101 The Independent Guide For Integrating Hewlett-Packard Systems In Your Enterprise

HP Professional

SEPTEMBER 2000

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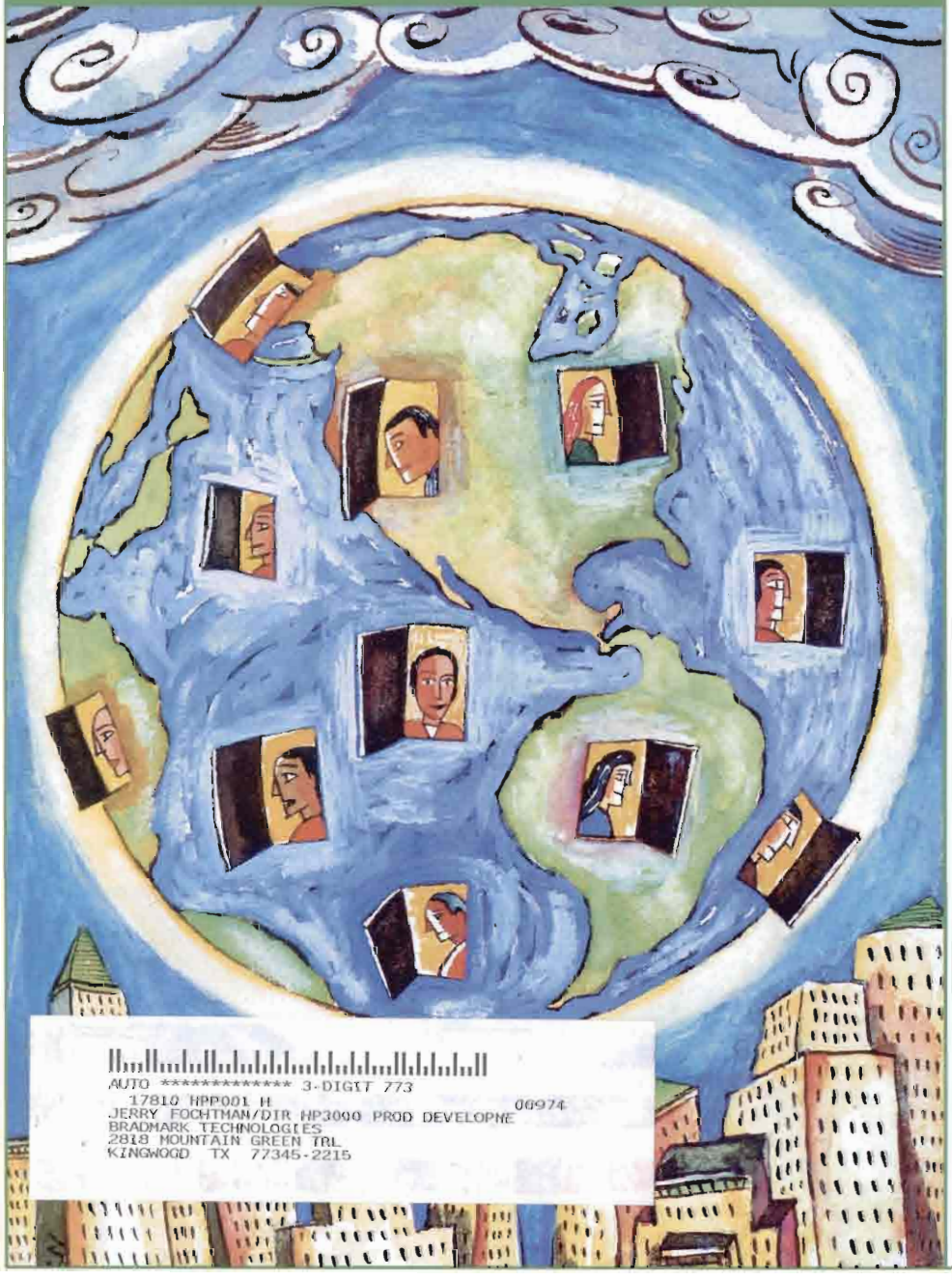


Portals and VPNs

The Portal:
Gateway to the World of e-Services

From the Beginning
Cargill Embarks on IT Overhaul

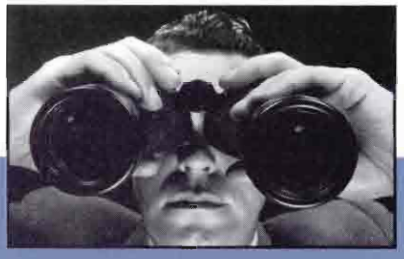
The Old One, Two
Content Management and e-Services

Networks à la Mode
Hardware Vendors Grab a Piece of the VPN Pie

Talking the Talk
Talk.com Eases Online Long-Distance Phone Service

HP ProFile
Frank Barker, GM, Utility Computing Services and VP, HP Solutions

DIS Research



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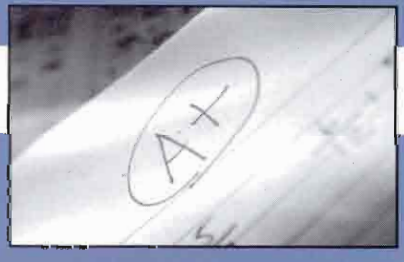

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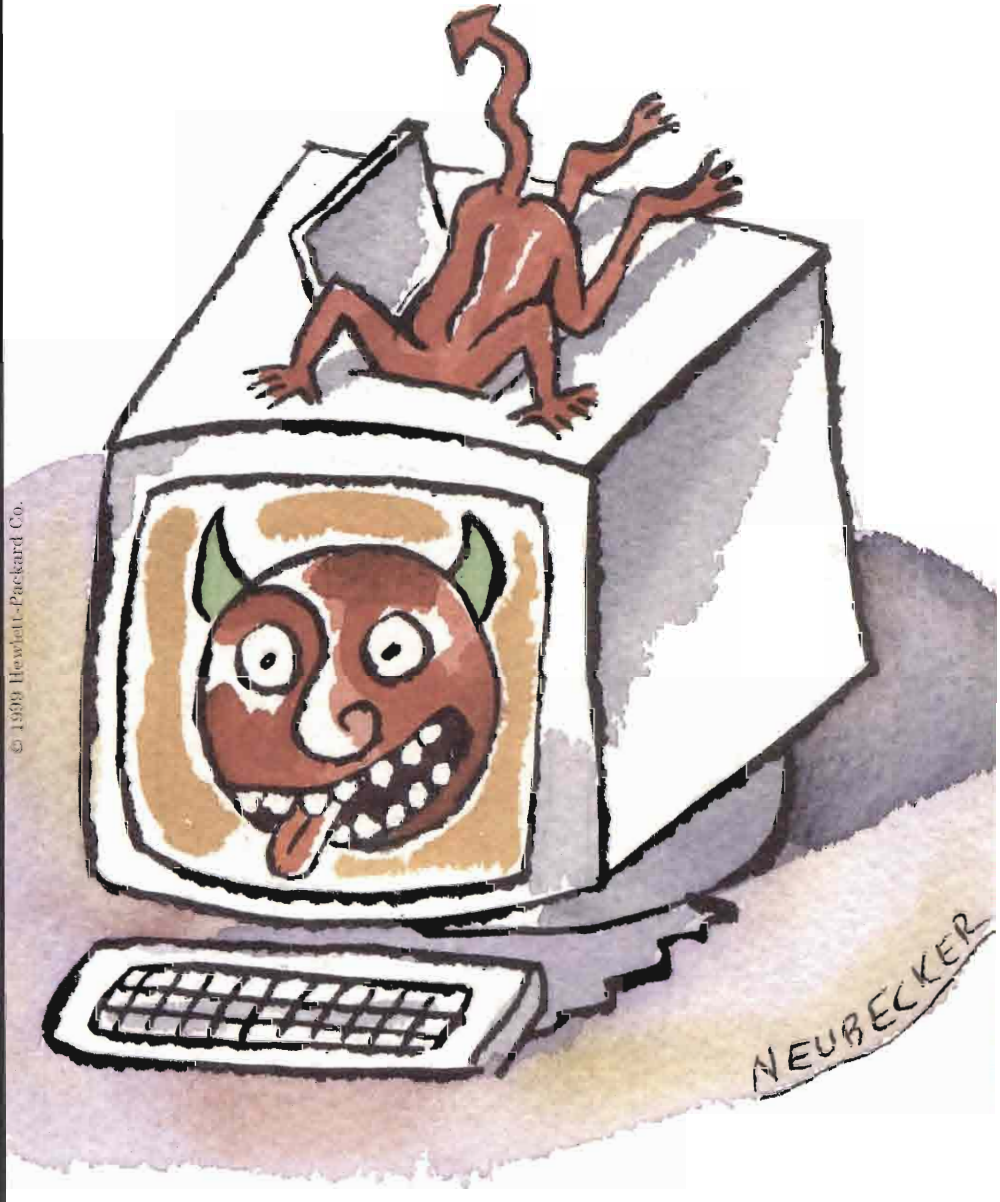

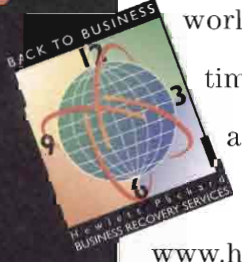

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HP – Inventor or Integrator?

When HP CEO Carly Fiorina unveiled a new HP logo late last year, only one word appeared underneath it – "invent." These days, though, HP is emphasizing other words, like "integrate" and "aggregate."

This isn't surprising. Today, customers aren't so much interested in point products as overall solutions. In response, the large vendors have been forming alliances and integrating their partners' technology into so-called end-to-end solutions. In other words, the big players have become systems integrators, with HP as no exception.

What about that word "invent" though? It's been a – maybe *the* – key to HP's success. It's what built HP's reputation. Customers may complain about consulting or sales or pricing, but they almost always praise HP's technology.

It's not technology, but flaws in organizational structure and marketing that have been HP's Achilles' heel. In the past, technology and products withered in company silos – separate business units that seemed to compete rather than cooperate with one another. That isn't happening as much anymore.

Take, for example, e-speak, the software that allows for creation and brokering of e-services on the fly. E-speak is a big plus for HP. Playing directly into the company's services strategy, it is being integrated into the solutions and initiatives of any number of HP's business units, as well as solutions developed by HP's partners. What's important here is that everybody at HP knows about e-speak. It's talked about by people in almost all the business units.

In contrast, look at Changengine, a technology that hasn't received much attention from the press or within HP. Although Changengine doesn't rival e-speak in scope, HP, when launching it in late 1997, touted it as "central" to the company's "e-business strategy." After that, Changengine seemed to languish in what was then the Electronic Business Software Organization (EBSO). From time to time, EBSO unveiled enhancements and upgrades to Changengine, sending most journalists and analysts into research mode so they could remind themselves what Changengine was, and what function it performed.

Ah, but there's a success story here. A month or two ago, Bill Russell, an HP vice president and now General Manager of HP's Software and Solutions Organization, told *HP Professional* that, "Changengine is a product whose time has come." Russell's point was that, with the growth of e-commerce, the market has finally caught up with Changengine.

The different histories of e-speak and Changengine say much about the changes that have been taking place at HP. Since Fiorina came on board, the company has firmed up its overall marketing strategy and consolidated numerous small business groups into larger, more focused units. But, the history of Changengine says something else important about HP, and about that word "invent."

In the past, HP's attitude seemed to be, "If we build it, they will come." That visionary view sometimes worked for HP. At HP, someone (or ones) somewhere developed Changengine, and the technology eventually found its audience.

Many of us hope that HP is still encouraging its visionaries. That doesn't mean we expect the company to build every piece of technology contained in its solutions. It must access technology from other vendors. And when it can't find needed technology, it must build its own, as it is apparently doing to provide analytics capabilities in the portal space.

HP is looking fairly good right now. It is focused and is being applauded for that by the press, its customers and the markets. But that "invent" in the logo still means something. Let's hope someone somewhere in the HP Labs is working on the next Changengine.

Jean Nattkemper
jnattkemper@hppro.com

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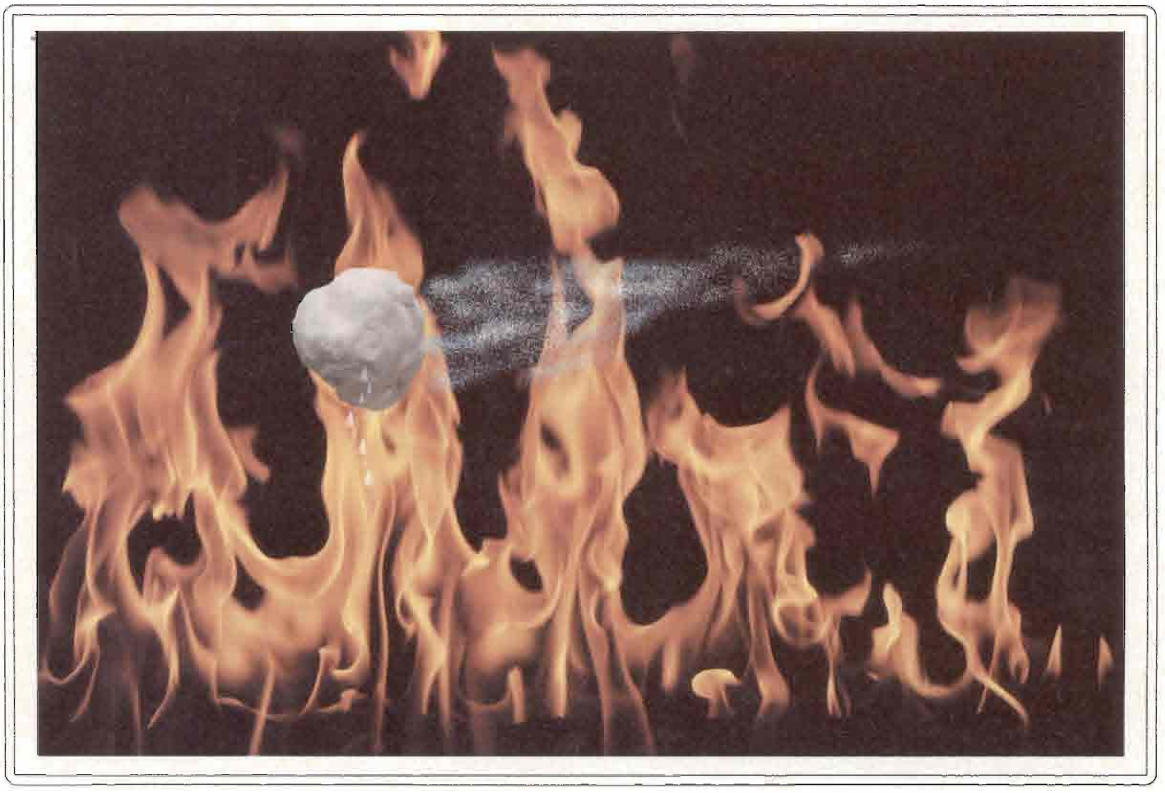

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HP, AT&T TO OFFER E-BIZ SOLUTIONS

HP and AT&T have struck a deal to jointly develop and co-market integrated, managed e-business solutions for global companies and high-growth dotcoms. AT&T Solutions, AT&T's managed networking and professional services subsidiary, will support the new services through its global networking infrastructure and Internet data centers. AT&T said it will offer customers end-to-end reporting, monitoring and management through its Global Enterprise Management System. HP will supply e-services expertise, hardware and software consulting and support.

Initial services will include e-commerce solutions for the enterprise, custom hosting solutions, high-availability computing services and an outsourced e-mail messaging and collaboration service based on HP OpenMail.

The two companies' joint e-commerce services include solutions made up of software, hardware, hosting services, network connectivity and management and legacy system integration. Planned application functions include storefront capability, pricing, order processing, tax calculation, payment processing, shipping and handling, customer service, and security. HP and AT&T plan to support the solutions with customized service level agreements (SLAs).

The custom hosting solutions include management of an entire Web system, from the network to Web applications, including end-to-end SLAs. The solutions will include HP Internet software and computer systems and will be based on AT&T's existing hosting portfolio and global networking infrastructure. The two companies plan to offer services that include Web design, application development and implementation and management of integrated network, server, database and application components.

To deliver the high-availability computing services, HP and AT&T will design, engineer, and implement network-managed services, including business and technical risk assessment. Solutions will include AT&T's networking management centers and HP's high availability servers.

For e-mail messaging and collaboration, AT&T Solutions will provide managed services for customers outsourcing HP's OpenMail, an e-mail messaging and collaboration solution for UNIX and Linux users.

HP, Cisco Ally on Customer Contact Solutions

HP and Cisco announced a joint effort to deliver call center solutions based on Cisco's customer contact software platform, a CRM solution. Customer contact software is used to, for example, route customers to the most appropriate agent, escalate a situation based on previous history, and enable Web-based collaboration between a customer and an agent.

The Cisco platform combines intelligent contact management, Web collaboration and e-mail response management with Cisco's IP telephony networking solutions. Its purpose is to provide for integrated management of multiple contact channels, including Web, phone, chat, VoIP, IVR, fax and e-mail – all the channels used by customers when they try to establish contact with a business.

Under terms of the new agreement, HP Services will sell, integrate, and service the Cisco platform. The deal also calls for HP Services to expand its worldwide consulting practice and support organization so it can offer pre-integrated and pre-tested components for a range of businesses, from small offices and home users to large enterprises. Network, systems, and applications management solutions will be based on HP OpenView products.

HP and Cisco will also develop a plan to integrate HP's Smart Contact capabilities into the Cisco platform. As part of the integration process, Cisco is acquiring the intellectual property rights to Smart Contact.

With this new initiative, HP and Cisco are targeting three large markets: IP-enabled call centers (which Datamonitor forecasts will grow from 8 percent in 1998 to more than 40 percent percent by 2003), CRM-focused service providers, and enterprises that want to improve the effectiveness of Web-based transactions for end users.

HP INVESTS IN NOVADIGM

HP has forged an alliance with software management provider Novadigm whereby HP will both invest in Novadigm and integrate Novadigm's products with HP's OpenView solutions for Windows users. HP's equity stake in Novadigm is in the 4 to 5 percent range, according to Novadigm chairman and CEO Albion Fitzgerald.

The two companies will collaborate in three main areas: product integration, migration of OpenView Desktop Administrator (DTA) to Novadigm's Radia and joint marketing and sales efforts. The product integration, combining Novadigm solutions and HP OpenView Venture solutions, will extend OpenView's reach to cover deployment, ongoing management, and, ultimately, the replacement of software, according to Fitzgerald. The companies expect the integration to be completed by the end of 2000.

The migration of OpenView DTA to Radia is primarily designed to meet the needs of Windows 2000 and mobile users, Fitzgerald says. The project will involve the introduction of several migration tools and utilities, and will be completed in stages over an 18-month period.

On the joint marketing and sales front, Novadigm will gain access to HP's direct and indirect distribution channels, allowing Novadigm to "extend its channel reach and increase market share," according to Fitzgerald. The CEO says these joint efforts will be aimed primarily at the mobile and Windows markets and at specific vertical industries, such as health care, communications and financial services.

The deal looks to be a good one for both companies. Novadigm is teaming up with a partner that has a large direct sales force and a strong global distribution channel. Moreover, the alliance gives Novadigm what may be a much-needed boost. Following news of the alliance with HP, Novadigm reported a fiscal first-quarter loss of $2.5 million and the resignation of its president. Nevertheless, the company said that the alliance with HP was allowing it to raise

See The Buzz on page 42

A Q&A with Frank Barker, GM of Utility Computing Services Division and VP of HP Solutions

Jean Nattkemper

When HP first announced its e-services strategy in May of 1999, it identified three linchpins of the e-services marketplace: apps on tap, portals and dynamically brokered e-services. Since then, HP has announced a number of initiatives to drive apps on tap, or its Internet utility computing model. *HP Professional* decided to explore those initiatives by talking to Frank Barker, General Manager of HP's Utility Services Computing Division. Barker, we found, is not only responsible for apps on tap but was recently given additional duties. HP's chief of the Utility Services Computing Division is now also serving as one of the general managers of HP Operations, the new organization formed from the consolidation of HP's separate outsourcing services groups.

HP Pro: Perhaps you would start off by explaining what HP means by utility computing.
Barker: The new utility computing model is based on a big shift taking place in the marketplace. Today, people are buying their applications and having them delivered over a network, whereas in the old model, applications typically sat in the IT shop, somewhere in the organization. We believe this new model for how you get your computing is a fundamental shift in the whole of the computing marketplace. HP has marketed this as the rise of apps-on-tap – applications delivered over a network.

What's happening is that utility computing is becoming possible because of the standardization the Internet brings. If you go to any Internet data center today, you'll typically find the operating systems are standardized around UNIX, Linux and NT. The database is typically standardized around Oracle. The network and system management is typically standardized around OpenView. And, the protocols around the IP networks are very standardized. So, the standardization is taking place anyway.

We're basically taking the standardization that's starting to occur de facto and ratcheting it up to the next level for our customers. It's typically happening box by box or infrastructure by infrastructure for each customer, and what we're doing is saying, "Well, rather than have it be done one by one, why don't we design an infrastructure that takes advantage of all this standardization and sell it to multiple customers."

Frank Barker

HP Pro: So you're selling a series of services based on standardization?
Barker: Exactly. And we're offering an infrastructure that is pre-defined and already there, so service providers can get to market quicker. They don't have to worry about filling out the infrastructure. And they don't have to worry about the scalability issues that come with growing their infrastructure. We take care of all that for them.

The big thing for most customers, when you talk with them, is it's kind of a hidden treasure for them. They're able to take some of their key people and have them focus on the front end of their business, adding value on the front end for their customers, rather than on the back end, building out their IT.

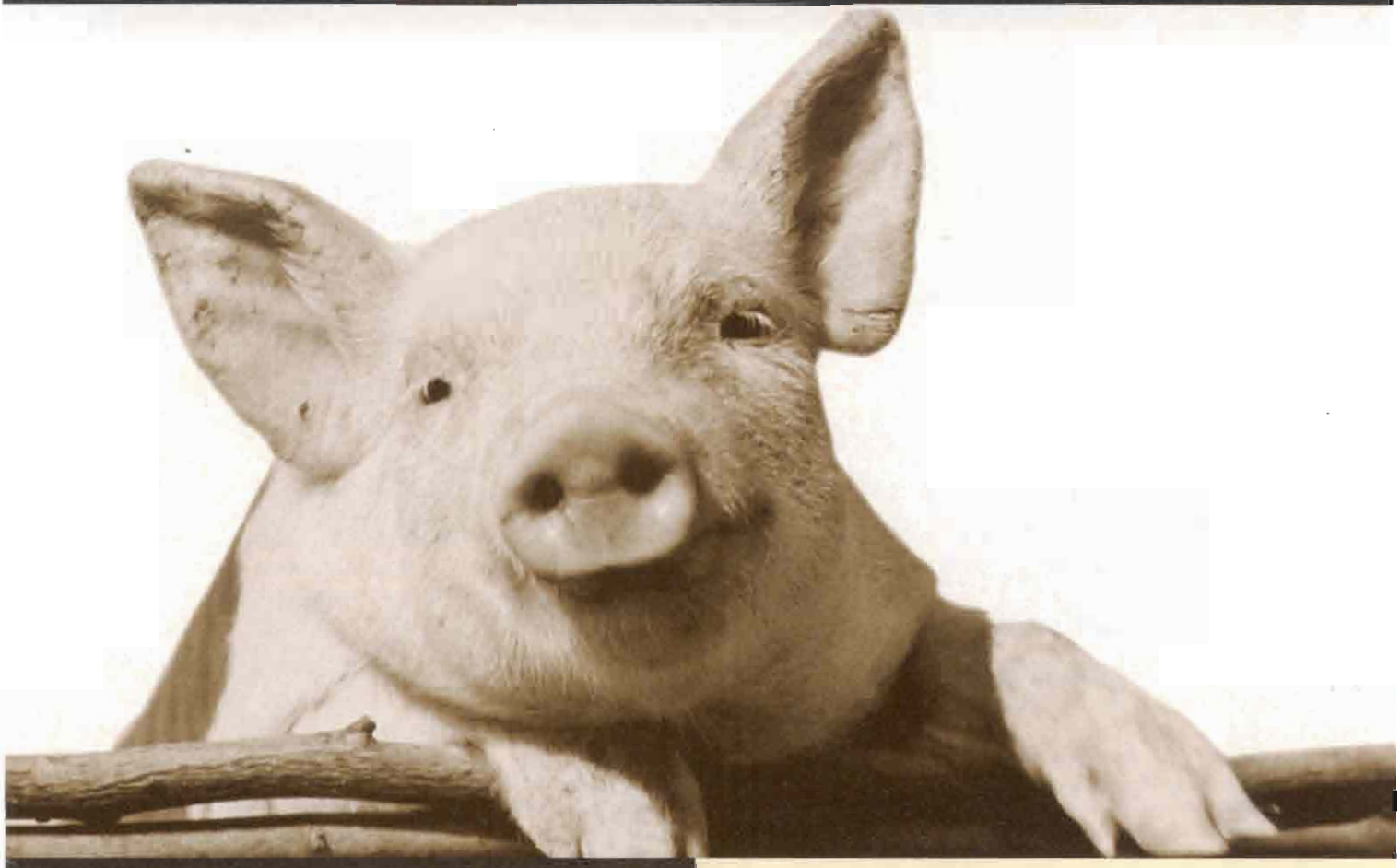
HP Pro: Your target market is service providers?
Barker: Definitely. By helping service providers take e-services out to market, we can drive the growth of the ASP and service provider model. That's our key strategic focus.

Because service providers pay only on a usage basis, the costs fit very much with their business models – their revenue is typically based on usage, and cost of infrastructure is based on usage.

HP Pro: This is a relatively new area for HP. How did the company – and you personally – get into it?
Barker: Prior to moving to the United States, I was based in Europe, running the consulting business for HP in Europe. And Tom Ashburn [Senior Vice President of HP's Customer Service and Support Group] felt there was a business to be made out of utility computing. He asked me to come over here, to check it out, and build a business, if it could be done. So, I moved here in May of last year, basically with nothing, to look at this opportunity. And what we've done over the last 14 plus months is put together a business plan, get it finalized, and hire a management team and people to go to market with Internet utility computing. We formally announced we existed in September of last year. That's when we kind of came out of the closet and said, "Hello, we exist." At that time, we laid out a roadmap of services that we would introducing over the next 12 months. We've been announcing those services, typically, every couple of months.

HP Pro: What are some of those services, or offerings?
Barker: I'll present them chronologically. In November, we announced Messaging-on-Tap, and then in December, we announced E-Learning-on-Tap. In February of this year, we announced IT Billing-on-Tap, and in March of this year, we announced Infrastructure-on-Tap.

HP Pro: Let's discuss the first offering, Messaging-on-Tap.
Barker: We went out with Messaging-on-Tap first, because we thought taking Microsoft Exchange into enterprises as a



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utility service was one way to open up the enterprise to this new model of how you get your computing. For Messaging-on-Tap, we're going directly to enterprises to open up the enterprise to the service providers. Then, we expect the service providers to come in selling their services. So Messaging-on-Tap is all about opening up the enterprise to this new model and putting HP's weight behind it.

The fees are based on usage, so if enterprises have a number of users on the system – 10,000 users, 20,000 users – they pay for that at the end of the month.

HP Pro: What is the typical size of businesses adopting Messaging-on-Tap?
Barker: Small and medium-size businesses have been buying this model for the last six to nine months, but large enterprises had not really bought it in any volume. Now that's changed. A major bank, the Canadian Imperial Bank of Commerce, one of North America's largest banks, recently adopted Messaging-on-Tap. The bank has 8 million banking and business customers, and 45,000 employees globally.

HP Pro: What prompted the bank to choose this service?
Barker: The bank had different messaging environments, based on geographic decisions or based on business decisions in different parts of the organization. They had to decide whether they'd build their own IT infrastructure for standardized messaging or whether they'd just outsource what they had and give it to someone else to manage. There was a third option, which was to have someone do it all for them – design the architecture and manage everything. In the end, they chose this third option.

We're in the process of implementing it right now, connecting 42,000 users to Exchange over the next 12 months. HP is taking care of all the operations, the upgrades, the deployment, the security and some of the end user training. And we've made service level commitments on how this will be delivered and what the availability will be – just like a utility. For example, we guarantee that when a message is sent, it will get there. Also, that a message sent from one part of the world will be delivered to any other part of the world within five minutes.

HP Pro: How about your other offerings? Infrastructure-on-Tap, for example?
Barker: With Infrastructure-on-Tap, we're targeting service providers directly. If you're a company that's setting up in business, say, a dot com offering some service, then rather than build out your computing department to take your service to market, you can just buy that service from HP. I think of HP's Computing Utility Services Division more as the enabler of e-services, because what we do is help service providers get into business and grow. But when you think of Infrastructure-on-Tap, we're actually offering infrastructure as an e-service that people buy on a usage basis.
Now, as companies start to adopt that business model and buy Infrastructure-on-Tap, they usually find they need a way to bill their customers. When you create a bill based on a computing service, it's quite complicated. So, we offer IT Billing-on-Tap, a billing utility service where customers pay per bill per month to have their bills delivered to their customers.

We also offer E-Learning-on-Tap, and this is one we've done in conjunction with HP Education. What this offers is an Internet classroom capability so that companies can offer, say, training to their employees on a new product or a new service by setting up a virtual classroom. Registration and training can occur online, distributed over the Internet.

Also, our roadmap includes plans for an offering in the area of mobile e-services, and we wholly intend to do that, although I can't say more about that today.

HP Pro: Who are your typical customers for Infrastructure-on-Tap?
Barker: The typical customer who finds Infrastructure-on-Tap attractive is a service provider who is looking to rapidly scale up their business. They're looking to grow very rapidly, and they know they need a reliable, robust infrastructure to run their business. We're typically targeting large organizations that need to provide a high level of service, like B2B hubs. When you create a B2B hub, you need a very big infrastructure. So do companies looking to sell their services in the enterprise space or in large companies.

Among the companies that spring to mind here is Lawson Software, which has a recruitment service, called ijob, that they sell to corporations. That service is paid for on a subscription basis. Lawson offers the service and we provide the infrastructure. With Infrastructure-on-Tap, billing is tied to the transaction, so HP charges according to the specific usage by each customer subscribed to the Lawson service.

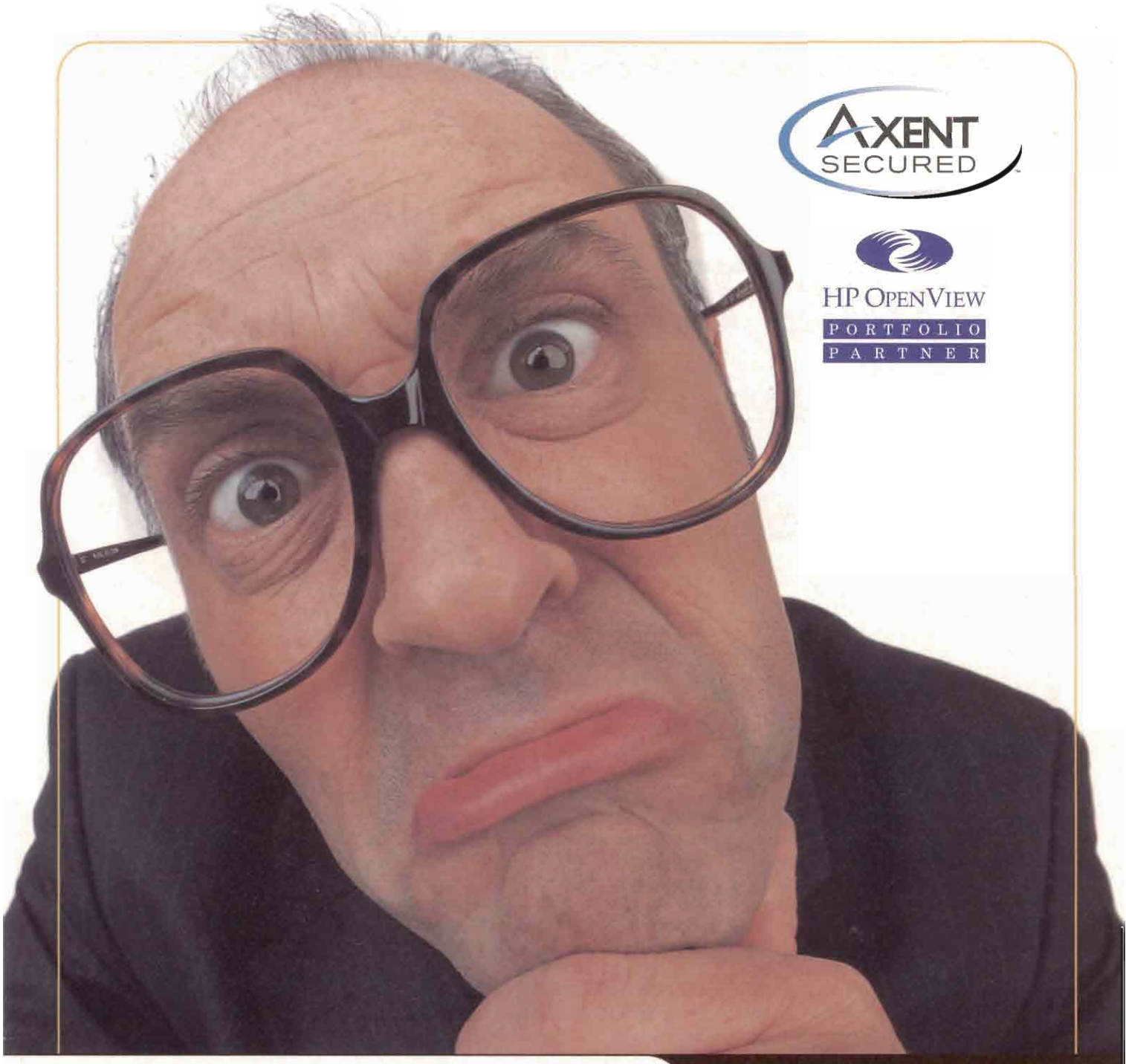
Another company is IPNet, an ASP that provides software that helps people set up B2B hubs. And IPNet offers that software as an ISV. In other words, they sell the software license or they offer the software as a service. And when they offer it as a service in the ASP model, we provide the infrastructure.

HP Pro: HP seems to be investing heavily in apps-on-tap. What's the size of the market?
Barker: The market's a great question. We've discussed this a lot with industry analysts. In fact, I recently had the opportunity to present at a colleague industry analyst event in Chicago. And I presented this model as a new emerging market that HP was playing in. Over the next couple of years, this market will grow, we think, from a very small marketplace to about a $3 billion marketplace.

If you also look at the marketplace that it sits within, it is typically sitting within an outsourcing marketplace. It's another form of outsourcing, and the outsourcing marketplace is expected to grow to about $160 billion by 2003. That includes mainframe outsourcing and legacy application outsourcing. So within the overall market, it's relatively small, but in itself it's still a big market, very focused. And it's focused on the new e-economy rather than on traditional mainframe and legacy environments. ◆

– Jean Nattkemper
HP Professional Editor at Large

"By helping service providers take e-services out to market, we can drive the growth of the ASP and service provider model. That's our key strategic focus." – Frank Barker



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Portals: The Gateway to E-Services

Jean Nattkemper

It's easy to see why portals are such a hot topic. They provide a single point of access for the mountains of data buried in different databases, enterprise applications, corporate intranets and so on – data that could be accessed previously only through different systems and interfaces. The case for portals has become so compelling that research firm and consultancy Ovum, in a recent report on portals, refers to "an increasing expectation that portals might replace the Microsoft Windows desktop as the standard interface for information access and delivery."

Portals are being embraced by businesses building electronic storefronts, companies looking to provide their employees and partners information from a variety of internal sources, and communities of buyers and sellers engaged in trade the means to deliver personalized information to their users. But, acceptance of portals doesn't mean there's a clear understanding of what they are. Sometimes, for example, they are equated with Web sites or URLs – but they are neither. In fact, a portal exists only when a URL viewed by a particular consumer, employee or business partner is customized for that person. In other words, a portal provides personalized access to specific information.

HP extends the definition to describe portals as proactive and predictive, as well as personalized, points out HP's Jennie Grimes, a director of e-Intelligence and Portal Solutions. Take, for instance, a fictional example – Music.com. Music.com offers its company banner as the first view visitors see when they arrive at the site. The Music.com site obviously lacks the personalization required of portals. But, it does offer visitors titles of some suggested CDs, based on the kinds of CDs they bought on previous visits. Personalization is coming into play here, but it's not very sophisticated. Music.com does not suggest a range of CDs, based on that visitor's previous buying habits over time. Music.com faces another issue – it's pushing out discount offers to visitors' e-mail, not presenting these offers as visitors browse through the site.

Music.com has some work to do to make its Web site into a portal. First, it should offer users a customized screen when they log in – a screen personalized for the individual user. Next, Music.com's software should interact with visitors as they click through the site by picking up on clues and making suggestions that jibe with a visitor's musical tastes. If Music.com makes those changes, it will have a real portal, one that, in HP's words, is personalized, proactive and predictive.

HP FOCUSES ON THREE KINDS OF PORTALS

HP offers three kinds of portals, all of which provide business opportunities for its customers rather than simply a means of facilitating and sharing ideas. They are e-commerce portals, enterprise information portals (EIP) and trading communities.

An e-commerce portal enables tailored commerce through a storefront. "This type of portal is essentially transaction-based," Grimes explains, "because its function is to track business transactions – for example, what a user places in the shopping cart, what gets abandoned or taken out of the cart, what page the user clicks to, when the user exits the site, and what products the user buys at the same time."

HP offers e-commerce portal solutions primarily through its partnership with BroadVision. HP integrates its own and other partners' technologies with BroadVision's Enterprise Business Portal Solution (EBPS), an e-commerce solution that enables enterprises to deliver personalized transactions and one-to-one experiences, not only with customers, but also with partners and employees. In June, HP made what some considered to be a surprising move by entering into a partnership with a BroadVision rival, start-up Intershop Communications. HP is now in the process of integrating Intershop's storefront engine into its e-commerce portal solutions.

The second type of portal offered by HP, EIPs, are sometimes called corporate portals, because most of the information

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accessed through them comes from within the corporation. Here the portal design is content-based, because the portal enables workflow or collaboration. EIPs allow users to access both unstructured and structured data – "scanned documents as well as spreadsheet data," Grimes explains. An EIP allows two employees engaged in salary planning, for instance, to access their company's latest salary guidelines and to discover the salary allocated to a specific employee last year.

BroadVision also takes a partnership role in HP's EIP solutions. In mid-July, HP extended another important relationship, a year-old alliance with Yahoo!, to deliver a new EIP solution – a Corporate Yahoo! customized, global EIP. The Corporate Yahoo! portal enables companies to offer their employees targeted Internet, intranet and extranet content through the widely used My Yahoo! interface.

The third type of portal, trading communities, is not, Grimes maintains, "an e-commerce portal on steroids." What she means by that is that trading communities exhibit distinct differences from e-commerce portals. In trading communities, relationships are many-to-many, rather than point-to-point, as in e-commerce portals. For that reason, trading communities are session-based, as many buyers and many sellers come together through an aggregator function.

Jennie Grimes: HP's Director of e-Intelligence and Portal Solutions

HP's strategy for trading communities is to partner with other vendors in launching independent companies that serve the needs of particular groups. In April, for example, HP allied with Cadence Design Systems and Flextronics International to launch SpinCircuit Inc., a business-to-business (B2B) e-commerce company, billed as an Internet gateway that bridges the gap between the design desktop and the electronics supply chain network. A month later, in May, HP and 11 partners – AMD, Compaq, Gateway, Hitachi, Infineon, NEC, Quantum, Samsung, SCI Systems, Solectron and Western Digital – unveiled the High Tech Industry Exchange, an independent company serving the high-tech supply chain community.

Although HP distinguishes among its portal solutions by grouping them into these three categories, it does not view the different portal types as independent silos. In fact, it expects customers to begin by launching one type of portal and then to add elements from the other types. Grimes uses as an example two companies in financial services – Fidelity and Schwab. Fidelity began by offering a portal that delivered to its customers personalized services centered on e-commerce – on making fast buys and sells. Schwab's portal, on the other hand, was data-oriented, focusing on portfolio history, comparison among elements of a portfolio, track records, brokerage recommendations, etc. Before long, though, Fidelity realized it needed to provide more data to customers making buy and sell decisions, and Schwab decided it needed to go the other way by adding buy and sell capabilities. In other words, each company had to integrate components from other types of portal solutions to serve customers.

HP STRATEGY AND TACTICS

HP's basic strategy in the portal space is simple, Grimes claims. "Basically, we help our customers deliver business portals at Web speed. We provide fast deployment by offering both the technical ecosystems and the business ecosystems that have to go around them. That's the strategy."

If that seems simple – and it is – it still takes some explaining. "Web speed," of course, means fast deployment, something HP has been emphasizing in any number of areas. In the portal space, "Web speed" translates into a proof-of-concept that is up and running in about 100 days. This effort to offer rapid deployment is especially significant because portals are fairly complex from an architectural perspective. "If you thought it was complicated to get just your cache server, your proxy server, and your content server up, wait till you see what happens with portals," Grimes says.

In using phrases like "technical ecosystem" and "business ecosystem," HP is further clarifying its strategy. HP builds a technical ecosystem by playing on a number of its strengths – always-on infrastructure, manageability, security, reliability and scalability. HP deals with the business ecosystem not by dealing with specific business processes, such as identifying where in the supply chain to optimize for inventory management from one site to another, but by mapping to business demands. That involves, for example, determining the kind of infrastructure to put in place and deciding how to enable and make business processes dynamic.

To enable dynamic change of business processes, HP makes use of Changengine, its workflow technology. Changengine plays in the EIP space, for example, by allowing companies to dynamically change hiring processes as the need arises. It performs a similar function for trading communities, for example, by shifting a business ordering process to allow two product designers to procure a needed part outside the traditional supply chain.

To drive its overall portal strategy, HP has adopted five tactics. First, it guarantees what it calls bulletproof solutions. Second, it precertifies the solutions, performing the integration and guaranteeing that the different products and solution work together. Third, it embraces solutions from both HP and its partners. In other words, HP integrates its own technology, like Changengine, with technology like BroadVision Enterprise Manager, which allows customers

to manage their portals from an HP OpenView environment. HP's fourth tactic is to invent portal-enabling technologies when necessary. HP has already developed e-speak and is now, Grimes hints, working on analytics technology that will be used in portal solutions. Fourth, HP is helping to build business ecosystems by providing tailored financing, consulting and support. An example is HP's Discovery Workshop, created solely for portals. The offering allows customers to identify the precise portal solutions that meet their business needs. Finally, HP is making equity investments in partners. It has, for instance, taken an equity stake in Moai, a company that provides dynamic pricing capabilities for public or private auctions and trading exchanges. HP has also invested in Divine interVentures, an incubation company that provides Internet start-ups and corporate Internet spin-outs with financing, infrastructure and support services to build B2B companies.

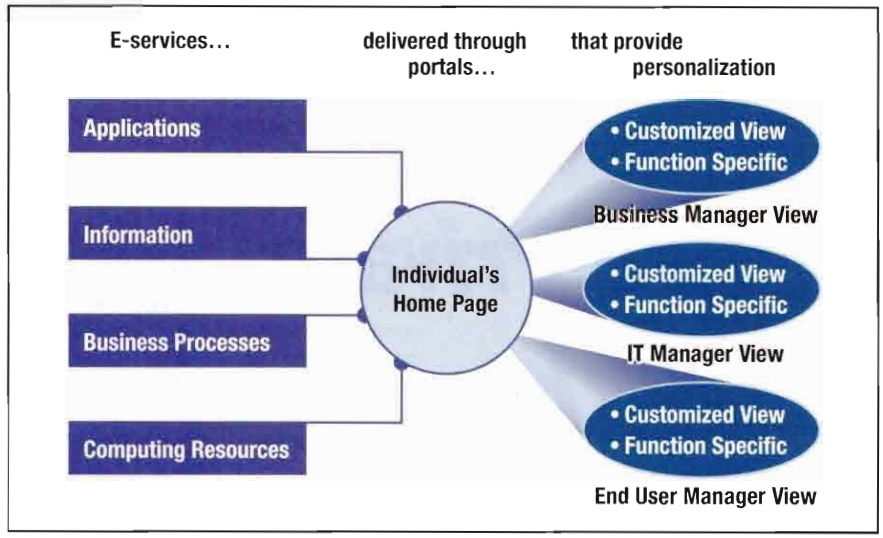


Figure 1: Portals provide a single point of access to e-services and views personalized to meet the needs of individual users.

HITTING THE BULLS-EYE?

HP may be betting heavily on portals, but how is its strategy playing out in the marketplace? Why should customers adopt HP's solutions rather than those from other vendors?

Let's look first at an area where HP is receiving mixed reviews – its efforts to launch independent companies that provide blockbuster trading communities in distinct marketplaces. Speaking of the High Tech Industry Exchange, HP's Grimes says, "I think we'll see more collaboration hubs for supply chain collaboration and design collaboration ... I think the model we took with the High Tech Exchange is going to become increasingly frequent, where a hub is spun off as a separate company that has separate governance, has its own board, and makes its own decisions. This will be a service provider predicated space." Grimes also credits the Exchange with triggering additional opportunities that HP can spin off and offer as services, although she's not yet ready to be specific.

Research firm International Data Corp. (IDC) provides a different view of the Exchange in a paper titled "Trying to Forget the Enemy: The High Tech Industry Exchange." Although IDC argues that reducing "the current level of confrontation through the creation of an independent entity to make technology and services decisions is an idea 'worth pursuing'," the research firm argues that "the competitive nature of the IT industry guarantees conflict and delay." IDC further says that the Exchange "and the industry it addresses would best be served in the short term by a truly open and robust e-marketplace that does more to reach out to small and medium-sized businesses usually ignored in these supply chain initiatives." IDC also expresses doubts about the breadth of industry support for the High Tech Exchange.

In the EIP space, HP's strategy seems to fit well with business needs and corporate trends. HP's EIP solutions, for example, jibe with the overall strategy outlined by Ovum in a report on EIPS as well as meeting the requirements Ovum sets forth for EIPs. Ed Mueller, president and CEO of ShortCycles, a start-up that partners with HP, agrees. Mueller, who wants ShortCycles' Sales and Marketing application to be part of HP's Corporate My Yahoo initiative, has a vested interest in HP's EIP strategy. Nevertheless, Mueller knows the marketplace, because he is pursuing partnerships with vendors in addition to HP.

"Overall, the strategy HP is implementing is definitely what the market as a whole is looking for," Mueller claims. "The same strategy we're seeing followed by HP – offering a corporate portal that is generic in nature and offers employees a single access point – we see other companies pursuing. It makes a lot of sense."

When Mueller talks about "other vendors," he is not specific, but it's no secret that HP has competitors in the portal space. One advantage HP has over its rivals seems to be its ability to combine fast deployment with customized solutions. IBM, for example, is more than competent to offer customized solutions but would have difficulty matching HP in rapid deployment. Sun, which CEO McNealy recently billed as the "plumbing supply house for service providers," focuses little on integration. That means that customers are left to integrate different components.

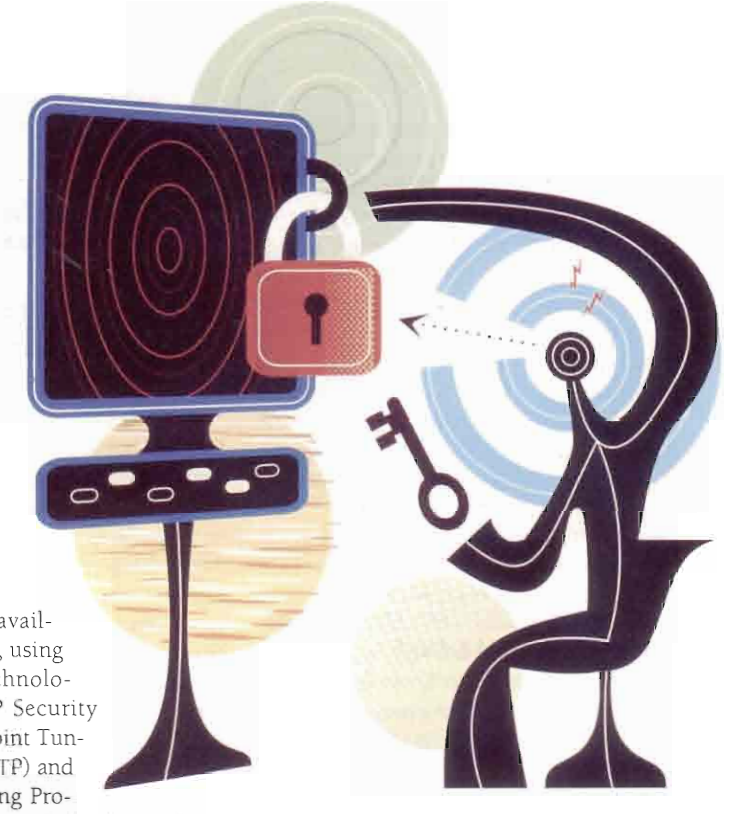
HP's range of partnerships provides another advantage, giving it the ability to integrate different solutions for different customers. IBM seems to offer less flexibility, especially because of its commitment to DB2, while Sun focuses on specific solutions, primarily the Netscape Application Server. On the other hand, HP offers different products to meet the same needs, allowing customers to substitute one component for another or even to eliminate unneeded components.

In talking to customers, HP can also make the argument that it practices what it preaches by increasingly driving its own business through portals. That, says Grimes, shows "we have skin in the game – that we walk the walk." ◆

– Jean Nattkemper is the Editor at Large for HP Professional. *She can be reached at jnattkemper@hppro.com.*

Virtual Private Networks

Hardware Vendors Grab a Piece of VPN Pie



Karen D. Schwartz

Virtual Private Networks – networks constructed by using public wires to connect nodes securely and privately – will increasingly become the communication method of choice over the next several years, according to industry experts, like Infonetics Research Inc., a San Jose, Calif. Internet consultancy. The technology is mature enough, in fact, for VPNs to become, within a few years, as ubiquitous and easy to use as today's public telephone network.

According to Infonetics, the market for VPN products and services will rise from just $6.3 billion this year to nearly $40 billion by 2004.

"VPNs are the next way companies will securely transmit corporate data, because they allow companies to leverage the infrastructure that was built with the Internet for their own corporate networks," says Jeff Wilson, Director of Access at Infonetics.

STANDARDS DRIVE ADOPTION

There has been a tremendous amount of work over the past three years in the IPsec world to make sure that products adhere to the IPsec standard and are interoperable with one other. In addition, Microsoft 2000 offers IPsec compliance and an IPsec client for remote access, giving every person with a Windows 2000 desktop access to a usable IPsec client. These efforts, combined with efforts on other fronts, are driving the great VPN stampede.

VPN products available today are built, using the same basic technologies – based on IP Security (IPsec), Point-to-Point Tunneling Protocol (PPTP) and Layer Two Tunneling Protocol (L2TP). Differentiation in products comes not from the technology itself, but in other ways, from offerings like value-added services and additional features.

Vendors are leaping to the challenge. Companies, like Lucent Technologies, IBM Corp., Cisco Systems, Watchguard Technologies and Intel Corp.'s Shiva, have jumped into the fray, offering VPN-compatible products and services and forging alliances to provide soup-to-nuts service for their clients.

In large part, VPNs will begin replacing traditional methods of data communication, including frame relay, leased lines, ATM services, private extranets and even dial-up remote access services. Now that VPN technology has matured enough to make adoption feasible and costs have dropped dramatically, it's almost a given that most companies will move to the VPN model over the next few years, Wilson says.

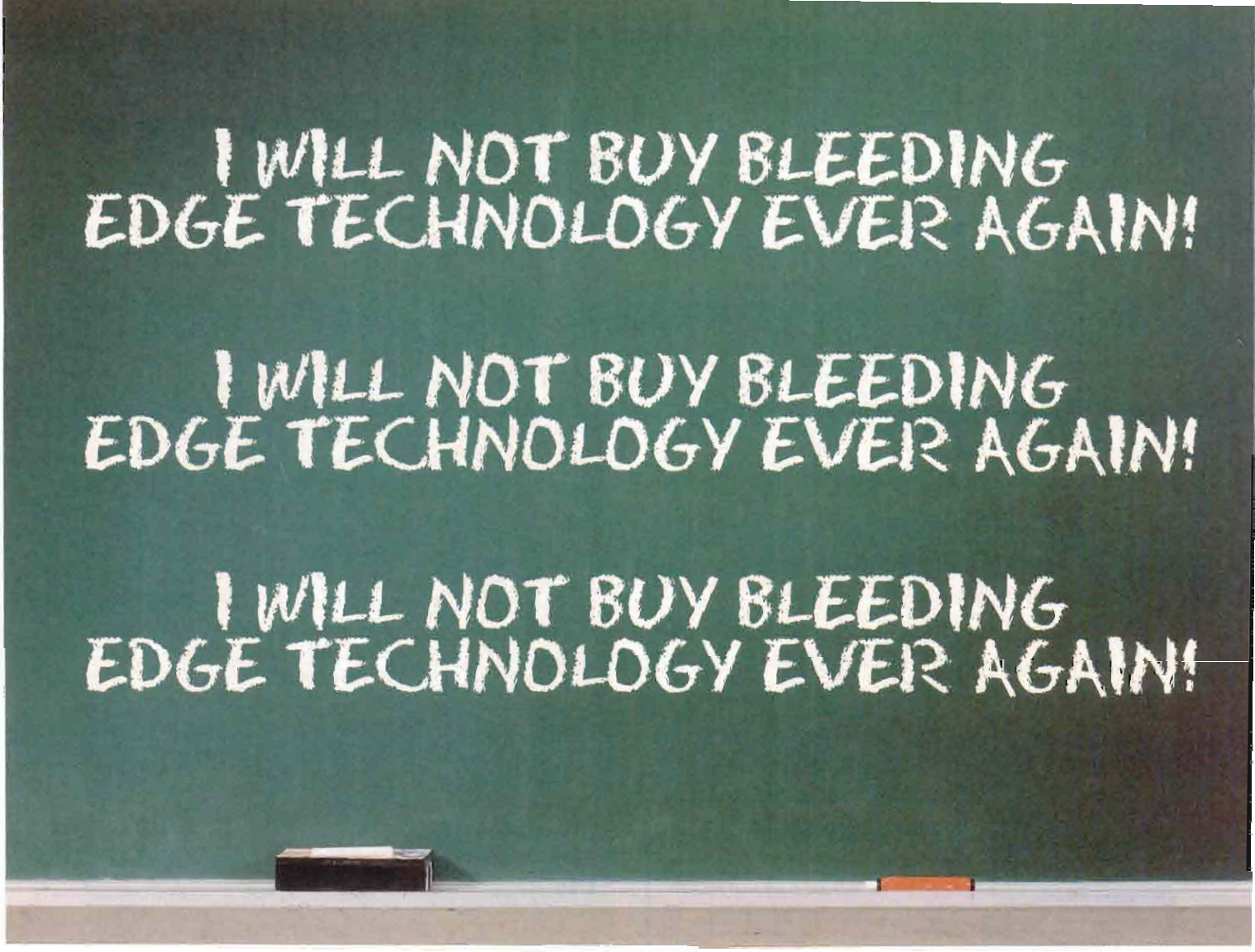
"If you pay $8,000 per month for a leased line from San Francisco to Boston, you could decrease your monthly cost to less than $1,000 if you replaced that leased line with Digital Subscriber Line (DSL) or a T-1 Internet connection and used VPN," he notes.

HP MUM ON VPN STRATEGY

There are three basic types of VPNs that companies are choosing to implement. Remote access VPNs – by far the most popular – provide secure, scalable access to remote workers, while large-scale site-to-site VPNs are the second-most popular option. Extranet VPNs, which Infonetics Research estimates will be deployed by as many as 27 percent of all companies by 2002, help extend services to suppliers and customers over a shared infrastructure with the same policies as a private network.

HP executives refused to comment on the company's VPN strategy – HP is reportedly is in the process of firming up its strategy internally – but, clearly, it is positioning itself as a player in the extranet VPN arena. Its flagship VPN product, HP Praesidium Extranet VPN, is billed as an offering that allows companies to safely build secure extranets, while providing strong user authentication, encryption and granular access

Illustration by Campbell Laird/SIS



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control filters. The product supports all IP-based client-server applications, including legacy mainframe, Web, custom corporate and emerging object-based applications, according to company literature.

Further strengthening its position, HP last fall struck an alliance with IP infrastructure company GRIC Communications Inc. of San Jose, Calif., to bundle its GRICtraveler Internet roaming service and GRICdial dialup connectivity utility with HP's Praesidium Extranet VPN, creating a product called Secure Remote Access. The goal of the alliance, according to Ken Stasi, GRIC's Director of Business and Channel Development, is to provide an end-to-end VPN solution for ISPs and their customers. To complete the package, HP agreed to provide integration and installation services.

"Praesidium provides the secure tunnel for the remote user and we provide the transport mechanism to the Internet," Stasi explains. "It's a great way for HP to combine third-party solutions with HP solutions for its customers."

Alliances like these are the best way for traditional hardware companies to enter the VPN marketplace, says Nick Wray, Executive Consultant in the Networking Division of Compass America, an IT consulting firm based in Reston, Va. By offering a VPN-ready server and adding VPN-ready software and Internet service, hardware vendors can present a comprehensive package to clients, he says.

In August, HP entered into another kind of alliance, one that also touches upon VPNs. HP revealed it was teaming up with Genuity Inc. to provide Windows 2000-based Web hosting services that accelerate development and delivery of business-to-business and business-to-consumer extranets and secure managed intranets. Genuity, which provides managed Internet infrastructure services to enterprises and service providers, offers VPNs as part of its E-Business Network provider platform.

Despite these efforts, HP and other hardware companies hoping to make a dent in the growing VPN market could face an uphill battle. They will be competing with companies that have spent the past few years honing their VPN products and services – and gaining market share and mindshare at the same time.

HP can't go wrong, however, in attempting to wade into the VPN market. Although the company will have to prove itself in the VPN arena, "it's a growth area, so it's a good place to be," Wray says. ◆

– Karen D. Schwartz is a freelance writer specializing in business and technology, based in the Washington, D.C. area. She can be reached at karen.schwartz@bigfoot.com.

Virtual Private Network Terms

IPsec (IP Security): A set of protocols being developed by the Internet Engineering Task Force (IETF) – the main standards body for the Internet – to support secure exchange of packets at the IP layer. IPsec supports both Transport and Tunnel encryption modes. On the receiving side, an IPSec-compliant device decrypts each packet.

L2TP (Layer Two Tunneling Protocol): Enables ISPs to operate Virtual Private Networks (VPNs). L2TP merges the best features of tunneling protocols from Microsoft and Cisco Systems.

MPLS (Multiprotocol Label Switching): An IETF initiative that integrates Layer 2 information about network links (bandwidth, latency, utilization) into Layer 3 (IP) within a particular system or ISP to simplify and improve IP packet exchange. MPLS gives network operators flexibility to divert and route traffic around link failures, congestion and bottlenecks.

PPTP (Point-to-Point Tunneling Protocol): A new technology for creating VPNs developed jointly by Microsoft, U.S. Robotics and several remote access vendor companies, known collectively as the PPTP Forum. PPTP is used to ensure that messages transmitted from one VPN node to another are secure. With PPTP, users can dial in to their corporate network via the Internet.

Transport Mode: Encrypts only the data portion (payload) of each packet, but leaves the header untouched.

Tunnel Mode: Encrypts both the header and the payload.

– K.S.

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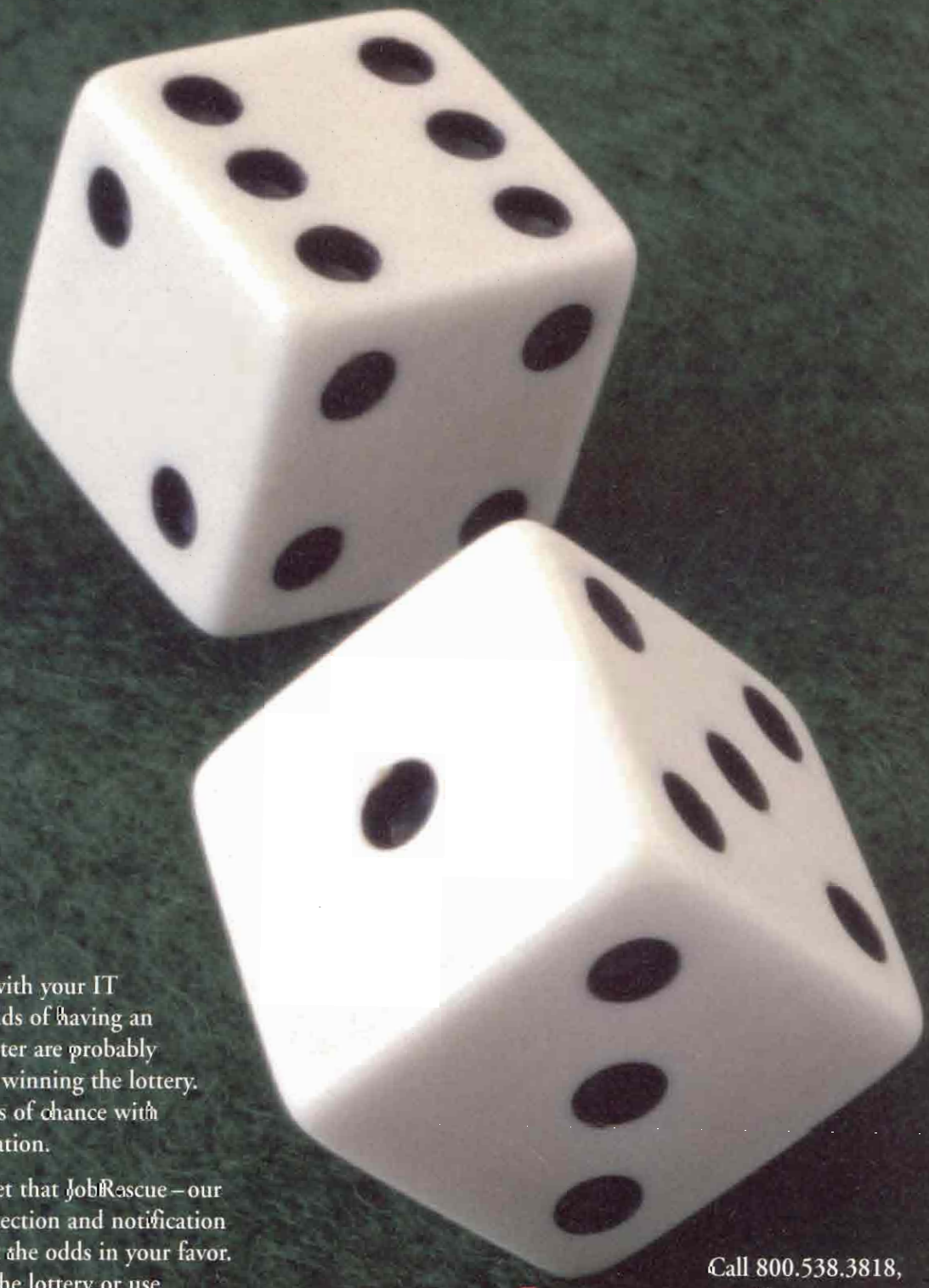

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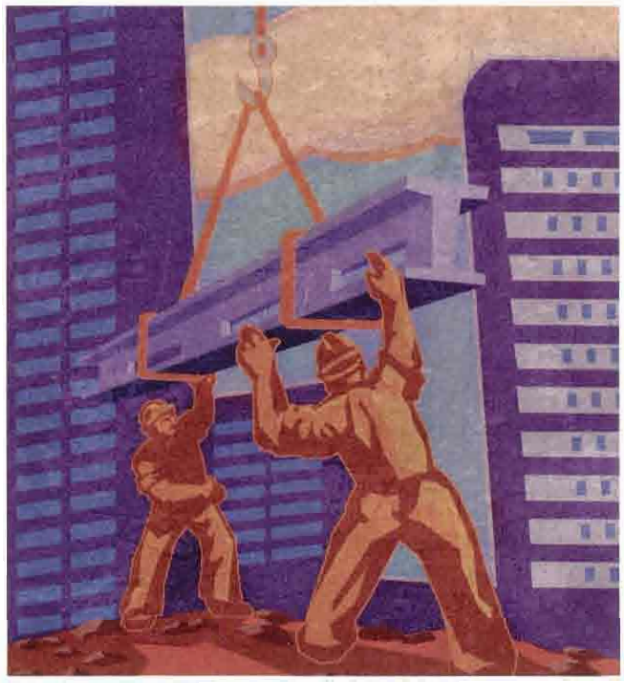
The HP e3000

Using Visual Basic for Rapid Development on the HP e3000



Charles H. Finley, Jr.

The HP e3000, with its built-in database, TurboIMAGE, has an installed base of between 70,000 and 100,000 computers. That makes it one of the most widely-used mid-range computer platforms for data processing. And it has made it necessary to open up the HP e3000 so that both host-based and client-server applications can access the same data.

Visual Basic is arguably the most popular Rapid Application Development (RAD) language for Microsoft Windows platforms. With an "off-the-shelf" HP e3000 and an "off-the-shelf" Windows 98/NT computer with Visual Basic 6.0 (or higher) and some free software, it is possible to create a simple client-server application for any database in just a few minutes. And you do not have to purchase any software other what comes with the base HP e3000, which must include a database (IMAGE or ALLBASE), and with any Intel-based client or server host (PC or server).

As a practical matter, for applications that use at least two tiers (two networked computers working together), whatever you can do with Visual Basic, you can do with Visual Basic and the HP e3000. In other words, for client-server and Web-based applications, where the HP e3000 serves as a host environment for servers (Web server, application server, database server, etc.), you can use the HP e3000 in applications solutions, just as you use a Windows server. Moreover, you can use the e3000 as a client host and run applications on a Windows-based server.

THE KEY IS MIDDLEWARE

In most cases, using the HP e3000 with Visual Basic is no more difficult than using Visual Basic with a native Windows 98/NT data source or application. When both the client host and the server host are properly configured for networking and interoperability (using the right middleware products), it is often

Components of Visual Basic

Visual Basic 6 is a very large application, including a number of technologies. Some of the most important are described below.

COM, OLE and Active/X COM (Component Object Model) is the foundation for most, if not all, of Microsoft's recent program-to-program interoperability solutions. In short, COM defines a number of rules that programs must obey in order to communicate with one another in a language-independent manner. Object Linking and Embedding (OLE) and Active/X are basically different names for the same thing. OLE is simply the older term. Active/X, an extremely complex group of features based on COM standards, makes it possible for two programs and/or applications that are both COM-compliant to interoperate even if they are written in different languages, or if they are executing on different computers that are networked together.

OLE/DB and ADO. OLE/DB is an application of COM and Active/X technologies that allows any data source to be accessed regardless of the underlying database or file type. Microsoft, in delivering open database connectivity, first offered ODBC, assuming that the data was stored in a relational database. OLE/DB provides a similar capability for all data types, including relational databases, ISAM files, text files, Microsoft Exchange files or any other data source. Active Data Objects (ADO) provides a simplified way for Visual Basic programs to communicate with OLE/DB providers.

IIS, ASP and COM. IIS (Internet Information Server) is Microsoft's Web server software for Windows NT. In addition to the HTML-based Web pages allowed by most Web servers, Microsoft has another type of page called an Active Server Page (ASP). ASPs can contain a combination of HTML and scripts. These scripts can take advantage of different built-in COM objects that enhance the capability of the scripting language and serve as a bridge to other, non-Web enabled programs. Moreover, ASPs are extensible, in that COM components that written in languages like Visual Basic can be called from scripts in Web pages.

Illustration by Tivadar Bote

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difficult to tell which server is being used.

Middleware, software that enables cross-platform integration, is the key here. Middleware allows PC-based applications to browse objects, execute commands remotely, transfer files, access data using SQL queries and native IMAGE calls, and navigate files on the HP e3000 or SQL results locally. If you use Visual Basic components, it is possible to remotely control terminal-based applications that now run on the HP e3000 and have them interact with applications on the Windows platforms.

For our purposes, middleware is what allows an application running on a Windows-based computer to access programs and data on an HP e3000. The different types of middleware include desktop and data access.

Desktop access middleware comes in handy when it is desirable to control an existing HP e3000-based application from a Windows computer. In this case, a program on the desktop controls another program, such as a terminal emulator. The middleware enables interoperability between client user interfaces, including GUIs and existing applications. It allows new

CSY's Dave Wilde Shares His e3000 Vision

HP Professional sat down with Dave Wilde, recently appointed Research and Development manager in HP's Commercial Systems Division (CSY), to get an idea of the directions CSY is pursuing for the HP e3000. Wilde is no stranger to the HP e3000 and to MPE users. An HP employee since 1984 and a part of CSY since 1992, Wilde has for the last two years been a section manager in CSY, focusing on HP e3000 platforms, operating system kernel, network drivers and storage and high-availability products. The discussion focused on CSY's priorities for the HP e3000 and the way those priorities are being met.

HP Pro: Thanks, Dave, for sitting down with us. Perhaps, you could start by identifying CSY's top priorities for the HP e3000.

Wilde: I'd like to divide my answer into two parts when it comes to priorities – external, or customer-facing, priorities and internal priorities. On the external, or customer side, our priorities fall into three categories:

- Enabling continued growth of the overall platform and of our customers
- Supporting and facilitating the deployment of the HP e3000 in an e-commerce, Internet, intranet environment, and
- Continuing to improve the data center management capabilities of the platform

In the growth area, we're working on new hardware platforms, which are always getting faster – higher I/O throughput, more bandwidth, more performance, etc. – and new network driver capabilities. Then, there's the ability of the operating system and the database and related subsystems to scale in terms of OLTP performance – which also allows more users to connect to the system.

HP Pro: May we interrupt here to ask about the role of IA-64 in your growth strategy?

Wilde: Well, right now, I think we're serving our customers best

user interfaces to be added to an existing application with little or no code changes and provides a means to leverage back-end applications with GUIs and Internet front ends. WRQ Reflection, with its OLE automation server and Reflection Basic, is an example of this kind of middleware. Using Reflection and OLE automation, you can programmatically control any terminal session.

Data access middleware, the most commonly used middleware, allows applications to access data sources. In such cases, a TurboIMAGE database on an HP e3000 is remotely accessed from the Windows desktop. ODBC is used for this purpose. This kind of solution provides a data-oriented application programming interface (API) to make requests to read or update data from server-based data sources and uses either SQL syntax or a proprietary database gateway API. Examples of data access middleware include HP's free ODBC/SE solution and products sold by M.B. Foster, Minisoft and Linkway.

Other types of middleware are discussed in detail in a presentation from Alvina Nishimoto on the HP Web site (//jazz.external.hp.com/papers/SolSymposium_00/middleware/index.htm).

GOOD NEWS, BAD NEWS

The Visual Basic world offers some of the best tools for enabling RAD. Most of these tools are reasonably priced, and some are free. But it's also possible to create an application without purchasing any software at all other than what comes with the base HP e3000 (including IMAGE or ALLBASE) and with any Intel-based PC or server. For an example, visit www.xformix.com/vbexample. I created the application shown here in less than two minutes and without writing a single line of code.

Now for the bad news. To do client-server or Web development, regardless of which computer is used to host the servers, you must install and configure the required software and hardware. And that can be complicated, or at least time-consuming. In many cases, it's more complicated than the development work itself.

How long installation and configuration take varies, depending on what has already been done to the computers you'll

Dave Wilde *Continued from page 24*

by continuing to support next-generation PA-RISC platforms ... We have a very minimal, long lead-time architecture investigation staffed in the IA-64 area. I don't think customers care whether the chip is PA-RISC or IA-64. They're concerned about having platforms available, having the capacity, the scaling and the right support of peripherals on the platforms.

HP Pro: OK, that takes care of growth. What about e-enabling the HP e3000?
Wilde: In the overall area of e-commerce, Internet, middleware tools, etc., there are a lot of tools that customers need to interoperate with other platforms in order to Web-enable applications. We offer the Apache Web server and Java, for example. We've also been working with Channel Partners to offer specific middleware tools, like message queuing.
More recently, we've begun offering SSL on the platform, making sure that it is integrated with Apache. Other areas we're looking into include single-on.

HP Pro: You mentioned new network driver capabilities and data center management as priorities.
Wilde: Yes, network drivers and continuing to support new platforms. One example is PCI (Peripheral Component Interconnect), a new backplane architecture. A lot of our network and I/O drivers for disk and tape devices need to be significantly re-engineered for that new environment. There's a big benefit here – much higher I/O throughput. Also, this is an essential change, because next-generation platforms will support only PCI.

HP Pro: Continuing on, what are you doing in the area of data center management?
Wilde: In the area of data center management, we're focusing on storage, enterprise management and high availability. We're tracking the overall HP storage roadmap when it comes to disk and tape products, and we're making sure we have up-to-date technologies in the area of disk arrays. We offer the AutoRAID disk array today, and we offer the XP256 disk array, as well as other arrays.

HP Pro: Fibre Channel is a hot topic for storage. What are you doing here?
Wilde: Actually, we have three Fibre Channel solutions: SCSI Fibre distance solutions that are shipping now; a SCSI Fibre solution shipping in the near term; and then, in the one-to-three-year time frame, a native Fibre Channel solution. With this offering, we basically go from a 3000 SCSI driver to a hardware box that actually maps onto Fibre Channel and then translates back to a SCSI device. It allows you to use Fibre Channel in the middle to expand the distance between SCSI connections – to have peripherals at a significant distance from the HP e3000. And, we'll be offering a SCSI Fibre solution that will allow you to connect Fibre Channel devices to the HP e3000, again using a hardware solution. That means if you have a device that supports only Fibre Channel, you'll soon be able to connect that to the HP e3000.
For enterprise system management, we've been beefing up our OpenView products, like IT/Operations [now called VantagePoint Operations]. We're basically offering templates to make it easier to make the HP e3000 a managed node when you use OpenView IT/Operations.
And, for availability, we're working with the HP OmniBack team to make sure the HP e3000 can be a managed node from a backup perspective, so you can back up an HP e3000 using OmniBack.

HP Pro: Let's cover some of your internal priorities now.
Wilde: Internally, our big areas of focus are schedule accuracy, quality and efficiency.
We're working on improving our schedule accuracy by doing a better job of setting expectations and then delivering on our commitments. On the efficiency side, we've always leveraged compiler technologies across HP-UX and MPE. Now, we're

See **Dave Wilde** *on page 26*

Dave Wilde *Continued from page 25*

doing more to leverage I/O drivers and some of the network driver technology. We're more closely aligning the I/O subsystems within MPE and UNIX.

HP Pro: Are your efforts to e-enable the HP e3000 paying off? Are a significant number of users setting up their e3000s as Web servers?
Wilde: Recently, I've seen quite a bit more of this. A number of people are using the e3000 as a direct Web server. In the Smith-Gardner environment, for example, the e3000 is a very big part of an Internet e-commerce world. And traditional companies are using the e3000 for Web serving, as well as some of the really small dot-com companies that are growing very quickly. Some businesses have been exposing their e3000 data to the Internet – companies in the financial marketplace, for example, that offer their customers access to financial information in a read-only environment over the Web. Others are using the e3000 in an intranet environment, serving up information from, say, data warehouses.

HP Pro: As you continue to e-enable the e3000, what about new applications? Where will they come from?
Wilde: First, we want to make sure that Channel Partners who have been running their applications on the HP e3000 and have large successful businesses continue to be successful. Also, remember that these vendors started out as small HP Channel Partners – they didn't start somewhere else and move to the e3000. That means our best opportunity is to identify vendors that may be small now but are growing very quickly and have a unique value add. It's a better opportunity to grow seedlings you already have rather than try to transplant big trees.

use. For example, if the Windows computer is already networked with others, if Visual Basic is installed, and if ODBC and networking are already enabled on the HP e3000, it may take less than an hour to add another DBE (a database environment that is a collection of SQL tables attached to an existing TurboIMAGE database; these are needed for ODBC access using the free HP driver). On the other hand, if none of the work has been done and the task involves a number of patches and service packs, it can take 16 hours.

If you've never done it before, it's a good idea to get help, whether that involves enlisting a paid consultant, a friend or a person at your firm. ◆

– Charles H. Finley, Jr. is President of Transformix Computer Corporation, a software, consulting and systems integration company, specializing in leveraging software and data that operate in an HP e3000 environment either by migrating to another OS or by providing enhancements – client-server, Web access and other forms of operability.

HP 3000, HP 9000

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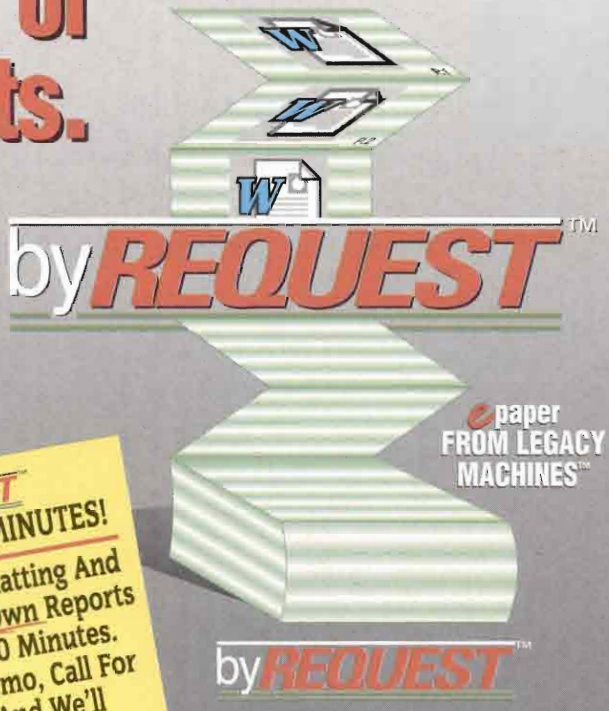

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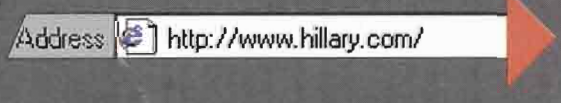

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Could It Get Any Easier?

Talk.com Customers Subscribe and Pay Online for Long-Distance Phone Service

Greg Wood

For consumers, the new appeal of competitive telecommunication and long-distance service providers is the pursuit of greater conveniences, even a means for cutting time spent on such ordinary "nuisances" as bill paying – especially when the convenience of online payment at Internet retail services already provides a highly successful comparison.

Talk.com is one of the largest long-distance carriers in the United States, yet what is newsworthy about this provider in quiet Reston, Va., compared to dozens and dozens of noisy competitors, is an unconventional technology application for customer billing and payment. Talk.com is the only company of its kind to have tackled back-office processes that contribute to stacks of paper bills arriving at our homes every month and provide, instead, online billing services via credit card to approximately 1.6 million customers.

Think about how this works for everyday customers – the public. One of the company's largest partners to date is AOL, whose members need only to click and register online for long-distance service, and who, subsequently, receive bills on the Web and pay automatically and electronically through their credit card records already stored in the AOL database. Customers from other non-AOL distribution channels also benefit from online rating, billing and customer service.

The good news about this is a back-office billing revolution for Talk.com, one that slashed overhead costs for billing, collections and other customer interfaces an estimated 1.5 cents per customer, involving the processing of over two million call detail records per day.

Talk.com is a rapidly growing integrated communications provider marketing long-distance and, recently, local services to residential and small business customers. In the last two years, it began utilizing a proprietary "realtime" online billing and customer service platform, building heavily upon an HP infrastructure of application engines and database servers, as well as critical system support. Talk.com's services are marketed directly, through various business arrangements in addition to AOL, which include such prominent entities as Prodigy, E*trade, First USA, DSI and Quintel marketing. In addition, it has gained accreditation to become a registrar of domain names on the Web.

WHAT'S SO DIFFERENT ABOUT ONLINE BILLING?

Several years ago, corporate executives at Talk.com looked at the tremendous costs the company incurred associated with acquiring and billing customers. They decided there had to be better ways of, one, attracting customers to the service, and two, avoiding the costly, labor-intensive process of billing by mail.

"Here's a long distance provider that recognized standard billing arrangements commonly used throughout the industry were long overdue for change," says Al Schraeder, HP's Account Manager for Talk.com. "They were the first to look closely at e-commerce and the Internet as supporting technologies for feasible adaptations that provided the right foundation to appeal to Internet users and transform them into customers."

Using Web-enabled technologies and proprietary applications, the company saw ways to offer its customers online conveniences including:

- Detailed rate schedules and product and service-related information are easily accessible for customers online.
- Online sign-up for the company's telecommunications services.
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- Realtime and 24x7 billing services,

Illustration by Si Huynh

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Another key difference in all this is that users have instant access to their call records and other call-related information, instead of waiting for a monthly phone bills to arrive with the regular mail. Instead of making calls oblivious to the costing structure, online rating schedules enable at-a-glance decisions about call initiation times. Round-the-clock customer service makes sense for many people nowadays who do their personal business online during peak service-call hours between 5:00 p.m. and midnight. Talk.com's system saves lengthy phone waits for signup procedures and billing questions – customers just input their own signup information or research up to a year of call record history on their own time.

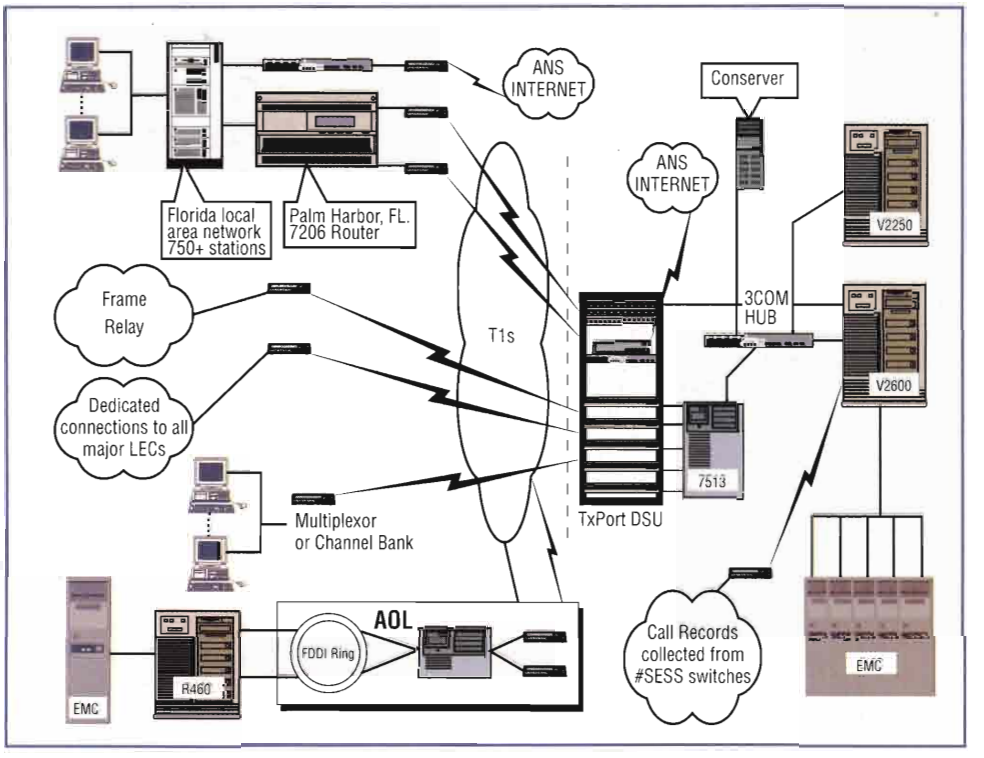


Figure 1: Talk.com's Computer Infrastructure

HORSEPOWER AND ARCHITECTURE BEHIND THE TRANSFORMATION

As discussions of reinventing rating and billing went through the hallways at Talk.com, the challenge was how to deal with accumulating millions of process transactions per day. Talk.com reengineered its hardware and software infrastructure in response to higher levels of computer demand and availability. In order to store and process what now amounts to two terabytes of history contained for one billion call data records (CDRs), Talk.com has invested in hefty hardware engine and storage technology, and has tuned its software applications to exploit all that power.

Talk.com's new computer infrastructure revolves around several hubs of superservers in the eastern U.S. – one in New Hope, Pa., and the other in Reston, Va. About 1,000 geographically distributed client systems located in such venues as Florida, home base for Talk.com's customer service staff, round out the company's IT hardware.

Executives' view of hardware and storage costs is that these are relatively inexpensive assets, and as a result, the IT team has followed a strategy of installing sufficient power for the volume of data being transacted, and then maximizing that equipment to what managers there call "the nth level." In fact, a hallmark of Talk.com's infrastructure is the high degree of process automation and parallelism that reduces operating costs.

For example, the IT group recognized that application databases of the scale used at Talk.com could potentially become a bottleneck. As such, the applications and databases were architected specifically to operate in parallel and significantly improve the overall performance of rating and billing processes. Fully leveraging hardware throughput is one of the most interesting aspects of how the infrastructure was tuned to Talk.com's business. Because the company utilizes High End Parallel Databases (Informix), the company developers also needed to write software to operate in a parallel mode. Looking at this another way, if the application is single-threaded, then one processor provides maximum performance since one thread of a process runs on one CPU at a time. In this case, the database might be capable of more, but its capacity cannot be utilized and the application has become a bottleneck.

In contrast, most of the applications at Talk.com create from 20 to 40 child threads or processes upon invocation and attack the data at the same time. By creating applications from the ground up, the company is able to maximize the processing power of the HP multiprocessor machines (see Figure 1).

It's this very capability that enables Talk.com to process millions of call records daily, on a near realtime basis. As the company has had large growth in almost every year since inception, it was necessary to not only look at immediate needs, but at other forward-looking requirements on an ongoing basis. The general power and scalability of HP's platform was instrumental in this respect, as was software compatibility across all of HP's processors in the same family series.

This compatibility allowed the company to write software for requirements at the time and have assurance it would all be supported with tomorrow's hardware. It was important for company executives to know that when HP releases newer members of its family of computers, the company IT team can immediately begin running software without investing time and effort into porting to a new processor. Moreover, it allows the company to take advantage of a hardware upgrade almost immediately,

even as the IT group begins tweaking the solutions in order to get as much out of the new hardware as possible.

The heart of Talk.com's computer infrastructure runs off an HP V2600 with 32 CPUs and 16 GB of RAM. It is based on 18 fiber-channel controllers running three each to six EMC units. Talk.com's 500 to 700 customer service staff is also using the system to support its 24x7 operations. Instead of hosting them on an application server, they run client/server with an application the company developed that connects their Windows box to the database on the V-class, and does the queries against the V. The V2600 is backed up by a V2250 in a service guard configuration to ensure 24x7 operations 365 days a year. This system runs a 1.5 Terabyte Informix database.

The billing system was envisioned to support heavy transaction flows. In actual use, this is proven to be greater than two million call detail records per day and necessitates industrial-strength processing hardware. A pair of HP 9000 K570 servers support realtime call detail through the Talk.com Web application. Several billing cycles accommodate 400,000 to 450,000 site hits per day. The HP K570s store all the billing CDRs – an average record approaches 1KB in size – as well as unbilled call records, which appear within 30 minutes of a given call.

It's no surprise, then, that Talk.com's storage systems must transact, process and make available two Tbytes of data without the applications themselves becoming bottlenecks. The more that companies buy into massive parallel systems like the V-class, with 32 CPUs, the greater the need for a database that can parallelize queries and take advantage of the parallel architecture in the SMP world. The IT group believes it is the only one of its kind that also parallelizes their applications so that the database can get maximum throughput. It doesn't make sense for databases to be able to return 10,000 records/second if the application can only take and handle two.

Talk.com's parallelized applications includes three components:

1. The rater, that rates at least 2 million calls/day and could rate more.

2. The billing applications, which host multiple billing cycles within a day, along with all the permutations of monthly calculations per customer to be posted online. That application also needs to distinguish which records shouldn't be billed again. That means the company must be handling roughly 6 million call records a day in a transaction.

3. The sending of e-mails to communicate with customers, and directly with the RBOCs. Talk.com is connected by direct circuits, including T1 lines, to every RBOC in the country and communicates with them each day. Additionally, the company will send as many as one million e-mails in a day, demonstrating the system's large volume capacity.

HP servers are also supporting associated processes within Talk.com's IT infrastructure. Talk.com's network administrators use an HP 9000 N4000 server with four CPUs and four GB of memory to generate network statistics and analyze network traffic patterns and performance. For example, administrators can see how many people are calling from Los Angeles to New York City at a given time, and use that information to decide if they should put in more circuits.

Talk.com has another HP N-class server, in the same configuration, running billing statistics, such as the average number of months paid on the service, a customer's average bill, or the ratio of international vs. interstate vs. intrastate calls. This type of data helps Talk.com answer key questions such as, "What's the impact going to be if we lower our rate five cents/minute to try and get more customers? What would we lose, and what would we gain?"

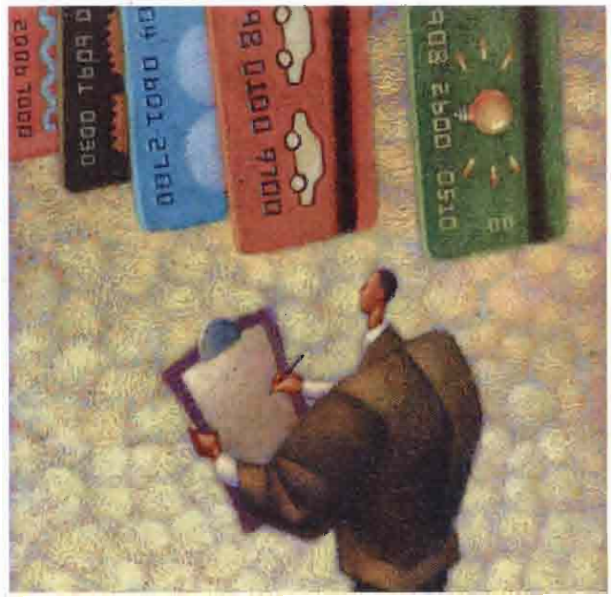
With all these innovative services available today, where is Talk.com headed? On the business side, Talk.com's long-distance will stay entrenched in the consumer market, eyeing what it believes to be 100 million potential subscribers. Company planners think the natural bundle going forward is long distance, local and dial-up ISP for the residential customer.

The impact on technology is for continually expanding power to support a similar trend in CDR volume. Company executives expect to increase the number of EMC storage solutions being used from six to eighteen, as terabytes of data resources grow from two to eight. This gives Talk.com even more reason to continue stretching and exploiting its HP hardware and storage systems to the max.

– Greg Wood is CIO of Talk.com. He has been with the company for five years.

Credit Reporting on the Web

When Database Scalability Really Counts



Igor Cabrera

Not too long ago, in the Dominican Republic – the second largest country in the Caribbean – manual reference checking, a process requiring several weeks, was literally the only way to effectively verify the credit of a person or a company. With a population of more than eight million people, a better system of generating reports was necessary to meet growing demands. Recognizing a business opportunity that could grow beyond the boundaries of the island, the Credit Information Center for the Americas (CICLA) was formed to close the gap between credit inquiry and information delivery.

Today, CICLA is running a Web-based credit report generation application that handles an average of 100,000 requests per month, delivering key credit data in just a few seconds, for a fast-growing customer base of financial institutions and credit-granting firms. The transition from a small business with a great idea to an organization using advanced information technology as the first step to becoming a player in the global e-business sector has introduced major challenges. However, the projected payoff that can come from maintaining a leadership position in the Dominican Republic's credit reporting industry and expanding operations into other Caribbean countries provides a powerful incentive.

CICLA, which began operations in 1994, was the first established credit bureau in the Dominican Republic. Headquartered in the capital city of Santo Domingo, the company is focused on a single business initiative – generating timely, accurate credit reports. From the beginning, CICLA relied on information technology, generating credit reports from data maintained on an internal database. Fairly rapidly, however, it was apparent that the organization's first-generation system would have to go to a new level in order to meet the needs of a high-growth, increasingly sophisticated customer base.

The search for database technology with the capacity for rapid business growth and expansion into neighboring Caribbean nations began in 1997. Key selection criteria included:

- Scalability. CICLA had early plans for expansion and no desire to switch database technologies in order to grow.
- High Performance. Customers' expectations for fast data delivery were high in 1997 and have grown with the adoption of Web technology worldwide.
- Reliability. Loss of information access and delivery can make rapid inroads in the customer base when the customers are highly competitive lenders.

Based on these criteria and an in-depth evaluation of multiple enterprise database technologies, CICLA IT specialists selected the CACHÉ e-DBMS from InterSystems Corporation.

BUILDING AN INFRASTRUCTURE

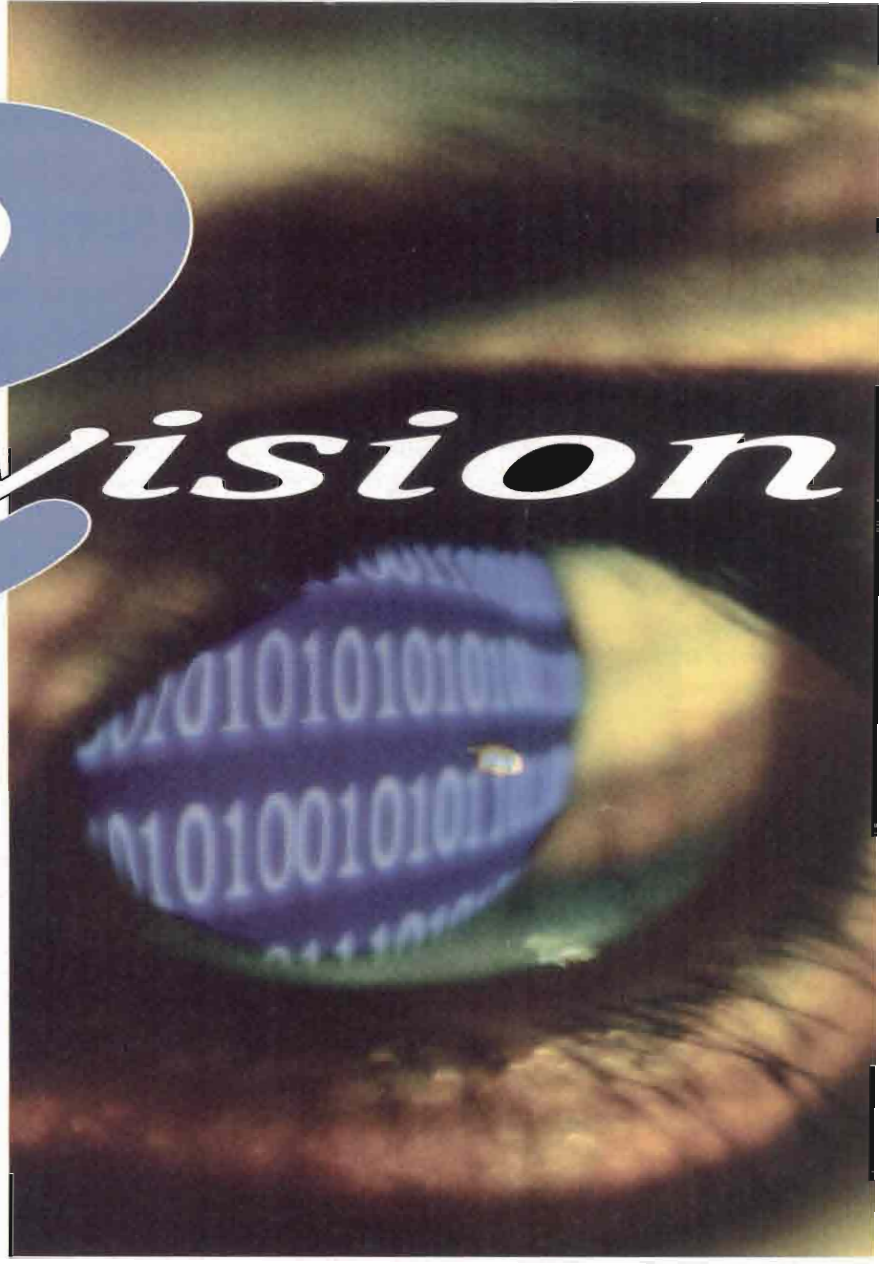
CICLA's transition to a new-generation operation began with the development of an application system designed to generate full credit reports, including employment data, credit information and relevant public records based upon requests from a nationwide customer base. Developers were able to build the core system, including more than 75 separate processing routines and thousands of lines of code in just five months. The Credit Report Generation Application went live in March 1996, on a distributed client/server network that processed about 2,000 credit report requests a month and has since been growing geometrically.

In this first incarnation of the system, clients accessed and received credit reports primarily through dial-up access. The application uses a modem attached to several analog phone lines to connect to a database server. Under this scheme, the average time for the client to receive a credit report from time of inception of data to retrieval time is about 35 seconds.

Although the dial-up scenario is efficient, it became obvious that the expanding CICLA operation would grow even faster by providing customers with convenient Web access to the credit information on the database. At the same time, the phenomenal growth of global e-business opened the door for larger markets internationally. The fact is that information has never been a hotter commodity than it is now. The age of

Illustration by Rob Colvin

e vision



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e-business has elevated the level of competition between lenders to unprecedented heights. By March 1999, CICLA made another transition by adding Web-based credit report generation to the product mix. The changeover was accomplished in two stages. Customers with frame relay access to the CICLA system were the first to make the move to the Web with the rest of the user base following in a progression that was complete within 18 months.

A SHARED PERSPECTIVE

Information users have enthusiastically welcomed CICLA's Web-based approach to credit reporting. Even the most computer-shy are already using PCs to handle processes, such as spreadsheet management or word processing, and can provide a listing of their customers and pertinent information for the CICLA database in an Excel format. In those rare cases where the CICLA system is their first exposure to the world of information technology, it's a simple matter to assist them with digitizing the primary data and to introduce them to the world of the PC.

Once that has been accomplished, the hookup via modem or ADSL and the ISP of each customer's choice is quick and painless. And accessing the appropriate credit information at CICLA's Web site is literally just a matter of entering minimal data. For individual reports, the only information needed is first name, last name and social security number. Credit reports on a company are generated based on entry of only the company name and city location. Based on this input, CICLA delivers detailed reports that include: General data (name, date of birth, etc.); Addresses and phone numbers; Employment records; Credit data; Public records; and Inquiry records.

Given the system's ease of use, minimal input requirements and detailed report generation, CICLA had literally no roadblocks to overcome in terms of helping their user base to adjust to a new e-business environment.

Equally key, the internal programming staff also embraced the new Web technology without any qualms. The versatility of the CACHÉ programming language contributed greatly to this rapid acceptance. For example, CACHÉ enables development using both relational and object approaches, depending on which is most appropriate. While CICLA developed one of several client interfaces using CACHÉ SQL, developers also rely on CACHÉ object technology to adapt very quickly to changes requested by customers on an ongoing basis. In effect, programmers have the choice of using the development approach – object or relational – most suited for solving a given problem. As a result, although some developers required training to get up to Web speed, the flexibility of the CACHÉ e-DBMS platform combined with the ability to minimize database administration requirements virtually eliminated any resistance to change.

E-BUSINESS IN ACTION

The decision to Web-enable the business-critical client server application was an obvious move and one that reaped measurable ROI in terms of cost savings and productivity increases. One example from a customer's perspective: An average bank customer with about 60 information users on the dial-up network would spend $1,500 for monthly analog line rent and $7,500 for line installation fees. However, with Web access, the customer needs only one dedicated line at a cost of $250 per month. Monthly savings for the customer are more than 80 percent, a major competitive advantage for CICLA.

Internally, CICLA's savings are reflected in dramatic reductions in the time needed for installation, training and application support. Prior to adding Web access, user training and software installation at remote client sites averaged three to four hours. Web technology has made it possible to reduce the time needed for training and installation to a mere six minutes, on average, because it is no longer necessary to install the proprietary client access software on the end user's PC – all one needs is a Web browser. Support costs have also plunged because changes and enhancements are made to the server-based application and the results are immediately accessible to all PC clients via the Web. As a result, CICLA has been able to cut manpower requirements in half, in terms of supporting customers using the credit report application on the Web.

The success of CICLA's transition to credit reporting based on advanced information technology is immediately visible and quantifiable.

Today, CICLA serves all of the nation's banks and credit card and loan issuers – some 350 customers and more than 2,000 individual information users. Using CACHÉ, the application has seamlessly scaled about 1,000 percent from initial volumes of about 7,000 report requests to about 120,000 requests/month. The average response time is less than two seconds for delivering complete, detailed credit reports, even during peak hours.

In addition to meeting CICLA's requirements for scalability and performance, the database technology has proved out in terms of reliability, enabling 99.99 percent systems availability for the 24x7 operation – and that's without a single database administrator. Equally critical for future growth is the cross-platform compatibility of the CACHÉ e-DBMS. In February, CICLA migrated the application from an IBM RS/6000 to a Sun Microsystems Ultra 450 running Solaris – an operation that involved only a database copy procedure and was accomplished smoothly and seamlessly.

The move from manual credit reporting to an e-business environment where credit information is available in a matter of minutes, or seconds, has had a major positive impact on the economics of debt in the Dominican Republic. In the first instance, credit information was limited to what could be manually obtained from sources that the would-be consumer would volunteer and what the credit grantor might already know about the applicant. As a result, very little credit was granted at the consumer level. Even at the corporate level, credit was typically restricted to a relatively small circle of companies, effectively limiting the rate at which the island economy could grow.

Today's economic picture is decidedly different. Over the last seven years, the increasing accessibility of credit information has resulted in:

- A 50 percent reduction in commercial bank accounts that fall into the "risky" category
- A 300 percent increase in the total lending portfolio of those same financial institutions
- A 1,000 percent increase in the level of bad debt "coverage" capacity for commercial banks. From an economic environment where 2 percent of assets held in reserve to cover bad debts only covered about 12 percent of overdue accounts, things have progressed to where the same 2 percent reserve covers more than 135 percent of overdue account totals. ◆

– Igor Cabrera is the Information Systems Manager and heads up the IT operations at the Credit Information Center for the Americas in Santo Domingo, Dominican

Case Study: Cargill Embarks on IT Overhaul

HP's OpenMail for UNIX Sees Tremendous User-Base Increase

Jean Nattkemper

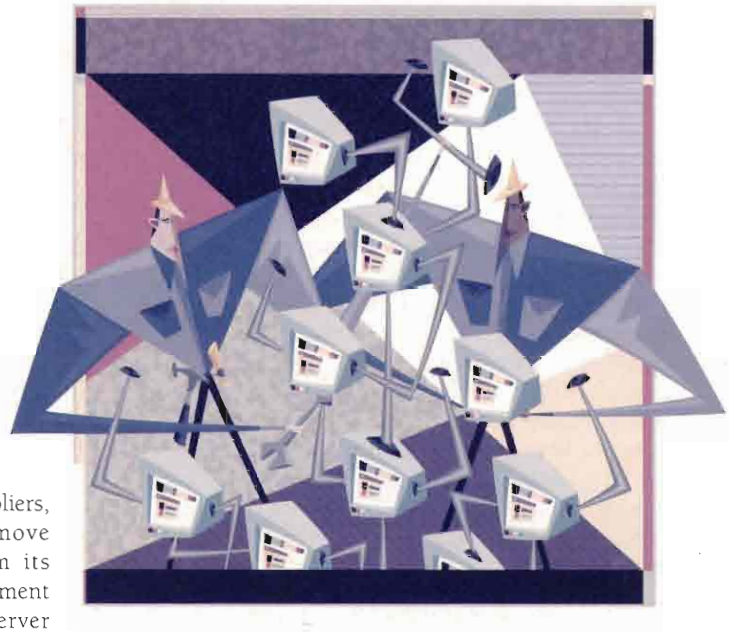


Illustration by Robert Burger

Minneapolis-based Cargill Inc. may not be a household name, but its more than 85,000 employees within 103 business units operating in 60 countries worldwide focus on marketing and distributing agricultural, food, financial and industrial products through a multitude of activities.

Like many large multinational corporations, several years ago Cargill noticed it was experiencing IT problems arising from topsy-turvy growth. Because the company's business units adopted solutions independently, IT had not been able to develop an overall focus. Moreover, some computer systems and solutions needed replacing, and system management was inefficient, causing IT to experience difficulty in meeting service level agreements.

Clearly, Cargill's IT infrastructure required an overhaul. The company needed to develop systems that allowed its business-specific applications to work across multiple business units. It also needed to replace and consolidate its 16 outdated e-mail systems with one centralized communications solution.

Finally, it had to find a way of managing its business tools to guarantee service level agreements (SLAs) and improve efficiency throughout the company.

Cargill's first step in dealing with its IT challenges was to bring in Lloyd Taylor as CIO. A firm believer in creating competition among IT suppliers, Taylor began to move Cargill away from its mainframe environment and into a client-server architecture based on UNIX and Windows NT servers, networks and open systems. Cargill chose to standardize its UNIX systems on HP-UX, consolidating and upgrading from HP 9000 E-Class, H-Class and I-Class servers to HP 9000 K- and N-Class systems. And it gave IBM its business for desktop and Intel-based systems.

DEVELOPING FRAMEWORKS TO ENCOURAGE STANDARDIZATION

To encourage divisions to standardize solutions, Cargill set up Centers of Expertise (COEs) around frameworks in areas like ERP, plant systems and integration. The idea was that business units looking to implement particular solutions would call upon the appropriate COEs for advice in linking applications, best practices, benchmarking information and so on.

Cargill's ERP COE was built upon a framework developed by Alistair Jacques, now Vice President of IT. Jacques developed the framework when implementing an ERP solution for Cargill's oil seed processing unit. For the ERP solution, Jacques selected QAD's MFG/PRO as the core application, then added best-of-breed solutions from vendors like Nu-Metrics, Manugistics, J.D. Edwards and others.

That led to the need for an application integration framework. "Our purpose was to develop a standard for the way in which applications could talk to one another," says Jacques. "Then, we could build a set of adapters and keep them on the shelf. So, if anybody decided to link J.D. Edwards to QAD or Manugistics to Numetrics, we'd have an off-the-shelf solution for making the products work together."

Cargill and HP worked jointly to build an Application Integration COE. "We suggested the idea to HP," Jacques says, "and HP said, 'That's absolutely wonderful. Let's build it together.' We put in several million and they put in several million, and we built an application integration framework together."

Cargill's idea was that the application integration framework developed through its work with HP Consulting would eventually be marketed by HP as a commercial product, but that never happened. "We ended up owning it, and we've been using it for five years," Jacques says. "It works great, even though the market has caught up with us and we can now go to packaged solutions that provide the same functionality."

"Through the COE," says Linda Ergen, manager of Cargill's Application Integration Center of Expertise," our oil seeds business developed significant application integration expertise. The integration was so successful that Lloyd Taylor then decided to make this expertise available across the company. "Now, whenever a business division needs to incorporate or update a software product, the COE helps it select and implement the best middleware solutions to make the integration a success," Ergen says.

The COE is a valuable resource for Cargill's divisions in part because it is staffed with technical consultants. "We contract with the divisions to provide architecture and technology strategies, development resources, the production environment and 24x7 application integration support," Ergen says.

Although Cargill won't disclose figures about the COE's return on investment, the center has significantly reduced costs. "Roughly 30 to 40 percent of spending on ERP projects is consumed by integration costs," Ergen points out. "When you have ERP projects in the tens of millions of dollars, even if you shave as little as 10 percent off the integration costs, you can bring a seven-digit number to the bottom line."

SELECTING OPENMAIL AS THE MESSAGING BACKBONE

Another of Cargill's IT tasks was to find a way to link 29,000 of its employees through a consolidated, efficient e-mail system. Cargill also had to look to the future and select an e-mail system that could grow to accommodate its remaining global employees.

In 1994, the company unveiled an OpenMail solution running on HP 9000 E-Class, 9000 H-Class and 9000 I-Class servers.

"From both an administrative and enterprise server point of view, we believed our best option was HP OpenMail running on the HP-UX platform," says Warren Schlichting, Cargill's Global Infrastructure Applications Corporate Information Technology Manager.

"Prior to implementing HP OpenMail, we had more than 16 different e-mail systems because all our divisions were using locally developed and implemented solutions," Schlichting explains. "Then corporate headquarters tried to tie all these systems together so that they could talk to one another. That left us with a very complicated mesh of gateways and bridges to the different systems, and capabilities that varied dramatically from one system to another."

While the HP solution has helped Cargill consolidate its messaging systems, the jury is still out on OpenMail, according to Jacques. "OpenMail is a wonderful product," he says, "but it's best when you have consistency across the board in your configurations. We don't, and we can't, because we're so broad and so diversified worldwide. We don't have a single directory for the organization – we have 30 directories for the Minneapolis operation alone and more than 500 worldwide. It's possible that OpenMail isn't flexible enough to use relative to our applications infrastructure."

"HP was willing to partner with us in ways that others just weren't, such as pricing and enterprising licensing."
– Carla Hawley

Jacques' doubts about OpenMail have also been reinforced by HP's decision to use Microsoft Exchange for its own internal messaging.

Cargill won't be making any decisions about messaging right now. "Our messaging decision will be considered as part of a broader analysis of our next-generation computing strategy. That will include network, hardware, operating systems, office tools and messaging," Jacques says.

MANAGING RESOURCES AND MEETING SLAS

To address another item on Cargill's agenda – system management – CIO Lloyd Taylor formed a council made up of IT managers from the company's different business sectors. The council's purpose was to analyze specific problems and create a companywide IT strategy for enterprise management.

After almost a year of work, the IT managers identified the resources requiring companywide management. These resources ranged from devices on the network to operating systems to specific applications. Cargill then created the Systems Management Environment (SME) to identify appropriate system management tools.

"The goal of the SME program was to have common enterprise management tools and processes used across Cargill's business units as well as at each of the company's four regional support centers," says Carla Hawley, the developer of SME.

"Prior to the program, individual business units took a best-of-breed approach to enterprise management," Hawley explains. "When Cargill started bringing in client-server applications a few years ago, the company's business units began installing a lot of different off-the-shelf tools for enterprise management. At one point, there were 47 different tools being used, and very few were productive."

Cargill chose HP OpenView and combined it with Microsoft SMS (System Management Server) for the desktop. "HP was willing to partner with us in ways that others just weren't, such as pricing and enterprise licensing," Hawley says. "That made a big difference in our decision to go with HP."

Working with HP Consulting, Cargill implemented OpenView Network Node Manager for global network management, Optivity for managing its Bay network hubs and IT/Operations [now VantagePoint Operations] for event management on its HP 9000 servers and Windows NT boxes.

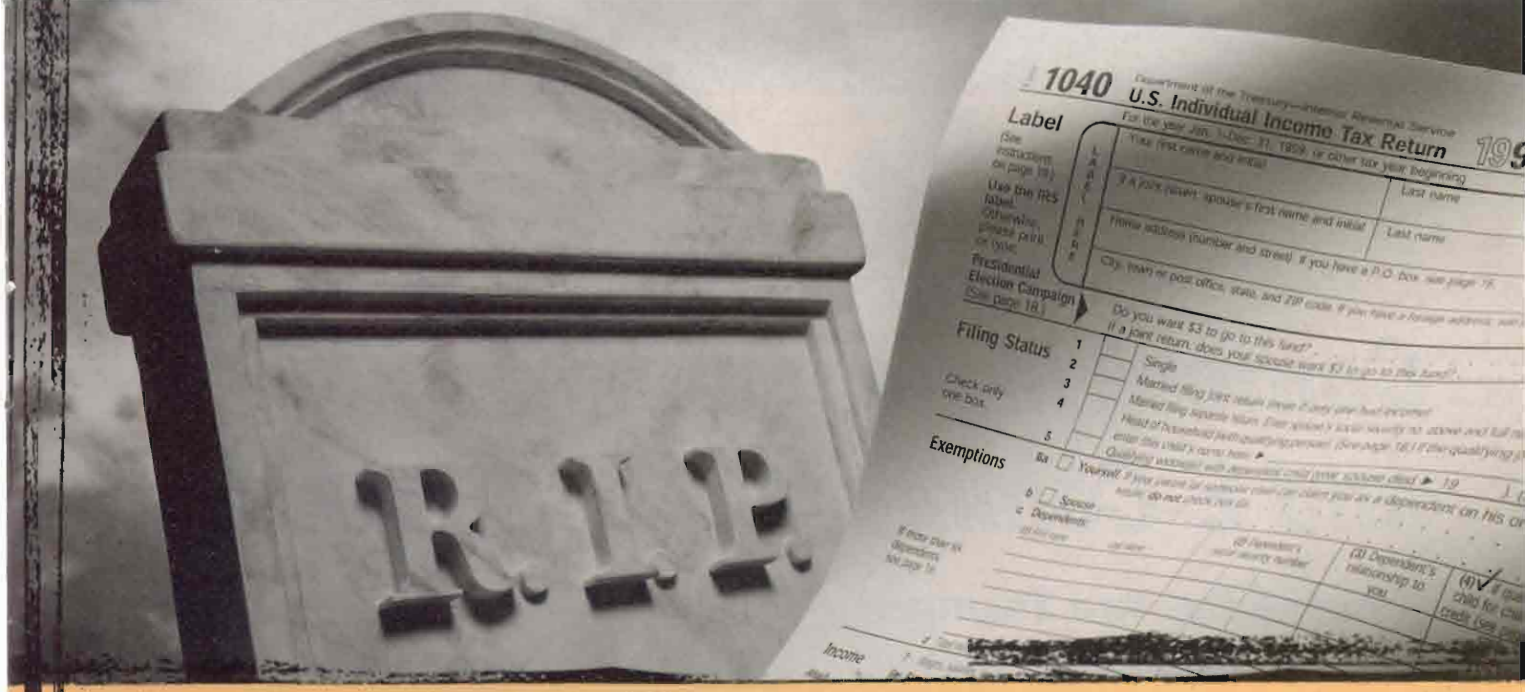
"We also use HP OpenView IT/ Administration for collecting inventory on our UNIX servers and Software Distributor for software distribution to our HP 9000 servers," notes Hawley.

The SME was Cargill's first global infrastructure program. "The return on investment on the SME project was planned for 19 months," Hawley says. "However, it will probably be quicker due to substantiated cost avoidance ... the biggest benefit we've seen using HP OpenView is the ability to leverage across all business units."

ALL IN ALL, A SUCCESS

On the whole, Cargill is pleased with its relationship with HP. "The servers are great," says Jacques. "Technically, HP is second-to-none."

CIO Taylor says, "Our people are more productive, our systems are more efficient, and our processes are more cost-effective. We now share and transfer information better across business units. We communicate better whether it's across the hall or around the world. And we're able to consistently meet our service level agreements." ◆



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Content Management and E-Commerce

Bringing the Two Together to Achieve Financial Success

Hank Barnes

At its simplest, e-commerce can be defined as transactions that occur over the Internet. This transactional focus is how e-commerce is typically measured. E-commerce is simply the Internet replacement for the terminal-based data entry clerks that handled orders submitted over the phone or via snail mail.

This is far too simplistic a view. Web sites that only offer order entry capabilities fail. Customers use the Web to research and compare products, understand options and make purchases. These broad informational needs are handled by e-commerce's key companion, content management.

Forrester Research defines content management as "a combination of well-defined roles, formal processes and supporting systems architecture that helps firms contribute, collaborate on and control page elements, such as text, graphics, multimedia and applets."

Content management is the key to e-commerce success – presenting the right information to the right people to get them to order your products. Without effective management, you could easily be presenting people with out-of-date, erroneous information. In addition, if you don't think about your audiences' needs, you can easily overload your visitors with irrelevant information that does nothing to help them buy, and potentially leads them to click away without doing anything.

BEST PRACTICES FOR CONTENT MANAGEMENT

To most effectively use content management there, are a number of "best practices" that businesses should take into consideration.

1. Content management is about people – not just content. Focusing on the people involved in your Web activities is central to successful Web sites. It must ensure that the right people create, update, review and approve and view the site's content.

Execute an audience-driven design. A Web site should be designed to enable its target audiences to obtain the information they are looking for, and execute transactions, as easily as possible. But, too often, a Web site is structured to reflect the organization, rather than for maximum impact on its audience. One of the key opportunities presented by the Web is its ability to recognize and classify the audiences who interact with the information it holds. Once these key audiences have been identified, the next step for a company is to associate business goals for each audience. By leveraging knowledge about viewer behavior and organization, content creators can immediately take advantage of flexible business rules that determine the most effective way to deliver a certain set of information.

Unify management of content creation and delivery. Many Web sites present potential content contributors with a hodgepodge of access control systems, application logic, personalization attributes, and other constraints that govern content creation and delivery. An effective content management system addresses this problem by providing an extensible, top-down management system that enables companies to associate business rules with the viewing, modification and management of content assets.

Implement non-technical content management. The key to eliminating bottlenecks and improving information quality is empowering business people to create and modify the content for which they are responsible.

2. Automate costly, time-consuming processes. A content management system should make managing Web content simpler and provide a unified environment for managing multiple types of content.

Simplify template and business rule management. Content management systems generally provide a mechanism for isolating content structure from information. Different types of content that appear in multiple instances on the site are often expressed as templates because templates support a consistent look and feel, promote the reuse of design elements, and

Illustration by Garry Nichols

make it easy for non-technical users to contribute content to the site.

Harmonize management of template-driven and ad hoc content. A content management system should harmonize the management of both template and ad hoc content. Unified management makes for a more consistent Web site, with all content moving through the same work processes and approvals, and accessible through a single, consistent set of business rules.

Track and manage content changes. The content management environment should be to allow content creators to see what their content looked like when they originally contributed it, as well as how it evolved and changed on its way to appearing on the site. To be effective, these capabilities must occur without requiring significant user action. This archiving capability is important for many reasons from being legally required to just making good business sense. This audit trail capability should be an automatic part of the publishing process, so that every new document is automatically added to the archive, and a change document is saved whenever the content is edited and resubmitted.

Use metadata to automate management and measurement. Metadata is the "information about information" within a site. Examples of metadata include the author of a piece of content, its creation date, its access control properties, the category the content is classified in or even a functional description of a page. Once metadata is associated with a particular type of content, it can be leveraged as a powerful management tool to generate automated directories and listings of content, assist in site measurement or drive the dynamic behavior of the site.

Metadata can be used to automate many parts of managing a site. For example, many sites feature a directory page that lists press releases, which must be updated every time a new release is added. If a press release is removed from the site, someone must also remember to delete it from the directory, or it results in a broken link. The problem is multiplied further if there are multiple directories or methods of linking to press releases within the Web site.

A content management system should make it possible to assign and save metadata attributes to each press release document, and use this metadata to automatically administer the press release directory page. When each press

See **E-Commerce** *on page 48*

nroff, The Making of man

When any of the descendents of roff are mentioned, the most common reaction seems to be either people running off, or holding up crossed sticks to ward off the speaker. The first reaction is

the more interesting of the two, since roff's full name is "Run Off," referring to it's original use of preparing text to be 'run off' on the printer. The second reaction is rather disturbing, since most of these same people use roff unknowingly almost every time they read a man page.

By default, all of the "runoff" family of commands will break text into lines of approximate length. This means that a text file without line breaks except at paragraphs can be easily reformatted into equal length lines (typically 6.5 inches on paper, or 65 characters) by issuing:

nroff textfile.name

In order to perform more complex formatting, you must delve deeper. Most of the actual work of formatting is controlled with formatting markup inserted into the text file. Markup commands are generally alone on a line, begin with a period, and contain one or two letters (with possible arguments). There are also escape sequence commands, where a backslash precedes a format directive.

Formatting directives come in three flavors:

- One-time effect
- Persistent effect
- Programmatic control (for writing macros)

An example of the one-time effect is the .sp or \bu used above. Some others that are frequently used are:

- .br line break
- .bp page break
- .ce center next line
- .ti temporary indent

Some examples of persistent effect formatting directives include:

- .nf disable filling
- .fi enable filling

These two directives allow you to specify sections of a text file that should not be formatted. For example, think of writing a man page; you would not want filling to occur in the examples sections.

- .ll n set line length to n
- .in set indent (persistent)
- .ad enable line adjustment
- .nh disable hyphenation

Some directives accept an argument, such as the .ll seen above. As an example, the following text (with a directive):

.ll 20
this
text will be formatted to 20 characters wide

Would be processed by nroff to the following:

this text will be formatted to 20 characters wide

Note the unusual spacing in the formatted text. This is due to justification. IF we also put .ad l as a directive before any of the lines of text were processed, the output would have appeared as:

this text will be formatted to 20 characters wide

The .ad format directive also takes c for center, b for both, and r for right margin justification. There are many more formatting directives, but by now you should recognize some similarities to HTML. Using these directives are rather simple except for a few gotcha's. One of them is that whenever filling is turned on, lines are not output until a line is filled, thus it can appear that nroff is ignoring format directives. To prevent this, you must often put in .br directives to force previous text to be output.

Getting back to how nroff is used in the making of man pages, we need to discuss macros. All of these tools are tied to the mm and ms commands. These commands use similar formatting directives, written as named groups of commands, called macros. These macros can be marked into text documents, and processed as the document is formatted.

Fred Mallett
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Many of these macros are used when marking up man pages, since similar tasks are performed repeatedly. In many versions of nroff and ditroff you have to issue the -mm option on the command line to get these macros to run.

Some examples of the macros used in man pages include the .TH Titleheader .SH Sectionhead and .SS Subsection directives which are used to define sections of a man page, such as:

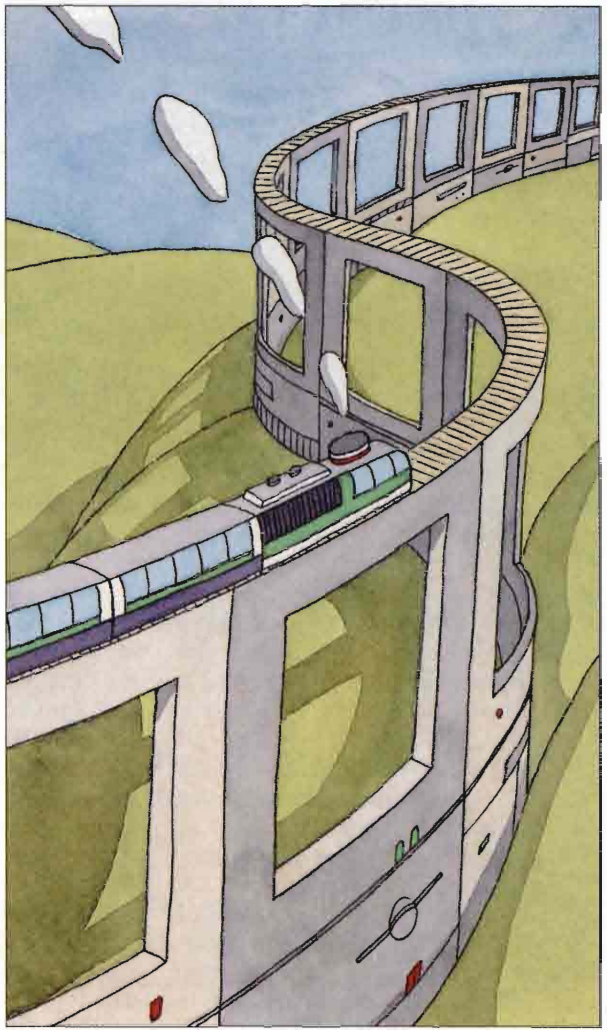
- . TH title section comment
- . SH NAME
- . SH SYNOPSIS
- .SS Options

Looking at the markup from a typical man page can be rather informative about how these macros are used. If your man pages look like line noise when you more them, they are probably compressed. If the directory name has a .Z on it, this is true. Be sure to use man pages from a man directory, not a cat directory (which contains the output of nroff, not the input to nroff). Copy a man page file into a temporary location, then rename it with a .Z extension so you can uncompress it.

Once you have done that, read the man 5 man page, which documents the man specific macros. After that, you can write your own man pages, copying them into the system man page directories, and access these files with the man command. ◆

Riding the RAIL

Major Public Utility Company Depends on RAIL Technology



Fred Bedard

When your customers depend on you 24x7, you leave nothing to chance. Nowhere is this more apparent than the public energy industry, where an extreme amount of effort is put into system and data availability. There's nothing like the threat of millions of business and residential users thrown into sudden, total darkness to cause you to reevaluate your data protection plans.

Though the above is an overly dramatic scenario, Ameren (formerly Union Electric), one of the country's largest public energy utilities, understands its responsibility to its 1 million-plus customers in Missouri, Illinois and Iowa. As with any utility company, Ameren is critically concerned with keeping operations running on a 24x7 basis.

Ameren wisely operates with a corporate policy that requires a duplicate copy of each backup tape, and keeps one copy offsite in case of a catastrophic data loss. But, too often in high-intensity business environments, a company that cannot afford data loss also cannot afford the time to adequately protect itself without compromising its 24x7 operation.

Ameren's St. Louis headquarters includes a computer installation of 1,500 nodes with 120 heterogeneous file servers running NetWare, Windows NT, Sun Solaris and HP-UX. Customized applications developed for a variety of tasks like time reporting, customer service systems and outage management, generate a data load of 100 GB that must be backed up nightly, with a weekly full system backup from 400 GB to 500 GB. All departmental data is backed up to two centralized tape servers, with each server handling backups for 60 file servers.

Each backup server connects to two Storage Technology 9714 tape libraries containing 100 tapes, and equipped with four or six DLT7000 tape drives using Legato NetWorker software for backup automation.

Ameren's IT staff satisfied the corporate policy of duplicate backup tapes by using the tape cloning feature within NetWorker to get offline tape-to-tape copy functions after the backup process was complete. While NetWorker's tape cloning feature created sets of backup tapes for safekeeping, according to Vance Bufalo, Senior Engineer in Networking Engineering at Ameren, it was not the best approach for the size and scope of their backup policy.

"My servers are doing so much work every night and the off-site tape had to be ready for pickup by 11 a.m. I did not have time to do the backup at night and do the tape-to-tape copy in the morning before the vendor showed up to pick up the tapes," Bufalo says.

"The other problem I ran into is that the two tape systems support about 1,500 users in our main office complex, and we do recovers on a daily basis. If the tape drives are busy doing tape-to-tape copies in the morning, then those drives are not available for tape recovers. I needed a solution where I was getting

true tape mirroring – realtime copy, so that while the first tape is being written, the second tape is being created at the same time."

The need to do realtime tape copying led Ameren to investigate the potential of a technology known as RAIL (Redundant Array of Independent Libraries) or RAIT (Redundant Array of Independent Tape), or sometimes simply – though less accurately – described as tape RAID. RAIL architectures consist of tape arrays optimized for throughput and fault-tolerance by advanced controllers, which enable tape devices to perform comparably to the way individual disks perform in RAID environments, with features like making multiple reads and writes in parallel, mirroring, and the use of parity. RAIT capabilities, like RAID, are often described in levels (0, 1, 2, 3, 4 and 5).

Ameren's new RAIL setup literally makes it impossible to perform any backup operations without creating the required offsite set of tapes.

Orange County, Calif. -based Ultera Systems was selected to provide the backbone for the installation, and Ameren built a solution around Ultera's ShadowMaster tape array controller technology. Ultera's ShadowMaster simultaneously writes data to a mirrored set of tape drives, automatically creating a duplicate set of tapes in the same time it takes to do the original backup – in essence a RAID-1 environment, and what would have been an immediate fix for Ameren's backup window issue.

However, beyond simple tape drive mirroring, Ameren and Ultera designed a RAIL environment that actually mirrors pairs of STK 9714 libraries, with one library dedicated to storing onsite tapes and the other used exclusively to make tapes for offsite storage. Each pair of mirrored drives is driven by a dedicated ShadowMaster controller, and another ShadowMaster manages the robotic media changers in each library.

Ameren's new RAIL setup literally makes it impossible to perform any backup operations without creating the required offsite set of tapes. Any read operations will read data from tapes in the primary library drive, but if a write command is issued, ShadowMaster will automatically write the data to the two mirrored drives. If the second drive is not ready, an error message will be generated and the backup aborted. "We never want to have a broken pair on a mirrored tape," Bufalo says.

This innovative solution delivered the realtime tape mirroring that Ameren required, but also made media management a painless process, says Bufalo. "We have a 30-day tape rotation because that's our data retention policy, and tapes never leave the onsite library. They're in there all the time for tape recovers and also for the writes at night, and the offsite tapes are rotated on a daily basis.

"What that gives us is realtime mirroring, which met our backup window requirements; offsite copies which are ready by 11 a.m., and we can still do all of our data recovers from the onsite tape library for the last 30 days without any tape handling by the operators."

The Ameren/Ultera configuration is completely software transparent, allowing the company to use Legato NetWorker for backup with no changes – and no learning curve – required.

Ameren also implemented an Ultera-based library solution on a grander scale with an identical mirrored-library system of Ultera controllers and an HP9000 K-Class Enterprise Server running HP-UX. Two STK 9710 libraries, each accommodating 512 tape slots and 10 DLT7000 drives, are configured as a RAIL environment. "We're doing the same thing on a much larger scale, only we're doing it with UNIX and the bigger libraries," Bufalo notes.

The larger solution, for the ever-expanding data requirements, is not yet slated for backups of the corporation's 5,000 total nodes. That project, planned for a future date, will incorporate mirroring controllers from Ultera with large-scale Storage Technology libraries.

Though the enterprisewide implementation of RAIL technology may seem like an enormous undertaking, for a company like Ameren, the risks are too great to leave data protection to a system with lesser capabilities.

– Fred Bedard is the Vice President of Sales and Marketing at Ultera Systems (Laguna Hills, Calif.).

The Buzz

Continued from page 8

long-term annual revenue growth target from 40 percent to 50 percent.

The alliance benefits HP, by allowing it to extend OpenView's capabilities of managing software and content. Novadigm's Radia software reportedly allows IT managers to oversee specific applications for as many as 100,000 computers. HP's Jim Grant, pointing out that OpenView is "the cornerstone of HP's e-services initiatives" in the software arena, touted the alliance as one that will promote "e-services management" and enable HP to further penetrate the dot com and service provider markets.

TANTU, BEA COLLABORATE ON WIRELESS E-COMMERCE

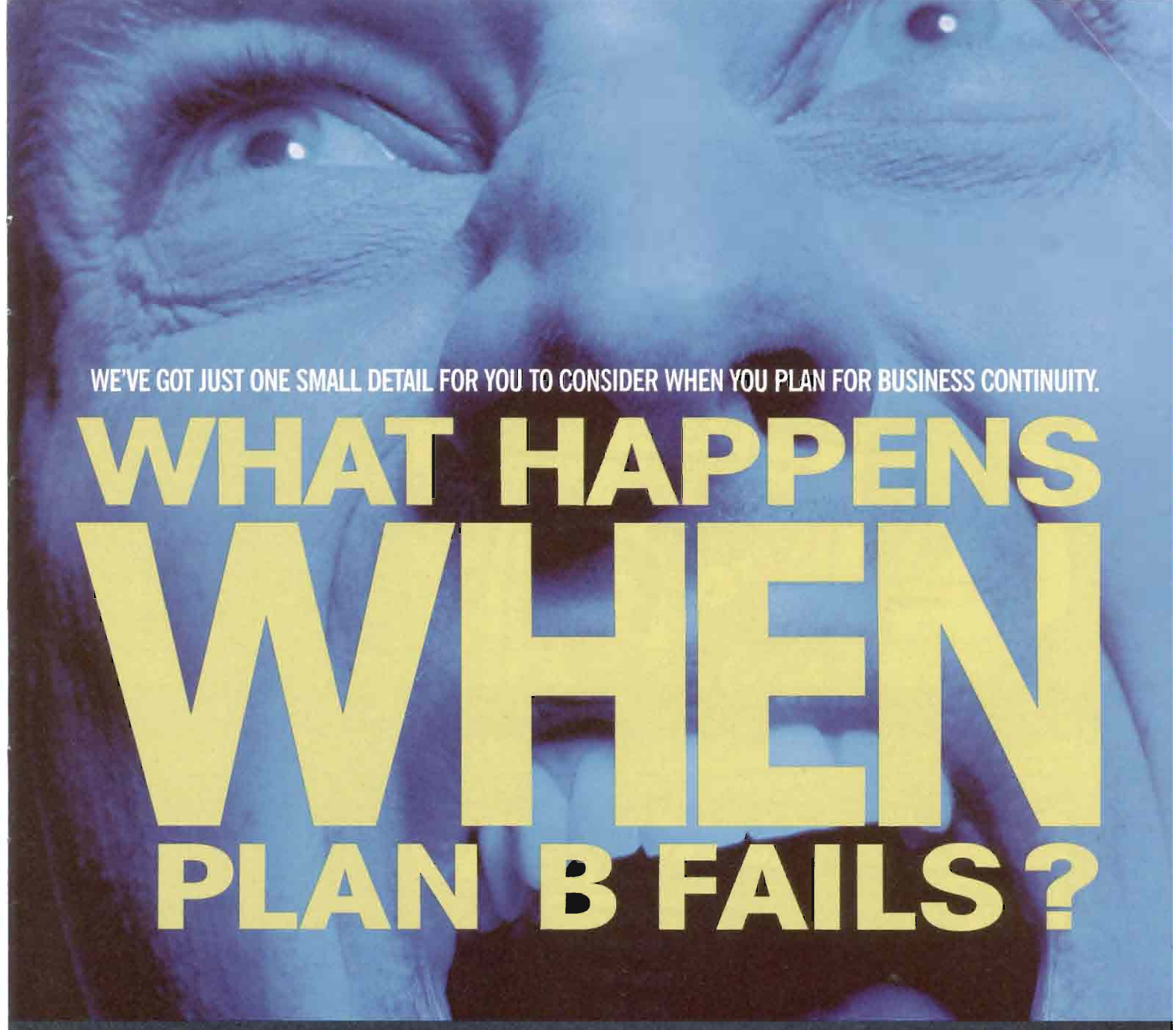
TANTU Software, a provider of mobile e-commerce software, and BEA Systems have struck a deal to provide solutions that allow businesses to extend wired e-commerce solutions to wireless, and thus into the hands of mobile device users.

Under terms of the alliance, TANTU's Wireless Internet Platform, software that connects back-end systems with mobile devices, will be combined with BEA WebLogic Server, a Java application server that allows businesses to build e-commerce applications. TANTAU's m-commerce software platform creates the link required for wireless devices – cell phones, PDAs, pagers, and so on – to interact with back-end applications and data sources. It also allows for the creation of personalized applications based on user preferences.

TANTU and BEA are targeting a huge market – wireless. Analysts predict that by 2003 more than 1 billion mobile phones will be in use, and half of these will support wireless Internet access. Users will expect their banks and brokerages to allow them to complete financial transactions, such as fund transfers, stock trades and bill payment, over their wireless devices. Aware of this, the companies are touting their alliance as one that will allow "banks and financial services [to] quickly build and deploy mobile e-commerce applications that combine the convenience, reliability and security customers demand with the scalability required for rapid growth." ◆

Got Some News?

Please send all news press releases to Jean Nattkemper at jnattkemper@101com.com.



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Continued from page 38

release is created, a metadata attribute called "page category" would be assigned a value of "press release." Querying the metadata present in the content catalog automatically generates the directory page. When press releases are added or removed from the site, the directory page is automatically synchronized with the site content. A content management system should support other uses, such as passing metadata to Java applets or DHTML code, without adding additional complexity from the content contributor's point of view. Additionally, metadata should be subject to the same management processes as other content so that it can be created, edited and put through approval workflow.

3. Leverage existing assets and skills. Companies need to take advantage of knowledge that already exists within their organization and build toward corporate goals. At its simplest, this means letting people apply tools and existing knowledge to the tasks of managing Web content. It also means integrating with other corporate systems to facilitate the reuse and exchange of information that can be found in those systems.

Support quality, brand consistency and corporate standards. Within a given Web site – and across the enterprise – there are likely to be many content and design elements that are reusable. A content management system should make it easy to manage, organize and share these common elements and to build them into other reusable objects. By implementing a platform that facilitates reusability, companies can enjoy a significant decrease in the costs of synchronizing and maintaining site content, and realize a more consistent presentation of information.

Use the Web to manage the Web. A large part of the cost of software is often indirect, experience cost – what it takes to build the skills necessary to use the system across the organization. This is why Web browsers have been so quickly adopted by business organizations. By allowing business people to access many systems through a single user interface, they promise to lower costs. This also helps to explain why a Web content management system should be browser-based. All functions – content catalog management, work flow, template definition, content contribution, versioning, business rules and so forth – are managed through a Web browser.

Leverage existing technologies and data. If a content management system is to be scalable into the future, it must integrate with other systems to make the most effective use of technology investments. Further, by enabling companies to choose the technologies that make up their Web infrastructure, the content management system can support a "best-of-breed" solution. To do this, a content management system must be as open as possible.

Leverage the corporate directory. In the future, corporate metadata is likely to go well beyond employee directory data to include a unified view of all of a company's information assets. Organizations that use Web content-management systems to tie together metadata from the enterprise directory with audience-driven intranet structures will be able to make new employees more immediately productive by giving them access to required Web content resources based on their roles in the enterprise. ◆

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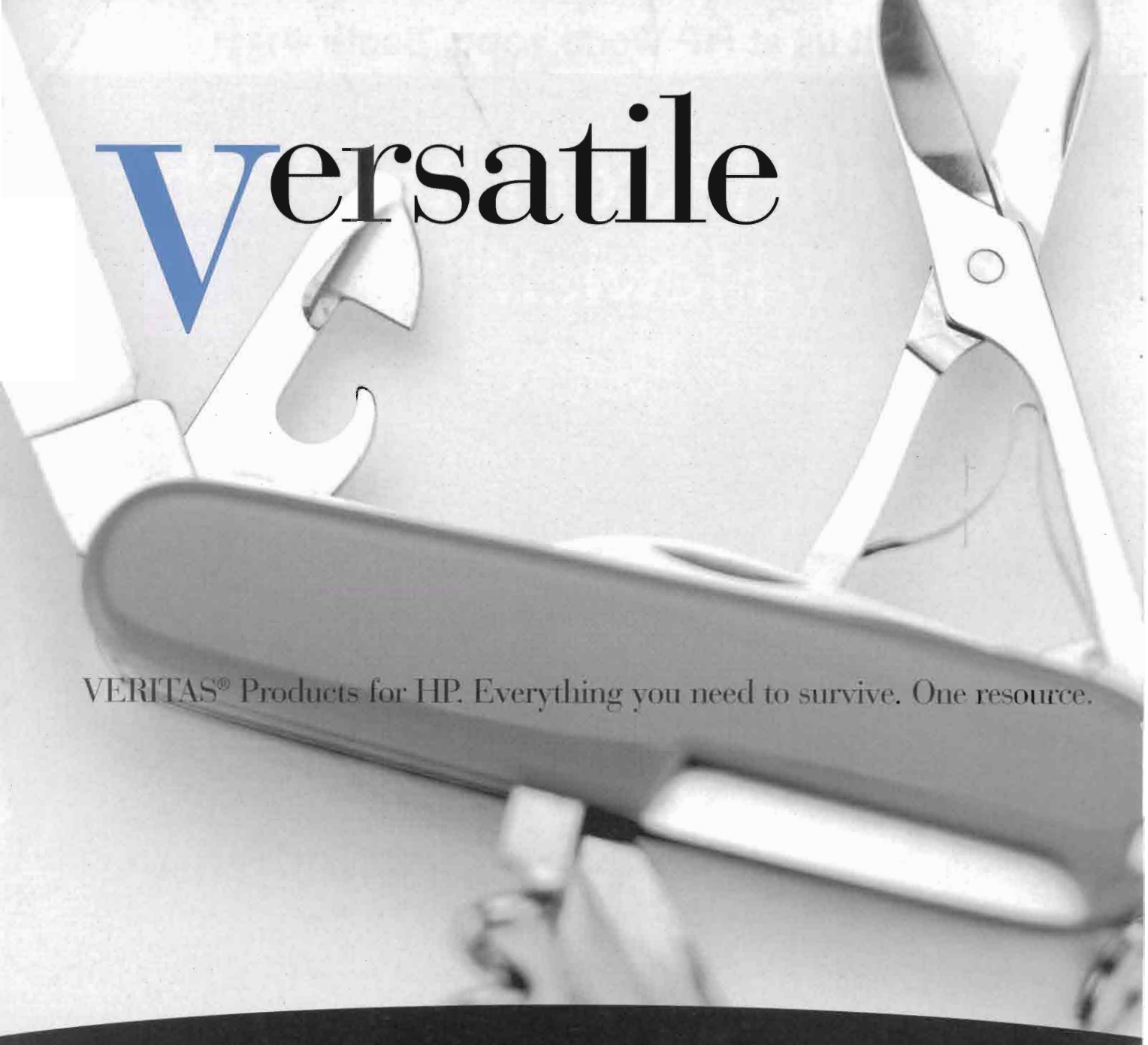

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