBack II version 3.0, a high-performance enterprise backup and restore application that allows IT managers to address the needs of a mixed UNIX and Windows NT environment from a single point of control.

OmniBack II 3.0 is integrated with OpenView network management



Did Y2K Bug Bag Bank Boss?

In his column, *The Economy* in the March 4,1998 edition of The Philadelphia Inquirer, Andrew Cassel may have found the first true Y2K victim, CoreStates' Bank "soon-to-be-former" chairman Terry Larsen. At a recent shareholders meeting, Larsen was asked if the upcoming "Year 2000 bug" was a factor in Corestate's decision to sell out to North Carolina's First Union, putting him out of a job.

"Yes, was Larsen's reply. The Year 2000 issue was a 'key thing' in convincing CoreStates' board to run up the white flag."

It seems that CoreStates, in their own dozen-year-long acquisition frenzy, has acquired a mish-mash of other bank's systems that would cause them to "face 'substantial exposure and risk.'" Larsen noted that First Union "was 'substantially further along' in the process."

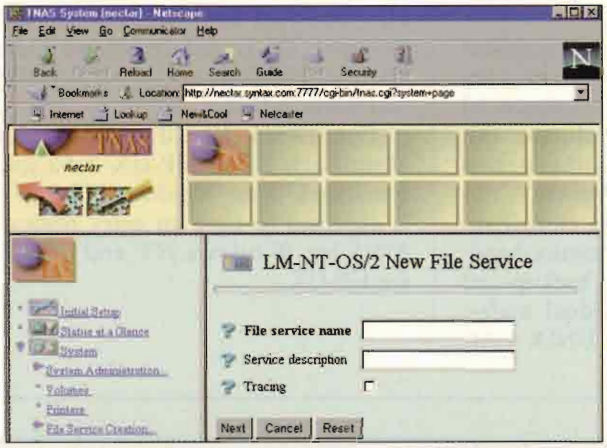
modules like PerfView and MeasureWare, providing IT managers with a reporting structure for evaluating, monitoring and managing the cost and quality of their services. Juergen Ketterer of HP's OmniBack II product group, describes a scenario where data from OmniBack log files can be exported to MeasureWare and PerfView for trend analysis, and, based on those trends, can forward real-time alerts from backup activities to IT/Operations. Ketterer also explained that the newly announced OpenView Reporting Solution can import OmniBack data to generate Web-based service level reports.

Another OmniBack II embellishment is in its ability to optimize bandwidth while customizing backup and restore scripts for individual nodes. Ketterer explains that a UNIX CAD user, with high data volume requirements, can backup to a local device, while a lower-volume NT user can send their data across the network to a central location, all under the design and control of a central HP-UX or Windows NT management station.

Other OmniBack II enhancements listed in the announcement are: support for application agents Sybase for Solaris, Oracle 7 and Oracle 8 (Solaris and NT), and SQL Backtrack (Datatools); integration with Microsoft Cluster Server; support for HP TapeAlert DAT/DDS, Sony AIT, Compaq DLT and Overland Data DLT; and backup agents NCR UNIX and Sequent Dynix.

OmniBack II 3.0 will replace OmniBack II for HP-UX 2.55 and OmniBack II for Windows NT 2.3. It is expected to have an entry price of $995 for Windows NT and $3,900 for HP-UX.

Integral Integration, Totally



TOTALNET ADVANCED SERVER 5.2

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- Supports HP-UX, Solaris, AIX and IRIX
- Pricing starts at $849 for five users, up to $27,999 for 500 users. Enterprise pricing available

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Intranet. Integration. Interoperability. Three industry buzz-words that sometimes can be the bane of a network manager's daily work life. How many IT professionals have inherited a hodgepodge of Windows NT, Netware, OS/2 and, yes, even Mac workstations that business planners say must all be able to share the same UNIX resources, and do it transparently to the users.

Syntax, Inc. (Federal Way, Wash.) claims to be able to do just that with their TotalNET Advanced Server (TAS) 5.2. "We can help integrate NT, Netware, OS/2 and Macs to use UNIX boxes as file, print and applications servers," says Roger Franklin, president of Syntax, Inc. "TotalNET lets them share data and bridge protocols."

Franklin explains that the function TAS fills for large, diverse networks is to allow managers to replace lesser capacity Intel servers with more robust UNIX boxes and link hundreds of PCs to them. The comparison to NFS utilities is easy, but misplaced, Franklin says. He explains the difference. "NFS sits on the desktop, where TAS is server-centric. We treat PCs as real UNIX users and we present NFS files as an extension to the PC."

TAS is loaded once on each UNIX server. It is delivered as an intranet server and administered across the network using a standard HTML-based tool called TotalAdmin. This allows each different UNIX system to look exactly alike to the administrator. TAS 5.2 offers improvements to TotalAdmin by using frames and Java technology to provide hyperlinks for quick access to other TAS servers. Also, each server can be administered from a single login.

Other enhancements in 5.2 include unified mapping of file names across services for Macs, Netware, Windows 3.x, 95, NT, OS/2 and UNIX. Users can map files with case insensitivity but with case preservation. Additional features include performance tuning, modification to device drivers, enhanced network utilities, enhanced tracing and support for outbound Macintosh printer (PAP) connections. Password synchronization, virus scanning and UNIX system administration are all planned for future releases.

Ingram Micro, a distributor of computer products and services, has been a TAS user through several product releases. Senior systems administrator for internal tech support, David Chao, explains an environment where he uses TAS 5.2 for viewing downloaded mainframe financial data on HP 9000 (HP-UX 10.2) and RS/6000 AIX servers.

Users have direct access to that data from a variety of Windows PCs. "We had some problems with speed using 5.0. It seemed a little slow," he says. "But upgrading to 5.2 really helped."

TotalNET Advanced Server 5.2 supports HP-UX, Solaris, AIX and IRIX. Pricing starts at $849 for five users and can go up to $27,999 for 500 users. Enterprise pricing is available.

Ken Deats,
Associate Editor

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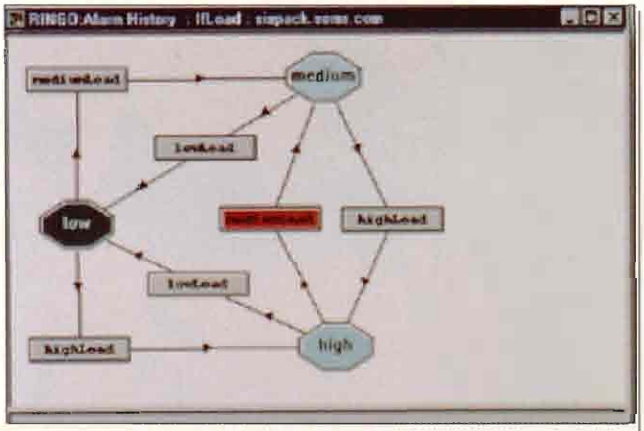

NERVECENTER 3.0

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Stubbing your toe is a lot like experiencing a node failure on a network. Your central nervous system (the network) sends a pain message (event) back to your brain (network management center). The brain recommends rubbing your foot and cursing the furniture (problem resolution) and makes a note to turn the lights on next time (proactive network management).

Seagate Software Inc. (Scotts Valley, CA) wants to minimize the anxiety managers feel when their network stubs its toe with NerveCenter 3.0, a rules-based, event management application for managing mixed UNIX, Windows NT and Netware environments.

"NerveCenter allows you to proactively manage network events, do problem identification and filtering using a rules-based engine," says Roy Luebke, product marketing manager for NerveCenter.

NerveCenter's rules, or behavior models, come in pre-defined, "out-of-the-box" formats for monitoring network traffic, performance, security and error conditions. Also included are API's to integrate perl subroutines for creating new models, as well as the import/export capabilities to distribute them.

NerveCenter integrates with network management platforms like OpenView Network Node Manager and IBM NetView. "We stay totally in synch with HP-UX and OpenView," explained Luebke. "And we communicate to NetView, but we're not native to AIX."

Any SNMP trap on the network is recognized. Since NerveCenter can be distributed across the enterprise, SNMP polling can be implemented closer to the devices being monitored, cutting down on the loss of SNMP traps due to network collisions.

Vishal Desai, president of The Savli Group, (Silver Springs Md.) an IT consulting firm, has integrated Nerve Center with OpenView Network Node Manager as part of Savli's Enterprise Management Now program.

"Our technicians used to spend 80 percent of their time determining where a fault occurred," says Desai. "NerveCenter has reduced the fault isolation time significantly and allows them to spend their time fixing the problem instead of finding it."

Desai described a WAN/LAN implementation that encompasses 15 sites across North America. "We have a 24x7 operations environment that combines HP 9000s, HP-UX 10.2, HP workstations, Cisco routers, Cabletron hubs and a combination of T1 and T3 connections."

One important feature was NerveCenter's ability to filter the thousands of network messages that can flood OpenView every day. "This increased our ability to correlate information from individual LANs and see across the routers," said Desai.

In future releases Desai says, "We'd like to see Web capability, a few more canned models that include application correlation and the ability to cut and paste models."

Ken Deats,
Associate Editor

Giving Satellite Data A Brand New LOOX

LOOX 3.3, LOOX++

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Most people would agree that keeping satellites in orbit is pretty important, especially if your main job function is to acquire the telemetry data constantly being beamed back to earth from the satellites and re-present it graphically to the engineers who monitor their condition - all in real-time. Telesat Canada uses LOOX 3.3 and LOOX++ from Loox Software (Los Altos, Calif.) for that job.

"We have to provide an easy-to-get-at repository of satellite data for the engineers," says Frank Smith, manager of data processing systems for satellite ground systems at Telesat Canada, a Gloucester, Ontario, Canada-based provider of telecommunications, broadcast distribution, satellite communications and space systems management. "We monitor five satellites at any time, and we have had as many as eight."

Engineers monitor a real-time, color-coded graphical representation of each satellite's thermal sub-system on HP 700 and C-class workstations. That graphic gives them a quick snapshot of conditions that change color as conditions change. "We had worked with several other products to give the engineers the graphics they wanted," says Smith.

He explained that Telesat had at one time used RT Works, from Talarian Corporation. But, while his staff had no complaints about RT Works, it was too powerful and expensive for this particular job. His LOOX development team consisted of one satellite engineer, one HP-UX programmer, and one screen designer. "We had a prototype up in 24 hours, and a working system in a couple of days."

The very low overhead LOOX required in Telesat's application, coupled with its sub-second response time and LOOX's "excellent support and good technical fixes," induced Smith to say that "LOOX met our requirements very nicely." Asked if he had any recommendations for changes in future releases, and, after asking his staff the same questions, Smith replied, "There may be one or two very minor things they might want to look at, but overall, we're very happy with it."

"We want to present a dynamic graphical image in a business process," says Peter Meehan, president and CEO of LOOX Software, Inc. LOOX started from a consulting business, specializing in designing graphical interfaces. "We knew what the users wanted because we had already been doing it."

Meehan points to several differences that he claims separate LOOX from its competitors. "We follow industry standards, in that we lay on top of X/Lib where others want to replace everything." That allows for continuity for those already familiar with X/Motif.

Meehan also touts LOOX's ease of use, a strong economic factor (there is no run-time requirement or development fee for applications), and its strong integration with X/Lib standards (other like products were developed before X/Lib's implementation).

Ken Deats,
Associate Editor

A "Predatory"

A slab of clay. A blast of air. But earth and wind could take the vision of a "voluptuous, flowing automobile," only so far. To take shape, Mark Gerisch's idea needed to be fired in a virtual oven.

Ken Deats and George A. Thompson

Wind tunnel testing found a drag coefficient of 0.35, and the clay model produced 1,850 pounds of down force at 200 miles per hour. That means, according to Gerisch, "you can drive the car upside down and you would stick to the roof (if the car weighed 1,850 pounds)." But that's all in a designer's days work for Gerisch, owner of M&L Auto Specialists (Two Rivers, Wis.).

Collaboration by Design

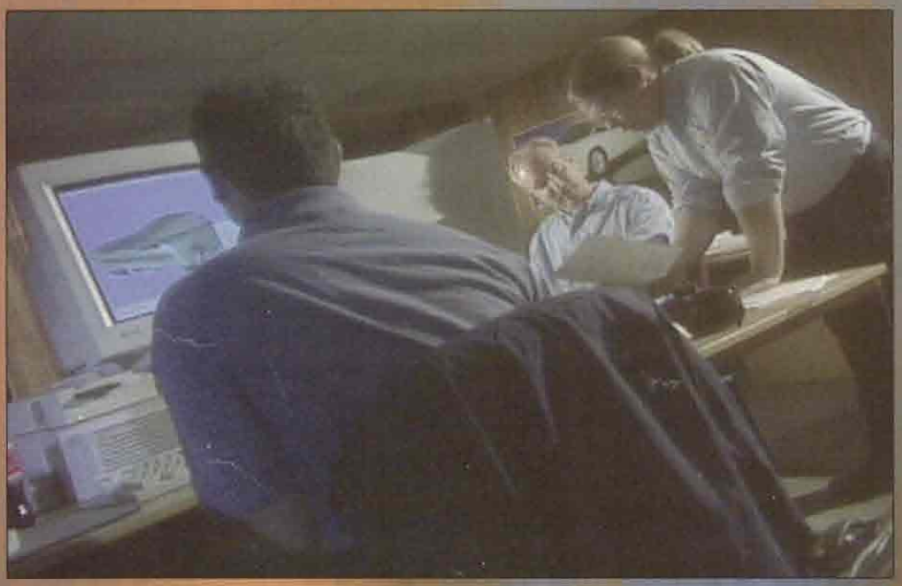
Gerisch collaborated with Ron Sims, a veteran designer and stylist at General Motors who shared a deep love of exotic automobiles. "We began drawing up different designs and thoughts on what a supercar was. But, because of Ron's background, virtually everything he drew kinda looked like a warmed over Corvette." Tiring of building "everyone else's cars," Gerisch and Sims "went off the map" to a different level.

Gerisch wasn't worried about accomplishing the goal of creating a new style automobile because many of the cars he had already fabricated were based on reproductions or modified versions of existing European sports cars like Ferraris, Lamborghinis and McLarens. But copying and modifying left Gerisch unsatisfied. He wanted to build the next great American supercar - the Romulus Predator.

The Predator was on its way to being an original M&L production. The slab of clay eventually turned into a wind tunnel model, before becoming a production model with carbon fibre wings, an inline top air scoop, underbody airflow tunnels and side air scoops which effectively manage the air flow around and through the body.

Although the Romulus Predator started as one man's vision, this latest example of high-performance vehicle technology is actually a high-tech partnership story. Gerisch admits that besides creating an automobile success story, "we wanted to do some-

Partnership



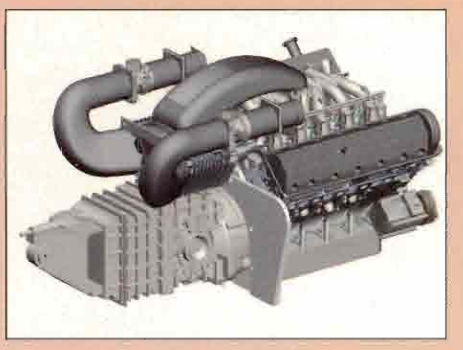
Mark Gerisch designed the Predator along with Ron Sims, a veteran designer and stylist at General Motors. Once in the tube, "you now have a body that you can tweak and manipulate to where all the light lines have a Class-A finish across them." Without virtual prototyping, the design process might have taken up to six months.

Instead, M&L Auto saved time and money by designing the Predator in three months. To meet their funding deadlines, the Predator team needed to have a car produced by the end of 1997.

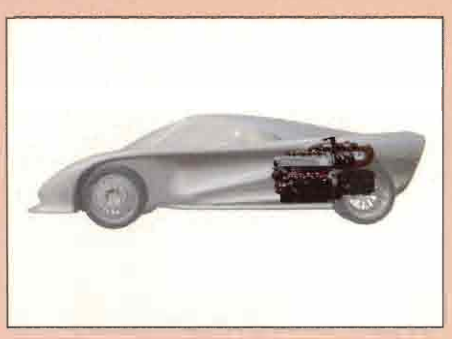
Virtual prototyping is the realistic computer simluation of a product, from concept and design to analysis and manufacturing. When it comes to prototyping an automobile in digital form, you must have four essential software technologies: surface modeling software to create the shape and feel of the vehicle body; mechanical computer-aided design (MCAD) software for basic product design; visualization software to communicate ideas among the different design pieces; and analysis software for kinematic and static analysis of the vehicle structure.

THE HARD DRIVING SOFTWARE TEAM

EDS Unigraphics contributed CAD modeling software to enable a fast-track implementation of the virtual development environment. Initial designs were released to a shared database as a digital assembly of solid representations of individual chassis' and components.



VisFly and VisMockUp (Engineering Animation Inc.) are visual communications and digital prototyping software, which enabled geographically dispersed design teams and suppliers to interact with, view and analyze the digital model in real-time so design flaws could be identified and fixed.



ICEMSurf (ICEM Technologies) is surface-modeling software, which obtained mathematical data from the digital model car to create realistic, sophisticated surfaces while eliminating the need to build and evaluate a surface out of metal or fiberglass.

MSC/PATRAN and MSC/NASTRAN (MacNeal-Schwendler) provided an open architecture finite element modeling and analysis system, which analyzed and optimized the vehicle structure, helping remove weight from the vehicle while maintaining strength.

We would like to thank Larry Baker from EDS Unigraphics; Erica Brizzi from EAI, Rhonda Amo from ICEM Technologies and Patrick Kresl from Coonts Design Group for their help.

thing that is a very hot topic-- and that's collaboration."

SCULPTING NEW DIMENSIONS

So, adding another dimension to the project, the M&L partnership was extended to include a virtual prototyping team consisting of HP, EDS Unigraphics (St. Louis, Mo.), Engineering Animation Inc. (EAI; Ames, Iowa), ICEM Technologies (Arden Hills, Minn.) and MacNeal-Schwendler (Los Angeles, Calif.). According to Gerisch, the team's first step was to digitize the clay model by mapping 1,850 raw data points from one of its sides and "get the thing into the tube." Gerisch explains that with a hand-sculpted clay model you need to pick the half that best adheres to specifications and mirror that image electronically.

Once in the tube, "you now have a body that you can tweak and manipulate to where all the light-lines have a Class-A finish across them," he says. "And that was all done in ICEMSurf." Next, 3D capabilities were needed. Gerisch chose EDS Unigraphics from a long list of candidates. Unigraphics gave us "parametric capabilities as well as sketching capabilities and fly-through stuff." In fact, all software roads eventually passed through a Unigraphics' shared database. "The other ISVs needed to collaborate with the mother source — which was Unigraphics."

All the software parties also had to meet the challenges of using a mix of UNIX and NT platforms. Working with a combination of HP C-180 and Kayak XW workstations, Gerisch and his crew strove to find an optimal mix of software processes that were best suited for the respective OSes. "If you throw a lot of analysis to something, or optimization to something or parametrics to something, you're going to need a UNIX box. It's just not going to happen with an NT system overnight — even with HP today."

VIRTUALLY DOUBT-FREE

Nevertheless, it all came off seamlessly, say Gerisch proudly. "We were able to pass information back and forth through all the software." That's not to say that Gerisch didn't

have his doubts. "You do hear the horror stories," he recalls. "The translation of data from a large group of points ... a lot can be lost." But after all was optimized and flown through, collaborating remained a significant issue.

"Your workforce has to be totally sold on the fact that this is what you are going to do. Implementation is a very big thing," emphasizes Gerisch. "If you're not on board, then you had better jump ship. We don't want you around like a boat anchor if you don't like the way we are doing it."

Using the tools provided by HP and its ISV partners, Gerisch gave shape to his vision and created the Romulus Predator in three months, instead of the six months or more that it would have taken in the physical prototyping stage alone. "Try doing that with a piece of paper and a wave of your hand."

The Predator, the first all-American-made supercar, uses a mid-mounted 6.8 liter, 550 horsepower, Ford Triton V-10 engine fitted with a dual Eaton/Magnuson supercharger; coupled to a 5-speed Porsche-style G50/52 transaxle. Brakes are 4 pot Alcon racing calipers while the wheels are aluminum HRE 450 with Goodyear Eagle F1 tires, specially designed by Ferrari and Goodyear and speedrated to over 200 mph. M&L Auto plans to build 250 cards with the first models ready for the millennium. The price? A mere $150,000.

NO MOCK TURTLES

"Users like Mark Gerisch and others are coming to us and asking for our assistance in virtual prototyping or virtual product development," says Larry Andersen, outbound marketing manager for HP's UNIX and PC workstations. No matter what you call it — virtual prototyping, virtual product development, digital mock up — it's an area of increasing interest for small discrete manufacturers like M&L Auto and large ones like Boeing, Ford and Toyota.

"M&L was an interesting case," says Andersen, pointing out that they were already prototyping using the usual manual and physical process (building a clay model and testing it in a wind tunnel). "They applied the technology midway through the old process, but we were able to jump into [their] design process quickly." From "five guys and a dog," M&L went from art to part quickly with high adoption rates, says Andersen. So, comparisons of the before and after effects were readily made: one-third the time and one-tenth the cost. By using virtual prototyping, the Romulus Predator was ready for the AutoFact showfloor in November 1997.

Although the M&L team worked with a mix of UNIX and Windows NT desktops, a high level of application integration allowed them to take CAD files from EDS running on an HP 9000 and move them over to NT-based desktops for modification. And application level integration is key to penetration of NT into larger UNIX environments, according to Andersen. For now, he observes that there is a large growth rate for NT in the technical marketplace, "more in the small- to medium-size customer that have little or no switching costs." Switching costs, he explains are a function of a UNIX legacy environment (i.e, proprietary code, training investments, etc.). "So, as long as we deliver the right price/performance across the spectrum, our customers are sticking with HP-UX."

But Andersen predicts that the day of the NT-based or PC workstation is coming soon enough. "Now, NT can't play because of [problems with] computation, throughput and visualization, but they are being minimized over time. So, [HP] doesn't get into the price performance game because the NT boxes are very capable and will become more capable, but HP-UX systems are delivering better performance."

— GAT

ENTERPRI$ING SERVERS

E-Commerce Applications Spin A Wider Web Around Corporate Planning

James R. Dukart

A recent Business Research Group (BRG; Newton, Mass.) study found that while Web servers accounted for 14 percent of overall server purchases in the past year, that percentage is expected to nearly double in the next year or two.

The same study showed that while the expected growth of overall server sales is expected to be around 19 percent in 1998, sales of servers designated as Web servers would expand by 80 percent.

"We've seen a real renaissance in terms of customer interest in high-end servers, much due to the Web," agrees Dan Glessner, director of product marketing for HP's 9000 Series of enterprise servers. Electronic commerce processes like online transaction processing (OLTP), data warehousing, enterprise resource planning (ERP) and supply chain management (see our February supply chain feature) all contribute to the demand for larger servers.

Glessner says customers are using HP 9000's as large, mission-critical database servers running Oracle, Sybase and Informix databases, as well as for back-end servers running SAP, Baan, and Peoplesoft and other large enterprise applications. For example, Bell Atlantic (Philadelphia, Pa.), following last year's merger with NYNEX, decided on a HP V-class systems to house its data-warehousing operation; as did British Aerospace Airbus, part of the European plane-making consortium Airbus Industrie. They will be using two V-class systems for technical engineering activities in support of design analysis for aircraft.

But Glessner adds, "customers are seeing very large spikes of demand on their [UNIX] servers due to both the internal and external demands of electronic commerce." He believes in most cases, that "larger, faster and more powerful servers can both help increase revenue and cut costs." Data warehousing or OLTP applications generating more transactions in a given amount of time can not only increase revenue, but also result in greater customer satisfaction and improved efficiency. The Keebler Company is using SAP R/3 and Manugistics running on an Oracle database for planning, manufacturing management and enterprise resource planning. Officials say they needed bigger, powerful servers to get a real-time view of the company's entire supply chain.

On the cost reduction side, customers are purchasing enterprise servers in order to either offload processing from an older mainframe, or to consolidate the work of several smaller, slower or more widely distributed servers. For example, Glessner notes what he calls "Year 2000 fast-track replacements," which he describes as a company that recognizes that fixing existing Year 2000 code is too big a problem to tackle, and so instead they decide to buy a new application on a newer, bigger server.

"The simple fact that today's business enterprise needs to get online and move core business processes to an automated, network state is fueling the speed of the server market," says Stephen Clancy, director and principal analyst for Dataquest's Server Services program. Joyce Tompsett Becknell, director of distributed computing research for BRG says, "the hot place for servers right now is for the Web."

DRIVING NETSERVERS INTO THE ENTERPRISE

"Sales in the enterprise server area are very strong," say HP's Glessner. "We are growing [HP 9000 servers] at more than 25 percent over the past six months of last year, and it's being driven by customer demands for high scalability and availability." But Steve Young, product marketing manager in HP's Network Server Division says, "We have been driving to make the

INTEL AND HP INSIDE

This past October 14th, at the annual *Microprocessor Forum*, an exclusive chip-designers need only apply symposium, details about Merced's technical architecture began to flow out of San Jose's Fairmont Hotel like the Merced River from which the CPU's code name is derived. HP and Intel, both well-aware of their technical accomplishments and economic contributions to the common good of Silicon Valley and the industry-at-large, cheekily christened their new 64-bit CPU architecture — EPIC (Explicitly Parallel Instruction Computing).

The EPIC architecture, like it's name implies, is momentous because it does away with the existing twenty year old CISC and the twelve year old RISC design architectures that have ruled during the last two decades. Having reached the law of diminishing returns, the prevailing computer science conviction is that "those dogs simply won't hunt."

EPIC uses a combination of long instruction words (LIW), speculative loading, predication (versus branch prediction) and explicit parallelism (versus implicit parallelism). That's CPU designer-speak for not only better performance, but for super performance.

How super? Although there have been no official speeds and feeds revealed, 400MHz to 600MHz have been suggested.

EPIC PROPORTIONS

Technically speaking, "EPIC means faster processing with greater performance for any given fabrication process that's available," says David Scott, HP's Director of Software development. Intel expects to use .18 micron process technology in manufacturing Merced.

Continued on page 20.

Continued from page 19.

According to Scott, HP-UX customers (with PA-RISC 8x00 systems) will have the most straightforward transition from PA-RISC to IA-64. HP-UX 11.x is already binary compatible with IA-64. So, there isn't any immediate need to recompile or rewrite the usual monster-size database applications running in every large corporation. So, end user applications don't necessarily need to be recompiled to take advantage of Merced. Scott estimates that only 10 percent of the processing happens in the user applications. When vendors like Oracle, Informix and Sybase eventually recompile their database apps for IA-64, HP-UX customers will automatically benefit.

LET IT FLOW

While HP and Intel worked together on the 64-bit instruction set and EPIC, Merced will be manufactured and destined to be sold by Intel into the mass market. Of course, in the CPU business, Intel well knows you can't entirely escape your past. All Merced chips will be backward compatible with the current 32-bit Pentium Pro CPU, which by no mere coincidence was designed specifically for Windows NT.

Not surprisingly, the first Merced CPUs (Merced remains a code word for the chip; not its official name) will show up in high end workstations and servers — the hardware of choice for large corporations. So, in the near future, look for Merced to replace your mainframe rather than x86 desktops. By 1999, when the first Merced chips are scheduled for production, it might be enough to make a grown CIO cry. Whether their tears of sadness or joy, remains to be seen. The only good news is, of course, you still have about two years to decide.

George A. Thompson,
Editor-in-Chief

[Intel Petium-based] NetServers ready for the enterprise. We are introducing servers that can deliver mid-range UNIX performance at half the price."

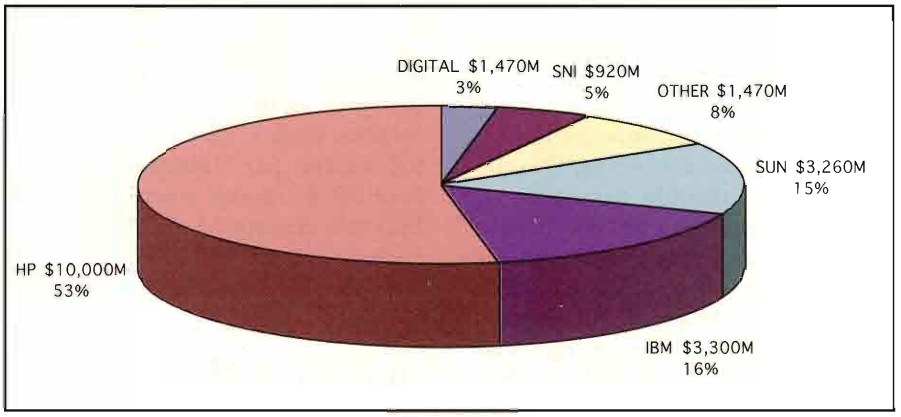
In the mid-range market, Young observes many companies turning to "rack-based" servers as a way to both meet stepped-up processing demand while simultaneously pulling server control back into a main processing or data center. The result, he says, is often several racks of six or more servers all collected in one room — the 1990s version of the mainframe "glass house" data center.

Young eagerly offers up HP's newest NetServer LXr Pro8, an eight-way 200MHz Pentium CPU SMP machine running Windows NT. He explains that this system as well as other NetServer efforts are all about bringing the reliability, scalability and availability of the UNIX world into the Intel/NT space. "With an eight-way system, you have more scalable memory systems, and can go up to 8GB in main memory. Our storage capacities now range into the multi-terrabyte area, so we are really shrinking the differences."

But Young cautions that boxes like the NetServer Pro LXr Pro8 with NT are unlikely to replace UNIX systems so much as augment them. And there are "ease of use and manageability features with NT. So some people use the UNIX server as the back-end database and the NT server as the front-end application. Or in some big companies they are UNIX-based at their central location with NT on the periphery." But that, says Young, means more of a focus on the interoperability features of all UNIX and Intel servers, which thereby provides an opportunity for VARs and integrators focused on UNIX-NT interoperability.

"What is worrying people about deploying Intel or Microsoft NT at the enterprise server level is that it is not thought to be scalable or reliable enough. But we have been chipping away at these issues all the way." However, George Weiss, vice president and research director for distributed systems at Gartner Group (Stamford, Conn.) dismisses the scalability issue. "Scalability and availability may be the qualifiers," Weiss says, "but the differential between what the leading vendors are able to offer in these areas is not that great any more." Weiss suggests that compati-

1997 Worldwide Commercial RISC/UNIX Market



1997 was the year of only two leaders: HP and Sun Microsystems. HP wants to be an enterprise's supplier-of-choice for a wide range of information technology products and services — including printers, PCs, NT servers — over the course of its future. Sun, on the other hand, wants to expand the universe of UNIX-based technologies to solve current IS problems, satisfy present unmet needs and establish a future of networked computing infrastructure. But for IS decision makers that do not see UNIX as potentially the ulitmate technology underpinning of the future, Sun can sometimes seem very intimidating. (Aberdeen Group, February 1998)

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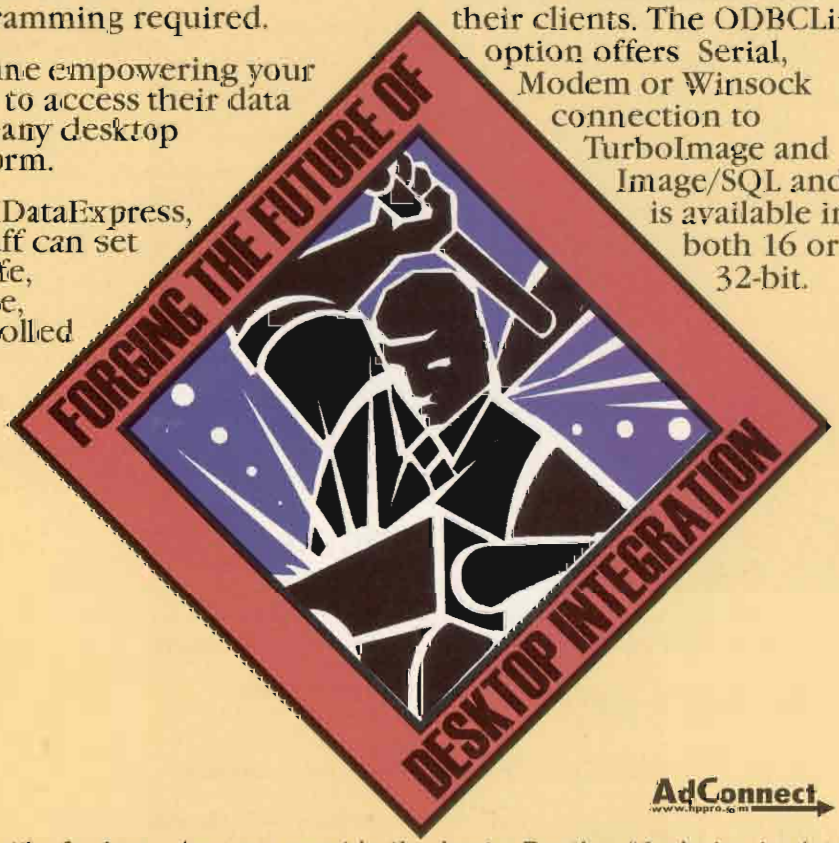

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FIVE-NINES (99.999) BEAT A FULL HOUSE

Terms such as fault tolerance and five-nines (99.999) availability used to be the exclusive property of IT managers involved in high-volume, online transaction processing applications. Two approaches to hardware availability predominate: Continuous Availability (CA) and High Availability (HA). Each approach has advantages, yet some confusion exists about how they complement one another. So, how does an IT manager, faced with a six or seven-figure investment, make CA and HA pay off?

Defining Terms

Continuous Availability describes a fault-tolerant architecture that is explicitly designed to eliminate all unplanned and planned hardware downtime. CA, the most advanced of the availability architectures, was pioneered by vendors such as Tandem Computer and Stratus Computer, and has a proven track record of more than two decades. Stratus Computer achieves fault tolerance through a unique design.

First, self-checking logic on each major circuit board detects and isolates failures. Second, the duplication of processors, memory, I/O controllers, disks, power supplies, and buses ensures that processing will continue should one of these components fail. CA systems achieve 99.999 percent - those five-nines - availability. On a 7x24x365 network, that translates to five minutes of unplanned downtime during a calendar year.

HA systems are comprised of conventional servers clustered in a crash recovery, failover configuration designed to reduce downtime. Failover software, installed on each of the servers, enables applications to switch from one server to the other in the event of a failure. One server can exist as a hot standby for the other, and if the system crashes, *there will be some downtime.*

Data could possibly be corrupted or lost. At 99.95 percent availability, considered the best high availability today, HA systems can be expected to produce about 4.5 hours of unplanned downtime for a 7x24x365 network.

While CA architectures provide a clear advantage in availability, the scalability of HA server clusters enables them to thrive

At 99.95 percent availability, considered the best high availability today, HA systems can be expected to produce about 4.5 hours of unplanned downtime for a 7x24x365 network.

Continuous Versus High Availability Comparison

FEATURE	CA	HA
Availability	99.999 percent	99.95 percent
Unplanned downtime/year	5 minutes	4 1/2 hours
Primary attribute	Availability, fault tolerance	Scalability
Built-in error detection	Yes	Limited
Instantaneous recovery upon failure	Yes	Limited
Performance affected by failure	No	Dependent on cluster complexity
Protection of in-memory data	Yes	No
On-line component upgrades	Yes	Limited
Automatic problem notification	Yes	Limited
Special programming required	No	Yes

in environments where raw processing power is a higher priority than availability. For example, even with the complexity involved in creating and maintaining a clustered environment, compute-intensive tasks could make the horsepower (up to 128 RISC processors) of this approach a more important consideration than availability.

Lower TCO

The CA and HA platforms differ in a fundamental way: CA solutions are engineered to transparently eliminate, rather than reduce, downtime. With fault-tolerance built into the CA system architecture, complex planning, implementation and testing procedures often associated with custom-designed HA clusters are eliminated.

For example, CA need not require the hiring of consultants for script creation or modification, purchasing extra support services, the licensing of multiple third-party software applications, or the acquisition of system administration tools. CA maintenance (through online upgrades, online backup and dynamic reconfiguration) and service (through failure identification, remote diagnostics, and online component replacement) are also simplified.

CA systems also can run commercial applications and operating systems. For example, Stratus Continuum series is based on the HP PA-RISC 8x00 CPU and HP-UX. With binary compatibility, applications that run on the HP-UX operating system can be continuously available by simply installing them and running, *without even the need for recompiling.*

The total cost of ownership for CA and HA solutions depends on a number of factors: hardware and implementation costs, service and support contracts, and others. The simplicity and greater availability of CA solutions can allow them to provide superior value and a lower total cost of ownership over the system's life cycle, despite their typically higher initial hardware cost.

Application-Driven

Ultimately, the IT manager's choice of a CA or HA solution is application-driven. Compute-intensive applications such as CAD/CAM or data warehousing may be best suited to the scalable HA architecture. Applications that demand above all fault tolerance and five-nines availability - online banking, electronic commerce, trading, telecommunications, reservations, emergency 911 services, health care IS - require Continuous Availability. With increasing business-critical activity dependent on network uptime, it seems evident that CA will answer a strategic need going forward.

Readers interested in more information on the comparative costs of HA vs. CA implementations may visit www.stratus.com and request the white paper "Changing Costs in Systems Availability".

John Scanlon is Vice President, of Marketing, Stratus Computer, Inc.

bility, cost of upgrades, serviceability and other cost of ownership issues are critical features.

SHIFT HAPPENS

Weiss also says that with increasing standardization of parts and interfaces and lowered manufacturing costs, the lifecycle of servers may be shortened, and IT staffs or systems integrators may begin to view server purchases and deployments in a different light. "Some users may decide that for tactical purposes they need a system quickly deployed. They feel they can get their ROI on it in a very short period of time and scrap it or shift it into new areas. This may be particularly true in industries like financial services, where they feel they are under constant pressure to be on the leading edge technologically."

He says in the past mainframes were expected to serve as the main corporate processing center for a minimum of seven or eight years, and that even today's larger servers are expected to be in service for four or five. That cycle may be as little as 36 months within a few years.

Thus, though it seems to contradict the movement to bigger, faster servers that serve more clients, the other enterprise server trend of the present and near-term future may be towards smaller, somewhat interchangeable and almost "swappable" boxes. Weiss says he can even see the day when Dell's heralded "build to order" model of PCs is applied to the smaller enterprise server market, or at least to the small-business and home office market.

"We can see arguments for centralization as well as for distribution," says Weiss. "Centralization plays into the IT organizations that are minimizing cost of ownership, while distributed servers are liked by organizations that favor a large degree of independence on the part of users or groups. In all cases, though, improved manageability will sit alongside with performance measures as the real marker of value to the customer."

1998: The Final Countdown To Y2K Begins

According to *The Year 2000 Software Problem: Quantifying the Costs and Assessing the Consequences* by Capers Jones, "the end of 1997 is approximately the last point at which Year 2000 repairs can start with a reasonable probability of finishing before 2000." With that sad fact in mind, the staff of *HP Professional* has prepared what we hope are some thought provoking "infrequently asked questions" concerning the Year 2000 problem.

QUESTIONS TO FREQUENTLY ASK YOUR OUTSOURCING VENDORS

1. Do you exclude dead code and dormant applications from changes?
2. Do you exclude blank lines and comments from changes?
3. Do you have satisfied clients with whom you can discuss performance?
4. Do you have any ongoing litigation from dissatisfied clients?
5. Do you have tools that support your primary programming languages?
6. Do you have tools that support mixed-language projects?
7. Do you have tools for searching databases for Year 2000 references?
8. Can your search tools find more than 99 percent of Year 2000 instances?
9. Can your repair tools safely repair more than 95 percent of Year 2000 instances?
10. How many undetected Year 2000 instances are likely to be left in your software?
11. Do you guarantee to repair bad fixes or new defects introduced by your work?
12. Will your Year 2000 repairs damage throughput or performance?
13. Do you have adequate personnel for repairing my entire portfolio?
14. Do you offer a warranty or guarantee of Year 2000 compliance?
15. Do you provide references from prior Year 2000 clients?

1. Ok, I admit it. Our company hasn't done our Y2K homework. What can we do now? *If a company lags in starting their Year 2000 repairs until calendar year 1998, the only real but slender hope of finishing in time is to adopt unusual methods such as suspending almost all other work and deploying about 85 percent of available resources, bringing in contractors, moving to 24-hour-a-day repair work or abandoning date field expansions and using only various masking approaches as temporary repairs.*

2. Can automated tools help accelerate the fix? *If automated search-and-repair tools are used, and if bridging, windowing, encapsulation and some other masking approaches are used, then Y2K repairs can begin as late as June 1998 and may possibly be completed — although it will be a tight race.*

3. I know what to do to check PCs for Y2K-compliance, but what about UNIX workstations? *If you happen to have a UNIX workstation, you might want to check the dates in the July 2038 time period when the UNIX clock and C library clock functions expire.*

4. Generally, what are the economic consequences of the Y2K problem for industrialized nations? *Although the future is hard to predict, the economic consequences are likely to be severe for industrialized nations and potentially advantageous for countries that lagged behind in early automation and computerization. The software development capacities of the industrial nations may be seriously degraded by the huge amount of effort absorbed by Year 2000 repairs.*

5. What happens after the Year 2000? Do the problems go away? *There is a strong possibility that post-2000 damages and recovery costs may exceed the pre-2000 repair costs. If the most probable scenario becomes reality at the end of the century, then the year 2000 problem will have serious consequences that will affect business operations for several years into the next century and will probably cause tax and revenue reductions from 1998 through 2005.*

All answers taken from *The Year 2000 Software Problem: Quantifying the Costs and Assessing the Consequences* (Addison-Wesley, 1998) by Capers Jones.

YEAR 2000
SPECIAL REPORT

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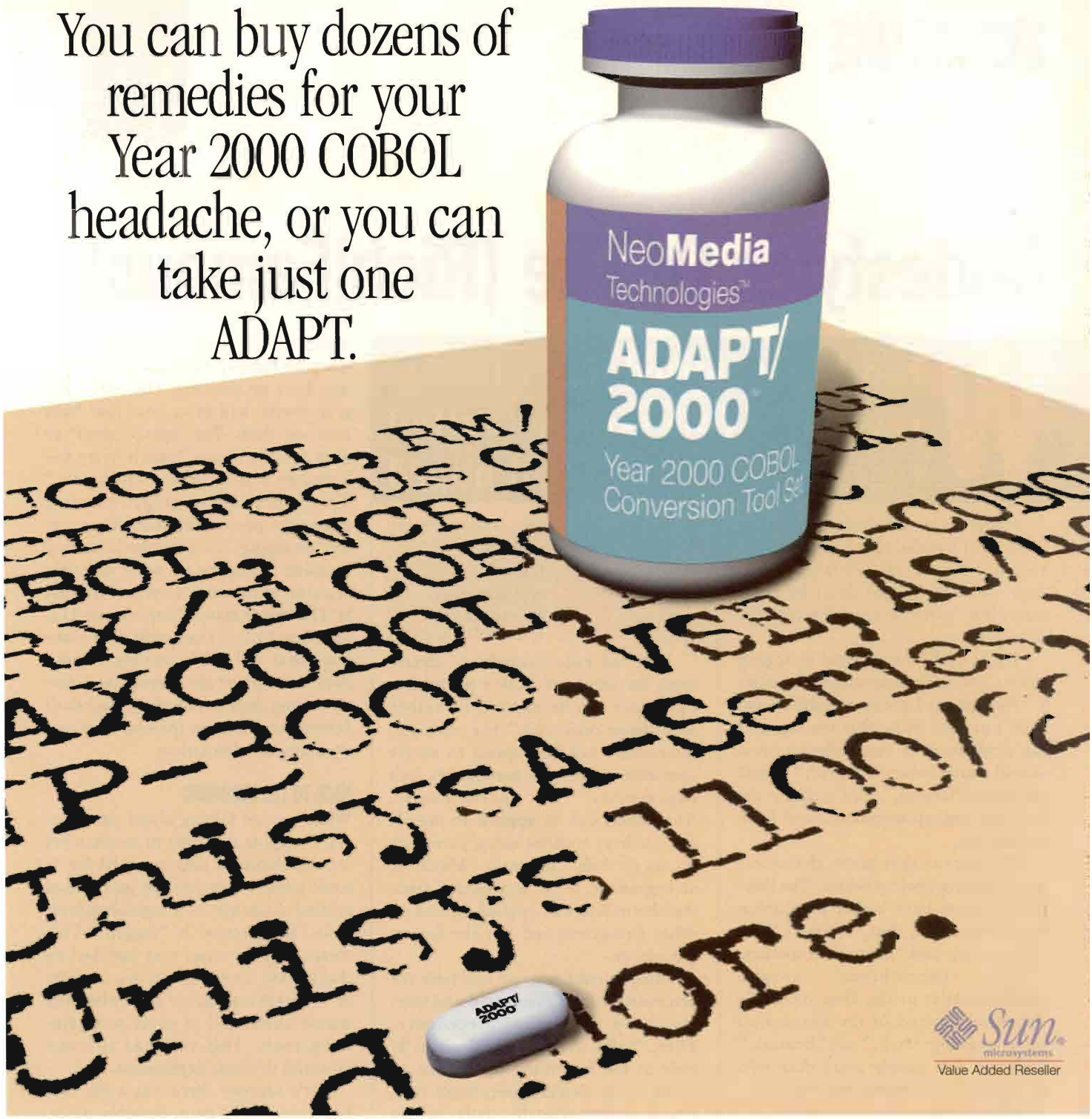

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Fred Mallett

Codestyles Of The (RichlFamous)

When I first started this series on regular expressions (called regexp for short), I had hoped it would make me famous. As time wore on, I decided that I would rather that it make me rich. Now, as I find how difficult it is to describe these complex issues, I would settle for either one.

This could be expressed in regexp syntax using the alternation character |. The regexp I became (**richlfamous**) does just that. Note that the regexp I am **richlfamous** is very different, as it would match either "I am rich" or just the string "famous." This is due to the fact that regexp metacharacters have precedence.

This means that some characters are interpreted before others. The literal characters have higher precedence than alternation, thus, "I am rich" is one alternate and "famous" is another.

The parentheses around (**richlfamous**) in the first example delimited the end of the alternation sets, meaning "rich," or "famous." You can also supply more than two alternates. For example, she was (**richlfamousldeterminedlsuccessful**).

WHAT'S IMPORTANT

The precedence of metacharacters can be seen below. The order of precedence is listed from high (top) to low (bottom):

( )	parentheses
[ ] .	single character matches
* + ? {n,m}	quantifiers
^ $ \b \< \>	anchors
abc	literal concatenation
|	alternation

You can read precedence charts using the axiom of "lower precedence operators can be applied to higher precedence operators." For example, quantifiers can be applied to single character matches or parentheses (sub expressions in parentheses). Alternation can be applied to literals and anchors without using parentheses, as in **^alb.** This reads "Match 'a' at beginning, or 'b' anywhere" since the alternation was applied against all other characters and has the lowest precedence.

Using parentheses, we can raise the precedence of the alternation and literals above the anchor precedence. Thus, **^(alb)** reads "Match 'a' or 'b' only at the beginning of the line or string." As another precedence rule, the quantifiers typically apply only to the smallest item that precedes (often called an atom). For example: **\.[0-9]+** reads "A literal period, followed by one or more digits." Compare that with: **([0-9]+[\t]+){2,}** in which grouping was used to make the quantifier apply to more than one atom, so that it reads: "Match 2 or more sets of digits followed by space or tab" (like " 9 3 6").

Beware that in several tools, parentheses are not special when typed into a regexp literally. For example, in **grep** they have no meaning. The command: **grep '(test)'** will print lines that have (test) on them. The regexp **(very)*** to **grep** actually means "match '(very followed by zero or more)' characters." This is because in **grep**, you must escape the parenthesis character to get its "grouping" or precedence raising meaning. Thus, you get some very ugly regular expressions: **error \(code: \)*112** means match "'error code: 112' or 'error 112'." *You might also make note that HP-UX's version of* **grep** *does not support the alternation '|' feature.* **Grep** does not need the backslash before the grouping (parentheses) and does support alternation.

BACK TO THE BEGINNING

While we are talking about parentheses, I suppose it is time to mention yet another function they are used for in some tools. When you put parentheses around a section of a regular expressions, that section is "tagged." This means that the exact text matched by that section is remembered for use later in the expression, or even after the match command in some programming tools. This can lead to some powerful dynamic expressions.

Let's suppose there was a file that had columns of data, possibly dates. The rules for that data is that lines must be of the format "dd-dd-dd" or "dd dd dd" where "dd" means two digits. A line with "dd-dd dd" is invalid. We want to automate verifying this file, so a regular expression like this would match the first case: **[0-9]{2} [0-9]{2} [0-9]{2}**. Let's suppose we are using a tool like Perl that allows **[0-9]** to be abbreviated **\d**. This simplifies the expression to **\d\d \d\d \d\d**.

In grep, you must escape the parenthesis character to get its "grouping" or precedence raising meaning. You might also make note that HP-UX's version of grep does not support the alternation '|' feature.

We would then need to test all the lines with another expression in case the digits were separated by hyphens: \d\d-\d\d-\d\d.

Hmm... how about combining the two: \d\d[-]\d\d[-]\d\d? Well, this is a problem, since we used a character class between the digits and said that the character between digits could be either a space or a hyphen. This allows the string **23-45 12** to match. We can solve this by having the second separator refer back to what the first character class matched.

To do this we must first tell the system to remember the first separator matched: \d\d([-])\d\d. Now that we "tagged" or remembered the first character, we can refer back to it (called backreferencing) at the second separator position: \d\d([-])\d\d\1\d\d. This reads "match two digits, then either a space or a hyphen, but remember which one it is, then two more digits, followed by what you 'remembered' first (\1), then two more digits."

If a regexp has more than one set of parentheses in it, the second can be backreferenced with \2, the third with \3 etc. Tools that use the DFA engines (as discussed in the first part of this series) cannot do backreferences. Some still allow backreferences by changing to the NFA engine when backreferences appear.

There is still so much more to learn about regexps than what we have discussed so far. For example, **perl** allows you to have non-backreferencing groups by putting ?: as the first two characters inside the group. Consider the regexp: **^(?:X=|Y=)(\d+);(?:X=|Y=)\1.** The **\1** means backreference the first tagged group. In this case, the (\d+) not the (?:X=|Y=), since the ?: said not to tag this portion of the expression. We needed the parentheses so that it read "'X=' or 'Y=' at the beginning of the line" instead of "'X=' at the beginning of the line, or 'Y=' anywhere." This expression would match the following lines:

```
X=15;Y=15
Y=3;X=3.
```

But, since we used \1 to refer back to the first (not ignored) tagged reference, which was the set of digits: (\d+) it would not match

```
X=15;Y=3.
```

OK, just to head this particular criticism off at the pass, yes, this expression would also match X=3;X=3, but I will leave you to figure out a single regexp that will match what we wanted and exclude that case.

It is all rather confusing, yet there is so much power in regular expressions that I usually feel it is worth taking the time to learn them. Sometimes though, I wonder if the trouble of figuring it all out is worth it just to become **(|Ff]amous|[Rr]ich){1}.**

Fred is wondering if you feel it is worth the trouble, and that this series should be continued with more example, and details of regexps. Let him know what you think at fred-erm@famece.com|www.famece.com.

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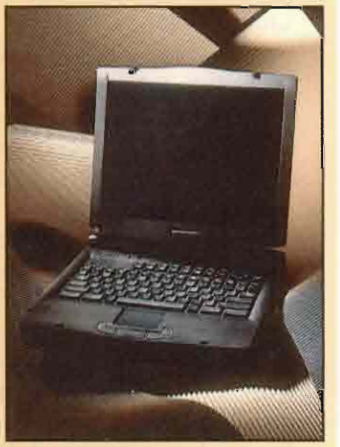

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RDI will be demonstrating PrecisionBook in booth 200 at the InterWorks Conference in Santa Clara, April 29-30. For additional information, visit RDI's web site or call to discuss how PrecisionBook can help you with a new, more effective way of working.

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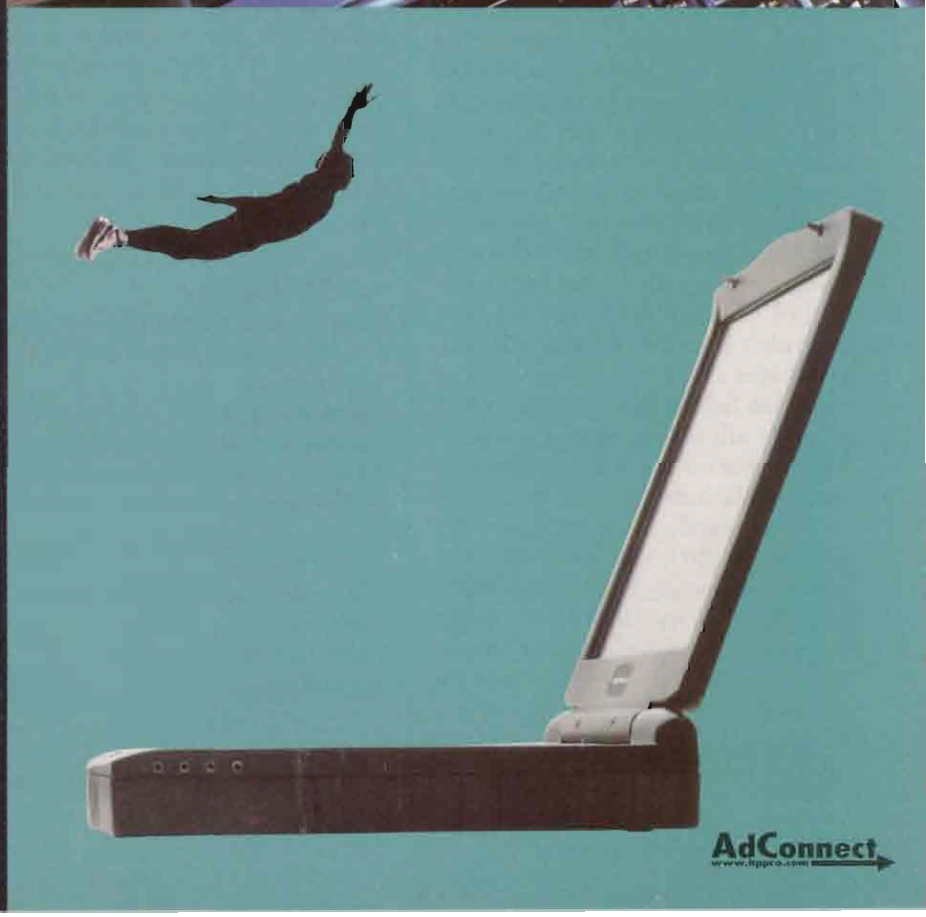

Ryan Maley

Millennium Malaise

Unlike the end of most decades, 1999 has a special meaning for IT professionals. It's payback time.

Payback for the very clever decision that was made many years ago. Sometimes, when it's very quiet and only the fan of your computer is making noise, you can almost hear those fateful words: "Of course, we'll be rewriting the entire thing long before that's a problem. Go ahead and just reserve two spaces for the year field."

DOES ANYBODY KNOW WHAT TIME IT IS?

If you don't know about the Millennium Bug by now, you just haven't been paying attention. The problem was first popularized in 1993 in an article by consultant Peter de Jager. Back in the bad old days when storage was very expensive, it became common practice to record the year portion of dates with only two digits. The logic was simple: the software's going to be updated long before the turn of the century. By the time the software's updated, storage will be a lot cheaper and the two extra digits in every date field to store the century will be easily affordable. Storage got a lot cheaper, but no one ever got around to updating the software.

What exactly is the problem? On January 1, 2000, your computer may believe it is January 1, 1900, *because it only has 00 to record the year.* When it calculates the age of someone born in 1930, it will say 00 - 30 = -30. Since -30 is less than 65, that person doesn't qualify for Social Security and will not get their January 2000 check.

It's widely believed that the computer systems most affected by the Millennium Bug are the so-called "legacy systems." However, PCs may present a huge problem at the end of the century as well. There are four parts to the PC Millennium problem: the real time clock (RTC), the BIOS (Basic Input Output System), the operating system and application software.

The RTC is a clock. It keeps track of elapsed time on your computer. The BIOS is firmware embedded on a chip attached to the motherboard of the computer. The BIOS provides certain basic information to the rest of the computer. Information such as the number and geometry of hard drives, what devices to boot from and the date.

The BIOS simply stores the date and time at any given moment and uses the RTC to record time passing. The operating system gets the date and time from the BIOS when it starts and uses the RTC to track time as it's running. Software applications get the time from the operating system as needed (although some query the BIOS directly). Applications perform elapsed time calculations, such as the age calculation in the example above.

All these parts have to work correctly before a system can handle the Millennium bug correctly. The RTC must be able to change from 1999 to 2000 without a problem. The BIOS must store the years above 2000 correctly after a machine is rebooted. The operating system must be able to store correct dates for the application to retrieve. The applications must have enough storage space to work with four digit years and make calculations accordingly.

The RTC and the BIOS are the hardware portions of the problem. Most testing software available for

BIOS UPGRADES

The two most popular BIOS are Award and AMI. However, many OEMS have licenses to modify the BIOS software provided by the companies. Check with your PC manufacturer for upgrades.

According to Award Software (www.award.com), BIOSs dated after May 1, 1995 are compliant. American Megatrends, Inc. (www.ami.com), claims that BIOSs dated after July 15, 1995 are compliant. Unicore (www.unicore.com) is a third party supplier of BIOS upgrades for a variety of systems. Check with them directly.

WEB RESOURCES

Peter de Jager's Year 2000 Site	www.year2000.com
Microsoft's Year 2000 Page	www.microsoft.com/ithome/topics/year2k
Microsoft Knowledge Base	www.microsoft.com/kb/default.asp
Test 2000 Software	www.rightime.com
Year 2000 Legal Issues	www.y2k.com

Year 2000 compliance works by testing these two components. By far the most important problem is the BIOS. The BIOS must be able to record the date correctly. Some BIOSs artificially adjust dates that are considered "out of bounds."

For instance, many older BIOSs will not permit a date below January 1, 1980. If such a date is entered, the BIOS automatically adjusts the year to 1984, when the first IBM PCs appeared. (If a PC wasn't around before 1984, the correct date can't possibly be 1970.) Even BIOSs created in the 1990's exhibit similar behavior, adjusting the date to conform to the earliest manufacturing date. Machines with BIOSs that adjust dates arbitrarily will not be Year 2000 compliant.

The RTC is much less important. PC RTCs are notoriously inaccurate and the fact that many can't transition from 1999 to 2000 is usually irrelevant. After all, the RTC doesn't serve the date to the operating system, the BIOS does. The RTC really only provides elapsed time. Once the BIOS correctly records a post 2000 date, your PC hardware will be all right.

Most current versions of Microsoft operating systems and applications are Year 2000 compliant. Emphasis is on *current versions.* Many people are not using the current versions and some software, notably Access 95 and Visual Basic 3.0, have problems. Known problems with particular versions are documented in the Microsoft Knowledge base. Search the base for your particular version to get the latest information.

There are many software products to perform Year 2000 tests. One particularly good (and free) software is Test 2000 from RighTime. It focuses its testing on your BIOS. Some packages try to test the RTC and the operating system. These often lead to results that cloud the most basic hardware issue: will the BIOS work correctly after 2000?

Test 2000 has a straightforward batch installation program, works quickly and is easily removed from a system once installed. If you're testing a lot of systems, these are important features. There are several other freeware packages available, including some offered by PC manufacturers, as well as a variety of commercial solutions.

The Millennium Bug is an enormous pain. All the time spent correcting the problem is time not spent deploying new systems and applications or learning new technologies. Additionally, there are innumerable lawyers ready to sue on behalf of anybody they can find once the full extent of the problem emerges. In fact, Symantec is already being sued by users of Norton Anti-Virus who claim they are being forced to pay for upgrades to correct "defective computer software" that doesn't handle the Millennium.

-Ryan Maley is a Microsoft Certified Systems Engineer and the information systems manager for a mid-western manufacturing company. He can be reached at ryan@maley.org.

Strategic Information Access

It's Not Just A Filing Cabinet Anymore

Frank Farese,
Vice President, Reseller Channels,
EMC Corp.

It's no surprise that today's most forward-looking businesses run at the speed of their information. While it sounds like a cliche, no one will deny that access to timely information is a powerful asset that can fuel new products, boost revenues, build competitive advantage and enhance customer service. Information that can't be accessed quickly, in this day and age, can rapidly bring a business to the brink of ruin.

A survey conducted last summer by the research firm Find/SVP, on behalf of EMC Corp., took a look at how prepared IS executives believed they are to provide corporate information to those who need it. More than eight out of every ten reported that management has directed them to make information from a variety of different systems rapidly available to those who need it, when they need it — regardless of what type of system they're using.

DON'T FALL INTO THIS GAP

More than three quarters reported being concerned or extremely concerned with their ability to meet that goal and close this "information gap." For example, users running an HP-based data warehouse may need to quickly and easily extract transactional information from their DB2 database running on a mainframe.

An initial step in closing the gap and a way to drive better business results is through consolidation. More than nine out of ten of the companies questioned are now consolidating their information to improve management and data protection. IS managers, in increasing numbers, are acknowledging the wasted resources, expense and negative business impact of managing fragmented information across multiple environments, without a common management framework for the entire organization.

To realize an organizational vision of enterprise information, IS departments are rejecting the traditional role of storage as an isolated CPU add-on or peripheral, which illustrates the growing demand to place higher emphasis on information access. As such, managers and systems administrators today require storage that acts as a strategic element of their IT infrastructure, not only bridging the gaps between disparate platforms, so they can use their information in powerful new ways, but also providing a robust environment to support newer, high-speed database and decision support applications.

Enterprise storage allows companies to manage, protect, and access information, as well as to plan for the enormous growth in the amount of information that was dispersed on multiple servers and

mainframes throughout their organization. As a result, enterprise storage is a fundamental technology enabler, as fundamental as software applications, operating systems, networks and servers.

IS departments are rejecting the role of storage as an isolated CPU add-on or peripheral.

No longer is storage incidental to the server sale. Instead, storage is now a *shared, consolidated repository for business information* to which various computer systems connect. No platform is too small, because enterprise storage turns it into a distinct client able to harness all the information in an enterprise.

ON BOARD THE ENTERPRISE

By taking an enterprise approach, IS managers are able to better leverage their information, instead of just managing dispersed technology. From a cost-of-ownership perspective, enterprise storage is attractive because it is reusable and it is not platform-specific. As preferred operating environments continue to change and information volumes explode, the "cascadability" associated with enterprise storage ensures that information can continue to be used.

For example, many companies today are using enterprise storage as the platform for testing and coding Year 2000 applications. They will be able to leverage this storage investment by utilizing the same system for other business critical applications in the future. By centralizing storage and taking advantage of a common set of management, protection and information-sharing capabilities, IS managers no longer have to deal with isolated islands of information scattered throughout their organizations.

Users, for instance, can implement one set of standard corporate backup policies for critical servers and large databases. Central control makes this task easier and more cost-effective to implement. Storage is no longer considered the peripheral that adds to the challenge and complexity of each IS mission. Instead, it can fundamentally change the way companies turn information into a competitive advantage.

Information is today's strategic tool for success. Enterprise storage allows organizations to deliver on new applications and business requirements sooner than before. Through timely information access, applications scale easier, implementation risk is reduced, and development times are slashed.

TRANSACTION REACTIONS

Information is a universal business asset. Investments in storage technology today are revenue-generating assets. Companies are discovering as much value in the information about transactions — such as demographic information — as exists in the transactions themselves. As transaction-based systems are coupled with data warehouses and decision support systems, companies can quickly and easily extract new value from their existing information.

Timely, accurate and complete information means that decisions can be made faster, providing companies with a competitive advantage and a faster time-to-market. Organizations can harness their growing volumes of information and deliver it to those who need it, when they need it, and close that information gap.

Frank Farese, vice president, reseller channels, EMC Corp. is responsible for all aspects of EMC's strategic relationships with several of the world's largest computer companies that offer EMC Enterprise Storage systems with their server platforms.

Jukebox Satellite Nights

HP Optical Jukebox Reaches For The Sky

Richard Game
Vice President, Sales and Marketing
KOM, Inc.

Lockheed Martin (Bethesda, Md.), is a $28 billion, highly-diversified global enterprise whose core businesses span space and telecommunications, electronics, information and services, aeronautics, energy and systems integration. In January, 1997, Lockheed Martin's Astro Space division launched their first of 20 satellites to replace the existing Block IIA satellites in the Global Positioning System (GPS) network for the U.S. Air Force.

Unfortunately, the Delta rocket booster upon which the satellites were riding malfunctioned. In less than a minute, the first GPS IIR satellite was "on the beach." That was the problem facing Todd Goodermuth, the Operational Support System (OSS) project manager for Lockheed Martin.

WHERE ARE YOU?

OSS monitors satellite performance in real time during launches and on orbit operations from a series of workstations. OSS was developed by Lockheed Martin with system requirements from Aerospace Corporation (El Segundo, Calif.). Used in both civilian and military applications, the satellites enable anyone with a small and inexpensive ground receiver to know exactly where they are with amazing accuracy.

It was Goodermuth's job to build a system that could support the telemetry from the 20 satellites that make up the Global Positioning System that is such a vital part of our global transportation system. The current generation of GPS IIA Satellites is rapidly aging in orbit and will be replaced with a new generation, the GPS IIR series. Lockheed has committed to support the GPS IIR until 2006, at which point Boeing will take over with a newer generation (Block IIF) of satellites that are currently on the drawing board.

For the factory team in Valley Forge, Pa. as well as the support team in Colorado Springs, Colo., the "beached" satellites was a heartbreaking moment. The manufacturing facility in Valley Forge is an impressive site, capable of handling four to six satellites in production at any one time. The finished vehicles are loaded into a C-130 cargo plane and flown to the Kennedy Space Center in Florida for launch.

WELL-GROUNDED

The telemetry data from the satellites beams down to ground-stations and then into the OSS via fiber optic lines. OSS's central data storage facility consists of a network of Sun workstations at Falcon Airforce Base and at Lockheed Martin's facilities in Valley Forge. The down-link is capable of handling 4KB per second sustained transfer with each of the vehicles online for potentially 2 hours in 20 to 30 minute bursts.

The challenge was to capture, manage and store this data in a secure manner so that it could be distributed to various workstations for real time data monitoring or analysis. Optical was chosen as the media of choice to store the on-line data for its economy, quick access time and long, secure archive life.

Criteria for the selection of software to manage and archive data on the jukebox was defined as:

- **WORM support for permanent record**
- **Use of a non-proprietary file system so that data could be widely viewed across a diverse network**
- **Seamless and transparent to the operating system and the OSS/database application**
- **First rate 24 x 7 software support**
- **Scalable for growth path as database grows**

HP's optical jukebox provided Lockheed Martin with the comfort level — dependable equipment (no downtime allowed) and first rate 7x24 on-site support — they required. With optical as the chosen technology, the system was configured to use an HP600FX optical jukebox (600GB capacity) with 12 drives and 238 shelves. Telemetry data was to be stored permanently on a 2.6GB platter.

The jukebox was connected to a Sun SPARC 1000 running Solaris 2.5 on a Sun based T1 network with a mix of Sun OS and Solaris operating systems. KOM's OptiServer software was used to manage the storage of data onto the jukebox. A Metrica database was used to track and sort data as part of the OSS application Lockheed had developed.

ONLINE AT ALL TIMES

KOM's OptiServer software, "provided us with a solution that allowed us to adapt to new hardware," says Todd Goodermuth. And "the HP jukeboxes are well suited to the demands of our application." Lockheed also runs an HP40FX, a 16-shelf "baby box" for testing purposes that allowed them to keep the HP600FX online at all times in a production environment. The HP40FX allows Lockheed to test new applications without the risk of having to take up to 600GB of data off line.

OSS represented a significant advancement in data storage and display systems when compared to previous telemetry logging systems. The OSS contribution to the GPS program was acknowledged by the American Institute of Aeronautics and Astronautics, which presented its 1997 Space Systems Award to Lockheed Martin. The successful installation demonstrates that optical storage systems can be integrated with database applications to provide a very secure, fast, yet economical solution. It's estimated that OSS will save $1.3 million in travel costs alone over the life of the Block IIR program for the Aerospace Corp. launch support team.

The importance of planning and the support of the software vendor is critical to the successful implementation of a multi-vehicle satellite telemetry system which utilizes a widely distributed computer network for the flow and transfer of telemetry data.


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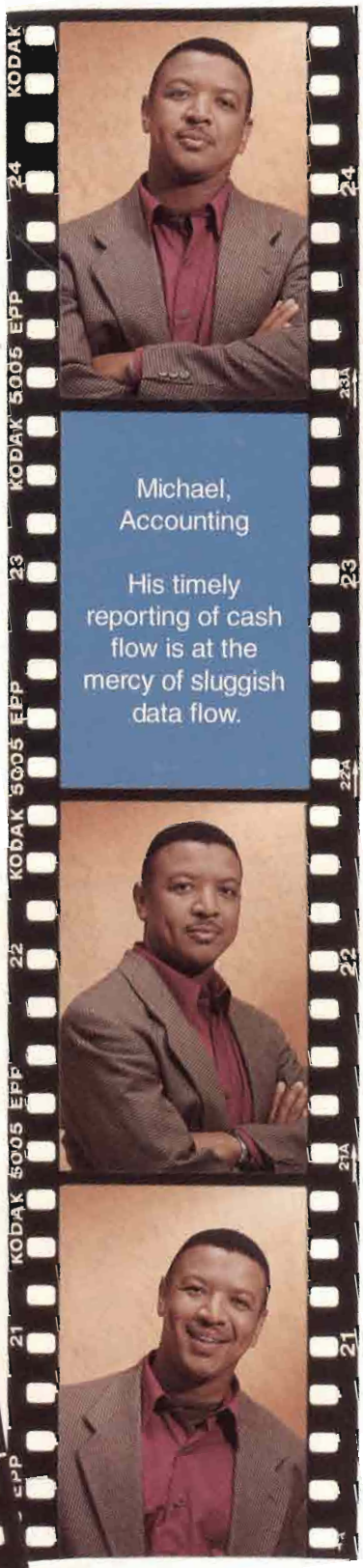
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Tape IT To The Limit

Going To Extremes With DDA

Lee H. Elizer
Vice President of Marketing
Breece Hill Technologies

An oft repeated question about the tape library industry is what is the killer application for automated data libraries? Where is the singular function that by itself justifies the investment in tape library hardware? The industry has struggled with this issue as various potential killer apps have come into prominence — Hierarchical Storage Management (HSM), then data mining and data warehousing.

But it's more likely that the makers of tape library hardware and software are on the verge of creating a "killer environment" called Desktop Data Access (DDA). Although not an application in and of itself, DDA is an environment that encompasses a collection of applications and technologies — the way applications like word processing, spreadsheets, database and e-mail produced an office productivity environment — designed to meet the needs of executives who sit at their desktop computer and access all of the information in the corporation (much of which is stored online with an automated data library, or ADL).

DIVIDE AND DISTRIBUTE

The current trend in network storage is distributed storage throughout the enterprise with some level of centralized management of data. While this model addresses the creation and management of information, it fails to consider the value of making that vast amount of information stored in the tape library available to all users throughout the corporate enterprise.

A successful DDA environment requires the appropriate hardware — essentially the automated data library — and software applications to have the intelligence, reliability and performance to meet the needs of data to the desktop on demand.

The first generation of tape automation was classified as loaders and stackers. Second generation libraries were designed to operate as standalone departmental devices, dedicated to a single server without regard to making the information available to the enterprise.

The hardware demand for a DDA environment requires third-generation tape libraries and software based on the principal that greater access to information leads to better, clearer business decisions by managers and other knowledge workers. This paradigm, in turn, is what is driving the robust growth of the tape and tape library peripherals business which stores huge amounts of data online. This goal fits well with one of the objectives of using an automated data library by taking advantage of the massive storage capacity to make all corporate data available online.

The current class of third generation automated libraries is characterized by its ability to attach to multiple host-servers; high availability designs; support for high-speed connectivity such as fibre channel to deliver information to multiple targets in a timely manner; and software application suites that

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have the requisite intelligence to manage the multiple access requests coming from servers and workstations scattered throughout the enterprise.

TRAFFIC MANAGEMENT

Network complexity issues demand some type of traffic management functionality within the software that controls the library. In cases of multiple hosts connected to a single library, the software must be intelligent enough to manage, prioritize and queue multiple file access requests. However, most third generation applications were developed with the model of a tape library attached to and servicing a single server, which adequately managed file requests from that server.

The storage software industry has recognized these new requirements, and current releases are beginning to be fully capable of supporting multiple hosts and other advanced architectures. In many cases the software simply allows one host to act as the master robotics processor for the library. Any subsequent requests for file access are routed through that server, which continues to control library access and robotic functions until its operations are completed and it relinquishes the SCSI bus. But this singular robotics control will change as automated intelligence expands, allowing independent hosts to control the robotics.

A critical aspect of DDA is for the tape library to provide continuous access to information on a 24x7 basis. This non-stop access to information is designated as Assured Data Availability (ADA) in the DDA environment. The need for this high level of library and data availability is a byproduct of the changing applications environment for ADLs.

Instead of just backup, ADLs are now the sole repository for active data. Using technology such as HSM, the files have been removed from server disk storage and relocated to more cost effective tape storage. As a result, the availability demands for the tape library are no different than for the main server disk. If the library goes down, critical business data becomes unavailable, directly impacting the business operations.

ARCHITECTURAL OPTIONS

Several architectural options are available to create a tape library design that will provide Assured Data Availability. A fully fault-tolerant design with redundant hardware and failover software is certainly capable of meeting these requirements, but at a generally unacceptable price. The most cost-effective method is designing a library installation that offers "graceful degradation." This design allows two libraries to operate independently, enabling users to take full advantage of the performance and storage capacity of each unit, rather than using the mirrored storage of a fault-tolerant model. If a component such as a drive or robot in one of the units fails, then all data is still available through the second library via cartridge pass through technology. Hot swap capability is another key to meeting these new reliability demands.

Hot swap is a necessary feature for both new generation library hardware and software. On the hardware side, hot swap functionality allows the failed component to be isolated and taken offline while all other library components and functions continue unimpeded. Similarly, applications must be intelligent enough to understand that a single failed drive in a multi-drive library is not a reason to shut down the library or re-boot the server.

While the search for the killer applications for tape libraries continues, the industry would do well to examine the Desktop Data Access opportunity to drive demand for ADLs. With the proper combination of intelligent tape library hardware and the evolution of advanced software applications, it is easy to project Desktop Data Access as the standard for a new generation of storage access and automation solutions.

new Products

For complete vendor contact information, go to ProductConnect www.hppro.com on the HP Professional Web site.

APPLICATIONS DEVELOPMENT

DB-HTML Converter 1.0 For Windows 95 And NT

DB-HTML Converter Pro is a tool that generates Web pages and HTML reports from all major databases. Computer users with basic HTML and database knowledge can create pages within several minutes. The program provides flexible database maintenance and HTML formatting functions that can satisfy advanced computer users. With just a few clicks of your mouse you can create HTML reports and web pages in plain or tabular form, one-page reports or grouped reports split into separate web pages. A powerful set of HTML formatting functions let you easily create quality, professionally looking documents, web pages, inventory reports with color, graphics, hyperlinks and different fonts. If you already have Web documents DB-HTML Converter PRO can use them as templates.

Designed to work on Windows 95 and NT platforms and with almost all major database formats: dBASE, Paradox, Fox Pro, MS Access, DB2, Informix, InterBase, MS SQL, Oracle, Sybase, DB-HTML Converter PRO lets you load data file from your desktop or network. DB-HTML Converter PRO 1.0 for Windows 95, NT costs $103 for a single-user license. Network and site licenses are available.

➤Contact PrimaSoft PC Inc., Surrey, BC, CAN at (800) 371-7520

TopSpeed Ships Clarion 4

A completely automated programming environment, Clarion 4 generates pre-tested code that is automatically created from the two-way templates and wizards. Its data-centric environment includes a comprehensive and versatile set of objects that provide reusable services for accessing, processing, reporting, and displaying data.

Clarion 4 brings with it a new database application framework, the Application Builder Class templates, which generate object-oriented code that is small, fast, and efficient. The Clarion 4 Application Builder Class templates generate everything from a single line of code, to full procedures, to complete applications. The generated code takes full advantage of the Application Builder Classes. Additionally, the Application Builder Classes feature super-efficient browse code, centralized error-handling, basic edit-in-place support, an intelligent interface, intelligent designation of virtual methods, and much more.

Clarion 4 retails for $499 and is available immediately.

➤Contact TopSpeed Corporation, Pompano Beach, FL at 800-354-5444

DATA WAREHOUSING

IBM Bundles Cognos' Impromptu And Powerplay

Cognos has announced that IBM will bundle business intelligence tools from Cognos into IBM's Visual Warehouse family to create a complete data warehouse and datamart solution. Cognos will immediately begin collaborating with IBM on additional extensive marketing and sales initiatives. Cognos also announced technical support for IBM's new DB2 OLAP Server.

Under the agreement, IBM will bundle Cognos Impromptu, for enterprise reporting, and Cognos PowerPlay, for online analytical processing (OLAP), with special editions of IBM Visual Warehouse. This will allow IBM to deliver an end-to-end solution for data warehouses, enhanced with powerful business intelligence. The bundle delivers a single solution to create and manage datamarts and data warehouses, and provide effective access to and analysis of the information stored within them for enterprises of any size. Customers who use this package as a starting point for a more widely-deployed business intelligence application will also benefit from access to a complete range of products and services from Cognos.

➤Contact Cognos Corporation, Burlington, at 800-426-4667

DESKTOPS AND SERVERS

WinBook XL Now With 233MHz K6

WinBook Corporation announced the release of a new WinBook XL that features the 233 MHz AMD-K6 MMX mobile processor. It features a 12.1 inch SVGA (800x600) active-matrix color screen, 16MB of EDO RAM (expandable to 128 MB), 2 GB hard drive, integrated 16-bit stereo audio and 20X maximum CD-ROM. Using an "All-in-One" design, it incorporates both the CD-ROM and floppy drive in the unit at once.

The WinBook XL K6 233 MMX has a 84-key Windows95 keyboard that provides full-sized 19 mm keys and 3 mm of up-and-down keyboard travel. It comes equipped with a pointing stick embedded in the keyboard and touchpad in the palm-rest. Both can be used simultaneously. Also included are 2 MB video RAM, zoomed video support, software MPEG support, NTSC video-out capability, and Soundblaster 16-bit stereo audio with built-in speakers. The list price is $1,999.

➤Contact WinBook Corporation, Hilliard, OH at (800) 468-2162

DISASTER RECOVERY AND SECURITY

SafenSigned Makes Software Distributed Over The Net Safe And Sound

SecuriSys Corporation has released a new version of SafenSigned (v1.2) that makes software and other digital content distributed over the Internet safe and sound. SafenSigned consists of two programs, the SafenSigned File Signer and the SafenSigned Verifier. The author of the digital content uses the File Signer to digitally sign any file distributed over the Internet. The recipients of the signed file use the Verifier to verify the digital signature. A successful verification of the digital signature ensures that the file is truly from the author and has not been modi-

fied in the distribution channel, either by accident or by malicious attempt.

SafenSigned uses a 1024 bit Rabin public key digital signature to protect signed files. The Rabin algorithm is as secure as RSA algorithm but has an extremely fast signature verification part. This makes the Rabin algorithm an ideal choice for signing digital contents to be distributed over the Internet, because the file is signed only once by the author but will be verified many times by the users.

The programs are designed for Windows 95 and Window-NT 4.0. The price for the File Signer is $35/copy, and the Verifier is $15/copy. The optional confirmation of the signature ID entry in the ID Server, including the digital certificate, is $25 for a two year period.

➤Contact SecuriSys Corporation, El Monte, CA at (626)-448-4273

E-COMMERCE

Frontier Technologies Announces New e-Lock Secure Electronic Forms And Internet-Based Electronic Transactions

Frontier Technologies announced e-Lock's new form signing capability which provides e-commerce developers, integrators, and consultants the ability to allow customers to digitally sign HTML designed forms, providing enhanced security for electronic commerce applications through persistent proof that a user has authorized a digital transaction. Further, e-Lock new form signing capability electronically delivers users digitally signed receipts from the web server for proof that the transaction was processed.

e-Lock works with Microsoft CryptoAPI and a number of Cryptographic Service Providers for software, Smartcard, and high speed hardware based cryptography. e-Lock controls are also integrated with the PKI capabilities of e-Lock Desktop. The e-Lock Desktop PKI uses the PKIX protocol for key and certificate management and certificate revocation checking with a PKIX supported Certificate Authority like e-Lock Director.

Pricing for the e-Lock Desktop is $249 and for the e-Lock Director is $1000.

➤Contact Frontier Technologies Corporation, Oro Valley, AZ at 520-797-0583

MESSAGING AND E-MAIL

New VSI-FAX For Lotus Notes

V-Systems, Inc. has announced VSI-FAX for Notes, an enterprise-wide fax solution that allows users and fax systems administrators to remain in their native world of Lotus Notes. Rather than being a fax gateway, VSI-FAX is integrated into the Notes environment.

Using the Notes client, users can send, receive and view faxes. They can also check on the status of sent faxes, retry or cancel failed faxes and view historical listings of previously sent faxes using the Notes database. Single seat administration can be performed on VSI-FAX for Notes servers regardless of their location.

VSI-FAX includes Load Balancing and Least Cost Routing and uses the same secure facilities of Notes to route faxes to their ultimate location. It is priced at $7,500 per server.

➤Contact V-Systems, Inc., San Juan Capistrano, CA at (714) 489-8778

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MULTIMEDIA

Sceptre Technologies Announces Dragon Eye Monitors

Sceptre Technologies, Inc., manufacturers of monitors and Pentium notebook computers announces the general availability of its new "Dragon Eye" series of high-resolution monitors.

Features of the Dragon Eye Series include: High refresh rate for more stable picture and no flicker Multi-step dynamic focus (MSDF) in the D97A allows sharper, crisper pictures at all points on the screen; Advanced Response Rotational Control (ARRC); two easy-to-use knobs, one for selecting the function and the other for the actual adjustment provide much finer adjustments than pushing buttons or cycling through a menu of choices; Ultra high resolution - In the D97A, 1600 x 1200 screen with oval apertures in the grill allows a vertical and horizontal dot pitch that produces a high level of sharpness; Screens with a larger viewing area than any competing monitors; 100% Full Run Adjustment.

➤Contact Sceptre Technologies, City of Industry, CA at (626) 369-3698

NETWORK INTEGRATION

Rhino Software Releases FTP Voyager Version 5.0

Rhino Software, Inc. today announced general availability of version 5.0.2.1 of FTP Voyager, a client program that makes FTP much easier to use on Windows 95 and NT systems. The program is modeled after the Windows Explorer graphical interface, making it easy to learn and efficient to use.

The graphical interface of the program makes it unnecessary to remember the FTP command set, and has many features that take it beyond the capabilities of command line FTP: drag and drop transfer in and out of the desktop and Windows Explorer; graphical navigation of remote sites; graphical hierarchical site manager for managing connections; transfer of directories and directory structures; context sensitive help; single step installation program; threaded file transfer for multiple simultaneous file operations; on-line file editing; folder Synchronization for one-step remote folder maintenance (web site maintenance); folder short cuts; S/Key password encryption support; automatic resume of broken file transfers; on-line credit card registration directly from the program

Single copies of FTP Voyager are $29.95, quantity discounts and site licenses are available. Distribution is exclusively through the Internet and on-line purchase is available directly in the program.

➤Contact Rhino Software, Inc., Helenville WI, at (414) 593-2751

SERVICES AND SUPPORT

WRQ's Updated Maintenance Plan

WRQ, Inc. has upgraded their Maintenance Plan to include toll-free access to their Guide Services technical support team, priority support vouchers which allow customers the option of placing a priority response on an initial call on a new case that guarantees a two hour response time, subscription to WRQ's TechRef CD-ROM for a complete library of technical notes and discounts on WRQ's training services.

➤Contact WRQ, Inc., Seattle WA at (800) 872-2829

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Expand Your Virtual Horizons

Join the Internet fraternity

The Internet holds many mysteries. It also holds an extensive library of training sites that can help turn those mysteries into useful tools for personal and professional betterment.

Many industry analysts agree that the future of business is over the Internet. To better understand and make use of the potential of the e-beast, this month HP Professional *looks at Internet sites that use the Internet to teach how to use the Internet. Got it?*

One problem though, you've got to know how to use the Internet to start.

Save your wrists! Go to HP Professional's Web Edition for these links.

The University of Massachusetts Dartmouth may be the only site you need to further your virtual education. They offer a variety of non-credit classes with titles like *Advanced WebCraft Workshop, Beyond HTML, Marketing on the Internet* and *Preparing Images for the Web.* Of course, with cybered, it's a little hard to enjoy the whole university experience. Try wearing cutoffs and a football jersey and listen to Pearl Jam CDs while working online.

GET A HIGHER VIRTUAL EDUCATION AT WWW.UMASSD.EDU/CYBERED/DISTLEARNINGHOME.HTML.

If you want to use the Internet to become a virtual marketer, try the online classes at Nevada-based Global Marketing Group. No subtlety here, one of their offerings is titled *Making Money On The Internet.* It must work. Apparently, they've figured out how to do that already.

TRY GOING TO NEVADA AND GAMBLE ON BUILDING AN ONLINE BUSINESS AT WWW.GMG-NV.COM.

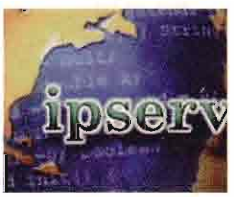
If Internet and networking support is more your style, but you're not sure how to get started, try the menu of classes at Aris Corporation's online school. They offer everything from basic classes like *Networking Essentials* and *Supporting Windows 95* to more advanced *Internetworking TCP/IP* and *Internet Information Server Administration.*

IF YOU'RE A LITTLE MASOCHISTIC AND YOU WANT TO GIVE NETWORKING SUPPORT A TRY, GO TO ONLINE.ARISCORP.COM

ARIS

Though technically not a training site, this is an excellent reference source for informational articles on topics as diverse as the Internet, intranets, Java, programming in Visual C++ and object-oriented programming. It even includes a link to the Smoky Hill High School Internet Club. How could you go wrong?

A HODGE-PODGE OF GOOD ARTICLES AND FACTOIDS ABOUT THE 'NET AND RELATED PROGRAMMING SKILLS AT WWW.IPSERVE.COM/SCHOOL/PUBLIC.



Now that you've developed all the necessary skills to be an Internet icon, you've got to get connected. This site claims to be able to tell you how to pick the ISP that's right for you.

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WRQ Express Software Management Journal

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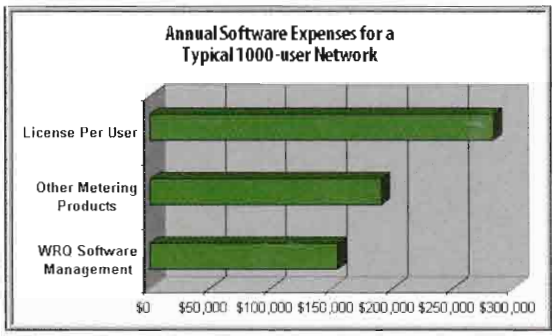

WRQ Express Software Management Tools help administrators minimize software expenses. The above chart illustrates potential annual savings on a 1,000-user network.

SOFTWARE LICENSING DECISIONS

Choosing the Right Software License Type

Deciding which kind of software license to purchase is no easy task. Is a site license always your best choice? Or should you purchase fewer licenses on a per-copy basis? And what about concurrent-use licensing? Is it worth the added expense?

For most IT professionals, the first step in sorting out license issues is understanding software usage patterns—how applications are used in your enterprise, and how important each application is to productivity and the bottom line.

For example, when negotiating a site license, showing the software vendor that only 80% of users ever access their application and only 50% access it with any regularity can give you an important advantage in determining a price.

But how do you find this vital usage information? You probably don't have the time or resources to manually survey each user's software usage profile. And the data from such a survey could vastly change from one week to the next. That's why WRQ developed a new class of software tools to help IT managers uncover usage patterns and make more informed business decisions.

Tracking usage often reveals surprises. An application may be far less widely used than assumed. In this case, there might be pockets of users for whom per-copy licenses can be purchased, presenting a more economical option than an expensive site license.

And many applications are still licensed for concurrent use, often at a higher cost per license. Gaining an understanding of when, how, and by which users the application is required gives you the data you need to decide whether a concurrent use license makes sense.

WRQ Express Meter®

WRQ Express Meter is a software management tool that monitors all software usage on a network. It captures every launch, regardless of whether it is from a server or local workstation. This allows for a clear picture of usage throughout an organization, so IT professionals can purchase and upgrade software licenses as economically as possible.

Widespread usage of an application may indicate the need to purchase a site license. To negotiate the best price, IT managers can present Express Meter's Peak Usage Report to the vendor. Some organizations using this technique have been able to obtain custom license agreements at a substantial savings. Often, these organizations agree to provide vendors with updated Express Meter reports quarterly, and adjust their licensing fees if the number of users changes.

When an application is used only in scattered pockets of the company, Express Meter makes it possible to restrict usage to those specific groups. This opens up the option of buying per-copy licenses and assigning them to the users who actually use and need the application.

WRQ Express Software Management Tools simplify IT decisions with clear information about software in use across the enterprise. With a focus on the financial and strategic success of IT, Express Tools ensure license compliance, reduce costs, and increase control over software and related IT resources.

And to reduce costs—up to 80%—when purchasing concurrent-use licenses, Express Meter includes a variety of pioneering optimization techniques. Dynamic allocation, waiting lists, license reclamation and other technologies provide IT professionals with the flexibility to decide exactly how to best manage concurrent-use licenses. Then they can create a balance between productivity and user access.

WRQ Express Meter Audit Kit

The WRQ Express Meter Audit Kit is based on the same technology as WRQ Express Meter. It provides a snapshot of usage—and 32 actionable reports—to give IT managers a starting point in building a software management strategy. Auditing software usage with an Express Meter Audit Kit is an excellent first step in determining the best license types for an organization.

The Express Meter Audit Kit is available free of charge to qualified IT professionals. You can request yours by calling 1-888-233-6262 and mentioning customer priority code EXPHP. You can also order or download your copy from the web at www.wrq.com/exphp.

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