24x7

SPRING 2003

THE MAGAZINE OF NONSTOP COMPUTING

REFLECTING ON SECURITY

Boston-based J.P. Morgan Invest, LLC, backs up critical trading application with NonStop servers

PLUS:

META'S CAROL KELLY ON GOVERNMENT IT CHALLENGES

ZLE TECHNOLOGY'S HUGE POTENTIAL IN HOMELAND SECURITY

hp invent

SPRING 2003
VOL. 4/NO. 2

24x7

THE MAGAZINE OF **NONSTOP** COMPUTING

FEATURE

STRATEGIC PARTNERS

ON THE COVER

Robert Cline, vice president of Technology and director of NonStop System Operations and Network Infrastructure, J.P. Morgan Invest, LLC

Photograph by Jonathan Kannair

COLUMNS

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SAFE AND SECURE

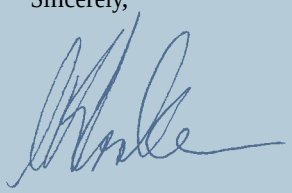
WE LIVE IN CHALLENGING TIMES. ECONOMIC UNCERTAINTY AND FIERCE GLOBAL COMPETITION make an adaptive but secure computing infrastructure more critical than ever. This issue of HP's *24x7* magazine focuses on a related topic that's a concern for all of us these days: security. Our cover feature on J.P. Morgan Invest, LLC, describes how one adaptive enterprise replicated its HP NonStop server environment—including its test and development systems—to enhance the continuity of its critical business operations. Another article provides an in-depth look at the hardware-based cryptographic offerings of Atalla Security Products, part of HP's NonStop Enterprise Division.

Carol Kelly of META Group offers a timely perspective on the role of information technology in effective government strategies. Wherify—a California company with an innovative wearable security product—counts on its NonStop system to help protect children. On the partner front, you can read about XYPRO's approach to ensuring secure data movement, both in-house and in transit. And a special feature describes the potentially pivotal role of HP's Zero Latency Enterprise (ZLE) architecture in homeland security.

The magazine includes articles of general interest as well. You'll see how diverse customers, including AdvancePCS, CRESTCo, Interpay Nederland, Loto-Québec, and Teleque, put their NonStop systems to work to maximize business efficiency and increase the satisfaction of *their* customers. You'll be introduced to a top-notch HP technical support team with deep expertise in ZLE architecture implementation. Articles on Baldwin Hackett & Meeks, SeeBeyond, and TapeLabs point to the ever-increasing cadre of key solution partners in the NonStop system environment.

We hope you find this issue of *24x7* both interesting and informative. And rest assured that with HP NonStop servers, your enterprise will be able to handle whatever the world sends your way.

Sincerely,



Chris Rooke, Vice President of Marketing
HP's NonStop Enterprise Division

24x7 CONTINUES TO EXCEL—AND EVOLVE

HP'S *24x7* MAGAZINE IS NOMINATED IN TWO CATEGORIES FOR THE 52ND ANNUAL MAGGIE Awards, including the prestigious "Best Semiannual Trade Magazine." The Maggie Awards, sponsored by the Western Publications Association, honors excellence in magazine and electronic publishing.

Look online for the next issue of *24x7*—transformed from print into an easy-to-navigate "e-zine," providing the same high-quality, informative articles you've come to expect. If you would like to continue receiving *24x7* and wish to be notified when each issue is posted on HP's website, please fill in (be sure to include your e-mail address) and return the subscription card at the back of this magazine, or send your name and e-mail address to 24x7@avantpub.com with "24x7 subscription" in the subject line. We will then send you an e-mail message with a direct link to the online magazine.

Singapore skyline

Around the world of NonStop computing

LIBRARY AUTOMATION NO LONGER OVERDUE

[ELPEDIA PTE LTD., SINGAPORE] As chief executive officer of eLpedia Pte Ltd., Chew Leng Beh manages a top-notch team that provides library automation services and consulting for hundreds of libraries in Singapore. eLpedia was formed in 2001 after the National Library Board (NLB) of Singapore realized the potential of one of its business units to provide library automation services beyond the NLB network of libraries.

> "Our proposition to libraries is: You **don't need to worry about IT**; just concern yourself with **information distribution** and **customer service.**"
>
> *Chew Leng Beh, CEO, eLpedia*

eLpedia relies on the HP NonStop S7000 platform as its primary system: One 12-processor NonStop S7400 server handles transaction processing and production, and another identical server provides full disaster recovery capability. The system handles automation services for more than 500 libraries in Singapore, including the NLB (with an estimated 2 million patrons). Other major customers include all government schools and junior colleges, the Singapore Management University, and several government and non-government organizations. In Singapore, approximately 26 million books are borrowed every year, making this the highest circulation load on a single library system in the world—and this is expected to grow to 30 million by the end of 2003.

"The NonStop platform gives us the reliability and scalability that is essential to what we offer. Our proposition to libraries is: You don't need to worry about IT; just concern yourself with information distribution and customer service," said Beh. NonStop servers provide eLpedia the "no compromises" backbone it needs to assist libraries in automating their services to the satisfaction of their patrons; that is, the servers deliver unparalleled availability *and* scalability—with no need to compromise one for the other. Plans are in the works to expand the business to the Asia-Pacific region. ◆

GLOBAL POSITIONING SYSTEM PROVIDES INNOVATIVE MOBILE LOCATION SERVICE

[INTRADO, DENVER] Colorado-headquartered Intrado Inc. is a leading provider of solutions that manage and deliver mission-critical information for U.S. telecommunications providers and public safety organizations. Intrado has spent more than 20 years perfecting the data and network infrastructure that makes it possible to locate telephone callers—anytime—regardless of communications device or protocol. HP NonStop technology has helped fuel the company's success.


Denver International Airport

So when Intrado decided to launch its managed service for identifying the location of emergency 9-1-1 callers—a new application that complements its existing wireless 9-1-1 service—the company quickly settled on the optimal solution: the HP NonStop S-series server, running wireless assisted global positioning software from SnapTrack. The September 2002 deal included two identical NonStop S7402 systems, located more than 1,000 miles apart.

"Since the terrorist attacks of September 2001, the focus on emergency 9-1-1 service has increased dramatically, particularly in the mobile sector," noted Dan Hoskins, vice president and general manager of Intrado's Wireless Business Unit. "Given the stringent service level agreements that Intrado is required to provide its customers, it is critical for us to have a solution that is always available. The HP NonStop platform brings continuous availability, scalability, and low total cost of ownership to the solution. Combined with SnapTrack's industry-leading software and Intrado's highly reliable service operations, it provides a best-of-breed service for our customers." ◆

A GLOBAL NONSTOP SYSTEM RESOURCE

[HP'S ADVANCED TECHNOLOGY CENTER, CUPERTINO] With expertise in everything from database and application architecture to operations management—and with a growing focus on middleware—HP's Advanced Technology Center (ATC) provides technical and business development support for global, complex NonStop system projects. As part of the NonStop Education and Technology (NET) organization, the ATC draws on and shares expertise with the Education and Training Center. The ultimate goal, according to NET general manager Randy Meyer, is to help HP customers and partners turn business opportunity into sustainable profit.

The Advanced Technology Center can help define business objectives, identify optimal technologies, and create the best architecture for the solution. "The customer may want to build a complex proof-of-concept system, and benchmark it to prove that it's going to work," said Meyer. "Such challenges don't scare us."

> "The ZLE architecture **opens people's eyes** to things they never thought were possible."
>
> *Jack Mauger, director, HP's ATC*

The organization often incorporates HP's Zero Latency Enterprise (ZLE) framework into its solutions. "ZLE technology makes it possible to link all the applications and operate from a common data model," commented ATC director Jack Mauger. "The ZLE architecture opens people's eyes to things they never thought were possible. It shows people that if you attack a problem in a different way, with an open mind, you can do incredible things."

In a nutshell, the ATC provides expertise in

- NonStop systems application architecture
- NonStop database technology (NonStop SQL/MP and NonStop SQL/MX software)
- Web-enabled applications
- Enterprise management operations, including HP OpenView
- Middleware (including Java™ software) and application integration
- ZLE technology
- Porting consultation and assistance
- Application migration and optimization
- Performance analysis and tuning

Mauger added that the ATC has developed a considerable amount of ZLE experience since the original 128-processor ZLE prototype was built in its Advanced Technology Lab in 1999. ◆

Expertise in real time

HP's Top Gun team supports ZLE implementation from start to finish

IN 1994, WHEN "ZERO LATENCY COMPUTING" WAS STILL A twinkle in Gartner's eye, a major telecommunications customer came to HP (then Tandem) with a problem. The telco company had several disparate systems in its network that didn't talk to one another. It was looking for a way to tie its systems together for a single view of network data.

The job was tailor-made for Glenn Woodard's "Top Gun" team, a group of highly skilled experts charged with exploring new industries and solutions for the NonStop platform. They embarked on the project, and the result was an architecture designated the Data Migration Engine (DME). A few years later, a solution based on this DME foundation was implemented at another telecommunications company. "Around the time we got it installed and operational, the term *zero latency enterprise*, or *ZLE*, came into being," recalled Woodard. "We realized this was our first ZLE system."

> "We have many **excellent middleware** relationships, thanks to the **open architecture** of the NonStop platform."
>
> *Glenn Woodard, director, NonStop Server and ZLE Sales and Technical Support, HP's Americas Division*

The original Top Gun team still reports to Woodard, who is now director of NonStop Server and ZLE Sales and Technical Support for HP's Americas Division. The group is part of a comprehensive sales and customer relationship model that provides everything from account support to sales, design, consulting, and implementation of ZLE and HP NonStop systems. Key elements of the service model include five geographically dispersed Solution Architect teams for account support and business development, an extended second-level organization for complex projects, and a rapidly growing professional services team.

"It's an end-to-end organization that provides sales and technical expertise—from the first customer call to turning over a fully functional and operational system," noted Woodard. "Customers appreciate the fact that there is a comprehensive, high-level organization to take them from the introduction of ZLE all the way through business consulting, architecture design, and implementation of the solution. Our Solution Architect teams maintain ongoing customer relationships and additional presales activities. All the teams have NonStop server, ZLE, and industry expertise—so once we get involved, the customer doesn't have to go anywhere else."

Even with their extensive background—the second-level support team averages 15 to 20 years of NonStop system experience per person—Woodard and his group gain new knowledge with each ZLE implementation. "It's an ongoing process," he said. "Customers are always a little bit different, even if they're in the same industry. Because each customer has unique concerns and requirements, we learn new things every time we install a ZLE solution—especially how valuable the architecture is in today's business environment, where everybody is trying to connect disparate systems for a real-time view of data across the enterprise."

PROVING THE CONCEPT

An integral part of most ZLE solutions is the formalized proof of concept (POC). "We sit down with customers, match our team with their own subject matter experts, and agree on a set of success criteria that we need to meet," explained Woodard. "They tell us what we need to prove. If we meet the success criteria of the POC—

PHOTOGRAPH BY LENNY GONZALEZ

HP's Glenn Woodard and his Top Gun team were incorporating zero latency enterprise features in the NonStop platform before the term *ZLE* even existed.

which we have never failed to do—the customers either buy the system or pay for the POC. This approach gives us a chance to work with their people, understand their business, and get a feel for the issues they're trying to address. It's an extremely effective model."

According to Woodard, there is considerable flexibility in the POC process. "Sometimes we run the demonstration at our Advanced Technology Center in California, and sometimes we run it at the customer site," he explained. "Whatever the customer prefers, we can work it out." As the list of ZLE reference customers grows, the need for POCs is declining, he added; however, the POC is still a valuable sales tool when potential customers want to see their own data running in a ZLE environment before they buy.

ZLE professional services is the final group to touch the system. There are now about 20 people in this part of Woodard's organization; the group doubled in size from March to November 2002, and he expects that it will continue to grow. "Once we've architected the solution, we involve our professional services people," he said. "They work directly with the customer to write the code, interface to the middleware, develop the tools—basically, to put the solution into production. In this way, the customer deals with the same organization from the first mention of a ZLE solution to the delivery of an operational system. That's pretty powerful."

Woodard points out that presales activity is provided by his organization at no cost to the customer. "I don't believe we should charge customers to tell them what we want to sell them," he stated. "To me, this is part of the strategic relationship we establish with our customers. Once they see the caliber of our people, they recognize that we truly are a strategic partner trying to help them solve their problem. They appreciate the fact that we're not sending a bill every time they turn around. Of course, they understand that when implementation of the solution begins, it becomes a billable process."

What about third-party solution providers? Woodard says there's plenty of flexibility in this arena as well. "We have many excellent middleware relationships, thanks to the open architecture of the NonStop platform," he said. "We go over the various options with the customer when we're discussing how best to architect the solution. If the customer has a preferred middleware vendor, we use that vendor. If not, we recommend the one we think best fits the business solution as part of the ZLE architecture."

Woodard couldn't be prouder of the people on his team. "These are highly motivated, highly skilled individuals who are totally dedicated to the success of our customers," he concluded. "They're some of the most talented, dedicated people I've ever met in this business, and I'm just glad they let me hang around with them." From the glowing reports received from ZLE customers, it seems clear that Woodard's opinion is widely shared. ◆

"Because each customer has unique concerns and requirements, we learn new things every time we install a ZLE solution—especially how valuable the architecture is in today's business environment, where everybody is trying to connect disparate systems for a real-time view of data across the enterprise."

Glenn Woodard, director, NonStop Server and ZLE Sales and Technical Support, HP's Americas Division

ZLE technology: Protecting the home front

Advanced architecture integrates vital security data from disparate sources

IMAGINE THIS:

- *Documents and computer disks captured in Afghanistan provide military intelligence with names and phone numbers in Indonesia, Houston, and Mexico.*
- *Communications intercepted in Yemen suggest that al Qaeda may have succeeded in smuggling spent nuclear fuel from Jakarta to the Western Hemisphere.*
- *Surveillance of suspected terrorist affiliates reveals preparations for a large suicide mission in a major southwestern city of the United States.*

Unfortunately, in the aftermath of September 11, such scenarios are all too easy to imagine. The question is: If these critical pieces of information reside in the databases of different government agencies, how quickly can an intelligence analyst put them together to avert a catastrophe? And the answer is: Not quickly enough.

The government's information technology (IT) infrastructure—whether in the intelligence community, defense, or homeland security—consists largely of legacy systems running custom applications. These systems were not designed to work with a diverse assortment of databases, nor to provide immediate access to data as soon as it is received. As a result, analysts often are unaware of key information that could help them put the security puzzle together—at a time when they are under intense and growing pressure to keep nations safe.

"Most government people now have a requirement to respond faster, integrate much more data, and create new capabilities for reporting that address issues of national security," said Dick Cassam, business development manager for Federal Programs at HP's NonStop Enterprise Division. "The new U.S. Homeland Security Department is an excellent case in point. It must integrate 22 different agencies, including Immigration and Naturalization, Customs, the Coast Guard, the Transportation Security Agency, and Border Patrol. The 170,000 employees of this new department—and their counterparts in defense and intelligence—are being asked to do things faster, more thoroughly, and in a more integrated and responsive manner."

> "The government is looking for the ability to **mine the data** in its existing legacy systems in real time, in such a way that we can **respond to various threats as they are evolving.**"
>
> *Dick Cassam, business development manager, Federal Programs, HP's NonStop Enterprise Division*

THE ZLE SOLUTION

HP, a technology leader with a global presence and impeccable credentials, has a solution that should make government employees breathe easier: the Zero Latency Enterprise (ZLE) architecture, based on the HP NonStop computing platform. ZLE integrates data from disparate databases, analyzes it in real time, and applies predetermined or dynamic business rules to enable an immediate and appropriate response. The technology, already proven in major telecommunications, travel, and financial services installations, is a natural fit for the massive information technology challenge facing the government today.

"The government is looking for the ability to mine the data in its existing legacy systems in real time, in such a way that we can respond to various threats as they are evolving," stated Cassam. "There is also a desire to enhance existing data with commercially available information, such as telephone records, large banking transactions, passenger name records, and the like, while respecting our citizens' constitutional right to protect their own personal information."

HP's deep expertise in telecommunications, travel, and financial services helps establish this critical link between government and commercial data. Data enrichment companies like HP partner Acxiom—which also integrates data, technology, and services to provide customer information management solutions—will play a key role in creating a modern, linked infrastructure.

SAFEGUARDING THE BUSINESS WORLD, TOO

Major enterprises across the industry spectrum—from financial services and telecommunications to travel, retail, manufacturing, and healthcare—know from long experience that HP NonStop servers are the platform of choice for mission-critical applications. But as the NonStop server makes its entrée into the national security arena, it's worth pointing out to new and prospective users that

- More than 135 public telephone companies currently rely on NonStop technology.
- More than half of all emergency 9-1-1 calls in the United States, and the majority of wireless calls around the globe, are handled by NonStop servers.
- Worldwide, 80 percent of ATM transactions and 66 percent of point-of-sale transactions are handled by NonStop servers.
- NonStop technology powers 75 percent of the world's largest electronic funds transfer networks and nearly all of the world's stock exchanges.

The NonStop platform offers a combination of technologies available from no other vendor, at the lowest total cost of ownership in the industry. As the foundation of HP's Zero Latency Enterprise (ZLE) architecture, it delivers the right stuff for the real-time enterprise—and for the real-time needs of government intelligence, defense, and homeland security agencies.

> "The important thing to keep in mind is that we are not merging all these databases into one huge, centralized database. Rather, we are **selecting critical pieces of information** from each, and **tying the information together**. This gives government agencies a broad view, and one that they can **act on in real time.**"
>
> *Dick Cassam, business development manager, Federal Programs, HP's NonStop Enterprise Division*

A SHARPER EYE ON THE BORDER

Federal agencies responsible for ensuring the security of U.S. borders face a daunting surveillance challenge. To monitor the borders, they deploy sophisticated systems—in-ground and above-ground sensors, multiagency databases, and smart card systems—and a host of multiagency programs. But because data from sensors and other sources is not integrated, a "single picture" view of border-crossing activity across the country is not available.

What does this mean? It means different people can use the same false identity cards for multiple border crossings within minutes of each other. It means an agent who's checking the validity of a student visa has access to only a limited subset of data. It means terrorists and illegal cargo may be entering the United States undetected.

Now there is a powerful and cost-effective solution for border security: the HP Zero Latency Enterprise (ZLE) architecture. ZLE can create a unifying architecture for all pinpoint sensors and databases, react to events instantaneously with recommendations based on agency rules, and analyze patterns over time for enhanced security.

For more information, download the white paper, *HP Zero Latency Enterprise Framework for Homeland Security Solutions*, at http://zle.nonstop.compaq.com/view.asp?IO=ZLHOMSECWP.

It's worth noting that Acxiom had current data on the majority of the September 11 terrorists in its database.

According to Jim Olivero, HP's marketing manager for ZLE solutions, ZLE is up to the challenge of integrating the various technologies in the government's broad IT infrastructure. "We can fit the ZLE hub in the middle of all these different entities," he said. "It is a perfect way of integrating the disparate databases. At the same time, it accommodates the government's massive mixed workload, including online transactions, ad hoc queries, and batch legacy applications."

Dick Cassam concurs with this assessment. "The important thing to keep in mind is that we are not merging all these databases into one huge, centralized database," he stated. "Rather, we are selecting critical pieces of information from each, and tying the information together. This gives government agencies a broad view, and one that they can act on in real time."

The continuous availability and linear scalability of the underlying NonStop system are crucial features in mission-critical areas such as intelligence, defense, and homeland security. In addition, ZLE integrates with existing systems and databases, preserving the government's investment in the current IT infrastructure while enhancing its capability by orders of magnitude.

PROVING THE POINT

To illustrate ZLE capabilities in the national security realm, HP has created two separate demonstrations—one for defense, the other for homeland security. A third demonstration, aimed at the intelligence community, is in process.

"We developed the defense demo in partnership with Boeing," noted Cassam. "It shows the value of ZLE in a national missile defense scenario in tracking air, ground, and sea engagements; identifying threats; and predicting

outcomes. On the strength of that collaboration, we were invited to join Boeing and other industry players in the establishment of the 'Strategic Architecture Consortium with Industry,' in order to develop and evolve an industry-standard common information and communication architecture that enables a Network Centric Operations environment."

The second demonstration, focused on homeland security, illustrates the integration of government and commercially available data to enhance the effectiveness of Customs and Border Patrol agents. The ZLE system gathers and analyzes information from various data sources in real time; then, based on a series of business rules, it immediately flags a government agency or person to investigate any suspicious results.

Whether handling mission-critical transactions in the commercial sector or integrating and reconciling national security–related data in the government sector—including biometrics, photographs, audio and video clips, scanned documents, and global information system data—NonStop servers and ZLE represent the best and most logical platform choice. ◆

LEVERAGING KEY ALLIANCES

HP knows the value of collaboration, and the company is working closely with several key players in the national security arena. It's engaged with a major systems integrator on a proposed project to modernize the Immigration and Naturalization Services exit/entry system. It has joined forces with leading defense contractors in various proposals in the intelligence community. It's collaborating with SAIC, the largest employee-owned research and engineering company in the United States, working on numerous programs for the Defense Advanced Research Projects Agency (DARPA) and the U.S. Air Force. Good teams make good security—and HP is working with the best.

Cash–and security–in hand

How HP's Atalla Security Products Group enabled ATMs to become a worldwide reality

TODAY, NOTHING COULD BE MORE NATURAL THAN stopping by an ATM to get some cash for the weekend; but 30 years ago, the notion of "vending" money was a revolutionary concept. It was such a complicated problem—not just a matter of hardware, software, and network technologies, but also of secure data encryption and the standards that would support it. An impressive consortium, including the U.S. government and many industry leaders, took up the challenge. A key member of that consortium was a small company called Atalla.

"Atalla didn't make the ATM machine, but we developed the hardware security technology that made it work," noted Chris Whitener, general manager of the Atalla Security Products Group, now part of HP's NonStop Enterprise Division. "Atalla worked with industry and the government to set standards—and by about 1974, there was a data encryption standard (DES) that allowed money to be moved and vended from ATMs."

The story of Atalla's subsequent acquisition by Tandem Computers brings a smile to Whitener's face. "Another upstart in the valley, Tandem, decided to target financial services applications that required continuous uptime," he said. "Every time the company won a deal with its NonStop platform—usually involving an ATM, since the financial industry wanted those machines available 24 x 7—an Atalla box seemed to be part of the system. So it was a natural move to bring the Atalla technology and expertise in-house."

From those beginnings, Atalla Security Products has grown to become an integral, respected, and profitable part of the new HP and a major part of the global financial infrastructure. According to Whitener, the cryptographic keys of nearly all the world's financial transactions now reside in Atalla products.

"Whether you're moving a billion dollars from a bank in the Far East to the United States, or just getting money at the local convenience store, the transaction is probably protected by Atalla network security processors," he noted. "In fact, between $3 trillion and $8 trillion a day moves through Atalla equipment. We are widely recognized as the leading supplier of hardware-based cryptographic processing products and solutions for the worldwide financial services industry."

CONTINUING INNOVATION

The Atalla Security Products Group is constantly looking for new opportunities to enhance the security of payments infrastructures, and this focus is amply demonstrated by a spate of innovative products.

In June 2002, the group introduced a new series of network security processors, the *Ax*100 product line, which

combines new levels of logical and physical security with high-performance cryptographic processing. "We took 34 years of code and knowledge and renovated it all into a new form factor, using industry-standard HP technologies as the foundation with our cryptographic processors on top," said Whitener.

"In developing the new products, we combined proven HP technology with our expertise in building secure cryptographic subsystems," added Gary Lefkowitz, director of marketing at Atalla Security Products. "In essence, we built a specialized security appliance that works hand in glove with applications that run on the HP NonStop system, most notably BASE24 from ACI Worldwide. When the application needs to do certain things from a cryptographic standpoint, it sends that information to the Atalla box, where the security processing is done within a secure shell."

As part of this renovation effort, Atalla Security Products took a close look at the latest Triple-DES encryption standard—and found it wanting. "The credit card associations are mandating the implementation of Triple-DES, but we identified several vulnerabilities in the standard," continued Lefkowitz. "Our folks rewrote the requirements for secure key management and construction of a secure key block, and submitted them to the American National Standards Institute (ANSI) committee. Our requirements for key management were adopted as the industry standard."

Another exciting new product is the Secure Configuration Assistant (SCA), based on a modified HP iPAQ Pocket PC platform. "The SCA can be used to configure our new network security processor series," noted general manager Whitener. "It will also allow security officers to initialize certified smart cards to define and enforce their corporate security policies. This is one of the most innovative and significant products we have ever offered to our customers."

Yet a third development effort leverages HP's industry-leading position in printing technologies. "In collaboration with a key partner, we are creating a new application built on the network security processor platform," continued Whitener. "This new solution uses HP printers and secure forms to generate, print, and distribute ATM

THE KEY MEANING

Any discussion of cryptography involves the notion of public and private "keys." A key is an identifier that unlocks an encrypted message by allowing an algorithm to decrypt the protected information. It is based on certain types of mathematics that involve prime numbers.

"Cryptography is based on the idea that I give you everything you want to know except the key," explained Chris Whitener, general manager of Atalla Security Products. "I give you the algorithm for how the message is encrypted, the encrypted text, anything you want—and you still cannot break it, if you don't have the key."

A CRYPTIC PATENT

In 1998, Atalla Security Products patented its revolutionary MultiPrime technology for public key technology. MultiPrime technology has been licensed to SafeNet, Inc., for use in its ASIC products, and to RSA Security for use in its best-selling line of encryption toolkits.

"MultiPrime technology is especially useful for deploying public key cryptography in memory- and processor-constrained devices, as well as low-power devices," noted Chris Whitener, general manager of the Atalla Security Products Group. "It also provides a significant performance boost when applied to practical applications of public key technology, such as encryption toolkits."

MultiPrime technology is now part of every major public key cryptography standard and every RSA BSAFE toolkit product. It enables strong security to be deployed in wireless devices such as cell phones and HP iPAQ Pocket PC and iPAQ BlackBerry handhelds. Concluded Whitener, "There will be literally billions of transactions in the future that use MultiPrime technology."

Chris Whitener (left), Atalla's general manager, and Gary Lefkowitz, director of marketing

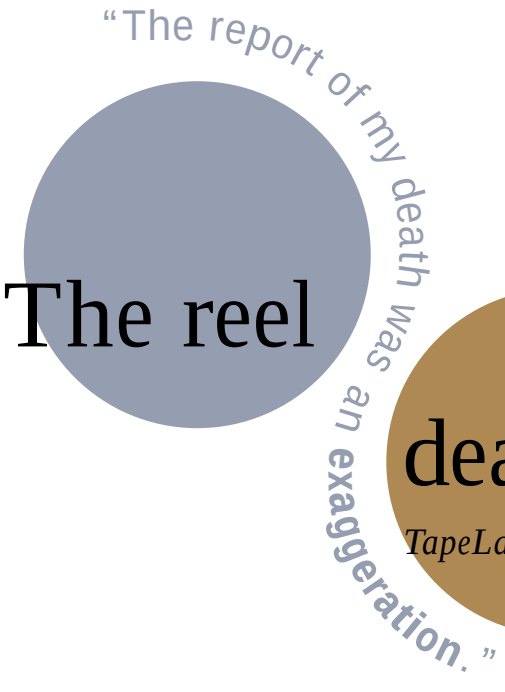
key components and customer PINs. It has the capability to support hundreds of HP printers distributed in branch offices at banks around the world."

MOVING FORWARD

Atalla Security Products sees new opportunities in many areas. In collaboration with key partners—including NCR, Diebold, Wincor Nixdorf, and ACI—the group has made it possible to rekey ATM devices via the network, using public key technology. Working with HP's Zero Latency Enterprise (ZLE) development team, Atalla Security Products provides support for such diverse initiatives as homeland security, healthcare, genetic coding, and travel reservation systems. As the de facto security consultant within HP, the group suggests security enhancements for networking chips and evaluates cryptographic chips, subsystems, and solutions that may lead to expanded partnerships. Atalla Security Products technology will provide some of the native cryptographic power in the next-generation, Intel Itanium–based NonStop platform.

In short, Atalla Security Products is on the move. "Our new hardware products offer unmatched cryptographic strength, innovation, and manageability," concluded Whitener. "Today, we have a unique capability to create and integrate new security solutions using HP building blocks such as MultiPrime technology, industry-standard technologies, cryptographic subsystems, and smart cards. Our goal in combining these elements is to help our customers reduce operating costs, safeguard critical assets, and fortify revenue streams." ◆

PHOTOGRAPHS BY PAT KIRK



The reel deal for disaster recovery

TapeLabs applies time-tested tape technology to new storage solutions

Mark Twain, American author and humorist, 1897

TWENTY-FIVE YEARS AGO, WHEN DISK DRIVES WERE approaching the then-astounding capacity of 10 megabytes, the trade journals were full of dire forecasts regarding the future of tape technology. Many predicted that disk would put tape out of business for good.

Allan Ignatin listened to the predictions, watched the market, and made a decision that went against the flow. In 1989, he founded Tape Laboratories, Inc. (TapeLabs), a company dedicated to leveraging the best technologies for backup, restore, archival storage, and disaster recovery.

"Originally, these areas required a complete understanding of tape," said Ignatin, now chief technology officer at TapeLabs. "Today it extends beyond tape, and some of our new products reflect that shift. But there are many business problems for which tape is still the best solution."

One such problem is permanent archival storage of data, either mandated by law—as in the financial industry—or by good business sense. "This is a perfect application for tape," stated Ignatin. "You write the data out to tape and ship it off-site or put it in your vault. And for the next 15 to 20 years, you can recover the data if you ever need to. With tape, you're able to store very large quantities of data fairly inexpensively."

MYTHS DEBUNKED

Still, there are lingering misconceptions about this tried-and-true technology: that it's dying, it's slow, and it doesn't offer sufficient capacity for today's applications.

Nonsense, says Ignatin. "The primary myth is that tape is dying," he observed. "The fact is, the market for tape and tape-related products continues to grow. The second myth is that tape is slow, and that's just not true; today's high-end tape drives can read and write data at up to 40 megabytes per second. In fact, most host systems can't keep up with them."

And tape capacities are enormous. "There's now a tape drive that will hold a terabyte of data on a single cartridge," continued Ignatin. "That's 1,000 gigabytes. Of course, you need to ask whether you *want* to put that much data on a single cartridge. What if you lose it? And the time it takes to access data on these cartridges is also a consideration. But no one should think that tape technology falls short in terms of capacity."

NEW TECHNOLOGIES FOR OLD PROBLEMS

TapeLabs has long-standing original equipment manufacturer (OEM) relationships with many companies, including—for the past eight years—the HP NonStop Enterprise Division. "We started with a 4-millimeter tape drive in 1995," Ignatin recalled. "We designed the interface, the enclosure, the power supply, and the packaging, and we wrote the manuals. That was our start as an OEM supplier to HP (then Tandem). We've supplied many variants on the product since then, and literally thousands of tape drives."

The latest TapeLabs products leverage new technology to solve some significant business challenges—for example, the frequent backups required in the HP NonStop

> "We bring **new technologies to bear** in solving users' backup, restore, archival, and disaster recovery challenges—and we're very pleased to be doing this **in partnership** with the industry-leading HP NonStop platform."
>
> *Allan Ignatin, founder and CTO, TapeLabs*

Transaction Management Facility (NonStop TMF) environment. "Cartridge tape drives were traditionally used for these backups," stated Ignatin. "The application was designed years ago, when the cartridge tape drive of choice was the 519*x* product. Those cartridges held approximately 500 megabytes, and a 30-minute time span would generate about that much data. So it fit neatly on a cartridge."

"The primary myth is that tape is dying. The fact is, the market for tape and tape-related products **continues to grow.**" *Allan Ignatin, TapeLabs founder and CTO, 2003*

But those drives are no longer manufactured, and the capacity of today's drives ranges up to 200 gigabytes. "The user is faced with writing just the first 3 inches of tape, for backups that have a life span of only a day or two," continued Ignatin. "This can result in a disproportionate investment in hardware infrastructure and media. So we started thinking that tape cartridges might not be the best way to handle NonStop TMF backups."

TapeLabs' answer is elegantly simple. "We've created a product called the Virtual TapeServer," explained Ignatin. "It uses readily available, low-cost, open systems hardware to create virtual tape cartridges on disk RAID arrays." By clustering multiple disk drives, these RAID (redundant array of independent disks) systems improve capacity, performance, and fault tolerance. Users can define as many virtual cartridges as they like, and they can back up as many as 16 different systems simultaneously on a single Virtual TapeServer. By writing the data to disk arrays, they eliminate the need to create, label, and handle huge libraries of tape cartridges.

The TapeLabs Virtual TapeServer also supports remote disaster recovery, by making it possible to replicate data across the country in real time. "You can have a live copy of your data on the other side of the country, and never have to write the data out to tape or transport it anywhere," stated Ignatin. "This is an excellent example of applying new technologies to an old problem." TapeLabs believes that users of its Virtual TapeServer will realize a return on investment in less than six months.

THE BEST TECHNOLOGY FOR THE PROBLEM

Ignatin is clear about the future of TapeLabs. "The focus of our company is to develop products using the best available technologies to solve problems," he said. "Sometimes that's tape, and sometimes it's not."

The inclusion of tools like Java™ software in the NonStop system environment bodes well for TapeLabs in developing new product offerings, according to Ignatin. The company is also investigating the possibility of creating a virtual tape server for HP's NonStop system–based Zero Latency Enterprise (ZLE) environment.

"In addition, we are planning significant developments in remote disaster recovery, new ways to use tape, and faster interfaces, including Gigabit Ethernet," concluded Ignatin. "In short, we bring new technologies to bear in solving users' backup, restore, archival, and disaster recovery challenges—and we're very pleased to be doing this in partnership with the industry-leading HP NonStop platform." ◆

The eye of the storm

BHMI helps FAA keep close watch on worldwide weather with NonStop systems

WHEN YOU'RE PLANNING A PICNIC, IT'S NICE TO KNOW what the weather has in mind. When you're piloting a commercial airliner across the North American continent, it's not just nice—it's imperative.

For decades, the U.S. Federal Aviation Administration (FAA) has collected weather-related data from—and distributed it to—flight centers in the United States and around the globe. The current network, called the Weather Message Switching Center Replacement (WMSCR) system, collects, processes, stores, and disseminates aviation weather products to major national airspace systems, airlines, and international and commercial users. WMSCR also collects, processes, and distributes up-to-the-minute flight bulletins critical for flight scheduling, security, and general operations.

Understandably, after so many years, the WMSCR system is in need of some updating. This is not to say that the current system isn't performing well—it is. But it does not provide the long-term flexibility required for this mission-critical system. So in 2002, the FAA inaugurated the WMSCR-Sustainment (WMSCRS) project to maintain and enhance existing functionality with modern, open technology. Following a rigorous pilot evaluation period, the project was awarded to HP partner Baldwin Hackett & Meeks, Inc. (BHMI), and the HP NonStop platform.

A SOLID REPUTATION

Over the past 17 years, BHMI has built a solid reputation around the world for designing, developing, and implementing enterprise-class software solutions. Because of BHMI, large telecommunications companies are offering value-added services such as stored-value and prepaid calling cards. Leading banks and financial institutions are providing sophisticated telebanking, electronic bill payment, and settlement processing services. And transportation companies are running state-of-the-art sales and ticketing operations.

Although the company boasts a platform-independent methodology as one of its key strengths, most high-end applications go on the HP NonStop server. "We develop our solutions on Windows NT clients and then compile them over to the target platform," explained Casey Scheer, director of Marketing and Sales. "This approach enables us to complete projects quickly, while optimizing flexibility for our customers based on their platform needs. In the case of mission-critical applications that can never go down, we feel the NonStop platform is clearly the best choice."

The open architecture of the NonStop platform is a critical feature, according to Jack Baldwin, chairman, BHMI. "More and more frequently, the customer prospects we talk to have an implicit expectation that any proposed hardware and software solutions will be open,"

ILLUSTRATIONS BY ARTHUR MOUNT

he said. “NonStop platforms *are* open, and have been for some time. Being able to offer the advantages that have always been associated with the NonStop server—while at the same time, addressing our customers’ open systems concerns—certainly makes our job easier.”

WMSCRS TAKES SHAPE

The FAA’s two-node WMSCRS system will be based on contemporary design and development techniques, using focused business objects, N-tier architecture, and graphics-rich, Web-based interfaces. And it will take full advantage of the inherent linear scalability, data integrity, and continuous availability of the NonStop architecture.

“It’s important to create a hardware environment for continued, efficient upgrades, along with enhancing current performance,” noted Baldwin. “Histories of all messages processed must be reliably and consistently maintained, in case research needs to be carried out as a result of some flight incident. And obviously, due to the critical nature of the weather and flight bulletins processed by WMSCR, the system cannot be allowed to fail. These requirements all point to the NonStop platform.”

Senior project manager Jacob Murphree agrees: “The WMSCR system sees high volumes of traffic every hour, every day, with a burst of traffic concentrated in a 15-minute period at the top of the hour,” he said. “So the application must not only support high volume and high availability, but also be sized and architected for significant spikes in traffic volume. Another crucial requirement is critical message delivery within a limited time frame. These requirements place extreme demands on software and hardware, and the NonStop system is ideally suited to handle them.”

The FAA looks to BHMI for a solution with long-term viability. “Using modern software and hardware technology—including NonStop SQL database software and NonStop RDF software for disaster recovery—we are providing an application that is open, and also easier to maintain and enhance for the foreseeable future,” commented Murphree.

Chairman Baldwin added: “The historic strengths of the NonStop platform environment—continuous availability, linear scalability, and data integrity—are precisely what the FAA requires for its weather message switch. And BHMI’s skill set will help facilitate the solution and the process. We are confident that the new WMSCRS system will fully satisfy the stringent requirements of the FAA for many years to come.” ◆

HOW BHMI’S PILOT TOOK OFF

Not surprisingly, the FAA wanted a high level of confidence that potential vendors for the WMSCR-Sustainment project understood what was required and, if selected, could meet their contractual obligations in a timely fashion. So the agency created a set of pilot requirements, asked candidate vendors to implement them within a fixed period of time, and carefully measured each vendor’s level of success.

BHMI chairman Jack Baldwin concedes that his company had an edge in the pilot competition. “BHMI had developed an interim system for the FAA about eight years earlier,” he noted. “We were able to resurrect that code, add a few modifications, and thereby meet nearly all the pilot requirements. This illustrates one of the implicit advantages of the NonStop system environment: Software applications developed for a given NonStop platform almost always, with some limited exceptions, can run on later models with little or no modification.”

The earlier application was designed to run on an early version of the NonStop K-series platform. “We were able to recompile that software and run it on the NonStop S70000 development platform used for our pilot demonstration,” concluded Baldwin. “The net result was that we were able to demonstrate far more pilot functionality than anyone else in the competition.”

Mirror image

Fully replicated NonStop systems help ensure business

ROBERT CLINE, vice president of Technology and director of NonStop System Operations and Network Infrastructure, J.P. Morgan Invest, LLC

continuity at J.P. Morgan Invest, LLC

Photography at J.P. Morgan Invest, LLC, by Jonathan Kannair

Robert Cline had no idea how providential his timing was. Cline and his team at J.P. Morgan Invest, LLC (JPMI), had just finished implementing full replication of all HP NonStop system production, test, and development application environments for the BrownCo broker-dealer system, based on a proof of concept (POC) that involved replicating the company's standard trades module. "We successfully integrated the entire disaster recovery system on September 8, 2001," he recalled. "We were fully ready to recover our back-office NonStop system environment in less than six minutes—three days before the events of September 11."

Because of the age of the company's third-party application, it was not clear that it could be upgraded without serious reprogramming or complete replacement, due to the disaster recovery and data access requirements of the business. After reviewing many options, Cline formed a tight-knit team with solution providers deemed to have the highest probability of success. "In hindsight, the software from Carr Scott Software and HP, which enabled us to upgrade from Enscribe to NonStop SQL, not only worked as advertised but greatly exceeded our expectations," said Cline. "In addition, the support received from both vendors was outstanding."

JPMI provides superior performance to customers trading through all major U.S. stock exchanges.

Fortunately, Boston-based J.P. Morgan Invest, LLC (formerly Brown & Company Securities Corporation)—one of the largest online securities broker-dealers in the United States—did not need to put its disaster recovery capabilities to the test as a result of the September 11 terrorist attacks. But the company was ready. "We were in a position to protect the business and the core data of the entire corporation," stated Cline, vice president of Technology and director of NonStop System Operations and Network Infrastructure at JPMI. "The timing was absolute, relative to what occurred."

In keeping with its history of record-breaking implementations, the JPMI IT staff managed to implement the full disaster recovery system into the NonStop system production environment in just 40 days. "We did a disaster recovery test on September 30, 2001, and it was 100 percent successful," Cline noted. "In addition, we had a full-firm business continuity audit in December 2001. JPMI received an 'A' rating on that corporate audit, which was a significant accomplishment for the line of business. The entire IT team and business leadership of the firm are very dedicated to business continuity."

The IT staff at JPMI had been busy in the months leading up to the disaster recovery system implementation. "In the summer of 2000, we rebuilt the entire back-office environment, which is based on HP NonStop S74000 technology," recalled Cline. "In addition, we completed the replication POC and demonstrated the ability to 'wrap' a legacy application in a framework to convert proprietary Enscribe structures to NonStop SQL. From that POC, we embarked on a strategy to replicate our entire production environment. As a result, we had the capability to fail over from our primary site in the event of a threat to the building; and on September 11, the possibility of a significant threat to the Boston skyline seemed very real."

> "We were fully ready **to recover** our back-office…environment in **less than six minutes**—three days before the events of September 11."
>
> *Robert Cline, VP of Technology and director of NonStop System Operations and Network Infrastructure, JPMI*

DISASTER RECOVERY: A MATTER OF RESPONSIBILITY

For Robert Cline, vice president of Technology and director of NonStop System Operations and Network Infrastructure for J.P. Morgan Invest, LLC, having a robust disaster recovery system is essential. "Given the global threats that we currently face, people in positions of responsibility within corporate environments must invest the time and resources in their IT strategy to get their businesses recoverable," he said.

"Enterprises must be positioned to recover from any catastrophic occurrence, whether manmade or natural," continued Cline. "An e-commerce firm like JPMI cannot afford any downtime, particularly during a trading period. Our customers could be greatly disadvantaged if our systems were not available to trade. So disaster recovery and business continuity, including human continuity—the staff and processes required to run the business in an alternate location—are becoming imperatives. In my opinion, these things are no longer optional."

EXTREME REPLICATION

Cline readily concedes that the extent of replication at JPMI can be classified as "extreme." The primary system is a 12-processor NonStop S74000 server, with an identically configured mirror at the hot backup site. Every type of data and file structure on the platform (including object and edit files) is replicated, using HP NonStop Remote Database Facility (NonStop RDF), NonStop Transaction Management Facility (NonStop TMF), NonStop AutoTMF, NonStop AutoSYNC, and the Carr Scott Escort SQL product. "We replicate the proprietary Enscribe data structures, which are fully audited," noted Cline. "We replicate the SQL tables and objects. We even replicate the spooler files."

Replicating spooler files is an interesting concept, according to Cline. "It assures recovery to a known good point during a batch cycle," he explained. "Typically, a report is generated at every step in the batch cycle. So in the event our primary system were to be lost, we could go

to the replicated spooler file, identify the last report generated, look at the time stamp on the report, and know our recovery 'synch point' within a matter of seconds." Using NonStop AutoTMF, JPMI audits its spooler data files, then uses NonStop RDF software to replicate the audited files to its hot backup site.

The potential time savings associated with this approach is impressive. "If we had to rely on analysis of the application alone to help us resynchronize the data, it could take hours," said Cline. "In one of our brainstorming sessions, we realized that all reports are time-stamped within the spooler, and the last report generated in the batch stream would tell us exactly where we left off." So the team undertook to replicate the spooler files, breaking new ground at JPMI.

> "We have had absolutely **no issues**. I would say our disaster recovery capability is **as close to absolute** as you can get in an IT infrastructure."
>
> *Robert Cline, VP of Technology and director of NonStop System Operations and Network Infrastructure, JPMI*

The innovation didn't stop there. "We were also the first company to fully replicate the source-code repository resident on our NonStop system development environment with real-time disaster recovery capability," said Cline. "People ask, why would you do that? Well, consider the asset value of the source-code repository and the cost of development in any given hour of the day. If you have a development staff of 20 people and you lose an hour's worth of work, that can mount up significantly; if you lose a day's worth of work, it goes up by orders of magnitude."

If, for some reason, JPMI had a catastrophic occurrence on its NonStop development system, the developers could simply point their browser to the test system and pick up where they left off in their source code. This successful project was completed in partnership with Carr Scott Software and Data Design Systems.

According to Cline, JPMI's replication strategy does a good job of exploiting the strengths of the NonStop platform. "In particular, we count on the auditing capability of NonStop TMF software to ensure data integrity," he explained. "NonStop RDF software, which is the transport mechanism for file replication, uses NonStop TMF to ensure the integrity of everything that is transferred. You can rely on the audit trails within the architecture to assure that integrity."

The system has run flawlessly since its implementation in September 2001. "We have had absolutely no issues," stated Cline. "I would say our disaster recovery capability is as close to absolute as you can get in an IT infrastructure."

MEETING INDUSTRY CHALLENGES

Disaster recovery is only part of the story at JPMI. The financial services industry faces major business challenges, ranging from the need for business resiliency—a fact of life today—to approaching mandates for T+1 (trade date plus one day) settlement, 24-hour trading, global trading, and straight-through processing (STP). Cline and his team are undaunted. They are confident that with the NonStop platform running the company's mission-critical trading applications, they can continue to provide superior performance to customers and an extraordinary return for shareholders.

The IT infrastructure at JPMI includes e-channel technologies (Web, direct line, PC line, callback, and faxback) as part of the front-end, mid-tier architecture. The back-office infrastructure comprises a third-party broker-dealer securities package and a message switch, which is connected to the various exchanges and market centers to clear transactions. This back-end processing relies on NonStop technology.

Two NonStop S74012 servers act as the primary host and hot standby for the back-office brokerage application. The development and test systems are NonStop S74006 servers; the development system is collocated with the host primary, and the test system is collocated with the hot standby at a geographically remote site. Additionally, JPMI has incorporated a full life-cycle development methodology for code migration in the NonStop system environment.

Cline is especially proud of the company's integrated test system for life-cycle development. "The NonStop servers have proven to be extremely flexible," he stated. "At JPMI, we have full application environments established for development, test, quality assurance, system

Boston's downtown financial district

integration, replication testing, and preproduction. Having the flexibility to segregate and establish many environments has saved us time and money.

"We do a significant amount of work here, and the system certainly has enabled consistency in configuration management," Cline continued. "When we migrate code from development to test and preproduction, we are going from a known environment to a known environment. This provides added assurance of success when it's time to move into the production environment." The integrated test framework has contributed to more than 375 successful releases in the production environment since its implementation in June 2000.

disk capacity. As with previous system upgrades, the task was accomplished with no impact to the customers or the production environment.

Cline has warm words for the support provided by HP's NonStop Enterprise Division during this critical project. "They definitely understood our requirements," he said. "Purchase orders were released Friday afternoon at 4:30 p.m. under very pressing implementation schedules, and the first hardware was received the following Tuesday at 11:00 a.m. The NonStop Enterprise Division management team, the local account team, logistics, and manufacturing all understood the importance of the DBS initiative to JPMI, and they exceeded our expectations for outstanding customer service." The upgrade, migration, conversion, and integration were a tremendous success for JPMI and its new customers.

EXTENDING AVAILABILITY ACROSS COMPUTING ENVIRONMENTS

JPMI selected ITI, Inc.'s Shadowbase software for its best-of-breed replication capabilities across heterogeneous computing environments. JPMI needs to replicate NonStop system–based, high-volume transactional data to its Solaris based Oracle data warehouse, and Shadowbase provides the features to make the integration seamless.

Using the proven Shadowbase technology, JPMI is able to filter, cleanse, and scrub the nonrelational source data into SQL format. Shadowbase guarantees the delivery of the data to the Oracle data warehouse in near real time, providing the warehouse users with ongoing access to up-to-date information from the NonStop system's ZLE data store. "Shadowbase is extremely easy to configure and supports a wide variety of relational database management systems," explained Robert Cline, vice president of Technology and director of NonStop System Operations and Network Infrastructure at JPMI. "It extends the availability of the data from the NonStop server source system of record."

A SMOOTH INTEGRATION

In February 2002, JPMI announced the acquisition of Dreyfus Brokerage Services (DBS) from Mellon Bank. The NonStop platform, in combination with the securities broker-dealer application resident on that platform, was determined to be the application of choice for the migration, conversion, and integration of the DBS brokerage accounts.

In preparation for the conversion, the JPMI IT team upgraded the processor technology of the entire complex—development, test, and production—with 4-gigabyte memory modules and multiple terabytes of additional

FUNDAMENTALS ADD VALUE

Many hallmark features of the NonStop platform—linear scalability, open architecture, continuous availability, fault-tolerant data integrity, and ease of management—are high on Cline's list of essential system attributes.

"We need to be proactive in dealing with customers' needs, so we can address any circumstance or market condition," Cline noted. "For this reason, the ease of scaling

the platform and overall architecture is of paramount importance. The NonStop platform enables us to incorporate true linear scalability into our business; we can focus on growing our business, without concern for the business outgrowing our systems. And because each dollar spent provides the same result as the previous dollars spent, this linear scalability ultimately lowers the total cost of ownership of the system."

According to Cline, the NonStop system has evolved into a significant engine for e-commerce as well as the more traditional online transaction processing. "HP and the NonStop Enterprise Division have done a remarkable job in incorporating industry standards into every aspect of the software and platform," he continued. "Businesses with mission-critical requirements in their computing infrastructures are fortunate that NonStop systems are available. These systems offer the most robust platform with the lowest total cost of ownership for the continuously available class of computing."

> HP NonStop systems incorporate industry standards into every aspect of the platform and software, making them the most robust platform with the lowest TCO for the continuously available class of computing.
>
> *Robert Cline, VP of Technology and director of NonStop System Operations and Network Infrastructure, JPMI*

The JPMI IT team implemented a full disaster recovery system into its NonStop system production environment in just 40 days.

Not surprisingly, the 24 x 7 availability of the NonStop platform is another key attribute for JPMI. "Production issues are almost nonexistent in our environment," stated Cline. "With the exception of normally scheduled maintenance windows, our uptime on the NonStop system is measured in years."

Ease of management is also important to Cline. "The NonStop platform is, without a doubt, the most cost-effective platform we're running. You don't need as many people to support the environment, so you get efficiencies relative to the personnel costs of running the system. And that is a significant factor in return on investment."

STAYING CURRENT

Cline has often been asked how he can justify the cost of upgrading the NonStop systems and applications. He responds with a question that the business needs to address: What is the cost of *not* upgrading?

> "The NonStop platform is, without a doubt, the **most cost-effective platform** we're running. You don't need as many people to support the environment, so you get efficiencies relative to the personnel costs of running the system. And that is a **significant factor in return on investment.**"
>
> *Robert Cline, VP of Technology and director of NonStop System Operations and Network Infrastructure, JPMI*

"Based on our analysis, we determined that the cost of upgrading our NonStop systems was insignificant compared to the benefits we stood to gain," said Cline. "A few hours of downtime due to a disaster would cost much more than the entire cost of the project. Furthermore, the business now has direct access to key data that was previously locked inside the back-office brokerage application on the NonStop server." And that prompts another question: What is the value of having direct access to all key business data and metrics?

In fact, with HP's Zero Latency Enterprise (ZLE) architecture, the ZLE data store will be able to notify JPMI's business users of situations that require attention proactively. "A customer may be approaching a margin limit, or trading activity may be beyond the norm for a particular security," noted Cline. "Whatever the anomaly, we will have early visibility so we can take the appropriate action. To summarize: The costs associated with the upgrade were very reasonable—and the benefits are huge."

MOVING FORWARD WITH ZLE

The disaster recovery system at JPMI was the first step in the company's ZLE architecture implementation. "We have created an extraordinary foundation for that architecture, and we are currently underway with an EAI strategy to take us to the next level," said Cline.

The company is also working on a far-reaching enterprise information strategy initiative, which takes advantage of the inherent flexibility of the ZLE framework. "We plan to use the ITI Shadowbase product to replicate data from the source system of record, which is the NonStop system, and synchronize it with an Oracle® database in real time," explained Cline. "This will enable us to use off-the-shelf products for business reporting."

JPMI's incremental approach to implementing the ZLE architecture is in tune with the times, according to Cline. "If you've already got the foundation for it, and you go through a tough economic time—like everybody in the world has over the past two years—you don't have to reinvent something every time you touch it. It's there, it's built, and you can put a strategy together that leverages the foundation that is already in place. It's an incremental approach to ultimately providing the best information to the business—actionable information in real time."

There's no way to predict what the future has in store for the economy, the financial markets, or the world. But by preparing itself for any contingency, while simultaneously delivering unrivaled customer service, JPMI is ready for whatever the future brings. Thanks in part to its strategic choice of the NonStop platform and ZLE architecture, this is one company that will clearly emerge a winner. ◆

ROBERT S. CLINE is vice president of Technology and directs the NonStop System Operations and Network Infrastructure team at J.P. Morgan Invest, LLC. Cline is nationally recognized for operational data store (ODS) and data warehouse architectural development in telecommunications and finance, as well as for foundation work in zero latency computing and disaster recovery solutions integration. He has an extensive background in knowledge discovery, business intelligence, and strategic integration, with more than 15 years of experience in telecommunications, finance, and government computing.

Government IT's new mission-critical task: Security

META Group's Carol Kelly discusses the special challenges facing public sector CIOs

IT'S NOT EASY BEING A CHIEF INFORMATION OFFICER. As IT continues its steady migration from back-office cost center to front-line competitive weapon—in industries as diverse as financial services, telecommunications, retail, manufacturing, travel, and healthcare—CIOs around the world are struggling to maximize the efficiency and productivity of their IT shops. Despite the global economic downturn, they are investing in creative technologies and innovative processes to enable real-time information access and the best possible business decisions. They are learning to do more with less, to help the bottom line.

Government IT shops also need to do more with less. But while the "bottom line" in the commercial sector relates to profits and market share, it has quite a different connotation in the public arena. Today, the bottom line for government is keeping the country safe. In the following interview, Carol Kelly, META Group's vice president and director of Government Strategies, discusses the important role of information technology in government and the special challenges faced by the public sector CIO.

Q Could you begin by discussing the linkage between government and private sector IT infrastructures?

A When we look at homeland defense and security, one of the significant components—and this is clearly laid out in the U.S. Patriot Act—is the private sector critical infrastructure, including health, safety, transportation, banking, telecommunications, and energy. There is clearly a tremendous need to share information rapidly in a very secure environment among these entities and with the government.

On September 11, when the planes hit the World Trade Center towers, we had no idea what was happening. In addition to FBI, CIA, military, and FAA databases, queries were made to every state and local law enforcement database. Transportation sector data was combed for relevant car and travel reservations. Bank records were reviewed for any suspicious movement of money. All these different entities, both public and private, were involved in trying to profile what had happened. So we are aggregating data as never before.

Q What are the major challenges faced by CIOs in the government sector?

A Obviously, one huge challenge is improving cross-collaboration among jurisdictions at all levels. The government is rife with "silos," or islands of information. This includes criminal justice, the court system, executive and constitutional officers, public health, the education system, tax and revenue—and that's not a complete list. But I think now, with the right governance model, we have an opportunity to start bringing these pieces together by focusing on collaboration and data exchange on a need-to-know basis.

Another big challenge, especially at the state and local level, is funding. Right now, the money is all going to defense and homeland security. With most states running budget deficits, there is a major focus on efficiency and effectiveness; and, of course, this focus also applies to government IT infrastructures. So we anticipate increased interest in alternative funding models, creative vendor partnerships, and service delivered by government consortiums or ASPs.

Q To what extent are government CIOs impacted by public policy decisions?

A Public policy has a significant and direct impact on the CIO. Economic indicators and population demographics typically impact public policy first, and then cascade down to IT. So it behooves the CIO to really understand the critical economic issues identified by the

META Group's VP and director of Government Strategies, Carol Kelly

PHOTOGRAPH OF CAROL KELLY BY ANGELA WYANT

"There is clearly a tremendous need to **share information rapidly in a very secure environment** among these entities [the private sector] and with the government."

policymakers in areas such as health, welfare, education, economic development, and land use. CIOs in the government space definitely need to incorporate economic policy into their IT strategy and execution.

For example, consider the current population outflow from California. High-wage earners are moving into Idaho, Utah, Montana, Wyoming, Arizona, and Nevada, looking for better quality of life, decreased taxes, and the like. Now, the state of Arizona is running a $1.5 billion budget deficit; but when you have population *inflow*, eventually you'll be able to catch up or reverse that trend.

Inflow states have problems with regular infrastructure, and that clearly affects how IT delivers services in the long term—water bills, ambulance surcharges for 9-1-1 calls, changes in fire districts, bond issues, hotel and property taxes, and so on. It's critical to build agility into the IT infrastructure to handle these increased volumes.

Q What fundamentals are essential in mission-critical government IT systems?

A Data integrity is really important. I can't afford, if I'm profiling a terrorist or doing an arrest, to have inaccurate data. I can't afford to lose a life by dispatching incorrectly, by not getting my "feet on the street" to the right location as soon as possible. And it's the same when you get to the Department of Defense, where you're moving equipment, tanks, and people—you can't afford issues with data integrity, and you can't afford downtime.

Linear scalability becomes important too, particularly as you start gluing databases together. What you're looking for is agility. Agility can mean availability; from a program process perspective, it means I can meet my mission-critical program objectives very rapidly. If necessary, I can scale as well—and I can scale without having 10 software specialists locked in a

room reconfiguring a computer for a day. The ability to rapidly extract information is also critical.

Q Could you comment on the importance of an open IT architecture in the government environment?

A Open architecture is getting more and more critical. If you look at the Office of Management and Budget circulars, they're all about developing common architectures as a prerequisite to receiving funding. Having the connectors and being able to glue things together are critical. Because the mega-databases in different parts of the government are not going to be redeveloped tomorrow, the ability to get the data I need out of what I have is essential.

Q How important is it to reduce the latency in information flow across government entities and applications?

A That depends on the application. If I'm the Department of Defense, and I'm moving tanks and people, I need that real-time visibility. Another area that would require zero latency information flow would be the Federal Emergency Management Agency and its linkage to state and local emergency services. Basically, the application must be appropriate to the program requirements.

Q Could you talk about the critical balance between privacy and security, and how government IT leaders can help maintain it?

A When changes are made to privacy policies as a result of lawsuits, legislation, or regulatory events, those privacy changes are often not reflected in existing security implementations. In other words, we have not created a closed loop. The question is, when a new privacy policy is implemented, how do you implement a security component to enforce it? That's where IT gets involved, and that linkage between policy changes and IT security implementation has been too loosely coupled to be effective.

In order to be agile, CIOs should try to make the process more reiterative as changes occur. In other words, when there's a change in a law or policy, IT security staff—both inside and outside the government sector—should immediately be asking how it affects authentication and access to data.

Q What other trends do you see in the area of government IT?

A There is an increased focus on human capital management—using employee portals for recruiting, training, inquiries, vacation, retirement, and the like—as the public sector workforce ages. There is, as I mentioned, an acceleration of cross-jurisdictional collaboration, largely as a result of homeland security. We believe that the CFO will play a greater role in the IT investment process, working with agency and IT staff to develop metrics and document ROI.

The use of analytic and business intelligence tools will accelerate, with an initial focus on savings and cost containment; examples here are fraud reduction in Medicaid and workers' compensation. Real-time fraud detection is also very important in preventing money laundering. But mainly, given the economic situation and the new level of threat we're under, the focus will be on maximizing the efficiency of government IT systems and processes.

The role of information technology in this new environment is paramount. You have to communicate. You have to collaborate to exchange information. And the hardware, software, and tools that help us do that—and provide the appropriate levels of security—are going to be critical. ◆

CAROL KELLY is vice president and director of Government Strategies for META Group. In this role, she covers a wide variety of areas, including government strategic planning, e-government architecture, privacy policies, integrated criminal justice, network strategies, enterprise resource planning implementation, and public sector customer relationship management. Prior to joining META Group in March 1999, Kelly held positions as CIO and deputy CIO within the State of California's Health and Human Services and Resource programs. She was responsible for the Health and Human Services telecommunications network of 120,000 devices, customer call centers, and statewide strategic telecommunications initiatives within California. Her responsibilities included enterprise architecture across health and human services programs and solution consulting for 18 major programs.

Spanning decades of data

SeeBeyond software and ZLE architecture optimize access to legacy systems

LEGACY SYSTEMS, BY DEFINITION, HAVE BEEN AROUND for a while. They often perform critical functions in the enterprise, and house large amounts of essential data. They may not talk to each other, but this obstacle can usually be overcome through the use of new enterprise application integration (EAI) technologies. So far, so good.

But there's something else about legacy systems, something subtle—and faintly insidious. It is simply this: Because key processes are often buried *inside* these legacy systems, companies may be forced to do business only in ways that the systems support. And this is a serious impediment to enterprise agility.

It was the recognition of this impediment that sparked the creation of SeeBeyond more than 13 years ago. "Enterprises need to be nimble," explained Reed Henry, senior vice president of Services, Support, and Alliances at SeeBeyond. "They need the ability to change their processes quickly to be more customer focused, to improve efficiency, and to operate in a more streamlined fashion. SeeBeyond provides process-driven integration tools that make this possible."

Not that legacy applications will go away. "Companies need to integrate them, and pull all that data together," continued Henry. "Today, many companies have hundreds of disparate IT systems that are islands of information. SeeBeyond software helps them integrate data and processes among those different systems—as well as enabling the sharing of information with customers and partners—so they can optimize business operations."

SeeBeyond's core offering is e*Gate Integrator, a messaging infrastructure and transformation product that runs on HP Tru64 UNIX®, HP-UX, Linux, Microsoft Windows, and now the HP NonStop platform. The e*Gate Integrator port to the NonStop server, a project that was closely overseen by HP's NonStop Enterprise Division, is the first phase of a partnership aimed at further expanding and strengthening the EAI capabilities of HP's Zero Latency Enterprise (ZLE) architecture.

> "Working together with HP, we believe that we can be a great solution for any organization focused on **bringing information together** for **better decision making** and **quicker reaction** to situations."
>
> *Reed Henry, senior VP of Services, Support, and Alliances, SeeBeyond*

Through e*Gate Integrator and a host of associated e*Way Intelligent Adapters, a ZLE system can also connect to other SeeBeyond products, including e*Insight for business process management and e*Xchange for business-to-business applications.

e*Way adapters also provide connectivity to the ZLE data store and enable bidirectional information flow. "A key element of the ZLE architecture is the real-time operational data store," noted Henry. "The primary function of e*Gate Integrator is to be the conduit of real-time and batch information into and out of this data store, to applications on the NonStop platform as well as external systems." In addition to providing the necessary connectivity, e*Gate Integrator transforms the data into the format required by the target application, such as Oracle® software, enabling other third-party applications to share information as well.

SeeBeyond products are well suited to the NonStop system–based ZLE architecture. "We target the same customer set—enterprises that require continuous uptime and instantaneous access to critical information," stated Henry. "There's also a strong technology alignment, in that our products take full advantage of the scalability, availability, and open architecture of the NonStop platform." Like HP, SeeBeyond's worldwide customer base spans industries from financial services and telecommunications to energy, government, healthcare, manufacturing, transportation, and retail.

Currently, SeeBeyond is expanding its presence in the government sector, as the adoption of EAI technology accelerates in the areas of defense, intelligence, and law enforcement at the state and federal levels. "ZLE and SeeBeyond are strongly positioned in environments that require 24 x 7 uptime and high transaction processing performance, and these requirements apply to the government across all agencies," said Henry.

"Working together with HP, we believe that we can be a great solution for any organization focused on bringing information together for better decision making and quicker reaction to situations," he concluded. "As HP's ZLE architecture continues to gain traction in both the commercial and public sectors—integrating with and enhancing existing legacy systems—we look forward to enhancing and expanding our strategic partnership." ◆

CONVERGING GOALS

HP and SeeBeyond enjoy strategic relationships with many of the same industry leaders, including both systems integrators and solution vendors. One such "partner in common" is Siebel Systems. "An early adopter of our joint technology is also a Siebel customer," noted Ruth McHenry, software alliance manager at SeeBeyond. "They have multiple instances of Siebel, with customer information spread across them. With our technology, they can bring that information to the ZLE data store for a single view of the customer and the enterprise. This is a real-world example of the great synergy between our products and the NonStop system–based ZLE architecture."

Safety net(work)

XYPRO software protects mission-critical data in transit as well as in-house

WELLS FARGO BANK. VODACOM. VISA. SABRE. ROYAL Bank of Scotland Group. The London Stock Exchange.

These are just a few of the many HP NonStop system customers who have chosen to enhance the native security of their mission-critical computing platform with products from XYPRO. The company's flagship product line, XYGATE, provides software mechanisms designed to "harden" the platform and encrypt data and communications.

To protect sensitive data managed by NonStop servers, XYGATE enhances Safeguard software to provide access control, rules-based object security, password quality, and flexible audit reporting—including the option to use a Windows interface for centralized security administration. To protect the privacy of data in-house and in transit, XYGATE performs file and session encryption using a variety of key mechanisms. The XYGATE Encryption Toolkit enables companies to encrypt their own applications and databases.

"Our security offerings protect data and access in the NonStop system environment, as well as communications between NonStop servers and other platforms," said chief executive officer Sheila Johnson. "This is our 20th year of leadership in security for the NonStop platform." With thousands of users, XYGATE enhances system security within HP's NonStop Enterprise Division and for major enterprises around the world.

REFRAMING THE PRODUCT SET

Anyone whose association with NonStop systems dates back to 1986 will remember the omnipotent "Superid" designation for system management. Then, security access could be effectively parceled out according to a simple management hierarchy; now, individual job functions represent a more accurate way to determine the appropriate level of system access.

XYGATE handles this new model with no difficulty. "We have reframed security objects and subjects to meet the demands of the current security environment," explained chief technology officer Dale Blommendahl.

According to Blommendahl, the old paradigm was not flexible enough for large corporations with many NonStop system nodes. "To address this challenge, XYPRO

> "If **people perceive security** as making it harder to do their jobs, they will just avoid it. That's not good for anybody. We ensure that our products not only are **easy to use,** but also help people **do their jobs better**."
>
> *Sheila Johnson, CEO, XYPRO*

developed a tool that enables customers to arbitrarily define job function groups and parcel out security privileges as needed." He continued, "XYGATE adds a layer of granularity, enabling security management to grant each user the privileges needed to perform his or her job, and no more. This represents a great improvement in security, without undoing any of the native Safeguard security of the NonStop system."

KEEPING IT SIMPLE

A key element of XYPRO's product development philosophy is that security must be easy to use. "If people perceive security as making it harder to do their jobs, they will just avoid it," noted CEO Johnson. "That's not good for anybody. We ensure that our products not only are easy to use, but also help people do their jobs better."

Johnson offered an example: "Our XYGATE Object Security product is an easy add-on to Safeguard. One of our customers had literally tens of thousands of access control lists (ACLs) under Safeguard; this customer was able to replace all those ACLs with fewer than 100 rules in XYGATE Object Security. This meant that security was orders of magnitude easier to administer and maintain, freeing the customer to focus on other tasks." ACLs enable companies to specify who is granted privileges to manipulate objects such as devices and files.

A PROVEN PARTNERSHIP

To remain competitive, companies today must leverage the cost-effectiveness and speed offered by new technology, without risking the privacy of business data and transactions. XYPRO helps make that possible.

"XYPRO brings products to the table that NonStop system customers like," said Johnson. "XYGATE helps companies meet their security goals and pass their security audits. Our customer-driven products are proven in the marketplace."

The partnership between XYPRO and HP is also proven. "We have confidence in the NonStop platform, and we have confidence in HP's strong reputation as a customer service–oriented company that leverages partnership advantages," concluded Johnson. "The generative, cooperative partnership between XYPRO and HP will help our mutual customers thrive." ◆

THE LATEST SECURITY MEASURES

XYPRO recently announced two new XYGATE modules:

- *Security Compliance Wizard (XSW)* is a Windows software–based rule development and compliance management tool that automatically discovers and tracks security anomalies. With point-and-click ease, XSW makes it possible to develop, apply, and monitor NonStop system security policies for one or many system nodes.
- *User Authentication (XUA)* brings industry-best user authentication capabilities to NonStop server environments. XUA expands on the security functions of Safeguard with customer-requested enhancements, including multifactor authentication, sophisticated error management options, and logon-specific audit reporting.

TRACKING THE MOST PRECIOUS ASSET

Wherify leverages advanced location services technology to help keep children safe

TIMOTHY NEHER WAS THRILLED. IT WAS the first time he'd been allowed to take his niece and nephew—ages 3 and 5—on an excursion without their parents, and the three of them were having a wonderful day at the zoo.

"Everything was going fine until we went to order lunch at the snack bar," recalled Neher. "I was looking up at the menu, and when I looked down, the kids were gone. I had that awful panic that all parents feel when they lose sight of their children. Thank God, I found them pretty quickly."

The experience was a catalyst for Neher, who subsequently founded Wherify Wireless, Inc. (formerly World Tracking Technologies). Wherify, a nationwide location service provider, develops patented wireless location products and services for child safety and other personal and business applications. "Our technology makes it possible to locate a person or asset anywhere in the country, within about a minute," said Neher. The end-to-end location solution—which also involves a partnership with the nation's largest PCS wireless network and a bank of certified emergency 9-1-1 operators—relies on the HP NonStop platform for its critical back-end processing.

Wherify's initial product, the award-winning GPS Locator for Kids, is a wristwatch-like device that combines a full-function cell phone, numeric pager, and enhanced global positioning system (GPS). It features a cut-resistant,

> "Our technology makes it possible to **locate** a person or asset **anywhere** in the country, **within about a minute**."
>
> *Timothy Neher, founder, president, and CEO, Wherify*

> "If we need to **expand the system**, we can literally throw hardware at the NonStop server, clone our application process, and increase the capacity of the system—**without making any changes to application code**. That's **a huge advantage** over other architectures."
>
> *Bob Jacobsen, director of network services, Wherify*

tamper-proof band that can be locked on the child's wrist with the push of a button. "The product is geared toward children 4 to 12 years of age," stated Neher. "It's really their first communications device." This year, Wherify plans to offer an adult version for Alzheimer's patients, as well as a sports model and various cargo- and asset-tracking applications.

LOCATING THE PERFECT SYSTEM

According to Bob Jacobsen, director of network services at Wherify, the multiprocessor NonStop S70000 server is the critical part of the company's back-end system. The overall architecture includes an array of Windows NT Server–based systems (also from HP) and a custom-developed application.

Wherify conducted a thorough analysis of all the major players, including Oracle and Sun, before deciding on the NonStop platform with NonStop SQL database software. "When we looked at the combination of fault tolerance, scalability, flexibility, and total cost of ownership, it was clear that the NonStop system–based solution was the best choice by far," stated Jacobsen.

The continuous availability of the NonStop system is absolutely essential to Wherify. "This is a service that can never go down," continued Jacobsen. "Having a back end that's architected to recover from failures and just keep on ticking is a huge advantage. It means our service can exceed the 'five 9s' availability that everybody in the industry tries to achieve."

It also means lower cost on the operations front. "We don't need an army of people to sit there and watch the system, responding to any little thing that happens," he added. "As a result, we can deploy those resources to other things. The NonStop system is much more efficient to operate because of its fault tolerance."

Scalability is also a critical factor. "We sized the initial system for 200,000 subscribers, with each subscriber doing roughly 25 locates a month," explained Jacobsen. "If we need to expand the system, we can literally throw hardware at the NonStop server, clone our application process, and increase the capacity of the system—without making any changes to application code. That's a huge advantage over other architectures."

CEO Neher agrees that the massive scalability of the NonStop system will come in handy. "We believe that location services will become a $20 billion to $25 billion industry by 2008," he said. "We're the pioneers in this space right now, and we expect to have at least a million subscribers within the next three to four years." In addition, Wherify expects to move into the international marketplace before long. The company will also make its back-end infrastructure available for use by other companies' mobile devices, further increasing the potential transaction volume. "The ability of the NonStop system to scale quickly and seamlessly is critical to us in planning for this kind of expansion," Neher added.

Neher's mind often returns to his frightening experience at the zoo. "If my niece and nephew had been wearing the GPS Locator, I could have simply called Wherify's toll-free number and given the live operator my password and security code," concluded Neher. "The operator would have said: 'Okay, the children are 50 feet in front of the gate. Why don't you walk over and find them?' Meanwhile, our customer service representative would have been doing more locates. If the kids had been taken out of the park, an emergency would have been declared and the appropriate public safety authorities would have been notified immediately. For this kind of application, Wherify knew it needed the best system on the market—and that is the HP NonStop system." ◆

FOR WHERIFY, NONSTOP SYSTEMS:

- Ensure the availability that is essential to GPS applications
- Provide fault tolerance that makes for cost-efficient operations
- Can easily be scaled to meet increasing transaction volumes and expanding markets

SHUFFLING ITS CARDS

Teleque Communications moves prepaid solution to scalable NonStop platform

AS ONE OF THE LEADING SERVICE providers in Europe, multinational Teleque Communications is always looking for new opportunities. In 2001, Teleque acquired the Italian branch of telecommunications group RSLCOM, a leader in the prepaid domestic market—opening up a whole new market opportunity. The company decided to focus on heavy users of international voice traffic in the consumer market, with the objective of substantially (and quickly) increasing prepaid and rechargeable card services to these consumers.

At first, Teleque planned to base its prepaid application on a Windows NT platform. But before long, it became apparent that greater system reliability was required to ensure continuous availability of the company's mission-critical applications. Teleque needed the security of a stable, reliable, and expandable platform—backed by superior customer support—on which to build and run its growing business.

So the company switched to the HP NonStop platform, running a prepaid card solution from Infitel and Teles AG Infinite Networking software. This powerful solution makes it possible to launch telecommunications services at the system size and investment level dictated by business requirements, with no restriction on future expansion. With its outstanding professional support and systems expertise, HP's NonStop Enterprise Division is one of the leading providers of server-based solutions for telecommunications companies around the world.

Teleque group president Sebastiano Galantucci is pleased that the company has built continuous availability into its new application infrastructure. "Our infrastructure investment policy is simple, but at the same time requires the utmost flexibility and growth potential from the solutions we choose," he said. "Our business partners' approach must be as unrestricted as our business

> "The choice to **rely on HP and its partners** to implement the technology has proven to be **the right strategy.** Our expansion process could not have been any smoother."
>
> *Sebastiano Galantucci, Teleque group president*

model. We found that NonStop servers offer the flexibility and capacity that we need for many years into the future."

A COMPLETE SOLUTION IN JUST THREE WEEKS

A key element in the flexibility Teleque requires is the ability to add processing capacity seamlessly, a hallmark feature of the NonStop platform. This linear scalability lets customers choose the capacity level needed to achieve their business objectives, today and in the future.

Another important element in providing for future growth is Infitel's InfiCore application platform, which provides a link between network technology and service applications. InfiCore easily adapts to hardware environments of different sizes and runs on all leading operating systems. In addition, the open architecture of InfiCore promotes scalability by supporting various intelligent network configurations.

Teleque operations director Mirko Mare sees many advantages in the NonStop platform. "The availability and scalability of the system are transparent to the application," he stated. "This was a major factor in our decision to base our prepaid application on the NonStop server. We were also pleased with the professional services expertise from HP's NonStop Enterprise Division. This outstanding support was critical in ensuring successful deployment by our deadline."

As if all of that weren't enough, Mare notes that the NonStop platform also reduced the cost per transaction, significantly cutting the total cost of ownership (TCO) of a large mission-critical, carrier-grade system. Incredibly, the complete solution was ready to operate just three weeks from the day on which the order was placed.

FROM ZERO TO A COOL MILLION

The solution from HP and Infitel—coupled with Teleque's marketing strategy of building customer loyalty and devising a strong product distribution channel—was an immediate and resounding success. It was so successful, in fact, that Teleque was able to go from zero to a million prepaid card sales in just three months. Today, the company's prepaid card sales exceed 2.5 million annually.

Transaction volume has grown right along with prepaid card sales. In March 2002, Teleque experienced a peak traffic load of 100,000 busy hour call attempts (BHCA). This was no problem for the new application running on the NonStop platform, which comfortably handles more than 200,000 BHCA per month. The system is sized for ample capacity and designed for seamless growth.

By April 2002, Teleque was looking at future development—in the form of international expansion with additional points-of-presence in Paris and Madrid. Once again, the NonStop system–based solution proved to be an excellent choice. Running on the NonStop platform, InfiCore software components can be distributed over diverse systems and geographically remote locations. This opens up unlimited possibilities for local points-of-presence, with the resulting benefits of lower connection expense and cost-effective central system management. The NonStop platform easily optimized the call flow for convenient use by Teleque customers, and Infitel implemented tariff plans for Teleque-specific prepaid card services.

THE IDEAL PLATFORM

For Teleque Communications, the combination of the InfiCore application and the NonStop server has produced an excellent match of hardware and software fault tolerance. The solution optimizes the use of available resources, resulting in a true carrier-grade system.

"Realizing this kind of exponential growth in such a short time could have caused us numerous problems," concluded Teleque's Galantucci. "In reality, the choice to rely on HP and its partners to implement the technology has proven to be the right strategy. Our expansion process could not have been any smoother." ◆

FOR TELEQUE, NONSTOP SYSTEMS:

- Ensure continuous availability for critical telecommunications services
- Provide linear scalability so customers can choose the capacity level that matches their business objectives
- Optimize call flow through efficient connections and central system management

DUTCH ICONS: TULIPS, WINDMILLS—AND NONSTOP SERVERS

Leading payment processor Interpay Nederland stays ahead of surging growth

MILLIONS OF PAYMENTS MADE THROUGHOUT the Netherlands are processed each day by Interpay Nederland BV. Payment methods include debit cards, batched electronic transfers, transfer instruction forms, direct debit, MasterCard and Visa credit cards, and electronic purses.

As the leading payment processor in the Netherlands, Interpay is the central "hub" that connects banks throughout the country. Interpay was formed by the major Dutch banks in 1994 as a subsidiary responsible for setting up and managing funds transfers as well as developing innovative new methods of electronic payment.

Until recently, Interpay was running its electronic funds transfer (EFT) applications on 12 HP NonStop K-series servers. But when faced with a 12 percent annual growth in transaction volume combined with the rapidly approaching switch to euro currency, Interpay knew it was time for a major increase in capacity. The company decided to migrate to the NonStop S-series platform, purchasing 12 NonStop S7400 systems with a total of 70 processors.

ENSURING A SMOOTH MIGRATION

Harry Joustra, manager of infrastructure for Interpay, oversaw the move from NonStop K-series to S-series servers. As Joustra observed, "With a great deal of pride, I can say the migration from the NonStop K-series to the S-series was very successful. We had to do a complete migration of our production systems within 10 months, and we did so with no production interruptions, reducing the cost per transaction significantly."

Joustra and his staff of 10 network specialists and 10 system specialists spent a great deal of time working with the NonStop system team to ensure a smooth transition. Joustra recalled: "To make sure we were prepared, in

> "The NonStop S-series platform gives us a very **cost-effective solution** that will provide enough **processing power** to handle **peak loads** for the foreseeable future."
>
> *Harry Joustra, manager of infrastructure, Interpay Nederland*

1999 we purchased a NonStop S-series server as a learning system for our people. In addition, we talked about our plans with personnel in the United States—primarily at ITUG user events—and received very useful information. The staff in the Netherlands also helped us with the migration quite a bit."

Interpay currently relies on 17 NonStop S7400 servers, 2 NonStop S74000 servers, and 3 NonStop K-series servers. It processes approximately 1 billion point-of-sale (POS) transactions per year, with peak usage always occurring the Saturday before Christmas (nearly 6 million transactions were processed on that day in 2001). The system handles up to 350 transactions per second, originated from approximately 165,000 POS terminals located throughout the Netherlands. Saturdays are typically the busiest transaction day of the week, with peak periods on the Saturday before payday.

Joustra observed: "The NonStop S-series platform gives us a very cost-effective solution that will provide enough processing power to handle peak loads for the foreseeable future. On euroday (the day the euro officially went into use), everything went smoothly—not a single problem."

SEEKING INNOVATIVE NEW PAYMENT METHODS

In the Netherlands, there are some 35 million bank accounts at approximately 100 banks. Dutch funds transfer is widely recognized as being among the most efficient in the world, with the Netherlands holding a leading position in developing new and innovative forms of payment. One example of

successful innovation is the "Chipknip" electronic purse introduced by Interpay in 1995. Within three years of its introduction, Dutch banks had issued more than 8 million cards containing the Chipknip capability.

One of the biggest challenges currently facing Interpay, according to Joustra, is finding new ways to ensure that customers can always pay electronically, from any POS location throughout the Netherlands. As he observed, "We realize that a shopping customer always wants to have the option of paying electronically. Our NonStop system gives us 99.98 percent availability, 24 x 7 x 365. But what happens if a shop owner's POS system becomes unplugged? We need to develop new products to ensure that payments can still be processed if system connections are interrupted." Interpay also relies on innovations to develop and grow new business. According to Joustra, "We are constantly looking at ways to increase our transaction volume."

Joustra is pleased with Interpay's working relationship with the NonStop Enterprise Division: "We have, through the years, always had a very good relationship. And the power of NonStop Enterprise Division employees is that they think with us and are always willing to help. They know exactly what our business is and how to handle situations in case of serious problems."

Joustra also likes the cost-effectiveness of running his systems: "Looking at systems management, a NonStop system requires only a few well-trained system managers. This is in contrast to competitors' systems that require a lot of different types of expertise, making them expensive to manage." ◆

FOR INTERPAY NEDERLAND, NONSTOP SYSTEMS:

- Ensure 99.98 percent availability for electronic funds transfer throughout the Netherlands
- Scale to handle 12 percent annual growth in transaction volume
- Facilitate the development and integration of new electronic payment methods
- Provide cost-effective operations and systems management

MAKING PRESCRIPTIONS EASIER TO SWALLOW

AdvancePCS improves quality, lowers costs for millions of Americans

ADVANCEPCS IS GIVING THE U.S. healthcare industry a good name.

And that is a challenge—especially today—when many Americans are cynical about the increasing costs of health insurance and prescription drugs. The overall cost of healthcare in the United States is rising at double-digit rates of inflation, with little sign of relief anytime soon.

AdvancePCS is the nation's largest provider of pharmaceutical benefits management, serving more than 1,500 clients (such as employer groups, HMOs, and government organizations), 75 million health plan members, and 58,000 pharmacies. A self-described "health improvement company," its stated mission is to make it easy for plan members to receive cost-effective, quality pharmaceutical care. AdvancePCS believes that health improvement is a direct result of the "smart use" of healthcare dollars—making sure that clients pay no more than they should for quality healthcare, by getting it right the first time.

Mitch Henry, senior vice president and chief information officer for AdvancePCS, explained, "Our primary focus is getting the right drug to the right patient at the right cost. When we call ourselves a health improvement company, we're talking about making it easier and safer for Americans to receive quality, cost-effective pharmaceutical care."

In addition to prescription drug services, AdvancePCS offers mail-order pharmacy programs and information management. The company runs an online healthcare site: AdvanceRx.com. And its subsidiaries include SpecialtyRx, a specialty drug pharmacy; Accordant, a disease case management company; and Consumer Health Interactive, a Web health-content information company.

2.5 MILLION CLAIMS PER DAY

More than 30 years ago, AdvancePCS pioneered the pharmacy benefit management industry by establishing the first online system for processing pharmacy claims. Almost from the beginning, HP NonStop servers have been at the core of the company's claims processing system. Today, AdvancePCS relies on a 14-processor NonStop S74000 server to process approximately 2.5 million claims per day, with a peak of 70 transactions per second. A 6-processor NonStop S7400 server handles testing, development, and quality assurance; a 4-processor NonStop S7400 server handles backup and disaster recovery.

Throughout the United States and Puerto Rico, 58,000 pharmacies send online claims to the AdvancePCS system. Each claim typically involves a complex list of items for authentication (for example, patient eligibility, drug-to-drug interaction, refill too soon, compliance with client benefit plan) and is processed in less than 2 seconds. This means that from the time the claim enters the NonStop system to the time that messaging is sent back to the pharmacy, no more than a couple

> "We think of the NonStop system as the heart—**the vital organ**—of our company. It's the **communications handler** for everything we do. Without it, we couldn't serve so many clients, members, pharmacies, and doctors so **reliably and quickly**."
>
> *Mitch Henry, senior VP and CIO, AdvancePCS*

HEALTHY RANKINGS

In 2002, *Barron's* ranked AdvancePCS second on its *Barron's* 500, a scorecard that grades how companies and their management teams have performed for investors.

The *Forbes* Platinum 400 list of Best Big Companies in America recently included AdvancePCS for the third straight year.

BusinessWeek included AdvancePCS in its Third Quarter 2002 Corporate Scorecard, a ranking of profits of 900 U.S. companies by sector.

of seconds elapse. (The average performance level for 2002 was 0.656 seconds—far below the 2-second standard.) "We think of the NonStop system as the heart—the vital organ—of our company. It's the communications handler for everything we do. Without it, we couldn't serve so many clients, members, pharmacies, and doctors so reliably and quickly," observed Henry.

DATA INTEGRITY AND DISASTER RECOVERY ARE KEY

Of top importance to AdvancePCS is protecting the integrity and security of the patient and pharmacy information it processes. One in four Americans submit healthcare claims through the AdvancePCS network, and the accuracy and timeliness of data can sometimes mean life or death. According to Henry, "Our service is measured by how well our clients, their members, and their pharmacists are served with accurate information. A big part of the value proposition of the NonStop system is maintaining absolute safety of information, ongoing quality checks, and detailed records of every claim. In many cases, our system might have the only record of all the prescription drugs an individual is taking—as well as the consequences of drug-to-drug interaction."

Henry, a veteran of the pharmaceutical industry, commented that the accuracy of AdvancePCS records is especially important in light of U.S. healthcare today. "In the United States, we have the ultimate in freedom of choice in healthcare, but that also brings ultimate fragmentation."

Henry and his team have accomplished a service level of 99.999 percent system availability. Even with this impressive record, disaster recovery plays an essential role. The company is working with HP to continuously improve its disaster recovery capabilities, which now run on a dedicated 4-processor NonStop S7400 system.

STRONG SUPPORT FROM HP

AdvancePCS has long enjoyed an excellent partnership with HP. As Henry recalled, "We've had a great relationship with HP over the years. The NonStop platform has provided hardware and software continuity. Even through the Tandem and Compaq transitions, we felt assured of continuity, quality, and return on investment."

Richard Gounaris, vice president of Production Environments, Technology Infrastructure, at AdvancePCS, added, "We completed a major upgrade from the NonStop K-series system three years ago without a glitch, and have continued to run this environment without issues. In addition to overall performance, the key advantages of the NonStop platform for us have been continuous availability, outstanding reliability, scalability, and return on investment—complemented by great support. I guess that pretty much says it all." ◆

FOR ADVANCEPCS, NONSTOP SYSTEMS:

- Provide unparalleled availability and scalability to process approximately 2.5 million pharmaceutical claims per day
- Offer outstanding data integrity and disaster recovery capabilities to protect the healthcare records of millions of Americans
- Have delivered a quarter century of proven performance

THE WINNING COMBINATION

Loto-Québec and NonStop servers feed Canada's lottery fever

In May 2002, Canada's "Super 7" jackpot reached an all-time high of Can$34 million. Excitement was at a fever pitch. People were caught up in the delirium of buying tickets and imagining how they would spend their winnings. The 8,266 lottery point-of-sale terminals operated by Loto-Québec—the government-owned corporation that runs the lottery and other gaming activities for the province of Québec—were practically under siege. The atmosphere was electric. Everyone was in a state of high alert.

Everyone, that is, except Sylvain Carrière. Carrière, director of computer systems for Loto-Québec, went home and had a good night's sleep. And the HP NonStop server that was processing the never-before-seen transaction load didn't miss a beat.

"Our typical volume is about 50 transactions per second," said Carrière. "Right before the drawing for the mega-jackpot, the volume jumped to 120 transactions per second, nearly two and one-half times what our NonStop server normally handles. Even so, the system was running at just 40 percent of capacity. For us, it's important that if customers want to buy a ticket, they can get one—and if they have a winning ticket, they can collect their prize. That's the reason we wanted a NonStop system."

THE PRIMARY BUSINESS CHALLENGE

For Loto-Québec, the most important thing is ensuring the continuous availability of its lottery system. "We want to be there 365 days a year, nearly around the clock," said Carrière. "That's what our customers want—to buy tickets where and when they want. We count on our NonStop servers to make sure that happens." Lottery tickets are sold 19 hours a day, but the terminals run 22 hours a day. The three extra hours are used for validating "instant ticket" winners.

In a world where "24 x 7" is a household word, 19-hour system availability sounds discordant. But there's a good reason. "Every night, we need five hours to do a batch processing run," explained Carrière. "It's not a problem with the system, but rather with our lottery application, which is approximately 12 years old. We have to close the application to open new files for the next day."

Loto-Québec uses a 12-processor NonStop S7400 server and HP NonStop

> "We want to be there **365 days a year**, nearly around the clock. That's what our customers want—to buy tickets where and when they want. We count on our NonStop servers to **make sure that happens**."
>
> *Sylvain Carrière, director of computer systems, Loto-Québec*

SQL database software for production, with an identical system located 9 kilometers away for testing, development, and disaster recovery. "Our previous system went down with any disk problem," noted Carrière. "But the NonStop system stays up even if a disk or processor fails. We can fix it during the day and continue to run. That's why we selected NonStop systems in 1990—and have stayed with the platform ever since."

Carrière stresses that the architectures of the development and production servers are identical. "If we have to move to the backup system, we want the same performance," he said. "Also, each time we test a major change to our application, we want to mirror our production environment precisely." A backup disk at the development site is connected to the production system, so the transactions for every ticket sold are written to disk at both sites. If there is a disaster at the production site, Loto-Québec has a copy of all transactions at the remote mirroring facility.

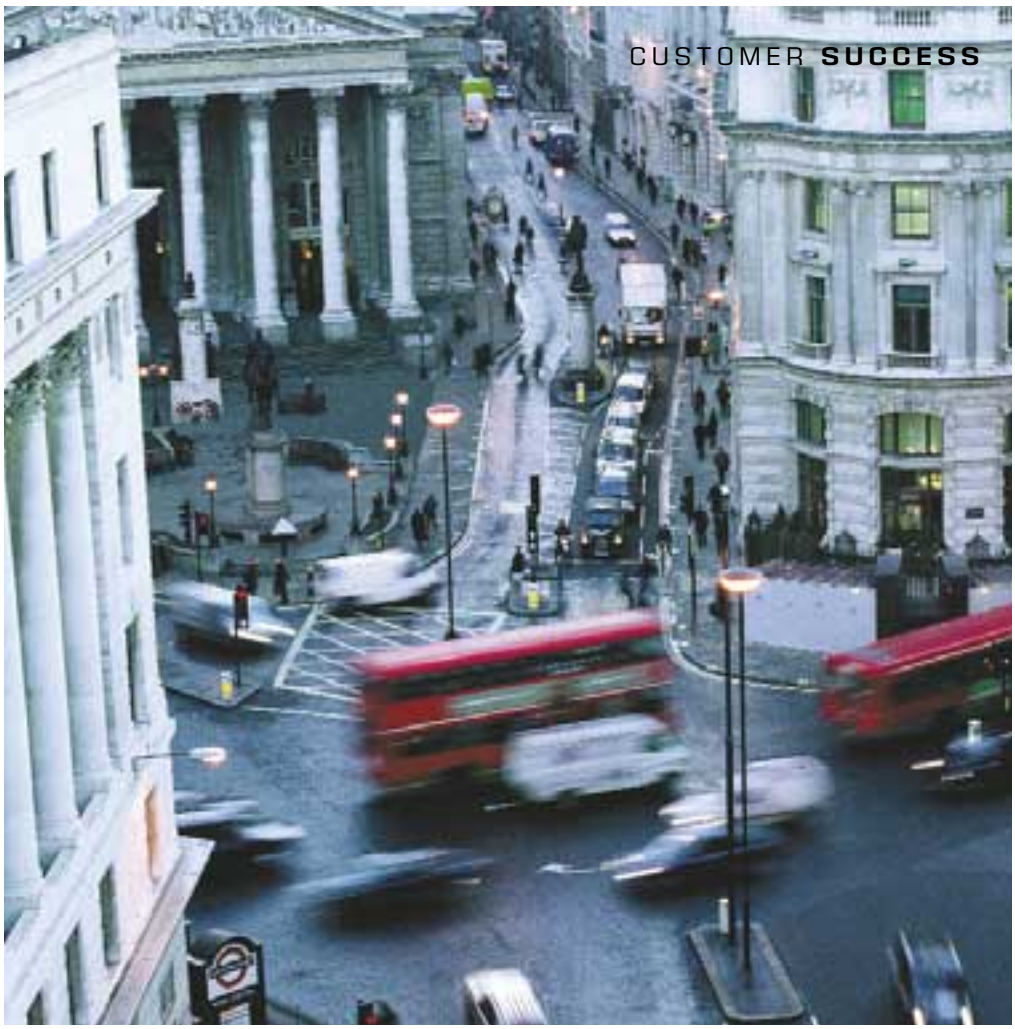
MOVING TO A MODERN, OPEN APPLICATION

In addition to the production and backup systems, Loto-Québec has a six-processor NonStop S7400 server. This system holds the key to greater revenue and profits in the future. It is being used to develop a new lottery system in a project called IRIS, which will make a big difference at Loto-Québec. "It is very expensive to change and support our existing application," noted Carrière. "We want to build a new application, using open standards like J2EE and CORBA. This will enable us to bring new products to market more quickly—in about half the time it takes now—and it will also make it easier to find qualified programmers."

For Carrière, it's very good news that the HP NonStop server has an open architecture and supports these industry-standard programming interfaces. "NonStop servers deliver a unique combination of common standards and uncommon advantages," he concluded. "This makes the NonStop platform very valuable to Loto-Québec." ◆

FOR LOTO-QUÉBEC, NONSTOP SYSTEMS:

- Handle the extreme transaction volumes resulting from mega-jackpots
- Incorporate a remote mirroring facility for disaster protection
- Enable faster time to market and ease of programming through industry-standard interfaces



CRESTCO'S DOUBLE PLAY

U.K. financial settlements leader upgrades from 16 to 32 processors with NonStop ServerNet Cluster architecture

WHEN IT COMES TO FAST AND accurate settlement of financial transactions, London-based CRESTCo is the expert. The company—which settles U.K., Irish, and international securities through its CREST settlement system, and money market instruments via the U.K. Central Money Markets Office—has relied on HP NonStop servers for many years to handle its mission-critical applications. On average, the organization processes 350,000 transactions per day, with a total daily value of US$740 billion.

CRESTCo's settlement services are in ever-increasing demand. Regardless of whether world markets move up or down, the CREST system must settle the transactions—and the trend toward consolidation in the financial services industry means even greater movement on global stock markets. To retain its competitive advantage, CRESTCo must always have sufficient processing capacity to meet sudden rises in transaction volume.

Mike Taylor, chief operating officer at CRESTCo, clarified the company's strategic need to achieve set performance standards. "In addition to our responsibilities to the U.K. economy, CRESTCo has an alliance with the Depository Trust Company, a subsidiary of the Depository Trust & Clearing Corporation in the United States. As American companies trade stocks in U.K. companies, these trades are settled through CRESTCo. It is therefore of paramount importance that CRESTCo is operating with spare capacity in order to cope with any sudden peaks in demand, whether in London or worldwide."

CRESTCo recently adopted HP NonStop ServerNet Cluster technology to enhance its robust, scalable NonStop server environment. This move has enabled the company to double its transaction processing capacity from 16 to 32 CPUs, with an easy upgrade path to accommodate future volume growth and business expansion. The cluster

> "The clustering architecture means that we have **increased performance without adding any complexity** to the management of the application."
>
> *Mike Taylor, COO, CRESTCo*

architecture minimizes the complexity that is inherent in multinode applications and has no negative impact on performance. The application runs as a single-system image. As processing needs rise, the architecture can be easily expanded.

COO Taylor fully supports the adoption of the ServerNet Cluster technology at CRESTCo. "The clustering architecture means that we have increased performance without adding any complexity to the management of the application," he noted. "The management overhead has been kept to an absolute minimum."

A COMPELLING PROOF OF CONCEPT

HP partner Sionet International was engaged to help CRESTCo achieve higher throughput from its existing CREST application with the lowest possible risk. According to John Geater, lead performance consultant at Sionet, the decision to move to clustering was straightforward. "Basically, each element of the cluster is a NonStop system," he explained. "As transactions rise, you can simply plug in new modules, without the need to retest the application on a new hardware platform. Clustering is an excellent approach to avoiding risk and significantly improving scalability."

Working closely with Sionet, HP proved in a comprehensive benchmark that its NonStop ServerNet Cluster technology would scale to meet CRESTCo's rigorous requirements. The six-month project involved a team of 55 from HP and Sionet, plus nine people from CRESTCo. The 128-processor benchmark demonstrated the ability of the NonStop platform and NonStop Remote Database Facility (NonStop RDF) software to support the processing of 1 million transactions per day—75 percent of them in a three-hour window.

The NonStop RDF portion of the solution included both Network RDF and RDF Lockstep. Network RDF, a networked backup copy of CRESTCo's transaction database, ensured that every transaction was backed up in real time to a remote secondary site. RDF Lockstep is an additional facility developed by HP to guarantee that updated transaction data at the primary site is safely stored at the remote backup site before the transaction is completed. This guarantees the integrity of the remote database, even if there is a power failure or system outage at any point in the processing of the transaction.

Hugh Malcolm, a consultant at HP EMEA, oversaw the benchmark. "This project proved conclusively that the NonStop platform can support CRESTCo's needs well into the future," he stated. "The benchmark had to confirm that the combined application and platform could scale dramatically from today's volumes up to 400 percent. I'm very pleased to say that this was successfully achieved."

CRESTCo's benchmark project leader, Andy Atkins, was particularly impressed by the scalability of the NonStop system. "The benchmark proved conclusively that there is no performance degradation using the NonStop ServerNet Cluster architecture, and also that it is linearly scalable," he explained. "Only a fraction of the capacity of the cluster switches was used during the benchmark, even when the nodes were working at over 90 percent utilization."

Martin Hills, chief information officer at CRESTCo, summarized the benefits of the company's enhanced NonStop system environment: "The performance from NonStop systems has always been outstanding, even more so since we have moved to the NonStop ServerNet Cluster architecture. We have doubled our transaction processing capacity in a robust, resilient environment in order to support millions of high-value transactions. The only technology I would trust for our current and future business needs is the HP NonStop server." ◆

FOR CRESTCO, NONSTOP SYSTEMS:

- Handle 350,000 transactions a day, with a total value of US$740 billion
- Incorporate NonStop ServerNet Cluster technology to double capacity and accommodate future growth
- Ensure data is safely stored using remote duplicate database software

AND THE WINNERS ARE ...

Thanks to everyone who completed and returned the reader feedback card from our previous issue. Your input is invaluable in helping us shape the content of HP's *24x7* magazine to serve your needs and interests. And congratulations to the two lucky winners of our drawing—each will receive an **HP iPAQ Pocket PC,** for anytime, anywhere access to personal information and entertainment:

- Neil Barnes, Lloyds TSB, UK
- Pamela Masola, The Cleveland Clinic Foundation, USA

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- ITUG, a user group for the NonStop system community:
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