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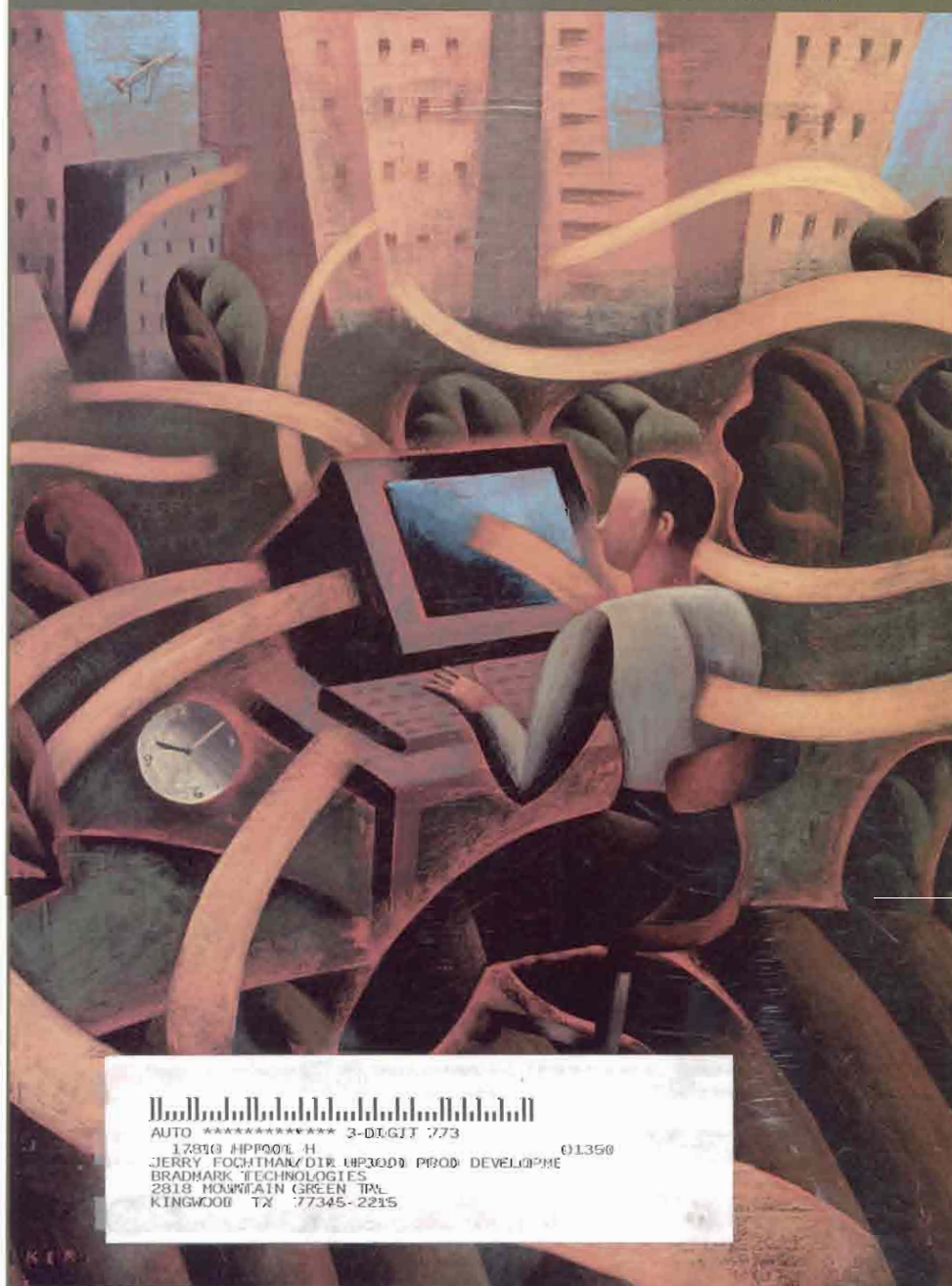
AUGUST 2000

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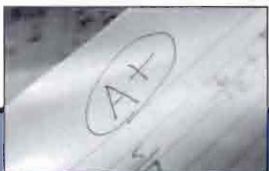
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**HP ProFile**  
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# HP Professional

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As the Internet and e-commerce transform business models, users have been looking to ERP vendors to Internet-enable their back-end applications. Although vendors have still not wholly succeeded in linking their software to Web applications, there has been progress. Products are maturing to embrace supply chain management and link to front office applications, and new partnerships are forming as major vendors collaborate to fuel the evolution revolution. *By Jean Nattkemper*

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## PRINTING

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Cover Illustration by Curtis Parker

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## HP ProFile: Azzarello Brings OpenView into Focus

If there were any doubts about the importance HP is placing on its OpenView enterprise management suite, HP CEO and President Carly Fiorina erased them in her keynote at the OpenView Forum, held in Orlando, Florida, in June. OpenView, Fiorina said, is "the rock that we're building our software strategy and services on." No wonder. Fiorina pointed out that if OpenView were an independent company, it would be among the world's 20 largest software businesses.

Fiorina's keynote followed a flurry of announcements from HP, which used the Forum to showcase enhancements to OpenView and reveal future plans.

For the enterprise, HP announced that VantagePoint Operations 6.0 provides the same functionality for Sun Solaris as it does for UNIX and Windows platforms. HP also unveiled a Transaction Management Quartet for VantagePoint. The so-called quartet is a common repository and set of integrated reports, combining actual end user transaction information from the VantagePoint Web Transaction Observer, simulated transactions at the edge of the enterprise from VantagePoint Internet Services, simulated transactions from the major backbone providers through an integration with Keynote Perspective and IT infrastructure management data supplied by VantagePoint Operations and Performance. Also unveiled was a SMART Plug-In Gallery, actually an online environment for users to distribute free management software for e-business applications and infrastructures, like Ariba, i2 Technologies, Portal and Vitria.

HP, which touted "closed-loop" service management throughout the Forum, unveiled VantagePoint SAP Business Transaction Observer. The product for SAP gives IT information on the impact of SAP transactions on volume and usage patterns at the application layer.

HP's OpenView offering for the mid-tier has been enhanced to provide Internet Information Service (IIS) monitoring, realtime alert notifications and reports that correlate line-of-business data with IT infrastructure. OpenView Express 2.0 provides for firewall security by transmitting alarms and data through the Internet traffic firewall.

HP also has beefed up its support for Windows 2000 in Express by providing additional management rules for Win 2000 and full data protection for the Active Directory Service database structure and new NTFS 5.0 enhancements. A new alliance with FastLane Technologies is allowing HP to offer Windows NT to Windows 2000 migration services.

HP is also partnering with Dirig Software to extend Express Web server management to Linux and Apache. An alliance with Keynote Systems will allow companies using Express to manage Web server performance using internal IT metric and external performance metrics.

Following up on all this news, *HP Professional* sat down for an exclusive interview with Patty Azzarello, the General Manager of the OpenView Software Business Unit. Appointed to her position about five weeks before the Forum took place, Azzarello brings software savvy to her new post, having worked for a number of well-known software companies before joining HP about five years ago. Azzarello sees OpenView, not only as the driver of HP's software strategy, but as crucial in establishing HP's presence as an e-company.

*Jean Nattkemper*

jnattkemper@hpro.com

**HP PRO:** How did your last position as general manager of HP's E-Solutions business prepare you for this new role as head of OpenView?

**AZZARELLO:** Well, I've been in the software business for my whole career, except for two years that I spent in the workstation business ... And, I think I still bring a very good perspective of what goes on outside HP, in terms of the experiences I had in software companies prior to joining HP. And, that's a

See **HP ProFile: Azzarello** on page 8



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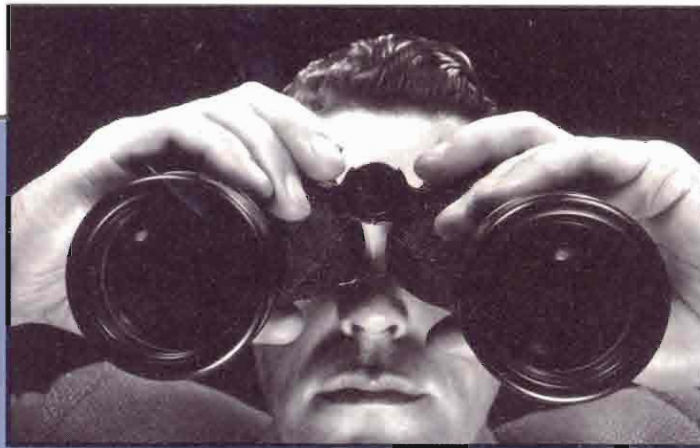
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HP OPENVIEW

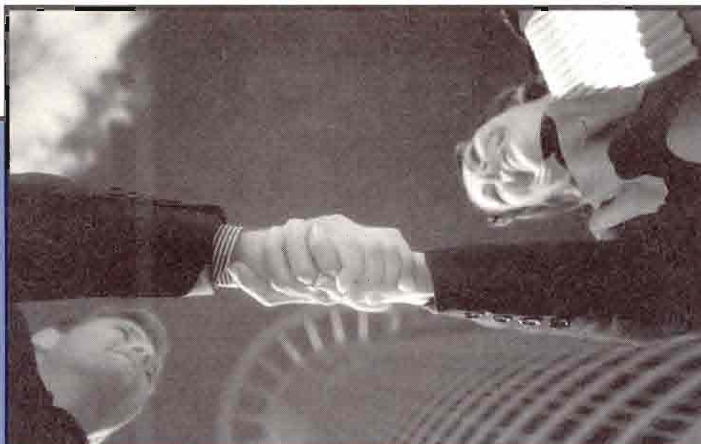
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big piece, I think, of [what] I'll bring into this role, because we have a new sense at HP of comparing ourselves to external measures and not just saying we did better this quarter than last quarter.

With regard to the past year I spent in E-Solutions, we had customers all over the map who were struggling to reinvent themselves for an e-business initiative or to start doing e-commerce. And I was responsible for e-commerce solutions and customer relationship solutions, portal solutions and business intelligence solutions. It was a portfolio of businesses in which OpenView plays a very solid role in creating the foundation for e-things to work right. As you put all your business assets on the Web and turn them into e-services, it better work.

In the E-Solutions job I led the development of HP's overall software strategy. So, I got a very personal insight into the level of support and the importance of software at HP in that project. And it's great to see that HP is really looking at software as a vital component of its growth engine for the future and understands that a different business model is required for support of software.

**HP PRO: How has HP adjusted business models to fit the software business?**

**AZZARELLO:** I'll talk about two key differences [between the business models for hardware and software], although there are many. One is the way we treat support revenue. In a software business, your support revenue becomes your annuity stream, and it directly funds your new product development. Software businesses just work that way. That's why you go into the software business – to get this annuity stream and fuel your growth. At HP, we were separating our support revenue and putting it into a support division like we do for the platform group. That is

not in support of a software business model. Now, OpenView and our other software businesses have the support revenue coming back in and fueling the business. That follows the fundamental software business model.

Another thing that's very different is the way the sales channel works. The way we sell and the way we recruit partners and the way we work with partners is much more specialized in software. It's a very value-add kind of sale, and it's a very solution-oriented sale. A hardware platform box is an enabler, and a software application is a specialty. So, you must have a specialty sales force to be successful selling software, and you must recruit a specialty channel. In OpenView we have a lot of plans to expand our sales force and channel quite aggressively.



Patty Azzarello

**HP PRO: When will this expansion begin, and what does it involve?**

**AZZARELLO:** It's already begun. We're in the process of expanding our sales force now, and we're looking at very aggressive growth numbers – more than 50 percent growth in the sales force – over the next few months. There's a big market out there, and we want to jump on it.

**HP PRO: Are you targeting new customers or primarily the installed base?**

**AZZARELLO:** Our installed base is not using all of our products. It has more network management software than anything else, and OpenView has a whole new portfolio of software. So, the installed base continues to be a main target. Making sure we're aggressive in selling our new value propositions and our new products into our installed base, I think, gives us a jump up on some of the new competitors that are starting from scratch.

The other thing we're doing, in terms of what shouldn't really be a new sales

channel but a new level of focus, is integrating with HP's top 100 accounts program, so we're going to have OpenView specialists who become part of the global account teams. That, I think, is going to open up a new channel of business into the enterprise accounts.

The market that's growing very fast right now is the Solaris market. A very fundamental component of being a real software business is that you have to support multiple platforms. Solaris is a fast-growing market segment for us where we don't have the big installed base, so this is a real growth engine. As we expand our sales force and our channel program, we want to make sure to reach the Sun customers. And the Sun customers are easier to reach through our channel partners than they are with the HP badge on.

There's a lot of new NT business as well, both in the enterprise and in the mid-market. The mid-market is underserved. Smaller companies have IT organizations that have one guy or a small group of people. Until recently, IT was just managing the company's print and e-mail, and having a reasonably happy life. Then, the CEO goes on an airplane and reads an article about e-commerce, and suddenly IT management becomes a huge new set of challenges – keeping the Web page up and running and reliable and those kinds of things. Our OpenView Express is really targeted at fulfilling that niche.

And then, NT in the enterprise is another growing market.

One of my first initiatives is to embark on a business-planning process across all of OpenView, and we're going to assess the whole portfolio of opportunities and be very specific about the winning plays we're going to go after.

**HP PRO: Obviously, e-commerce has dramatically affected IT management overall. Can you talk a bit about these effects and the way OpenView fits in?**

**AZZARELLO:** The most major effect is that IT is no longer in the back room. IT used to support the business behind the scenes. As you start turning yourself into a

**“You must have a specialty sales force to be successful selling software, and you must recruit a specialty channel. In OpenView we have plans to expand our sales force and channel quite aggressively.” – Patty Azzarello**

**“In terms of users interacting with wireless information appliances and the transactions that are routed across the Internet, I would like to see OpenView be recognized as the management package able to manage that whole transaction.” – Patty Azzarello**

business with an Internet presence and your interaction with your customers is over the Internet, IT becomes business-fundamental. If you're a service provider, IT is your business.

It used to be that you managed systems that sat in your own network, that you had control over. The fact that the Internet now causes your business and your services to reach outside to domains and systems that you don't have control over is an excellent opportunity for OpenView to really start driving in the direction of following those transactions around the Internet and measuring them. And, we've got a head start.

**HP PRO:** You've just introduced SAP Business Transaction Observer, which gives IT a lot of information about the impact of SAP transactions. Do you plan similar integration with other applications, perhaps front-office apps?

**AZZARELLO:** In some cases, we'll have deeper integration. Already, we're going to market with a OpenView-BroadVision integration. This is something I started in my prior assignment. One of the things that characterizes our software strategy is a real choice about investing in some places and partnering with best-of-breed in other places. And that, by definition, implies integration. And so, at the HP software strategy level, the integration strategy is one of the key things that we're working on right now. The good news is that OpenView is already integrated with a lot of these things.

The SMART Plug-Ins and the SMART Plug-In Gallery are a good way to get to market quickly. I think, however, that as we put together our integration plan for our software strategy, and we make some key plays, it will make sense to have a much deeper integration approach and provide more management capabilities. But, I haven't got all that figured out yet.

**HP PRO:** Back to trends affecting IT. How has the rise of service providers changed the landscape?

**AZZARELLO:** One of the issues service providers address is that there simply aren't

enough people on the planet to do all of the IT work. At one time, IT feared that their jobs were going to be outsourced, but these people are in such demand now that that's just really changed.

What I see is that IT organizations within enterprises are becoming service providers. You just can't be an IT organization going about your business and telling the business people, "Everything is working okay, just keep giving us money." It's very much a service provider model, where the enterprise organization has to deliver on service level agreements just as a service provider would. And, again, for OpenView, this is a very interesting dynamic, because we've already started making progress in abstracting the information of, not just managing all of the components and the systems and the devices, but what it adds up to in terms of the service you're delivering. The recent release of VantagePoint delivers even more functionality for service level management.

**HP PRO:** Another change that will affect system management is wireless. What are you planning in this area?

**AZZARELLO:** Wireless is regarded as the huge growth opportunity by everybody. And one of the three vectors in HP's strategy is information appliances. [The other two vectors are infrastructure and e-services.] So, in terms of OpenView, there are a lot of reasons to look into the wireless opportunity – both the basic growth of wireless and the alignment with HP strategy.

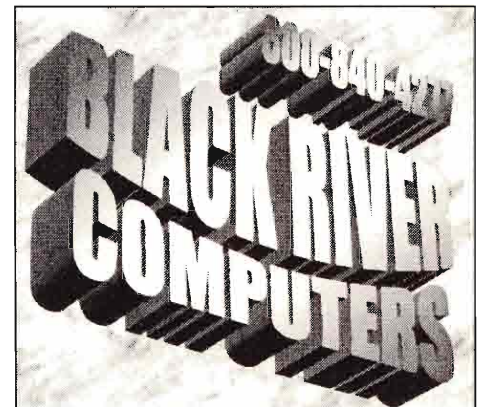
I see a couple of things. One is that applications that serve wireless information appliances need to be managed, but in that sense, it's pretty much like application management. It just happens to be an application that's a wireless application.

Then, there's a whole concept of provisioning and things that are specific to managing the information appliances and devices themselves. I think this is a really interesting opportunity for OpenView, and, strategically, that's right in line with my direction. So, in terms of users interacting with their wireless information appliances and the transactions that are

routed across the Internet, I would like to see OpenView be recognized as the management package able to manage that whole transaction.

**HP PRO:** If you were to sum up your goals for OpenView, what would they be?

**AZZARELLO:** My goals are to get the product program aligned behind the mission of being the leader in e-services management – get wider recognition for OpenView for the leading business it is today and grow the sales channel, grow the marketing and the publicity, and get a highly efficient product generation program together to start delivering on this leadership. I believe that OpenView can be one of the things that gets HP recognized as an e-company. ♦



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## HP Offers Heterogeneous Storage Consolidation with XP512

HP has been making big inroads in the storage market, since it introduced the XP256 disk array a little more than a year ago. Over the first year of the XP business, HP has shipped as many terabytes of storage as it did in the years of its relationship with EMC.

Now, HP has unveiled the SureStore eXP512, offering what it calls the latest in next-generation high-end storage and targeting Sun's UNIX users by embracing Solaris, as well as HP-UX and Windows NT environments.

The XP512, and its forerunner, the XP256, offer users what Craig Nunes, Product Manager for the XP Storage Operation, calls "SAN in a can," or a virtual SAN. The disk arrays allow users to convert all storage devices to a few XPs in order to consolidate storage.

Nunes also says that, "Solaris is the next big growth area from a consolidation perspective – one-third of all the Sun environment goes non-Sun connect." That makes the XP512 appropriate for straight Solaris environments. Where HP sees its biggest opportunity, though, Nunes says, is in heterogeneous environments – the XP512 offers users the chance to consolidate on a single-storage platform.

The XP512 is a hefty array, with capacity for up to 512 disks, up to 928 hosts and up to 96 drive slots (a 50 percent increase over the XP256). That means users can attach hundreds or more

servers to one device. It also offers 32 GB cache, double that of the XP256. For the XP512, HP has gone from a bus-based to a cross-bar architecture, duplicating what it's done on the UNIX server side. And HP has converted from Fast/Wide SCSI to Fibre Channel on the back end. The new architecture results in blazing speed. HP claims that the XP512 is twice as fast as EMC's Sym 8000 and IBM's Shark for data warehousing, e-commerce and Web-based applications, and that it is twice as fast as the Sym 8000 and three times as fast as the Shark for SAP, OLTP and messaging solutions.

For Solaris environments, HP is offering VERITAS cluster support, zero downtime and automated disaster recovery. The disaster recovery solution is especially attractive – the XP512 will roll over to a remote XP in the event of total site outage.

The launch of the XP512 doesn't mean the XP256 is being overlooked. HP has a roadmap for the XP256, which includes increasing the capacity from 11 TB to close to 18 TB, sometime in the fall. The XP256 also will boast new integrated performance management with OpenView Command View and new load-balancing features.



HP SureStore eXP512 Disk Array

## HP RELEASES HP-UX OPTIMIZED FOR THE NET

HP has rolled out HP-UX 11i. No surprise about the "i." HP wants to broadcast the Internet-readiness of this new release. HP-UX 11i features the Apache Web-serving software, the Nokia WAP server, LDAP-compliant enterprise directory servers, the e-speak runtime engine, e-service brokering libraries, Internet load balancing software from Resonate, Internet caching and content distribution software from Resonate and Inktomi, and InfoSeek's UltraSeek search engine. It is scheduled to ship in September or October.

The inclusion of the e-speak runtime engine is designed to spur development of e-speak applications, says Rajiv Gupta, the creator of e-speak. In fact, development already seems to be taking off. According to Gupta, there are now more than 10,000 registered e-speak developers worldwide and the open source Web site has recorded more than 13,000 downloads of the code.

HP is touting HP-UX 11i as "the industry's only operating system that supports applications developed on HP-UX, Win-

dows and Linux." Linux and Windows application development compatibility has been strengthened with Linux Open Source GNU tools, Linux APIs, the ability to debug and deploy from the Webgain VisualCafe Java Integrated Development Environment (IDE) and Java Virtual Machine (VM) optimization tools. HP claims that HP-UX 11i-based systems deliver SPECjvm98 of 91.1, compared to 34.4 from comparable Solaris-based systems. That allows for faster performance of Java applications and the ability to handle more users.

HP-UX11i features 100 percent binary compatibility with the most recent version of the OS, HP-UX 11.0, and with future PA-RISC and IA-64 platforms, as it can scale up to 256 CPUs.

HP also announced that it is offering optional intrusion detection software with HP-UX 11i, as well as the new HP Service-Control Manager, which provides a single point of administration for multiple systems running HP-UX. Also included in HP-UX 11i is a stripped-down version of HP WebQoS.

HP also unveiled a new complete version of WebQoS – Version 2.2. The new

release supports additional operating systems, offers vertical market capabilities and alleviates "denial of service" attacks.

Along with HP-UX 11i, HP unveiled a new Global Security Consulting Practice and new tailored e-solutions delivery services. The Global Security Consulting Practice will make use of HP's Praesidium products, as well as solutions from partners to provide Risk Management Services, E-Security Strategy Services, E-Enabling Security Services and E-Security Infrastructure Services.

The tailored e-solutions delivery services, intended to help businesses get up and running as fast as possible, while offering them a single point of contact (HP), includes pre-integrated, pre-tested and pre-certified applications from HP and its strategic partners. ♦

## Got Some News?

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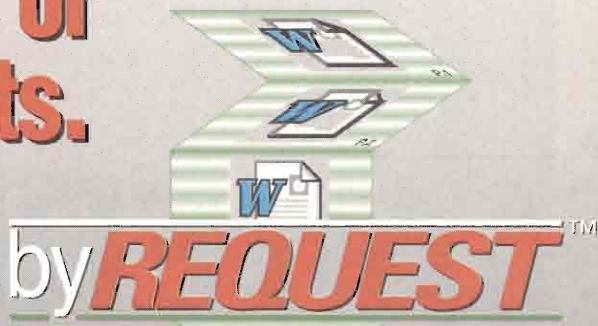
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# An ERP Evolution



Jean Nattkemper

## HP's Strongest Play in the ERP Space – Its Relationship with SAP

**A**s the Internet and e-commerce transform business models, users have been looking to ERP vendors to Internet-enable their back-end applications. The vendors, slow at first to respond to the Internet revolution, have still not wholly succeeded in linking their software to Web applications in realtime.

There has been progress, though, as ERP vendors have unveiled products that embrace supply chain management (SCM) and link their applications to front-office customer relationship management (CRM) applications. SAP, for example, unveiled mySAP.com early this year. mySAP.com, an e-business initiative focusing on online marketplaces, or exchanges, includes a Web portal and mySAP.com Workplace, which links users to SAP's suite of ERP applications. Also included is mySAP.com Marketplace, a B2B site for office supplies and services. In June, J.D. Edwards unveiled OneWorldXe, software that allows manufacturers to communicate with vendors and suppliers across the supply chain.



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**HP'S ERP APPROACH**

HP, which provides infrastructure, integration, data warehousing and business intelligence solutions and support and services for the ERP market, is riding the trend, not talking much about ERP anymore. Instead, it is touting Value Collaboration Networks, customer-centric networks that coordinate all organizations in the supply chain.

Application integration becomes central here, and late last year, HP forged an agreement with BEA Systems to incorporate BEA's eLink suite of enterprise application integration (EAI) solutions into a newly created HP EAI service portfolio. HP also arranged with BEA to integrate HP Changengine, a business process management system, with the eLink suite. The integration is designed to give users a means of using information from different parts of their operations and defining the flow of business processes across diverse applications, such as existing CRM and ERP systems.

In mid-June, HP introduced an e-intelligence solution that focuses on integration of data. Called HP E-VUE, the solution, designed to give businesses an integrated view of data across the enterprise, is intended to promote a real-time, panoramic, single customer view – a goal desperately sought after in the CRM space. E-VUE links internal and external data sources via a "virtual" data warehouse, enables complicated B2B transactions, and is employed through e-speak, HP's open platform for creating e-services.

For CRM environments, E-VUE enables companies to view customer behavior, modify the sales process in realtime and adapt internal business models to shifting customer requirements. For ERP, E-VUE provides an integrated product view so that companies can rapidly integrate new suppliers into a B2B chain.

Of course, HP's big play in the ERP space is its infrastructure, primarily its UNIX and Windows servers. HP also offers "Infrastructure-on-Tap," targeted initially at B2B hubs and based on the company's Internet computing utility model. With Infrastructure-on-Tap, HP provides all the infrastructure needed for e-business from HP data centers, charging customers a fee based on usage. HP's partner and first customer for the solution, Lawson, uses it to power its ijob electronic recruiting service. In mid-June, HP and Lawson extended their Infrastructure-on-Tap agreement by enhancing the Lawson ijob e-recruitment service to give businesses an "always-on," wireless-enabled e-service. The addition of wireless to ijob is intended to improve candidate and recruiter relationships, automate information delivery and speed time to hire.

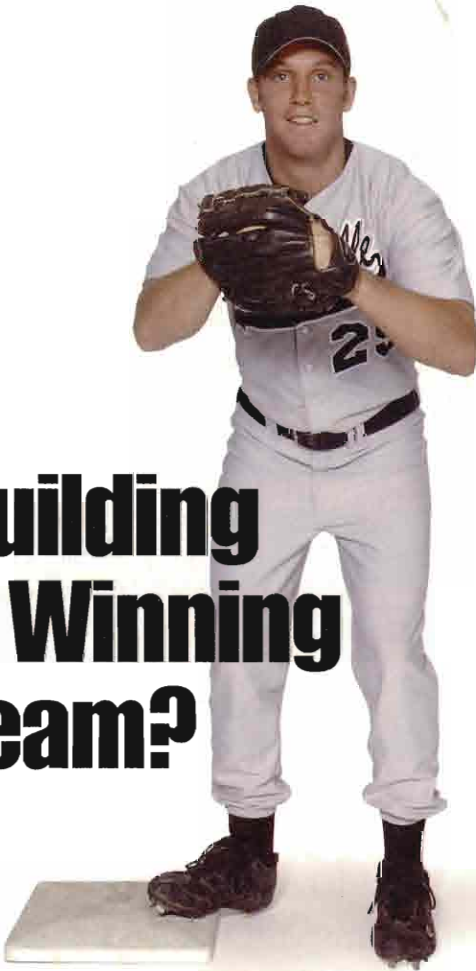
**SAP COLLABORATION**

HP collaborates with all the major ERP vendors – SAP, Oracle, PeopleSoft, J.D. Edwards, and so on – to integrate their offerings with HP computing systems. Nevertheless, HP's strongest and broadest relationship is with SAP. The two companies have collaborated on output management for SAP solutions, high-availability solutions specific to SAP applications, integration of the HP OpenView enterprise management suite with SAP, and a fast-start deployment of SAP applications.

The HP, SAP relationship is more than a decade old, dating back to 1989, when the two companies began collaborating to bring the first-ever client/server SAP implementation to the marketplace. In 1992, the first SAP R/3 customer went live on HP-UX, and in 1999, HP-UX was the first major 64-bit operating system to be supported by SAP. Today, the majority of users running R/3 on UNIX are HP-UX users. SAP solutions also run on HP's Windows

See Enterprise Resource Planning on page 27

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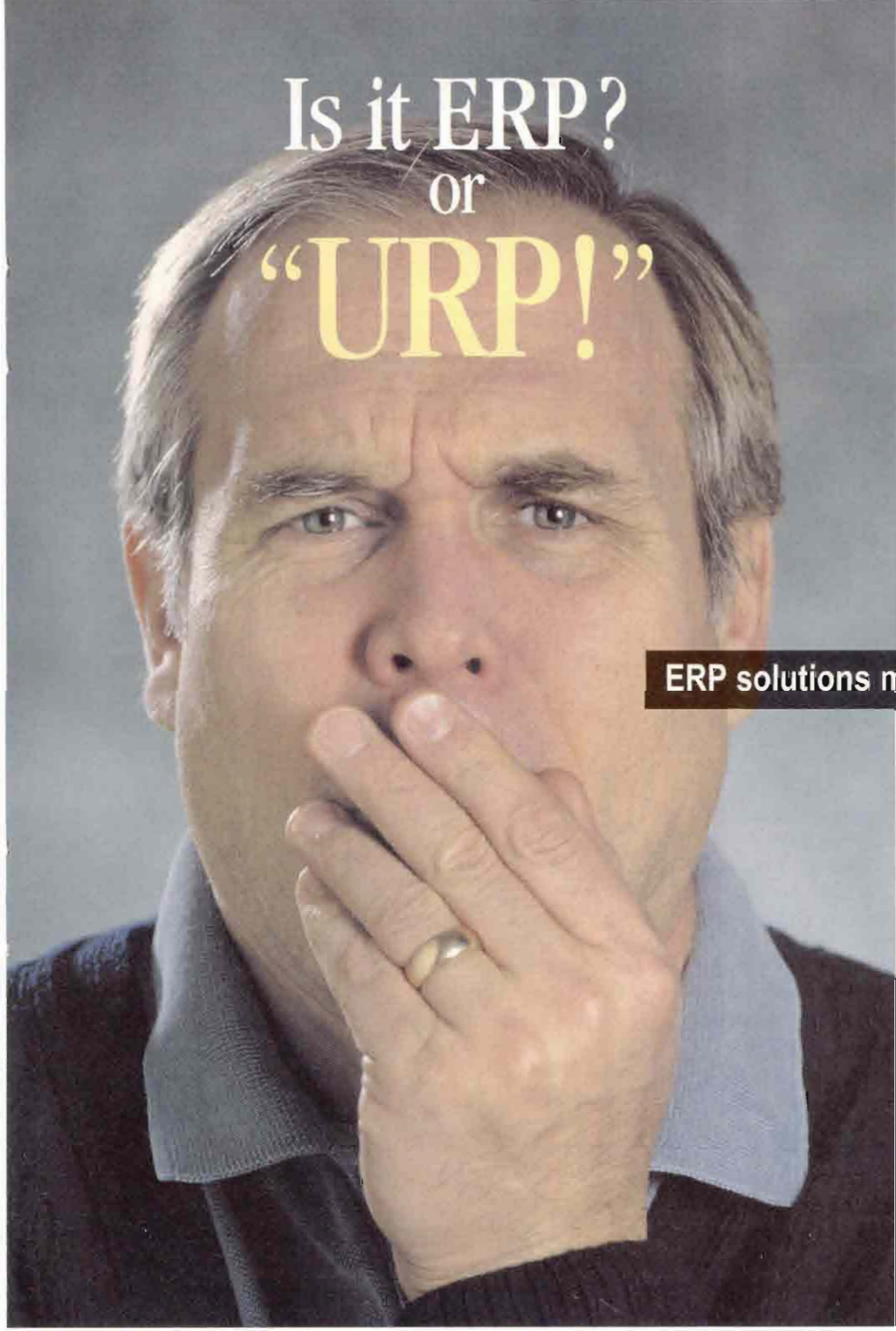
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# Availability Management

## A Framework for Business Continuity

Sam Mandelbaum

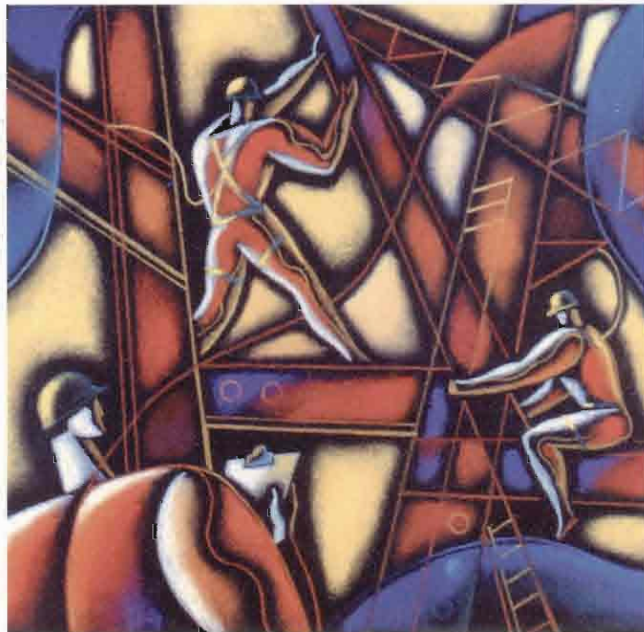
As the Internet economy continues to raise expectations and requirements for computing services, information technology is being transformed from an enabling technology to a strategic component of the business process. As a result, IT resources have become essential to the business' goals, driving companies to operate and manage by service-level agreements.

At the same time, the growing gap between demand and supply of skilled IT staffs, the addition of more distributed servers, more applications and new technologies, standards and compatibility issues, all create a formidable challenge for the administrative staff who are held responsible for system operations. Even at a basic level, monitoring and repairing the most common system problems has become too time-consuming, complex and costly for most IT departments to manage.

To tackle these issues, administrators are increasingly turning to systems management solutions. Traditional system management tools produce voluminous reports and logs, tracking a great deal of information about system operations. More often than not, these tools produce an overwhelming quantity of raw historical data and alarm notifications, while providing limited assistance in actual problem prevention. While maintaining optimal availability is the system administrator's primary mission, most administrators do not get the kind of assistance they need from management tools to effectively "prevent" availability lapses.

### MANAGEMENT BY SYSTEM-SPECIFIC INTELLIGENT AGENTS

Availability management – a new approach to systems management – involves proactively identifying and responding to system events that typically precede larger system problems, thereby preventing many types of common system failures, ranging from performance degradation to brief downtime to catastrophic failure. To maximize availability, this management solution continually monitors system components, such as CPU, memory, network connectivity and disk capacity, and their interactions, identifies events that are likely to occur and takes



appropriate automatic preventive actions to prevent a failure. By applying technical and business expertise and user-defined priorities, and by anticipating certain conditions affecting the system, analysts say that roughly 80 percent of the routine breakdowns can be averted.

Critical to this model are a set of system-specific intelligent agents that monitor and act when detecting leading indicators of imminent failure. These agents need to reside at every node so that, even in cases of network disruptions, each node can individually attempt to diagnose and correct problems. A flexible, designated control server keeps track of all the nodes in the environment, while the individual intelligent agents carry out user-defined, local and preventive actions as necessary.

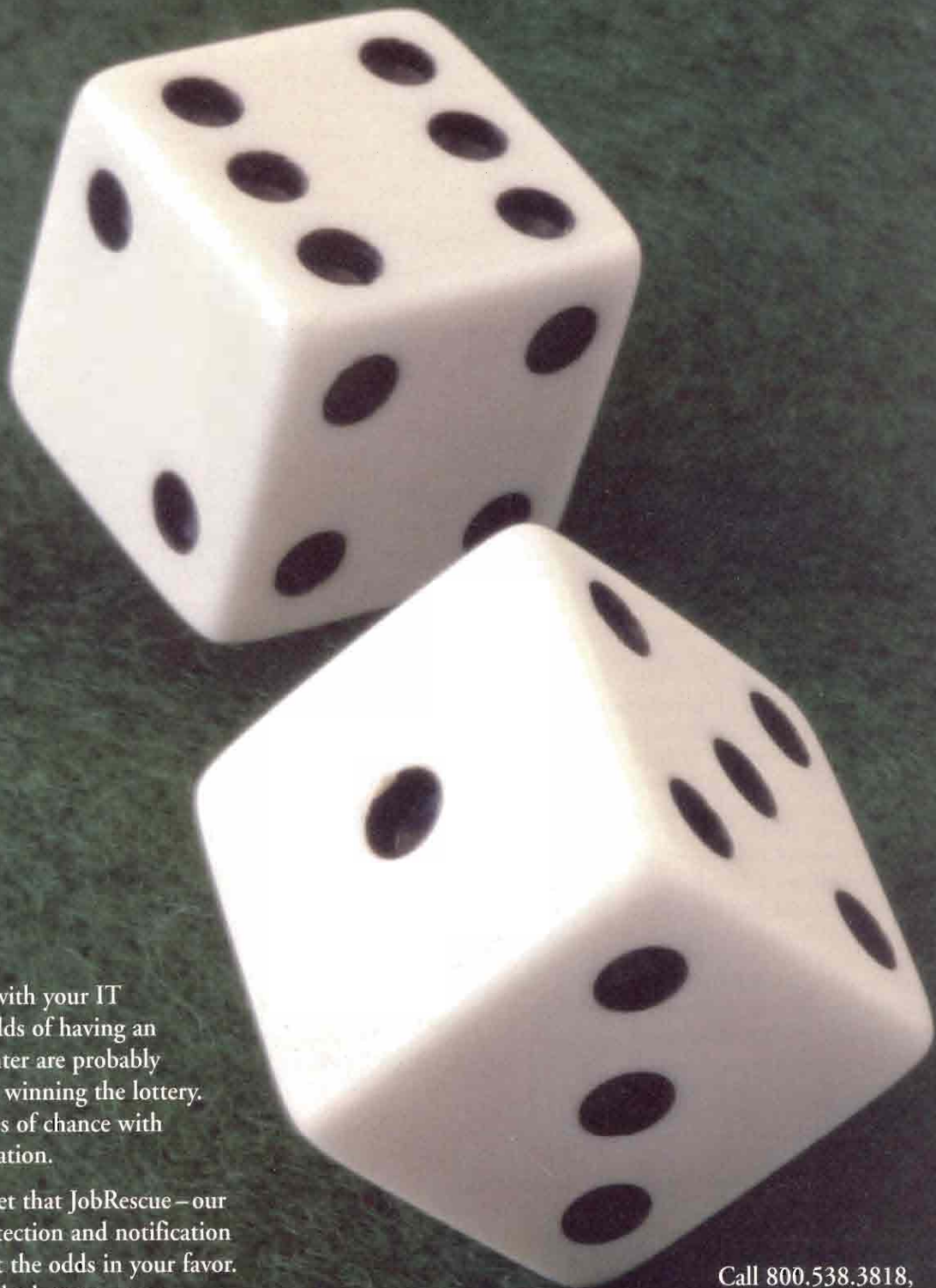
Intelligent agents which incorporate knowledge about typical system and application behavior and apply that knowledge in case undesirable conditions are detected. The actions of the agents are determined by user-defined rules that are customized for every environment, configuration, application and business process.

### MONITORING DISK CAPACITY

In the case of disk capacity, some applications fail when there is insufficient disk space to write data. By anticipating such a failure and preventing the disk reaching capacity limits, the agent can avert possible system downtime. The agent determines partition capacity by measuring percent full and the absolute size of the partition, or by measuring a directory or file in absolute size or as a fraction of the total partition. A typical sequence involving an agent automatically responding to an event or condition, such as the disk approaching its capacity, would proceed as follows:

1. **An event occurs.** In this case the disk space in use has exceeded a predetermined threshold.

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2. **An agent detects the event.** The monitoring agent detects whether too much disk space is in use, as defined by the rules configured for that agent. As soon as the event is detected, an event message is created that contains the event class and all of the defined event parameters.

3. **The agent logs the event.** The disk capacity agent's monitor writes the event to the event log for user viewing and reporting.

4. **The agent publishes the event message.** The monitor of the disk capacity agent sends the event message to all other agents (for instance, specialized application agents) capable of handling disk-related events. These agents are known because they have previously subscribed to that event.

5. **Subscribing agents receive the event message as an HTTP post.** Upon receiving the event message, all subscribing agents determine from the URL of the HTTP post which of their actors needs to be set in motion and to receive the message.

6. **An agent's actor receives the message and responds.** When the appropriate actor receives the disk full event message, that actor determines which rule it will use to process that event. Rules simply represent correspondences between events and actions, so the rule determines what action should be taken at this point.

7. **Agent actor takes preventive action dictated by the rule.** The actor then takes preventive action. In this disk-full event scenario, the actor might delete one or more unwanted temporary files to reduce disk space in use. Rules set previously would determine which types of files would be deleted first.

At this point, the disk space problem should be resolved, the system and its applications can go on functioning normally.

8. **The agent's actor then logs the response.** The user can view all log messages regarding the event detected and the actions taken.

### MEMORY CAPACITY AND CPU UTILIZATION

Devising agents to monitor CPU and memory usage is more intricate. In order to add useful intelligence to the monitoring process, so as not to trigger unnecessary preventive actions, the agents must "understand" what kinds of fluctuation in capacity utilization normally occurs. Abnormally high memory use can be caused by a memory leak or by a more general problem. It can also be the result of a normal pattern in the operation of an

application. Application start-up, for example, requires a predictably heavy use of memory until the application "acqui-escens" – settles in after start-up and before it reaches a state of equilibrium. Every application has a unique memory use "signature." An intelligent monitoring agent should be aware of the signature for every application so that it will recognize predictable spikes in usage as being normal application behavior.

**In order to add useful intelligence to the monitoring process, the agents must "understand" what kinds of fluctuation in capacity utilization normally occurs, and be aware of the signature for every application.**

Similarly, each application has unique, predictable memory use patterns that signal impending failure. An intelligent agent incorporates pattern recognition in its interpretation of events. Memory can then be measured for specific processes as the average allocation over a given period of time and as a count of page faults detected over a given period of time, disregarding expected peaks of usage. The agent's response could be restarting – for temporarily solving a memory leak – or shutting down the service, to allow other critical services to continue functioning optimally while the system administrator investigates the cause of excess memory use.

Tracking CPU utilization is very similar to monitoring memory use, as CPU use also has predictable patterns for each application that needs to be considered. To monitor utilization properly, the agent can measure global CPU usage as an average over a specified time interval and track CPU for an individual process, measured as an average over a specified time interval. Measurements are not used in calculating the average until after the normal, anticipated usage equilibrium is reached.

### NETWORK CONNECTIVITY

Discerning connectivity among nodes on a network is commonly accomplished by

attempting to communicate (pinging) with a predetermined site, usually the server that serves as the point of control. Monitoring done by a simple agent can indicate, via a message to the administrator on the control server, if communication with any of the nodes has failed or if network performance is unacceptable. However, with no connectivity to a failed node, the control server cannot identify the cause of the problem or do anything about it beyond error notification and logging the event.

If an intelligent agent resides at every node, however, each node can also monitor its own connectivity with the network. Then, if the network response is unacceptable, the local agent can attempt to repair the problem on its own – by reconfiguring or restarting the system, or even rebooting, if necessary. The presence of an agent at the local level that can initiate actions, which are predetermined by the system administrator, can significantly reduce mean time to repair (MTTR). In the event that connectivity with the control server is lost, any other node can take on the control server's monitoring and reporting duties – single point of failure is avoided and the availability management tools are still available to the remaining nodes.

### APPLICATION AVAILABILITY

The availability of IT applications goes beyond system level availability measured by mean time between failure (MTBF) and MTTR. This is achieved through sophisticated agents that understand the behavior of specific applications and their dependencies on the multiple resources supporting those applications. The agents recognize indicators of impending failure and initiate an appropriate response to prevent downtime and maximize availability.

To make the intelligent management process more effective, these agents can then incorporate the system administrator's responses to system events into their knowledge bases, learn from them and begin recommending preventive actions based on this history. The availability management tool tracks how events happen, how the system administrator responds, notes the result, analyzes and correlates this data into patterns, and based on those patterns, recommends a preventive action. ♦

*Sam Mandelbaum is Director of Products at Aviant (Cambridge, Mass.).*

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# Faster, Better, Cheaper ... But How?

## Western Wireless Improves CC&B

Jim Medick

The mantra for cellular phone companies in the fast-growing, but increasingly competitive mobile telecommunications, marketplace continues to be "faster, better, cheaper." The trick is to do all of these things at the same time – no matter what technical innovations leap out from R&D teams that may automate processes or make a wireless service provider's infrastructure either more powerful or manageable, the business that matters most is still customer care and billing.

Failure to keep these issues firmly in mind reduces our competitiveness and can encourage customers to shun one network for another, and the industry has known for years just how much more expensive it is to win a new customer than to retain an existing one.

The trouble for providers of cellular services is that the process of keeping customer care and billing (CC&B) operations up-to-date and tuned up for meeting customers' preferences is a bit like putting a set of new wheels on a moving car.

Nevertheless, carriers, such as Western Wireless, the largest provider of rural cellular services in the United States, have been very successful at keeping up with customers by using open systems and upgrading existing architecture, underpinned by robust hardware that improves the availability and management of storage capacity for CC&B-related data. We have achieved this by using solution partners to enhance

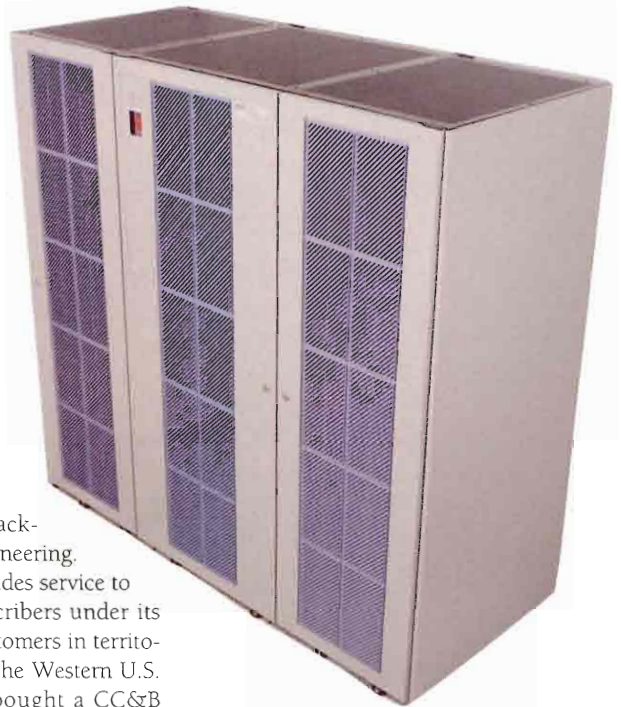
our processes, without back-office turmoil from re-engineering.

Western Wireless provides service to more than 874,000 subscribers under its Cellular One brand to customers in territories covering 19 states in the Western U.S. The company recently bought a CC&B product called Ensemble from AMDOCS. Providing an infrastructure to underpin customer services and the usage of the network by the provider's 2,800 employees was a key challenge. Part of the purchase involved AMDOCS supplying implementation and support services. The new product replaced an ITDS Tris Product, and company managers believe the Ensemble solution eclipsed billing system solutions from the other major leading providers.

The cellular company, with a predominantly analog network combining TDMA and AMPS technologies, had previously outsourced its billing processes. However, this approach was now being reversed – brought in-house to provide greater control, flexibility and lower costs. This move provided a new model for our billing and, as a result, the company now tests new plans and features in order to make sure that customers get the right bill. Previously, managers simply had to hope for the best on some occasions.

The picture of CC&B, before-and-after the change, is startlingly different in numerous respects.

The information technology group had been looking at cutting the cost of the



billing system for some time, in a background of squeezing margins. The business needs also spelled the need for faster billing cycles, enabling new offerings to move to market faster and with more features. Until recently, when Western Wireless wanted to introduce a new rate plan to spur customer demand or loyalty, it could take up to 30 days to have the network's billing systems ready to cope with the implementation of the offering. This time lag has now been cut to a matter of a couple of days and, in some cases, a few hours, enabling timely response to calling trends that our sales teams may spot or predict – or to counter competing offerings from other cellular operators.

Under the old system, Western Wireless would collect and package billing data at its operations center in Issaquah, a small town about 20 miles east of Seattle, and send the data to a facility in Illinois. It took five days to produce a bill. The new in-house procedure, together with the Ensemble solution, has reduced this turn-around time to between eight and 16 hours. It has also made the process more visible to our IT department in Issaquah than it was when handled over in Illinois.

We can also now offer aggregated, convergent billing for the different services, such as cellular, fixed wireless, paging and data services, and can blend rates that discount across multiple features and services. The previous billing system's limitations prevented this.

This sort of convergent billing is of special importance to high-value customers, typically businesses or high-worth individuals, who account for around 30 percent of the carrier's customer base. They want one bill so that they can manage their communications expenditure efficiently.

Bringing our billing capability in-house meant having to integrate our existing network architecture with the Ensemble platform, which is designed to handle customer care, billing and order management for both voice and data in a convergent, multi-service operation which includes local, cellular, paging, long distance, Internet and IP services. For a carrier, such a system needs to be scalable and utilize a multi-tier, client-server UNIX/NT platform to handle high-volume call traffic and meet the consequent performance targets and requirements.

However, Ensemble needed to be underpinned by a high-performance, mass storage system that was more manageable than Western Wireless' existing architecture. In the company's NT world, some machines had 300 gigabytes of free space, while others had 200 gigabytes, and so on. Obviously, these disparities made it difficult to manage and exploit the availability and capacity of various storage devices. The infrastructure also included HP K-Class, N-Class and HP 4000 servers to support functions, such as message processing that underpinned the billing system.

By comparison, the storage system selected to underpin the Ensemble solution has the capacity to store up to nine terabytes of data and provides a single, highly reliable repository of CDRs, customer information and referential data for system operations. It also holds a full business backup of all network data in case of system failures. The storage device also had to operate at speeds that matched or were comparable with the fastest machines of a similar specification that were available on the market, be highly scalable, and, of course, have "five-nines," or 99.999 percent reliability with a reasonably sized IT staff.

We looked closely at both HP and EMC as providers for the infrastructure, servers and data storage devices, and selected HP's new HP XP256 disk array storage machines because it fit all of these requirements. It offered five-nines reliability, plus battery backups, dual power supplies and SCSI channels. In short, the Western Wireless infrastructure just doesn't fail.

The HP XP256 storage device, with a list price of \$1 million, uses storage area network technology, which enables it to work with UNIX and NT data. The device also has open plugs to UNIX and NT machines, offering it greater flexibility and the ability to act as a storage device for many different needs and applications.

We are using one such device for dedicated billing and the other to enable support of the PeopleSoft ERP financial and human resources systems, fraud detection and other supporting financial applications. These applications include sales commissions, electronic document handling and substantial ad hoc reporting capability. The IT team at Western Wireless recently completed its integration of PeopleSoft with Ensemble in order to automatically extract financial data from the billing system for financial reporting.

The particular selection of data storage device effectively centralized storage capacity in one location on a realtime basis. This allows the company to copy or backup data smoothly and quickly, instead of having the data stored across 61 individual NT

servers. The alternative would have been to purchase more and more of our existing computers and their storage disks.

Running Ensemble together with the HP XP256 has produced a CC&B solution with considerable costs savings. We conservatively estimate this saving to be in the region of \$500,000 per month through lower costs, and maybe more. Another improvement on previous procedures is that Western Wireless used to take its CC&B system down every night for five hours for backups and nightly batch processing. With the HP XP256, the backups can be done in under 10 minutes through an online business copy and, with the AMDOCS Ensemble system, batch processing can be done while customer service reps use the system.

This successful joint implementation of the Ensemble and HP XP256 products is also a proof-of-concept illustration of the collaborative work that AMDOCS and HP have undertaken through their joint sponsorship of the Silicon Valley World Internet Center, a dynamic think-tank, showcase and collaboration facility for the advancement of e-Markets and Internet-related technologies. The Center is a place where vendors are developing new solutions for the advance of Web-enabled business systems for e-commerce, billing and customer care, plus a range of other IT products. It provides not only a physical location, but also a virtual infrastructure for networking with other technology and research groups, as well as thought leaders, in the areas of e-business, e-services and portals. ♦

*Jim Medick is Vice President of Information Technology for Western Wireless Corporation (Bellevue, Wash.).*

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## Solving the Meddlesome Print Spooler Dilemma

Vinnie Saladino

Printing is one of those tasks that a sys admin just loves to support. There are printers that always put the toner on the paper and there are printers that are covered all over with footprints from being kicked all the time. Of all the problems that can cause a print process to stop working, print spooler problems can be the most exasperating to solve.

When printing normal size files with the lp command, success starts when you see the message "request id is printer-1234" on your screen and success ends with a fistful of paper. When printing large files of over 100 Mbs each, success might start with the "request id..." message, but it can easily end with no paper, no toner and more footprints. So, what could go wrong with the print spooler?

If you look at the man page for the lp command and go down to the -c option, you will see, "Normally, the files are linked into a spool directory." This would be the printer's request directory: /var/spool/lp/request/printer. It leads you to believe that, normally print files are linked and not moved into the spooler's file system. If this were the case, then /var would never fill up by printing large files because this directory would only contain a link to the real file to be printed. But, the print spooler was rewritten after the man page came out to accommodate applications that need to



have their print files copied to the printer's request directory before the print file is overwritten by the application that created it. The spooler no longer prints from a link to the file. There is no option in the lp command to let you choose between a file link and a file copy. The spooler must copy the entire file to /var ... to print it. If your /var is anything like my /var, then you are not going to print too many large files.

/var is always filling up with system log files and other system files without any help from the print spooler. I chased a squirrel through /var once. It took hours to catch it. But, the print spooler

```
# disable printer
# lp -dprinter file_to_print
# ls-al /var/spool/lp/request/printer
  (two files will be present - the
  file to print, and its control file )
# enable printer
```

Example 1: Printer Request Directory Commands

does not give you a message that /var is full, or that the print file will be lost. If there is not enough room for your print file in /var, then you will just see the "request id is printer-1234" message and that's it. /var will fill up and kill the print process - no printout, and another sore foot.

If you want to prove that the print file gets copied to the request directory instead linking to it, then just stop a printer at the command prompt, print a file to it with lp, and then look in its request directory as in Example 1.

After the printer is enabled, the files will remain in /var for as long as it takes for the printer to print them. If the file to be printed is very big, it will remain in /var a rather long time. 100 Mb files can require four reams of paper. Other users might queue up their print files to the printer and ... yup, /var gets full. I knew a sys admin who would delete a printer's queue and recreate it just to

See *Printing* on page 24



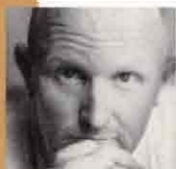
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solve this problem. He swore this fixed the printer problem, and there was something wrong with the software. What he was really doing was deleting all the print files that were queued up for the printer (when he deleted the print queue) and freed up the space in /var. By the time he told all the users to reprint their print jobs, /var stayed empty long enough to pass all the print jobs through it.

The real solution to the problem of filling up /var is rather simple. Move the printer's request directory to a different file system where you have the room to accommodate all of your print requests. Murphy's Law says that all of your biggest print files will hit the same printer at the same time. It might take a Gig of space or more for your print files, but you have to do what you have to do. Leaving this much disk space unused in a file system just waiting for large print files to fill it is a job in itself. It will cause a lot of fighting among your DBAs who want to park their archive files there. So, be prepared for them. You might have to kick the DBAs instead of the printer.

Moving the printer's request directory is simple and straightforward. Let's say you have space in the "/more\_room" filesystem. The commands to move it would be as shown in Example 2.

This will do it for a normal HP type printer. But, the story doesn't end here. If

```
# ls -al /var/spool/lp/request/Raw_printer
      (and wait for any print jobs to complete or you will lose them in this queue)
# disable Raw_printer
# mkdir /more_room/request/Raw_printer
# chown lp:lp /more_room/request/Raw_printer
      (make lp the owner and group for this directory also)
# mv /var/spool/lp/request/Raw_printer /var/spool/lp/request/Raw_printer_old
      (rename or remove the old Raw printer directory before making the link)
# ln -s /more_room/request/Raw_printer /var/spool/lp/request/Raw_printer
      (link the old request directory under var to the new directory)
# ls -al /var/spool/lp/request
      (to see the new link for the Raw printer)
# enable Raw_printer
# lp -dprinter file_to_print
      (to test this new link also)
```

**Example 3: Moving the Raw Printer's Request Directory**

you have a special printer, like a Xerox printer, that is networked, and you installed the print queue with Xerox's Xpadmin software instead of HP's Jetadmin, then the story continues (don't kick the printer just yet). /var will still fill up. If you call HP for help, they will tell you to call Xerox. If you call Xerox for help, they will tell you to call HP. Let me save you the trouble.

Xerox's printers, like many other printers, install two print spool queues to get the toner on the paper. One print queue feeds the second print queue. The lp command uses the first print spooler queue, which then sends its output to a second Raw print queue which feeds the printer. This second Raw print queue is also controlled by the same print spooler

that we have come to love. The spooler then copies its files to ... you guessed it ... /var/spool/lp/request/\_Rawprinter\_.

If you have a Raw queue attached to a print queue, you also have to move its request directory to your /more\_room file system by creating a link from the Raw printer's current request directory to your /more\_room file system with the same procedure we just did for the lp print queue, or it can also fill up /var.

You have to identify the name of the Raw print queue that is fed by the printer queue that you are fixing. In the case of Xerox printers, you can run xpadmin, select Modify a Queue, select the printer you are looking for, and you will see the name of the Raw print queue. You can not move the Raw queue's request directory from xpadmin, you can just find its name.

Moving the Raw printer's request directory is also simple and straightforward. The commands to move it would be as shown in Example 3.

Perhaps, one day, the man pages will tell it like it is. Perhaps, the HP-UNIX Install/Upgrade program of the future will ask us what file system we want to put the request directories into. Maybe, one day, printers will come with rubber panels that say "kick here before adding toner." Supporting printers is fun ... don't you think? ♦

— Vinnie Saladino is a UNIX Admin with many years of experience on HP, as well as AIX and Linux. He can be reached at [saladino@idt.net](mailto:saladino@idt.net).

```
# ls -al /var/spool/lp/request/printer
      (and wait for any print jobs to complete or you will lose them)
# disable printer
# mkdir /more_room/request/printer
# chown lp:lp /more_room/request/printer
      (make lp the owner and group for this directory)
# mv /var/spool/lp/request/printer /var/spool/lp/request/printer_old
      (rename or remove the old printer directory before making the link)
# ln -s /more_room/request/printer /var/spool/lp/request/printer
      (link the old request directory under var to the new directory)
# ls -al /var/spool/lp/request
      (to see the new link for the printer)
# enable printer
# lp -dprinter file_to_print
      (to test the new link)
```

**Example 2: Moving a Printer's Request Directory**

# For Whom the Test Tallies

The topic is certification. Technical Certifications, that is. Microsoft started its Certified Engineer (MSCE) thing, and a couple years ago, HP also jumped on that wagon with several types of certifications. It has had a

rocky start, and I heard various rumors of the tests being re-written after an initially high failure rate. My first real experience with the HP certification information came when I saw the Prentice Hall "HP Certified" book on HP-UX System Administration. It is an 800-page book, rather obviously loaded with information. Being the cocky sort, I immediately jumped to the back (appendix D) and started taking the Sample HP-UX Certification test.

Well, let's just say that there were a few questions that slowed me down in there. For example, what is rsh? Dang, since I work on mixed systems, it took a few seconds to remember that HP-UX calls remsh what most other UNIXs call rsh, but rsh is HP-UX's restricted shell. Another question asks what a pipe is used for, and lists that answer as "redirecting standard input," rather than connecting two commands. A third question asks how to determine the number of command line arguments supplied to a shell script. \$# was my answer, but the book said \$\*. This was when I realized that the answers were wrong. Looking back into the actual chapters that cover the information, the book's data was right, and the test questions in the chapters I read through were answered correctly, only the sample test in the back had some incorrectly labeled answers.

I have always leaned toward the side of "Who needs it?" about certification. Just because you answer a few questions correctly, does that mean you can troubleshoot? Does it mean that you can quickly learn new technologies? Does it mean you can work well with others, or deal with users efficiently? I think the answers to all those questions are "no."

More recently, I have been seeing the other side of certification. What does it mean? Well, read through some sample

tests online at [www.education.hp.com](http://www.education.hp.com), and you will probably find a few tough questions in there.

So, what it might mean is that the certified person has probably spent some time studying through the books, and studying is always a good thing. The exam is rather wide ranging, so you have to be familiar with many areas of HP-UX, some of which you might not use in your network. It means that the certified person has some baseline knowledge of HP-UX.

The root of the whole issue can be phrased with two questions:

1. If you are certified, does that mean you are capable of performing the job of an HP-UX system administrator?
2. If you are not certified, or fail the test, does that mean you are not capable of performing the job?

The HP Web site has this blurb: "The HP Certified program is designed to create a high level of technical competency among information technology professionals. This program includes HP-UX, HP OpenView, MPE/iX and UNIX/Microsoft Windows NT Integration certification tracks."

Another page on the Web site lists employer benefits: Increased staff productivity, motivation and performance; efficient operations and reduced business costs; improved service quality, technical support and user satisfaction; company-wide recognition for HP technical expertise; and increased reputation as a technical services provider.

The site also lists the benefits to the employee (certification recipient): Techni-

cal credibility; continuous opportunities for professional growth through HP's learning communities; technology

updates and white papers; the latest HP Certified news; greater job satisfaction through increased technical competency; customized technical support for HP; certified IT professionals; and recognition by peers within the industry.

I am not sure I can go along with all of these benefits. If a system administrator took a training class (or some study time) targeted toward a certification test, it

seems that they might be wasting an amount of time learning things that they don't need to perform their job (like the layers in the OSI network model). Might that time be better spent studying something that your network currently uses or plans to implement?

But, what about new admins? It is nice to have a new person familiar with all aspects of administration, and it does speak to the breadth of a person's knowledge. Then again, it is highly possible to study a book, take a test and pass the exam without ever sitting in front of a keyboard on the system you are certified on. Would you want to hire that person?

I had always held certification as a black mark against a potential employee. I felt that if they needed to be certified, they probably had no experience. I now realize that it at least means the potential employee has some fixed level of knowledge, and I could spend my time seeing if they could use that knowledge, asking about troubleshooting and relational issues. ♦



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# More Help Utilities

Last month, we looked at some of the utilities for Win 2000 and Windows NT available in the Winternals Software ([www.winternals.com](http://www.winternals.com)) Administrative pak. This time, we'll look at the rest of the utilities...

NTFSDOS Professional Edition is a device driver that allows you to read NTFS volumes from a DOS prompt. It was one of the first Winternals Software utilities and has saved many a system administrator time and trouble when trying to access an NTFS volume on a dead NT system. It's a straightforward utility. It installs on two diskettes and can be used on any machine. You can even make the diskettes bootable with DOS or Win 9x.

It seems the NTFSDOS software is the basis of a lot of the Winternals utilities

, such as Recover (see last month's column) and the ERD Commander (see below). Rightly so, it delivers much needed functionality. There isn't much to be said about this other than it works very well and if you manage a large number of NT/2000 systems, you're going to need it.

ERD Commander is used when an NT/2000 system just won't start. It functions as an enhanced version of the standard Emergency Repair Disk created in NT with the RDISK command. The standard ERD is designed to boot a problem system from floppy disks and perform basic repairs such as restoring missing operating system files. ERD Commander goes to the next logical step by allowing you access to a command prompt. From that prompt you can access both FAT and NTFS formatted disk volumes and perform quite a few functions, such as copying files, changing access rights, disable or enable services and change passwords.

The ERD Commander setup program creates the standard ERD disk set, using

NT's setup program. It then modifies the contents of the first two disks and creates a new fourth disk. Booting a system with this set of disks results in a blue screen featuring a list of volumes and a command prompt. The prompt supports about 30 commands that allow you to navigate around disk volumes and make changes necessary to get a dead system running again. The prompt supports a help command and all the basic file management commands, such as copy, delete and rename. Unlike a Windows

9x or DOS boot disk, you can see any NTFS formatted volumes and work on them, including changing file attributes with the attrib command.

In addition to the basics, you also have access to several more sophisticated commands. For instance, the registry command loads the contents of the registry into memory. This permits several other commands to work, such as password, which allows you to change account passwords. The chkdsk command will check and repair drives. The service command allows you to change the startup behavior of services. You can disable, enable or set the service to automatically start at boot time, just as if you were using the applet from the NT Control Panel. The ftdisk command activates any fault tolerant storage settings in the registry. This means that you can access stripe or mirror sets while booting from diskettes! There is even a feature to allow you to load third-party disk drivers onto the ERD disk set so you can access other hardware, such as RAID drives.



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TCPView Professional Edition is a TCP/IP network monitor. It displays and optionally logs any network activity in real time with a graphical user interface. TCPView has a number of features that make it very useful. For instance, with the real-time display, you can watch how a particular application is doing across the network.

After launching TCPView, you are presented with a window divided into two main sections. The top section contains what is called the static view. This shows a snapshot of all the "endpoints" currently active on your system. For instance, when a telnet connection is open, the static view shows a connection between the local machine and the remote telnet server. Each entry shows the process names and ID, the local address and port (your machine), the remote address and port (the server), the protocol (TCP or UDP) and the bytes sent and received. The dynamic view shows a realtime log of all TCP/IP activity as a scrolling window. Each entry shows a sequence number, a time stamp, the process name and ID, an action (such as send, receive, connect, etc.), the protocol, local and remote addresses and ports, and a status. Together, the two windows deliver a great deal of information about what a machine is doing on the network.

The program is well thought out. For instance, an option allows you to resolve the addresses of the connections so you just don't see the IP address, but a fully resolved name. It also will interpret the port names, for instance replacing port 25 with telnet. You can both filter and highlight entries. Filter will only display those entries you want to see. Highlight allows particular entries to be more visible by adding color. ♦

*Continued from page 14*

NT-based systems. Today, there are more than 7,000 SAP installations on HP-UX and HP NT servers worldwide.

In 1994, HP established global SAP R/3 consulting and outsourcing services to implement both customized and off-the-shelf solutions based on R/3. And by late 1999, HP and SAP unveiled plans to align their Internet strategies through reciprocal support for mySAP.com and HP's e-services strategy. The two companies have established a joint solution center in Wall-dorf, Germany, to serve as headquarters for joint Internet solutions, proof-of-concept methodology development, and performance tests of SAP solutions.

In 1999, HP and SAP announced they were jointly developing and delivering solutions under the HP 5 nines: 5 minutes alliance. SAP was the first application vendor to join the alliance.

Further supporting high availability in SAP environments, HP has introduced HP Somersault, software that eliminates the Enqueue Service, a critical component of every SAP installation, as the single point of failure in HP-UX or NT environments. HP Somersault mirrors the Enqueue Service and ensures its continuous operation if it is disabled by a system failure or operator error.

SAP complements Somersault with its SAP Business Technology Map, a guide for managing SAP solutions. HP and SAP jointly developed the high availability view of this map to provide an overview of the specific products, services and support available from both SAP and HP.

HP's clustering solution, MC/ServiceGuard, also has been tested for SAP, and HP now offers an MC/ServiceGuard Extension for SAP. The Extension is a suite of tools that manage the behavior of SAP in the event of a database failure.

### INTEGRATION WITH OPENVIEW

HP also offers products that tightly integrate its OpenView enterprise management suite with mySAP.com. The products, including HP OpenView Manager for SAP R/3 and HP OpenView SMART Plug-In for SAP R/3, are designed to help IT better manage the performance and availability of SAP R/3 applications.

This year, HP unveiled an advanced version of OpenView VantagePoint SMART Plug-In for SAP R/3. Combined with HP OpenView VantagePoint Manager, the integrated solution is tuned to manage both

R/3 and mySAP.com mission-critical, B2B environments. The solution manages from the SAP applications and database, including servers, desktops, networks and hardware and manages across functional disciplines, such as availability and operations, as well as conducting performance monitoring and analysis.

In June, HP announced a product that integrates SAP and OpenView to provide additional insights into SAP transactions. Called OpenView VantagePoint SAP Business Transaction Observer, the product gives IT information on the impact of SAP transactions on volume and usage patterns at the application layer.

### OUTPUT MANAGEMENT

HP and SAP recently announced that they are collaborating on the development of output-management and information delivery software for SAP customers. The product will be branded as HP's output-management solution for R/3 and will be sold by HP's worldwide sales force. The development efforts will focus on output distribution, spooling, Web-based information delivery and electronic forms.

The output-management solution owes much to software from Dazel, a company HP acquired last year. Dazel software takes input from different sources, searches through it for the content needed by a user, and then sends it to the user in the required format.

### INTEGRATION SERVICES

Last year, HP unveiled HP Rapid/WEB, the first set of integration services designed to link R/3 with the Internet. Rapid/WEB includes personalization services for creating a one-on-one Web storefront and makes use of HP's e-speak technology to allow users to conduct SAP transactions over the Web. HP also offers optional Internet integration products, including implementation services for secure Web services and Changengine, business process management software, which orchestrates the flow of business throughout an enterprise.

HP augments Rapid/WEB with Systems Performance Check for Windows NT in SAP Environments and HP Network Performance Assessment for SAP Environments. These services give users the ability to fine-tune their networks to optimize performance and integrate SAP's EarlyWatch and GoingLive with HP's NT consulting and multivendor network support.

To shorten the time for installation of mySAP.com Workplace in existing R/3 environments, the SAP enterprise portal solution, HP offers the SAP Ready-to-Run Workplace Server and R/3 implementation program. HP claims that this implementation program reduces standard installation time for mySAP.com Workplace Server from weeks to days.

HP and SAP also announced a fast-start implementation program for e-commerce Starter Pack, SAP's turnkey solution for users engaging in e-commerce. The Starter Pack gives users access to new Web-based capabilities, such as e-procurement.

### SUPPORT OFFERINGS

HP's mission-critical services for SAP include business-critical support for both UNIX and NT environments, Business Continuity Support and Business-recovery Services for SAP.

HP packages its business-critical support for R/3 running in UNIX environments as HP Critical Systems Support for SAP R/3. This level of support provides users with immediate access and response from an HP support team, priority system recovery with a maximum six-hour hardware call-to-repair commitment, and assistance from R/3 experts to prevent unplanned downtime.

HP provides equivalent support for NT in SAP environments, including the hardware call-to-repair commitment, around-the-clock priority recovery, proactive prevention and managed change.

HP's Business Continuity Support, HP's most comprehensive support offering for SAP users, ensures that users meet service level obligations to business units. The support offering is modularized so that users can tailor it to meet their specific needs.

HP's Business-recovery Services for SAP helps users recover from disasters by providing alternative sites worldwide from which users can run their R/3 applications, while their site is being restored. The alternative sites include fully configured systems. Other services include business-recovery planning, training and rehearsals; express shipment of replacement equipment; and mobile recovery centers. ♦

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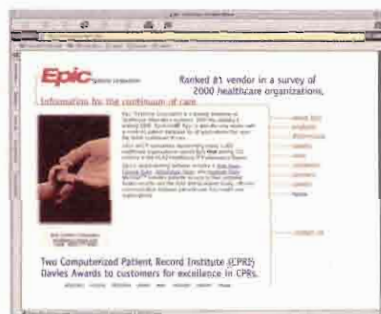
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**HP SURESTORE NETSTORAGE 6000**

The HP SureStore NetStorage 6000 provides raw capacity of 72 GB to 360 GB, boasts a 5u rack-mountable unit, and attaches to the network without disrupting current operations. The NetStorage 6000 is compatible with heterogeneous network environments, including UNIX, Linux and Windows NT. It can be installed, configured and managed with a Web-based administration tool that can be accessed remotely from any workstation on the network. The NetStorage 6000 also offers hot-swappable RAID technology and is compatible with different backup solutions, such as the HP DLT Autoloader 818 Tape Library and VERITAS Backup Exec. *For more information, visit [www.hp.com](http://www.hp.com).*

**SUN REMOTE SERVICES 2.0**

Sun Microsystems offers Sun Remote Systems (SRS) 2.0, a suite of remote management services with phone-home capabilities that supports Sun's network storage products. SRS 2.0 is designed to enable Sun to proactively identify and resolve potential problems that might threaten the availability of a customer's systems, including storage, the server, Solaris Operating Environment and applications software. It uses an agent-based architecture to continuously monitor key system variables and contact Sun in the event of a problem. *For more information, visit [www.sun.com/srs](http://www.sun.com/srs).*

**TAPEWARE BUNDLES SURESTORE**

Yosemite Technologies has entered an agreement with HP to have TapeWare, Yosemite's storage management software, bundled with the HP SureStore family of DAT and DLT tape drives. The introduction of TapeWare into HP SureStore products offers a complete backup solution and One-Button Disaster Recovery for Windows NT and NetWare. TapeWare will be offered through HP's international network of resellers and distributors. *For more information, call (559) 292-8888, or visit [www.tapeware.com](http://www.tapeware.com).*

**DLT STORAGE SOLUTION**

Benchmark Tape Systems and NovaStor Corp. have joined forces to offer a complete DLT Storage Solution with the compatibility of the Benchmark DLT1 tape drive and DLT7 autoloader with NovaStor's NovaNET 8 network backup software. The NovaNet 8 solution enables

Benchmark users to backup multiple servers and workstations in a mixed NT/2000, NetWare and Linux network environment. The Benchmark DLT1 tape drive features an 80 GB compressed capacity and a 6 MB/second transfer rate; it is read-compatible with the DLT4000 utilizing DLTtapeTM IV media. The Benchmark DLT7 autoloader features a seven cartridge 280 GB native capacity (560 GB compressed) and a single drive performance of 6 MB/second compressed transfer rate. *For more information, visit their Web sites at [www.benchmarktape.com](http://www.benchmarktape.com), or [www.novastor.com](http://www.novastor.com).*

**OFFICEJET G SERIES ALL-IN-ONES**

The HP OfficeJet G Series printer, fax, scanner, copier all-in-ones provide photo-realistic color printing, high-quality color scanning, standalone color faxing and



walk-up color copying. Users can print, fax and scan from any PC within a networked office. Features include USB connectivity and a new simplified software interface. The OfficeJet G Series all-in-ones' printing features include HP's exclusive color layering technology from PhotoREt III, print speeds of up to 12 ppm for black text and 10 ppm for color images on various paper types and sizes and an alternative photo mode, which prints up to 2400 dpi on photo paper. Scanning features include high-quality 600x3600 dpi scanning and a "scan to" button on the front panel to send scanned images directly to a networked PC or automatically place scanned images into software applications and e-mail. *For more information, visit their Web site at [www.hp.com/go/all-in-one](http://www.hp.com/go/all-in-one).*

**SURESTORE AUTOBACKUP**

HP's new thin server, HP SureStore AutoBackup, allows automated backup for desktop and network-connected mobile PCs. This NAS appliance comes in two versions: the PC25 (designed for up to 25 users) and

the PC100 (designed for up to 100 users). SureStore AutoBackup automatically stores all of the data from a PC's hard drive, and backs up only data that has been changed. *For more information, visit [www.hp.com](http://www.hp.com).*

**ULTERA DVD-R MULTIMASTER**

Ultera Systems' DVD-R MultiMaster array controller allows up to 12 DVDs to be created simultaneously in about the same amount of time it would normally take to create one disc. It supports up to 12 SCSI-based DVD-R drives from Pioneer New Media technologies, and is flash-upgradeable to support recording speeds beyond the current 8x (1.2 MB/second). The Ultera controller supports both disc at once and incremental writing recording modes on the Pioneer DVD-R drives. The Ultera controller is operating system- and application software-independent, providing plug-and-play compatibility with Windows 95/98/NT, Mac OS, UNIX and Linux platforms. *For more information, call (949) 367-8800, or visit [www.ultera.com](http://www.ultera.com).*

**SPECTRACOM'S NETCLOCK/NTP**

Spectracom Corporation has enabled customers to share accurate time with other network nodes throughout an Ethernet network with its NetClock/NTP Network Time Provider, Model 8189. The NetClock/NTP Network Time Provider is designed to deliver system-wide split-second timing information to computer networks. It has both an Ethernet network interface and the industry-standard NetClock RS-232 and RS-485 time code outputs for non-networked devices. Model 8189 includes a window-mount GPS antenna (Model 8228), 50 feet of coaxial antenna cable and SMA connector. *For more information, call (716) 381-4827, or visit [www.spectracomcorp.com](http://www.spectracomcorp.com).*

**ENHANCED SUN STOREEDGE L700**

Sun Microsystems has enhanced its Sun StorEdge L700 tape library with support for DLT7000 tape drives. The enhanced Sun StorEdge L700 tape library enables customers to integrate existing DLT7000 media. It delivers native capacity of up to 24 TB and native throughput of up to 100 MB/second for DLT7000-based configurations or 120 MB/second for 9840-based configurations. The system houses up to 20 DLT7000 or 12 9840 tape drives and can accommodate up to 690 tape cartridges. *For more information, visit their Web site at [www.sun.com](http://www.sun.com).*

**NETCRACKER PROFESSIONAL**

NetCracker Technology's NetCracker Professional and NetCracker Designer are now available in a client/server application, as well as a standalone application. NetCracker Professional is an advanced network AutoSimulation and Autodiscovery tool that allows users to proactively design, plan, simulate and present complex voice, video and data networks. NetCracker Designer is advanced network design, presentation and Autodiscovery software. A new feature set comes with both products. NetCracker Professional and NetCracker Designer also boast the following new product features: Copy/Paste, network generic schematics, and network filtering. *For more information, call (781) 736-0860, or visit their Web site at [www.netcracker.com](http://www.netcracker.com).*

**CSI MOBILELINK 2.3**

CASIO Soft introduced CSI MobileLink 2.3, its data gathering and order taking software. MobileLink 2.3 combines palm-sized PCs, the Internet and SQL database technology. New features included with version 2.3 are digital image capture in the field, bar code look-up and enhanced

Internet functionality. MobileLink 2.3 also features Windows CE/95/98 handheld computers for data collection and transmission; desktop PC questionnaire creation; centralized call scheduling and distribution; SQL database for data storage and Web-based in-store information reports; electronic signature capture and automatic tracking of call duration; and the ability to work with bar code readers and digital cameras. *For more information, visit [www.casiosoft.com](http://www.casiosoft.com).*

**GOBACK TURNS THE CLOCK BACK**

Adaptec's GoBack software enables the user to turn back the clock and revert the hard drive to the way it was before the problem arose, in order to recover damaged data intact and protect the data. GoBack is not a replacement for anti-virus software and cannot disinfect a system. *For more information, call (408) 945-8600, or visit [www.adaptec.com](http://www.adaptec.com) or [www.goback.com](http://www.goback.com).*

**AVT INTRODUCES RIGHTFAX**

AVT Corporation's RightFAX Connector for Oracle Applications E-Business Suite allows the electronic delivery of critical

purchase orders, releases and change orders directly from Oracle Internet Procurement. The RightFAX Facsimile Command Language (FCL), its production API, is written into Oracle Internet Procurement, making it convenient for companies to implement, manage and use the production-level electronic document delivery capabilities. Users can set document delivery options through a graphical tool which allows design and configuration flexibility. *For more information, visit [www.avtc.com](http://www.avtc.com).*

**NEW SUPPORTS FOR HIARC'S HSM**

HIARC Inc.'s hierarchical storage management (HSM) software now supports the Ultrium (high-capacity) LTO (linear tape-open) technology. HIARC also supports the following tape technologies: 4MM (DAT), 8MM, 3480/3490, AIT, DLT, Magstar, MLR, SLR, VHS, D1/D2/D5. Supported manufacturers include: ATL, Breece Hill Technologies, Exabyte, IBM, M4 Data, Overland Data, Plasmon, QualStar, Spectra Logics, StorageTek, Straight-Line, Sun and Tandberg Data. *For more information, call (714) 532-7411, or visit [www.hiarc.com](http://www.hiarc.com).* ♦

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