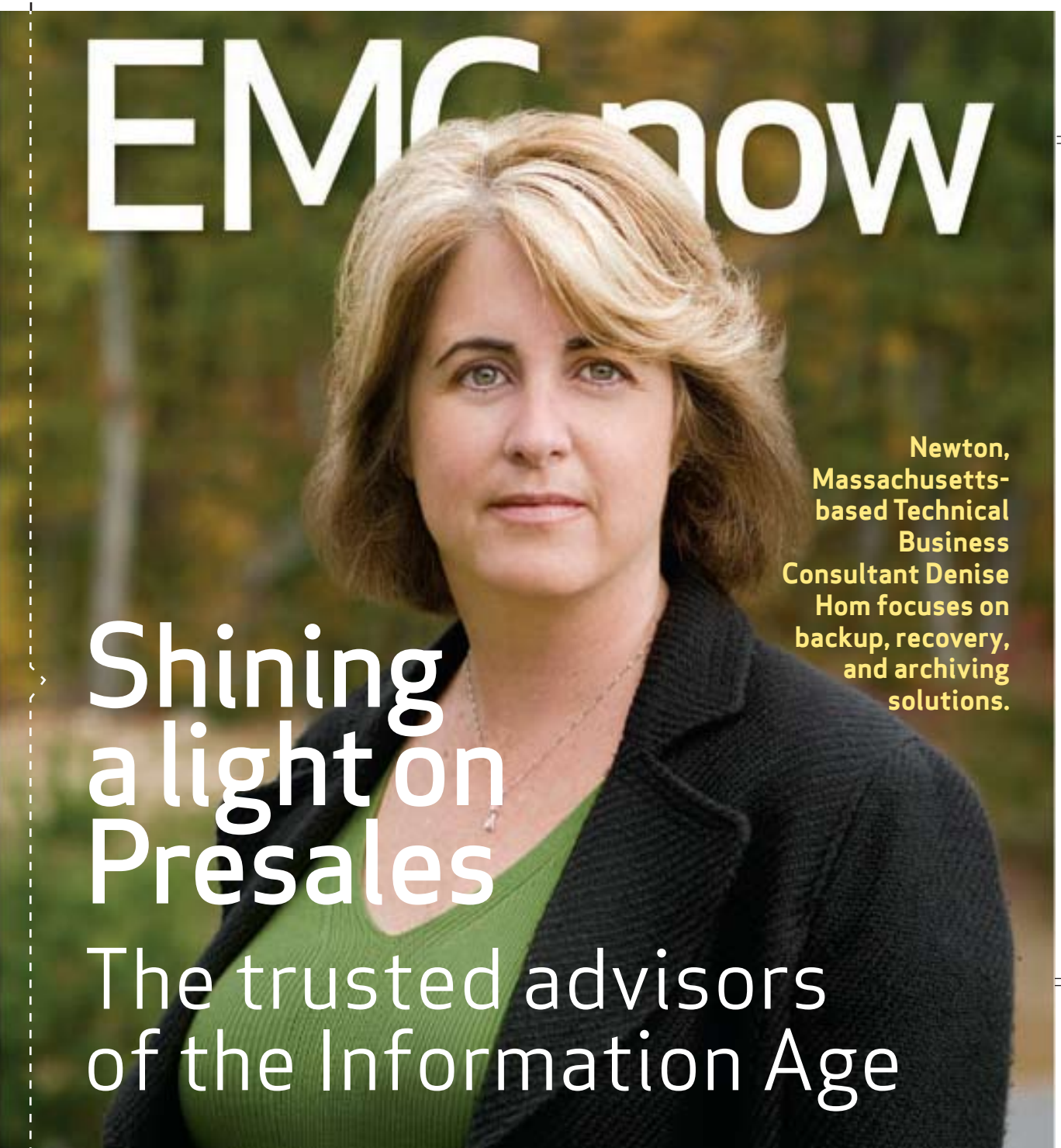
BACKUP WINDOW: Remembering how a RAID machine got its soul

EMC now



Newton, Massachusetts-based Technical Business Consultant Denise Hom focuses on backup, recovery, and archiving solutions.

Shining a light on Presales

The trusted advisors of the Information Age

Q1 2009
A QUARTERLY MAGAZINE FOR THE EMC COMMUNITY WORLDWIDE

ALSO INSIDE:

What's better than plugging data leaks? Preventing them. How EMC fights this battle for its customers and itself

Software connects with audiences on a personal level

EMC²
where information lives®

editor's desk It's okay to stay amazing

THEY'RE IN OUR faces every day: all those reminders that the economic challenges now imbuing our professional and personal lives are reaching the code-red level.

However, it makes sense to keep thinking expansively about opportunities. People and organizations are still generating digital information. Customers' IT budgets have shrunk, but they're still buying high-priority, quick-ROI technologies such as the ones we offer. Forrester Research predicts feeble 1.6% growth in 2009 IT spending, but that growth would be better than the 15-20% spending declines we endured in 2001 and 2002.

But I feel pragmatically optimistic mainly because I see that around this company, we haven't stopped doing amazing things.

Take data protection, for instance. IT security holes come in many shapes and sizes—all scary, all expensive. Companies spend $202 per consumer record compromised, according to the Ponemon Institute, and that adds up to big losses when you consider that 33,000 consumer records are exposed per breach, on average.

In this issue of *EMC.now*, we examine data leakage, a major focus area for data protection. You'll learn how our solutions not only help our customers, but also keep our own corporate financial data and employee information safe.

These pages also continue to recount the opening of new markets for EMC. The Nigeria office opened last July. The Kenya office opened in November. We've done business in Africa for years but are accelerating activity across this continental patchwork of emerging economies and developed markets. These newer sales represent just a few drops in the EMC revenue bucket, but still, they increased as much as 900% last year. Nice.

And please don't miss our Backup Window: the tale of an unassuming little team at a Data General satellite lab that invented what would ultimately become the brain of CLARiiON.

These guys worked in an *extremely* financially stressful environment, aware that their project could be shut down and their jobs could evaporate at any moment. That awareness didn't keep them from accomplishing something so extraordinary, so high-impact, that we are still enjoying its ramifications today.

In that team's refusal to bow down to economic ugliness 20 years ago, I see a lesson for us: Don't stop being amazing, no matter what.

Moya Keane

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features

also inside

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COVER PHOTOGRAPH OF DENISE HOM BY DANA LANE

from the tell emc files

THE PAST QUARTER'S feedback touched on topics including eLearning, EMC's retail product strategy, and diversity.

MELINDA BECK

Have something to say? If you're inside the EMC firewall, go to: www.channelemc.isus.emc.com/channelemc/Tellemc/toc.asp.

J.O. TELLS EMC: EMC should take its basic business and personal storage product lines to the retail market under EMC's name at retail chains such as Best Buy, Staples, OfficeMax, and Apple Store. Imagine a consumer or small business owner going into Staples and seeing an "EMC" sign overhead and displays of Iomega hard drives, boxes of VMware software, RSA key fobs, and CLARiiON storage systems. Trained personnel would be ready to answer questions. It could be another way to promote our brand.

JAY KRONE, SR. DIRECTOR OF STORAGE PLATFORMS MARKETING, REPLIES: We are pursuing several of these ideas; however, cost and customer behavior dictate how EMC and

its subsidiaries can and should approach the market.

EMC offers the Symmetrix and CLARiiON brands for large enterprises and medium businesses, and it has chosen to take the Iomega brand to consumers and small businesses.

This customer-centric branding approach has been shown to work in all industries. For example, you wouldn't find a high-performance BMW M5 automobile for sale at a Mini dealership, although those two car models are both manufactured by the same company. And DeWalt power tools and accessories are positioned specifically for professional builders, although they're made by the same company that markets and sells Black & Decker tools to home users.

Similar to Cisco's approach with its Linksys home-networking products, we are using the "Iomega, an EMC company" logo on consumer products and placing both the traditional "EMC² where information lives" logo and the Iomega logo on business products.

Retrospect software has been on major retailers' shelves for years. Iomega products are in stores in the U.S. and in many European chains.

Retrospect backup software has been on major retailers' shelves for years. Iomega products are already in stores including Best Buy, RadioShack, Apple Store, and Fry's in the U.S. and in even more chains in Europe. We are moving into Staples on the U.S. East Coast with New England Patriots-branded Iomega eGo portable hard drives. Iomega hopes to pilot a concept similar to what you suggest in a Staples store, with an area devoted to Iomega products staffed by Iomega experts or specially trained Staples employees.

You probably won't see too many other EMC products in local stores. The smallest CLARiiON system starts at $8,000. A VMware ESX license can run in the thousands. An RSA fob is inexpensive, but the price of its underlying user-authentication infrastructure

represents more than an impulse purchase for a small business owner buying office supplies.

D.G. TELLS EMC: We can save money by providing more training courses at EMC offices. If my job requires a course not available locally, I must book a car and hotel—too expensive in these economic times.

TOM CLANCY, VP OF EDUCATION SERVICES, REPLIES: EMC Education Services, which manages sales, technical, partner, and customer education, has been making significant eLearning investments. You may use eLearning or video instructor-led training* to pursue Associate- and Specialist-level EMC Proven tracks and many technical training paths. And the Education Services Virtual Lab lets our field and partners access virtual training on particular products. Our eLearning to instructor-led training ratio is about 55/45, indicating a lot of eLearning is being consumed.

We've converted many field conference rooms into classrooms and mixed EMC field people, partners, and customers in class—adhering to EMC's "closer to the customer" approach.

We continue to make more simulations, labs, and collaborations available through eLearning. Let me know what other classes you think we should offer.

W.P. TELLS EMC: We should update the employee directory to include correct pronunciations of employees' names/nicknames. I have no issue with mispronunciations of my name, but some employees are uncomfortable correcting those who make a mistake. This could be another way to make our diverse staff more comfortable.

ED GOLITKO, SR. DIRECTOR OF HR, REPLIES: This is a good suggestion that seems like an easy fix, but it will require some programming. We will place it on our list of planned enhancements to our HR system.

EMC Education Services, which manages sales, technical, partner, and customer education, has been making significant eLearning investments.

*A CD library of 50 multi-day courses available to anyone at EMC.

SUPPORTING THE TROOPS: EMC was honored with the Above and Beyond Award by the Massachusetts Employer Support of the Guard and Reserve (ESGR), a U.S. Department of Defense organization, for exceeding federal requirements to support employees called to active military duty. Attending the November ceremony in Hopkinton were (back, l. to r.): Scott Sanfason, Director of Operations for EMC University and Major, Army National Guard; Brian Massey, EMC Solutions Developer and Master Sergeant, Air National Guard; Dave St. Germain, ESGR; and Chris Yarger, EMC Solutions Validation Specialist and Warrant Officer, Army National Guard. (Front, l. to r.): John Pelrose, ESGR; Jack Mollen, EVP of HR; and Roger Fortin, ESGR.

Record quarter and year

Despite the tough economy, in January EMC reported all-time record fourth-quarter revenue of **$4.02 billion, up 5% year over year.** GAAP net income for Q408 was $288 million or $0.14 per diluted share, including a $0.10 restructuring charge. **Full-year 2008 total consolidated revenue was a record $14.88 billion, up 12% year over year**—EMC's sixth consecutive year of double-digit annual revenue growth. GAAP net income for 2008 was $1.35 billion or $0.64 per diluted share.

Joe Tucci said, "We've entered 2009 with a robust and diversified business model, which we intend to leverage to extend our technology lead and gain market share."

KUDOS EMC's Global Security Organization earned **ISO 27001 SECURITY CERTIFICATION** in the U.K., Ireland, and Japan. The certification formally validates the GSO's proficiency in operational security and in integrating security into EMC's information infrastructure business and go-to-market strategies.

In November, EMC landed spot #71 on *The Boston Globe* **100 TOP PLACES TO WORK '08** list, which recognized the most progressive companies in Massachusetts based on employee opinions about company leadership, training, diversity/inclusion, career development, compensation, flexibility, values, and ethics.

The ***China Business Journal*** and Mercer Consulting chose EMC China as one of the **BEST 50 PLACES TO WORK** based on surveys of employees hired within the past 2-3 years at EMC China's Center of Excellence. Selection criteria included leadership opportunities, career development, teamwork, work environment, and compensation and benefits.

Express Scripts Inc., one of North America's largest pharmacy benefits management companies, recognized EMC with its **2008 IT SUPPLIER OF THE YEAR AWARD** for continuous improvement in supplier relationship management, quality, service, innovation, and cost reduction.

The "BKube" team topped 95 global submissions to capture EMC's **2008 TCE EXCELLENCE CORPORATE AWARD**. The BKube is a reusable 200-drive packaging container that eliminates the need for customer engineers to unpack, break down, and dispose of hundreds of cardboard boxes at customer sites.

AN ECONOMICAL BOOST TO SUSTAINABILITY AND TCE The creators of the BKube were recognized at the Employee Quarterly Review Meeting in Southboro, Massachusetts.

CONFERENCES

In November in Prague, Czech Republic, EMC hosted nearly 1,500 attendees at **MOMENTUM EUROPE 2008**. It was the largest-ever gathering outside of the Americas of customers, partners, and industry experts who are involved in enterprise content management and archiving.

EMC had a strong presence at **STORAGE NETWORKING WORLD** in Dallas, Texas. It unveiled the EMC Connectrix NEX-5020—the first Fibre Channel over Ethernet switch—and announced its support for the Storage Networking Industry Association's Storage Management Initiative Specification version 1.3 across current and prior models of EMC Symmetrix and CLARiiON systems.

December's **RADIOLOGICAL SOCIETY OF NORTH AMERICA** conference in Chicago attracted 40,000 healthcare community professionals from around the world. There, EMC demonstrated EMC Open Systems Archive Solution for Healthcare Organizations, EMC and RSA Information Risk Management for Protected Health Information, and Centera, CLARiiON, and Celerra systems.

NEW PRODUCTS

New versions of EMC **DATA PROTECTION ADVISOR** (formerly EMC Backup Advisor), **NETWORKER**, **AVAMAR**, and **RECOVERPOINT** software are helping customers to meet new backup requirements, control explosive data growth, and simplify management of their expanding IT environments.

The EMC **ATMOS** multi-petabyte offering is the first that can centrally manage and distribute unstructured rich content across global cloud storage environments. It lets Web 2.0 and Internet providers and telcos build and deliver cloud-based information-centric services and applications securely on a huge scale.

The Iomega **STORCENTER IX2** network storage appliance for small businesses and home users connects to multiple devices, supports up to two terabytes of data, and includes information management, protection, and sharing software.

EMC unveiled EMC **SERVER CONFIGURATION MANAGER** and EMC **CONFIGURATION ANALYTICS MANAGER** software to help customers automate configuration and compliance management across physical and virtual information infrastructures.

OTHER NEWS

EMC joined hundreds of organizations and the U.S. Environmental Protection Agency (EPA) in the EPA **SMARTWAY TRANSPORT PARTNERSHIP**, which aims to make product-transportation operations cleaner and more efficient. By 2012, the partners expect to be able to eliminate between 33 and 66 million metric tons of CO2 emissions and up to 200,000 tons of nitrogen oxide emissions per year.

INNOVATION

EMC's second annual Innovation Conference drew 300 physical and 1,000 virtual employee attendees from around the globe. Its Innovation Showcase featured 30 ideas chosen from 984 submissions from 19 countries, reflecting, as SVP and CTO Jeff Nick says, "the power of tapping into EMC's vast human intellectual capital."

New EMC Fellow Bob Solomon (seated, center) with executives and eight of the 11 EMC Distinguished Engineers inducted in October.

(Back, l. to r.): Howard Elias, Bill Teuber, Roy E. Clark, Sorin Faibish, Craig Randall, Jim Dowson, Amnon Naamad, Joe Tucci, Steve Todd, and Jeff Nick. (Seated, l. to r.): Philip Love, Bob, and Peter Madany. Not pictured: Francesco Gennari, Doug LeCrone, and Magnus Nyström.

THE WORLD'S PRE-EMINENT STORAGE PARTNERSHIP DEEPENS

On December 9, Dell Chairman Michael Dell (l.) and Joe Tucci announced the extension of the Dell|EMC global alliance through 2013. Dell also has begun selling under its own brand its first non-CLARiiON product—the EMC Celerra NX4 entry-level device.

An organization works to aid EMC's prized technology consultant heroes

Shining the light on Presales

DANA LANE

DENISE HOM: "I love being in front of a customer. And I love being able to help craft a campaign and help our Technology Solutions organization fine-tune which products and services to propose—then deliver the products and services that directly help that customer eliminate frustrating IT obstacles."

Shining the light on Presales

They are a force behind every major deal that EMC Sales closes directly. They are a vital link between Sales, Services, and Engineering. And now more than ever, the spotlight is on them.

Last July, Dennis Hoffman accepted a role new to EMC: leader of Global Presales, Education Services, and Productivity. Now he's giving EMC's technology consultants—also known as TCs, the people who help sales reps "engineer" a sale—an executive voice of their own.

Dennis, with senior leaders Howard Elias and Bill Teuber, also are giving the TCs tools, training, and a better-defined career path for a job that's getting more complicated by the day.

WINNING BEHIND A CURTAIN

Known over the years as "systems engineer," "sales engineer," and other titles, a TC works alongside a sales rep or channel partner before a sale closes (hence the term "presales") to help a customer understand how and why products being proposed will best meet that customer's requirements.

TCs traditionally work in the field and are devoted to specific accounts, territories, technologies, or partners. EMC's almost 3,000 TCs handle the technical discussions, as sales reps concentrate on learning the customer's business requirements, providing wide-ranging customer care, uncovering new opportunities, and articulating the ONE EMC story.

"Basically, TCs make customers want to buy our stuff," says Patrick Dennis, former longtime TC and now Director of

Shining the light on Presales

Presales for the Americas.

It can be a behind-the-curtain kind of job, however. And, at high-tech companies in general, TCs' contributions are sometimes taken for granted. EMC's Global Presales organization is making sure it doesn't happen here.

At EMC, Global Presales is part of the Global Services organization, but its funding comes from Customer Operations. Dennis's new job stemmed from collaboration between those organizations. Vice Chairman Bill Teuber, who heads Customer Ops, and Howard Elias, EVP and President of EMC's Global Services and Resource Management Software groups, came up with the idea.

"I went to Howard asking for his help to better understand our Presales model and the associated costs that affect a selling cycle," Bill recalls. "I learned that Howard already was focusing on the TC community. So we began working together to examine the best path forward for Presales."

Howard says, "A technology consultant's job is incredibly important. Our TCs must first help our customers make the right technology choices to solve their business problems and get the most value possible

CHUCK VEIT

EMC'S ULTIMATE COMPETITIVE ADVANTAGE

In October, for the second time in two years, TCs were the focus of a three-day conference. The Florida event, themed "One Team, One Dream," brought the dispersed group together as a community—something that until last year hadn't been done for years. In between workshops, attendees received praise from a lineup of execs for their vital role. Dennis Hoffman says, "We know they're crucial to this company. We know they have a tough job. We have to do everything we can to make it easier for them."

out of their EMC investment. Then our TCs must ensure an integrated solution is properly architected and can be implemented and supported. With one foot in Sales and the other in Global Services, our TCs are the trusted advisor to our customers."

Ed Berndt, Global Services VP, Americas, welcomes the senior execs' attention. "Theater-level VPs like me aren't always able to focus exclusively on TC needs," he says, "because we're managing the entire, united efforts of Presales and a growing Professional Services staff."

Adrian Iannessa, Senior Manager of Presales, EMC Australia/New Zealand, also applauds the interest, saying "it shows that this company values its TCs and is committed to investing in this function."

The executives' focus is helping to give TCs the resources they need, such as more sales tools, automated systems, and advanced training. It's all part of the effort to make sure TCs are recognized as a distinct and vitally important community.

JUGGLING SO MANY DEMANDS

A TC's role is substantially more complex these days. As EMC invents and acquires products extending across the entire spectrum of a 21st-century information infrastructure, TCs must become conversant with them all, including how they interact.

Ed says, "When I joined EMC nine years ago, we had two products to master completely: Symmetrix and Connectrix. Then, a few months into my tenure, we had a third, CLARiiON."

Back then, TCs would validate for a customer the speeds and feeds of the hardware products, and they made it their mission to accrue enough deep technical knowledge about system capabilities to make compelling presentations during even the most intense competitive situations.

Fast-forward to 2008. Ed says, "We're in a really different place. EMC offers hundreds of technologies stretching beyond classic storage. Today's TCs aren't just storage pros; they're trusted technology advisors guiding customers on all of their information management needs."

Even just six years ago, for instance, TCs didn't have to explain how products function in virtualized environments. "Now," Dennis says, "they can't have a conversation with a customer in which they are not asked that question."

The role's dramatic expansion is one reason TCs are now

Shining the light on Presales

known as technology consultants, not systems engineers.

As EMC extends its market reach into midsize- and small-business segments, more demands are being placed on the TCs who assist channel partners. If that weren't enough, EMC's full-scale solutions are more relevant to customer CIOs than hardware alone ever was. TCs must elevate the sophistication of their presentations accordingly.

"They're being stretched sideways with more products to learn and stretched up and down with more market tiers to support," Dennis confirms.

Personifying this phenomenon is Technical Business Consultant Denise Hom, who focuses on backup, recovery, and archiving solutions. During her four years in Presales, she has felt the change. "EMC is, of course, the 800-pound gorilla,

DENNIS HOFFMAN:
"We want our TCs spending time with customers. Anything we can do to reduce their time on a laptop is a win."

and everyone wants to knock us out," she says. "So we're pretty busy juggling our day-to-day workload, coordinating when to engage various other EMC specialist groups, evaluating the interconnections of the solution sets we are proposing, scoping-out post-sale service opportunities ... all while acting as the advisor to, and the voice for, our customer."

NEW BREED

A TC in the field can no longer be a deep-dive expert on all EMC products. But the new breed, together, can be. Thus, the TC community has split into collaborative categories.

Account TCs work alongside reps or in sales teams to un-

derstand a specific customer's needs. They have extensive technology, selling, and consultative skills and often focus on the higher end of the portfolio. Specialist TCs or, in EMEA, SMEs (subject matter experts) concentrate on specific technologies. Technical depth is their mission. Hybrid (or geo) TCs are highly skilled in specific areas (BURA, DR, ECM, etc.) but know the whole portfolio. Most Commercial Division TCs fit this category, as do TCs in regions with geographical or resource constraints, according to Jason Webber, Director of Technology Solutions, Commercial Division.

Partner Solution Leads (PSLs) and Partner TCs (PTCs) help channel partners stay current with EMC's full portfolio, especially the midrange products. PSLs and PTCs coach partners' SEs, making sales calls with them and working with them in the classroom. Commercial TCs dedicate at least 20% of their schedules, Jason says, to assisting PTCs and PSLs in helping partner SEs attain the skills and abilities of a Commercial (hybrid/geo) TC.

Jason adds he "would like to see improvements made to the tools that PTCs and TCs use in order to drive more productivity. Certain processes and procedures need to be fine-tuned or, in some cases, eliminated."

GETTING THE JOB DONE

Different regions and divisions have adopted special ways to cope with the growing demands on Global Presales. Ed Berndt's Americas theater, for example, created virtual teams to leverage peoples' specialties. So, when a customer is considering a backup and recovery upgrade, the account-centric TC recruits the BURA-centric TC to position those technologies.

In EMEA, Presales created a three-layer model—from TCs who handle more routine tasks at one end, to those very technically trained at the other—putting the right specialists in the right places.

In the APJ region, says Hong Kong-based Presales and Solutions Director Peter Beer, TCs have become very self-reliant. Working in time zones opposite those of the U.S. and coping with considerable language barriers, TCs there voraciously consume technology information and documentation. And, like other regions, they are "trying to reduce limited-added-value tasks to free-up more time to spend with customers and partners," Peter says. "There is also a big push in APJ to bring all Presales staff to at least the 'EMC Proven

Specialist' level and to get them aligned to a focused set of practice areas."

Presales is getting the job done. But the different approaches in use across the worldwide TC community sometimes make it difficult to exploit in-house resources consistently. Ed says, "We've adopted efficiencies but haven't yet shared enough best practices."

Where once every geographic theater fought its own fight, now initiatives are gaining speed to solidify the unified Global Presales strategy. The key is good communication, starting with conferences *(see photo, p. 13)* and continuing on a regular basis.

"We all need to be on the same page in regard to what 'good' looks like," Dennis says.

The effort involves ensuring that TCs feel appreciated and realize that change is imminent. "I want them to feel supported, well-trained, and productive," Dennis says. "Their expanding needs have been well studied. And we are taking action."

The effort also involves creating an overall Presales model—a 360-degree view of current practices and gaps in needs.

THREE-PRONGED CHALLENGE

Dennis is pursuing three big Presales goals in the coming months: improving productivity, enhancing capabilities, and optimizing coverage. He's set up an advisory board and is holding roundtable discussions with TCs around the world.

Dennis also is analyzing various coverage practices to create a consistent model that will maintain the technical excellence for which EMC is known.

The model needs to recognize that "one size doesn't fit all" across geographic regions. In EMEA, as Presales Director Markus Pleier reports, Presales is dealing not only with an expanding product portfolio, but also with emerging markets and cultural differences. "A sale unfolding in the Middle East or Russia is quite different than one unfolding in the U.K. or Germany," he says.

In South Asia, Technology Consultant Manager Annamalai Chockalingam is now expanding coverage with the ramp-up of a commercial TC division after very successfully focusing on enterprise customers.

TC capability is also a complex issue. TCs already spend about 40 hours each quarter training. The biggest challenge involves helping these busy TCs find time for all the training they must take to keep pace with evolving technology and the accelerating nature of the

Information Age itself. "The business is speeding up," Patrick says. "Any one thing we did before over three months, we are now doing it 12 times."

RETOOLING PRESALES

All the regional leaders agree that creating better, more integrated tools is essential to maximizing a TC's productivity.

TCs must master an array of internal EMC systems. They use sales quoting tools including Direct Express and Channel Express, as well as the Powerlink extranet, to configure solutions, make quotations, track customer information, order products, and more.

Presales is working with EMC IT to consolidate the tools and ensure that the processes TCs must follow are efficient. "We want our TCs spending time with customers," Dennis says. "Anything we can do to reduce their time on a laptop is a win. What's more, we'll make it easier for these employees to maintain work/life balance." The Presales organization also has enhanced efforts to define career-growth opportunities for TCs and review compensation processes.

People are encouraged. Markus received good feedback about the October conference from the 600 TCs he oversees in EMEA, and he praises the launch of the Presales Advisory Board, saying, "Dennis is spearheading an excellent level of communication and is one of the most creative executives I've seen."

Patrick, also, says communication is improving and that Dennis is "doing the right things" to understand Presales priorities.

From APJ, Annamalai says Dennis has "brought about renewed motivation and confidence in the Presales team here in South Asia," while Peter Beer joins in praising the effort to give Presales a global vision and direction.

Ed believes the makeover is helping EMC to keep its edge. "Technology consultants truly are the hub of the wheel that makes a whole sales process work," he says. "They are the unsung heroes. They want to feel appreciated. And they *should* be appreciated." ◇

"With one foot in Sales and the other in Global Services, TCs are the trusted advisors to customers."
—EVP HOWARD ELIAS

EMC OFFERS a holistic approach to ...

Stopping data leaks

Sensitive information including credit card numbers for 84,000 alumni of a major U.S. college is compromised when a thief grabs a laptop from a software vendor's car.

Tens of millions of credit card numbers are stolen and sold abroad after cyber thieves hack into the wireless network of a major retailer.

Stopping data leaks

A financial institution loses the information of more than 12 million customers when a backup tape disappears from a truck traveling to an archiving facility.

Data leakage, a major epidemic in today's information-driven economy, costs companies millions of dollars in remediation costs, lawsuits, and reputation damage.

It's a good thing that EMC is around. Consider, for instance, that financial institution. With help from EMC Consulting experts, it's working to prevent further loss of sensitive data. One of its new solutions is EMC Avamar disk-to-disk backup, which eliminates the risks of losing data-filled tapes being trucked from branch offices.

The customer also is using the EMC RSA Encryption and Key Management Suite to encrypt sensitive data and EMC Data Protection Advisor for real-time monitoring of its data-protection environment. The work is ongoing with the help of an account team *(see photo, right)* headed by Michael Wing, EMC District Sales Manager, New York and New Jersey.

Actually, the team, with oversight from Global Account Manager Peter Trizzino, had been talking with the financial institution about EMC Avamar backup solutions even before the tape was lost. But it was that multimillion-dollar mishap that caused the customer to view EMC "as the only company out there that can really bring a holistic approach to reducing data security risk," says Michael. "The costs they incurred in informing their account holders about the incident, providing credit monitoring, and handling the lawsuits have been massive. But the reputation damage was

FRONT (L. TO R.): Chad Sumner, Account Technology Consultant; Moira Sullivan, Account Manager; Brigid Thompson, Account Manager.
BACK (L. TO R.): Peter Trizzino, Global Account Manager; Michael Wing, District Sales Manager; Mike Ryan, Client Solutions Director. Not shown, Larry Lucerne.

more costly."

Peter says, "We've supported this customer for years, but this is our highest-profile win ever. Four months into the implementation, we're receiving high marks—especially from the board of directors. The 'One EMC' message really hit home as we solved a very complex, expensive business problem that they'd assumed was beyond the realm of our typical storage solutions."

A CHANGING DATA SECURITY WORLD

Fear of winding up on the front page of *The Wall Street Journal* and facing unforeseen expenses are just two factors driving organizations to plug data leaks.

The real challenge is the information explosion itself. Organizations are generating and storing more information than ever, sometimes without a comprehensive way to track, control, and secure it. They are sharing more data with partners, vendors, colleagues, and clients, too. More opportunity exists for sensitive information to fall into the wrong hands.

If it does, sophisticated markets exist for cyber criminals to sell such data. "The risks have changed," says Andrew Cohen, VP of Compliance and EMC Assistant General Counsel. "Teenage hackers in basements evolved into criminal cartels operating globally."

The increased risks have spurred regulations. Todd Graham, Sr. Technologist, RSA Office of the CTO, reports that in the U.S., regulatory pressure really began to mount in 2002 when California passed Senate Bill 1386. That law required organizations storing Californians' confidential information to immediately notify those individuals of a breach. Violators became susceptible not just to embarrassment and fines, but also to lawsuits filed by data-leak victims.

Most U.S. states and many European countries followed suit with similar laws. The credit card industry joined the fray in 2004 with its Payment Card Industry Data Security Standards, mandating proper practices by organizations handling credit card information.

Organizations have tried hard to adhere to the

New frontiers

In December, the RSA division forged a deal with Microsoft to bundle RSA's DLP software with Microsoft's security offerings. Under the agreement, Microsoft will build the RSA DLP classification technology into the Microsoft platform and its related information protection products.

regs. But in the past 12-18 months, Todd has noticed something more. He says businesses looking to protect company data—intellectual property, trade secrets, and financials—from being leaked "have found that the consumer-protection-related data-leakage regulations work well and can be applied to other business needs."

INFO-CENTRIC APPROACH

Helping customers secure data is a small but fast-growing segment of EMC's consulting business, according to Thomas Roloff, SVP, EMC Consulting. Traditionally, he says, customers were focused on backup/recovery and business continuity. "Any discussion of data leakage used to be a reactive conversation. They are starting to ask us for proactive strategies now."

Tommy Ward, Sr. Manager of EMC Consulting's Security Subcompetency, leads a team assisting customers in assessing and planning information security strategies that include data-loss prevention (DLP). He sees some customers still in reaction mode, using isolated, IT-owned programs not tied to business needs. Others have taken it a step further, setting up a risk management process to meet regulations and viewing DLP as part of the cost of compliance.

DLP can be a force for business innovation, better customer service, and greater efficiency. Tommy's group helps customers create a holistic strategy that does more than just prevent leaks; it also brings competitive advantage and supports collaboration.

"Some companies get good ideas and business leads from their external partners, so these customers tend to view their security deployments as significant business enablers," Andrew says.

Although security is still lacking in many SAN environments, scattered data represents the No. 1 challenge to preventing data leaks. Sensitive data is "now everywhere," Tommy says. And practices for handling it tend to vary; each customer business unit may follow its own process. "Organizations don't even know where all their information is—in the SAN, on desktops, USB drives, tapes, or SharePoint," he says.

Still, most are realizing that securing data just by building a firewall around it is ineffectual. EMC Consulting helps companies locate their data, review their IT systems and processes, pinpoint vulnerabilities, set security priorities, and devise strategies to protect sensitive information.

Frequently, these EMC employees are recommending changes, after, for example, witnessing customer employees engaging in unsafe practices just to get their jobs done. "People will e-mail

documents to their homes, not to steal them but because they need to work on the documents during the weekend and have no way to get secure network access," Todd says.

EMC's consultants will also recommend technologies including disk-to-disk backup to replace tape, data encryption, and authentication and information rights management.

LEAK-STEMMING TOOLS

There's no "one mistake" that companies make. "It's all over the board, but typically, what we observe is a lack of an overall strategy from the very top," Tommy says.

His team spends a lot of time helping customers start intelligently tailoring protection levels to actual data content. Organizations need to realize that the old model of labeling information "confidential" or "non-confidential" is no longer sufficient. Some private information becomes public after an approval process. Other material is confidential just for a specific client. "We introduce the concept of data stewardship," Tommy says.

The toughest part of creating a data-leak prevention strategy, Todd says, is getting concurrence on how data should be prioritized for protection. Often, the data that the customer's IT team thinks is most important to protect isn't what its business divisions would single out.

But before concurrence can happen, companies need an overview of their data. EMC's RSA division offers multiple solutions to help customers find, manage, protect, and monitor sensitive information.

EMC's RSA DLP Suite provides a comprehensive solution, says Katie CurtinMestre, Director of Product Marketing at RSA. Suite component RSA DLP Datacenter first helps customers locate information in databases, filesystems, e-mail systems, and SAN/NAS environments.

"Customers sense that their sensitive data is all over the place," Katie says. "But they're often surprised to find it's much worse than they thought."

One thing distinguishing Datacenter is its high level of accuracy in identifying sensitive data. It even provides drop-down templates with guide-

Some customers learn that the problem is much worse than they thought.

lines on defining data and its value. That feature saves organizations lots of time and effort, Andrew says, "because determining what constitutes a 'trade secret,' for instance, can be an arduous task."

After a customer has a data inventory and security priorities in place, it can turn again to EMC to prevent leaks.

The RSA Encryption and Key Management Suite lets customers encrypt sensitive data, then secure the accompanying encryption keys throughout the data's lifecycle. RSA Access Manager software manages large numbers of users through a centralized security policy that protects an enterprise's resources while enabling legitimate users to access them easily. RSA DLP Network lets customers monitor and control sensitive data that is leaving their network. RSA DLP Endpoint helps them discover, monitor, and control data on endpoints such as laptops and desktops.

And of course, EMC's disk backup and recovery technologies help customers bid farewell to risky tape environments.

As part of its information-centric approach, EMC builds security capabilities right into its infrastructure management and storage products, "so the customer can follow data wherever it goes at all times," Todd says. ◇

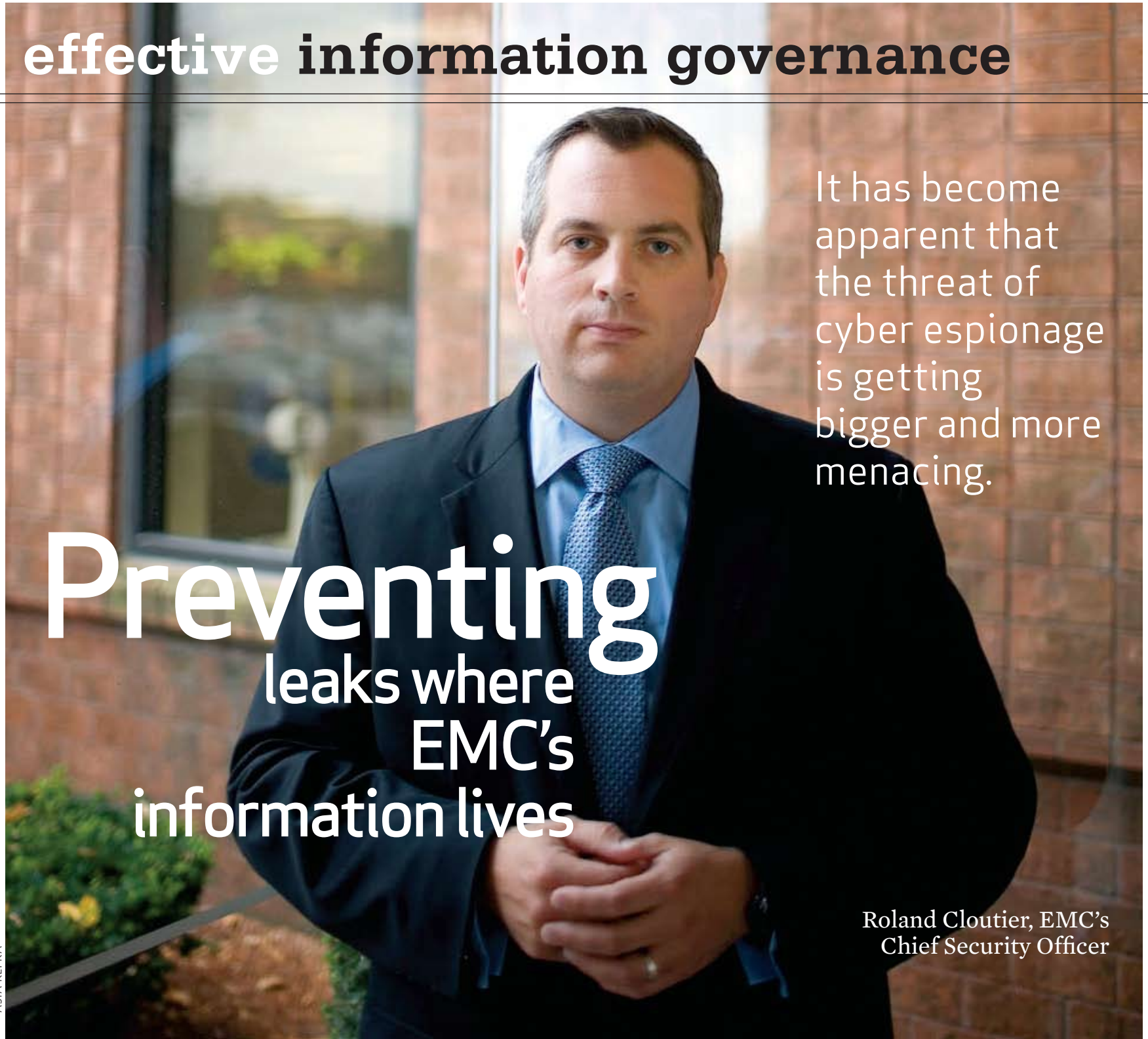
Servers need protecting, too

"We must protect account-holder data." Not surprisingly, that was the big concern of the bank that had experienced the disappearance of a tape containing information about 12 million customers.

But the firm also had been copying complete images of its corporate servers to tape, and it was storing those backups offsite. Losing a server image isn't as catastrophic as losing 12 million bank-account numbers. But it's still an IT security setback.

So, EMC's Michael Wing suggested an alternative idea: Improve server protection with a better approach to bare-metal server recovery.

Now the bank uses EMC HomeBase software, which works seamlessly with EMC Avamar backup. The HomeBase bare-metal recovery images are even stored on the bank's Avamar-dedicated servers. Because HomeBase profiles are much smaller and use little internal bandwidth, server recovery now happens disk-to-disk. No tapes—or trucks—needed.



It has become apparent that the threat of cyber espionage is getting bigger and more menacing.

Preventing leaks where EMC's information lives

Roland Cloutier, EMC's Chief Security Officer

ASIA KEPKA

Preventing leaks where EMC's information lives

Since Roland Cloutier became EMC's Chief Security Officer four years ago, the amount of information in EMC's data centers tripled from two petabytes to six. The number of employees using that data climbed from 19,000 to more than 40,000. Hundreds of additional partners linked into the company's network. New international EMC sites opened.

And hackers' spyware and malware programs grew increasingly sophisticated. Cyber theft of personal and corporate data is now big business.

EMC's Global Security Organization, led by Roland, certainly faces many challenges in safeguarding EMC's data. But its members have been making sure that the company keeps pace—and even that it pushes the envelope of progress—to prevent data leaks.

This is a "converged security practice" composed of security technologies (including EMC products) shared and spread across security teams such as Information Security, Risk Management, and Corporate Investigations. EMC's internal protection specialists strike a balance between protecting sensitive data and promoting collaborative information usage so that employees can do their jobs unimpeded.

This year, one of the Global Security Organization's major missions involves working with vendors to transform enterprise-centric data security and business protection technologies into products suited for the cloud. Their effort will help EMC advance its product and IT cloud strategy without having to recreate a new security infrastructure.

TAMING UNSTRUCTURED DATA

The biggest data-leak prevention challenge that EMC faces involves protecting unstructured data—all that information existing as something other than a database record or other standard "fielded" data format. Unstructured data includes PowerPoint files, videos, e-mails, web content—the files people continually create, duplicate, and transmit in the normal course of business.

It's even easy to transform confidential database records and other structured data into unstructured forms, as Roland points out, simply by copying and pasting the data into a Word document, Excel spreadsheet, presentation slide, or e-mail

message. Sensitive data also is shared in eRooms, stored on USB flash drives, and carried around on laptops.

In other words, we use company information in very dynamic ways. Our habits render the traditional approach to data security obsolete, says Andrew Cohen, EMC's VP of Compliance and Assistant General Counsel, Legal Solutions Department. He notes, "Traditionally, security happened when an IT executive would say, 'Let's build a moat around our enterprise.' The assumption was that securing an IT infrastructure's perimeter would keep information in and intruders out."

This perimeter technique no longer works to keep in information. In today's business environment, the sharing of data on multiple levels inside and beyond an organization's walls happens all the time, for all sorts of legitimate reasons. Nor does perimeter-based security help much in a world where organizations face threats to their data from people who are already inside the wall.

EMC takes a bottom-up, holistic approach to protecting its information resources. Multiple levels of controls exist for data. These are "mini-moats" of sorts, based on formal determinations about what data needs securing at what level.

Basically, EMC's security practices are tied to the type of information being protected. As one might expect, the highest security priorities apply to EMC's core financial information, its trade secrets and intellectual property, its customer information, and of course, the personal data of its employees.

The first step in safeguarding confidential information is to secure the infrastructure properly. "We're talking about doing basic things, like making sure servers don't have operating system holes, keeping virus protection software up to date, and having firewalls in place," Roland says.

EMC then uses its own security tools and some partner technology to add additional safeguards to the storage layer, application layer, network layer, and at the user-endpoint.

For example, the RSA Data Loss Prevention (DLP) Suite allows EMC to look at, and even evaluate, data usage. This software identifies sensitive data and reveals who has access to what files. Collaboration tools such as eRoom may contain many thousands of files. The discovery capability of the RSA DLP Suite discovers sensitive data and can put the appropriate protections on it based on policy. Protections can include, for example, modifying who has access to a file or encrypting that data.

For highly sensitive data, Roland says, the company uses EMC Information Rights Management

technology: It sets up rules for the information no matter where that information goes. "For example, it can make sure that only Jim, Julie, and Jane can access certain files but that even they cannot print or e-mail them," he says. In general, EMC tries to minimize the number of people who have access to sensitive data, thus shrinking the "threat surface" for potential data leaks.

The highest security priorities apply to EMC's core financial information, trade secrets and IP, customer information, and the personal data of employees.

EMC also uses the RSA DLP technology to discover sensitive data and examine where it is in the network. EMC's Critical Incident Response Team monitors data leakage concerns worldwide. If that team detects sensitive data residing somewhere it shouldn't be, Roland says, they flag it for a security review.

PRACTICE WHAT YOU PREACH

EMC really does follow the same data-security methodologies that it talks to customers about using, including inventorying information, identifying priorities, setting policies, enforcing them, monitoring data, and making adjustments as needed.

Data security is a "living, breathing practice," Roland says, one that needs to be updated every time something changes regarding information use, business practices, or threats.

Obviously, some trade-offs must occur to balance flexibility and sharing versus making sure content is locked-down. Again, EMC practices the same proactive approaches that it encourages its customers to implement.

"If you set up security in the right way, you can actually *increase* people's ability to collaborate with confidence," Andrew says. "The new collaboration technologies are powerful business tools, and it would be foolish to stifle their use. On the other hand, we have a very good warning system to catch attempts to innocently send or actively steal EMC's trade secrets."

STAYING AHEAD OF THREATS

The company relies on a global network of resources to stay ahead of cyber criminals. It has relationships with US-CERT (the U.S. Computer

Emergency Readiness Team), the U.S. Department of Homeland Security, and other industry and enforcement entities worldwide. It has created a separate Office of Risk Management to address threats to business operations. It retains companies to provide threat information and has its own full-time risk analysts. Roland says, "We keep tabs on this stuff every single day."

To get a further edge over "the bad guys," Roland's teams run a special lab where technicians try to hack into EMC systems in order to spot and correct vulnerabilities.

Education also is a crucial part of keeping data safe. Yearly, all employees receive security compliance training to teach them good data-protection practices and make them aware of their important role in the company's security ecosystem.

NOT "BIG BROTHER"

Both Roland and Andrew emphasize that the Global Security Organization isn't focused on monitoring people; it's focused on controlling data leaks.

"We're leaving employees alone," Andrew says. "We're not constantly monitoring their behavior. We're only monitoring exceptional activity to make sure that wrong things are not about to happen."

Roland adds that "people should think of this not as 'big brother,' but as something akin to RFID (radio-frequency identification) tags for sensitive corporate information."

It is serious work. Threats of data leakage overall have climbed relentlessly in recent years for EMC and every other organization.

At EMC, the quantity of internal versus external data leak threats is about equal. Internally, data leaks most often stem from faulty business practices, not malicious intent. Roland says, "The biggest problem we see is not bad people doing bad things; it's good people doing their jobs in accordance with bad business practices."

For instance, an administrator may e-mail an executive's credit card number because it's been a longstanding practice. In regard to these types of internal threats, EMC's security specialists spend 90% of their time working to fix the broken business practice at the root of the problem.

The good news is that the business units are showing true responsiveness to the team's help. "There's been an impressive evolution in attitude at EMC regarding data security," Roland reports. "Folks are far more aware of the global data-leak epidemic. In the old days, they'd grumble about 'Security coming to put the hammer down.' Now they ask us, 'How can we be more secure?'" ◇

Gaining revenue and market share, EMC is

leaping across Africa

TIME WELL SPENT EMC Africa Marketing Manager Cathy Burns prepares snacks and gifts at the Tamaho School, which teaches 1,300 children from the severely financially disadvantaged local community. Decommissioned railway containers with rusted, disintegrating floors are the school's classrooms and offices. EMCers provided funds to fix the floors and worked with school staff to hire students' parents and other community residents, most of whom are unemployed, to make the repairs.

leaping across Africa

AN AFRICAN PARABLE GOES SOMETHING LIKE THIS: Every morning, a gazelle wakes. He knows he must run faster than the fastest lion or he will die. Every morning, a lion wakes. He knows he must outrun the slowest gazelle or he will starve. It doesn't matter whether you're a lion or gazelle. When the sun comes up, you better start running.

Competition for information infrastructure market share is intense in every region across the globe. But the battle is especially fierce in Africa, where emerging economies are combining with mature ones to create a landscape rich with promise.

Recognizing the potential, EMC is investing time, talent, and funding resources to take business there to a new level. The African continent's business development sun is rising. EMC is leaping.

"We're poised for fantastic growth," reports Fady Richmany, District Manager, Global Accounts, North/West Africa. "At year-end, revenue in West Africa was up 900% over 2007."

It was admittedly growth from a very small base; still, the employees expect West Africa market share and revenue to nearly double again in 2009.

GETTING CLOSE TO CUSTOMERS, EAST AND WEST

Fady says most of the opportunities in the West are in Nigeria, "so we've really been devoting a lot of attention there." In July 2008, EMC opened an office in the oil-rich country. In mid-November, it opened an office on the other side of the continent, too, in Kenya, to take full advantage of opportunities there as well.

It is a greenfield area, says Mohammed Amin, Area Manager for the Middle East and North/West Africa. "For a long time, we left it to the competition. Now we're jumping in with both feet. The timing couldn't be better."

Until recently, Nigeria had little in the way of infrastructure. EMC is helping to establish the information infrastructure the country needs to support its development. Toward that end, Mohammed says, "we're partnering with both public and private entities."

Nigeria's economy—with a GDP of $165 billion and growth rates of 7-20% since 2000—offers opportunities for EMC in a variety of sectors. Telecom is red-hot there, for example, as it is across the continent. Regional telecom provider Zain Group has been adding a million subscribers monthly. EMC's Middle East/Africa team recently achieved a major coup by winning large deals with Zain Group and its

leaping across Africa

subsidiaries in several African nations.

"We were able to convey a clear understanding of their clients' needs," Fady says. "Thus, we also very effectively communicated the business and technical benefits of our solution over the competition's. We also were able to offer services to help them implement the solutions in multiple geographic locations."

To the East, EMC's new direct presence in Kenya should help increase market share in three sectors: telecom, banking, and oil & gas, according to François Chazalon, Marketing Manager for EMEA South.

"It was important to get closer to our Kenyan customers and partners," he says. "New projects in public and private sectors crop up in Kenya literally every day. We need to be there."

In the East, West, and North, the strategy is to focus on larger developed markets including Kenya, Nigeria, Algeria, and Angola through 2009. Then the company will move to capture markets in less-developed countries. Teams already are reaching out beyond enterprise-tier prospects to gain share in the fast-growing commercial tier of smaller firms.

A big element of the strategy centers on hiring people well-rooted in African business and culture. "They must have a lot of IT aptitude," Mohammed says. "They also must understand the global *and* local marketplace. Our hiring requirements make it tough to find just the right person. But I'd rather keep a position open for a while than hire the wrong person. Compared with the competition, I think we already have one of the best teams in the region."

SOCIAL INVESTING Tamaho Primary School Principal Walter Vukedhwel (l.) and EMC SA Country Manager Gerhard van der Merwe in Katlehong, South Africa. The school held a celebration in November to acknowledge EMC's commitment.

Gerhard van der Merwe is Country Manager for South Africa and SECA (South East and Central Africa). He adds, "We already have three people in Kenya looking after the East Africa countries. Very soon, we will also have a team in Angola."

SOUTH AFRICA: A PICTURE OF MATURITY AND STABILITY

In contrast to the nascent markets to its north, South Africa represents an extremely mature IT market. EMC has had a direct presence there since 1995, a year after the end of apartheid. In mid-2008, the company bolstered this foundation

by making a strategic investment in a company called Enterprise Content Management Solutions (ECMS), a subsidiary of Waymark Infotech (Pty) Ltd. The move established a focused Content Management Solutions division in South Africa.

Gerhard says, "With Waymark, we are creating a specific competence around content management and archiving, which is essential to almost every company. Actually, we see CMA as being especially vital to customers operating in fast-growing markets like those throughout Africa."

The work with Waymark also supports EMC's long-time commitment to Black Economic Empowerment (*see box, right*). Waymark is widely regarded as a BEE leader with substantial equity shareholding held by senior black executives.

The years to come should be interesting, as EMC strengthens its ties to African business and society and supports the growth that seems to be spreading, like a herd of gazelle, across this continent. ◇

Black Economic Empowerment

A DRIVING FORCE IN SOUTH AFRICAN BUSINESS

According to Hannah Rooke, HR Operations Manager for South Africa, "An understanding of Black Economic Empowerment (BEE) is vitally important to anyone who wants to do business here."

Established by South Africa's Department of Trade and Industry to redress the inequalities of apartheid, BEE standards aim to remedy past racial injustices by providing business opportunities to black South Africans. The opportunities encompass seven elements of business: Ownership, management control, employment equity, skills development, preferential procurement, enterprise development, and corporate social investment.

Each element carries a value up to 100. Companies are awarded percentages of that total based on their implementation of the initiatives. For example, EMC currently has 12 of 15 points in skills development and 8 of 10 points in management control.

"The important thing," Hannah says, "is to remember there's a domino effect. Companies receive additional points for doing business with other companies with high point values. Without question, our strength in South Africa depends directly on our commitment to BEE."

Two decades ago, during the booming minicomputer era, a small team was quietly altering the future of the IT industry.

The soul of a RAID machine

IN 1987, THE information technology landscape was very different. The PC revolution was just beginning. The Web didn't exist. Data storage, such as it was, lived in the shadow of the glamorous, number-crunching "computer system."

At a bucolic facility in Durham, New Hampshire, Data General employees immersed themselves in this reality. DG had built its reputation by designing and manufacturing powerful, affordable minicomputers. Its engineers had even been made famous in the 1981 Pulitzer Prize-winning best-seller, *The Soul of a New Machine*.

THE START OF SOMETHING BIG
Steve Todd (far-left, blue shirt), Dave DesRoches (white shirt), and Bob Solomon (pink shirt) posed with their machine at DG's Westboro campus in June of 1991.

The soul of a RAID machine

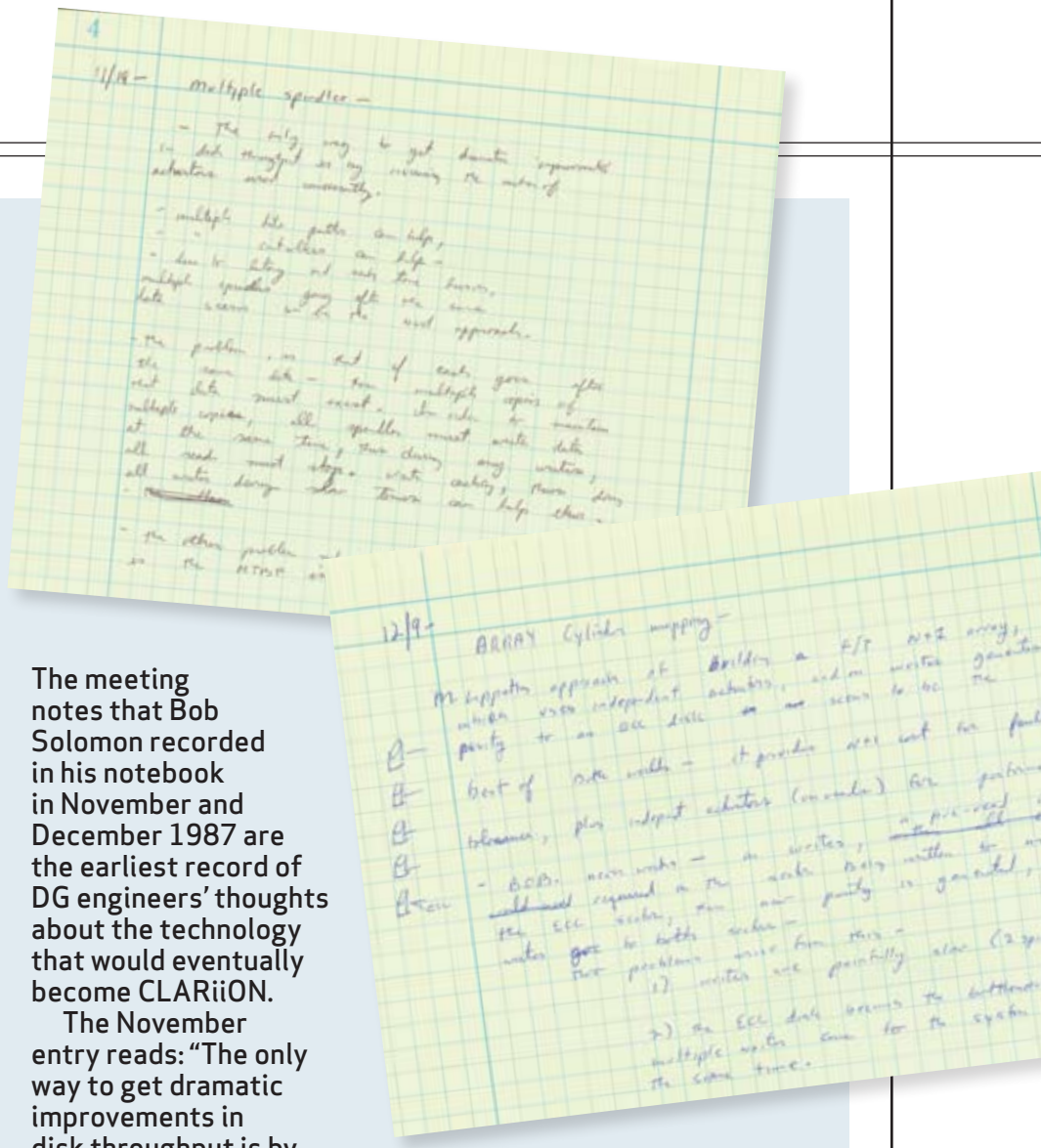
But as computing became more crucial to business, data proliferated. Another shift was occurring, too. Customers were moving away from proprietary systems. The advent of the Small Computer System Interface (SCSI)—which would make smaller, more economical disk subsystems possible—accelerated the adoption of industry standards for hardware connectivity.

These advancements opened a door to something new: redundant arrays of inexpensive disks.

Some people assume the development of RAID storage by DG and other firms began with the publication of a groundbreaking UC Berkeley research paper, "A Case for Redundant Arrays of Inexpensive Disks (RAID)," by David A. Patterson, Garth A. Gibson, and Randy H. Katz. In reality, that paper crystallized and clarified many ideas and experiments already underway.

At DG, engineer Mark Lippitt's work with disk drives had previously led him to make a crucial observation: In a multi-spindle system, most I/O (input/output) operations clogged just one drive. That fact drove him. He wanted to find a way to spread loads evenly over multiple drives.

He wrote a short paper describing an idea. "My peers dismissed it as flawed," says Mark. "They told me it basically described how to incur a seri-



The meeting notes that Bob Solomon recorded in his notebook in November and December 1987 are the earliest record of DG engineers' thoughts about the technology that would eventually become CLARiiON.

The November entry reads: "The only way to get dramatic improvements in disk throughput is by increasing the number of actuators used concurrently."

The December entry reads: "ARRAY cylinder mapping: M. Lippitt's approach of building a fault-tolerant N+1 array, which uses independent actuators, and on writes generates parity to an ECC disk, seems to be the best of both worlds. It provides N+1 … for fault tolerance, plus independent actuators on reads for performance."

The soul of a RAID machine

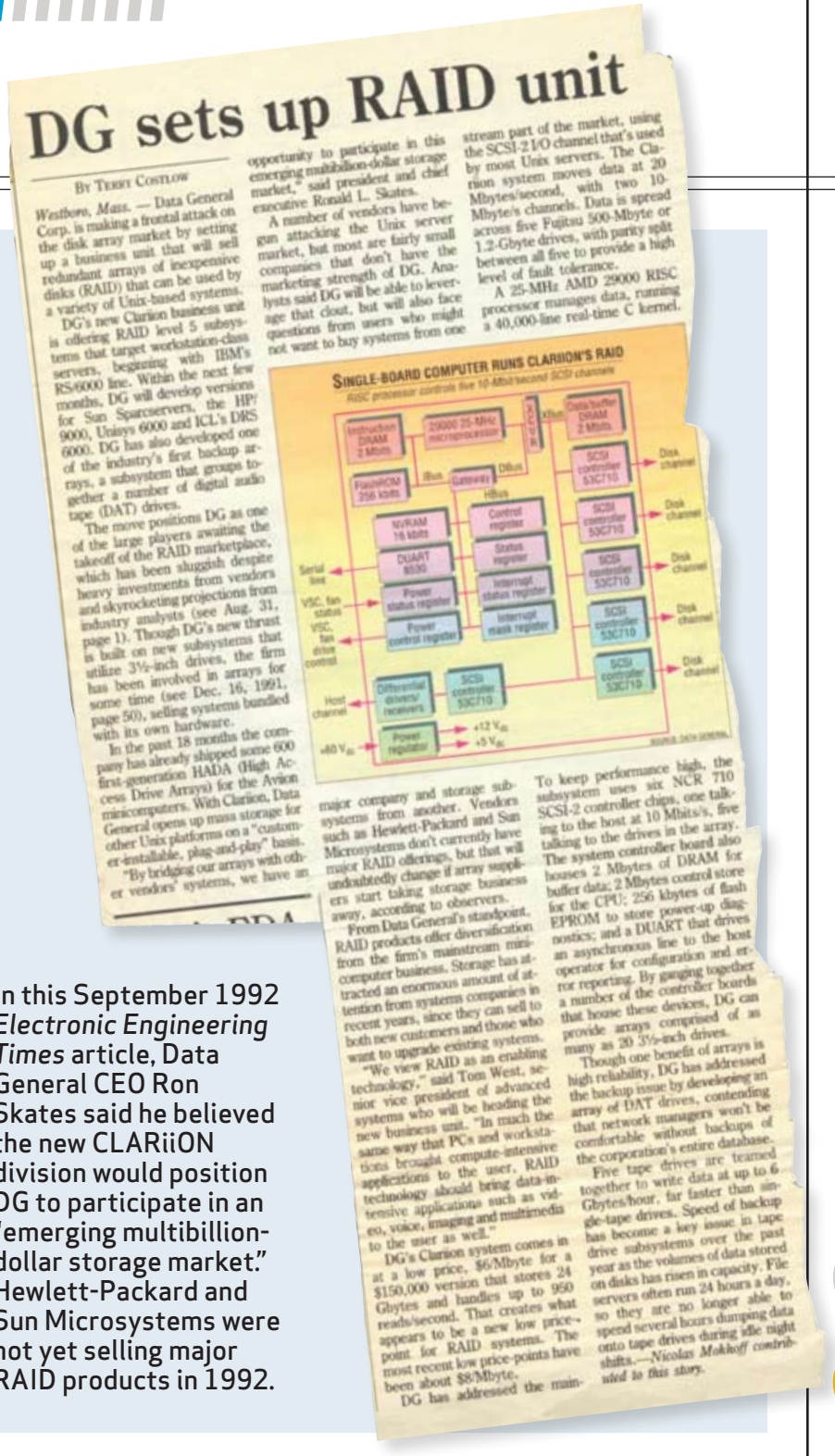
ous system-reliability problem."

Meanwhile, in Chatsworth, California, employees at Micropolis Corporation, an early maker of hard drives, were testing a four-drive array that contained a fifth drive for parity checking. It was an approach to multi-spindle storage that would become known as RAID 3. Mark believed the design was a step in the right direction but that performance would be too slow for the demands of DG's customers. Then he realized something. Marrying parity (for error detection) with striping (for disk load-balancing) might overcome his own design's reliability problem and multiply performance.

"I vividly remember bolting up in bed at 2:00 a.m. with this realization," Mark says. "It was a multi-step read/modify/write process that is the basis for RAID 5 systems."

Data General's executive leadership had been hearing of developments in data storage. They decided to create a team to design peripheral storage technology that would support the next generation of DG minicomputers.

In 1987, as part of this larger project called Corona, the FLARE-creation effort officially began. Mark, who reported to Paul Suffredini (now retired from EMC), was the group's manager. He oversaw the hardware design team, which included Joe



DG sets up RAID unit

By Terry Costlow

Westboro, Mass. — Data General Corp. is making a frontal attack on the disk array market by setting up a business unit that will sell redundant arrays of inexpensive disks (RAID) that can be used by a variety of Unix-based systems.

DG's new Clarion business unit is offering RAID level 5 subsystems that target workstation-class servers, beginning with IBM's RS/6000 line. Within the next few months, DG will develop versions for Sun Sparcservers, the HP/9000, Unisys 6000 and ICL's DRS 6000. DG has also developed one of the industry's first backup arrays, a subsystem that groups together a number of digital audio tape (DAT) drives.

The move positions DG as one of the large players awaiting the takeoff of the RAID marketplace, which has been sluggish despite heavy investments from vendors and skyrocketing projections from industry analysts (see Aug. 31, page 1). Though DG's new thrust is built on new subsystems that utilize 3½-inch drives, the firm has been involved in arrays for some time (see Dec. 16, 1991, page 50), selling systems bundled with its own hardware.

In the past 18 months the company has already shipped some 600 first-generation HADA (High Access Drive Arrays) for the Avion minicomputers. With Clarion, Data General opens up mass storage for other Unix platforms on a "customer-installable, plug-and-play" basis.

"By bridging our arrays with other vendors' systems, we have an opportunity to participate in this emerging multibillion-dollar storage market," said president and chief executive Ronald L. Skates.

A number of vendors have begun attacking the Unix server market, but most are fairly small companies that don't have the marketing strength of DG. Analysts said DG will be able to leverage that clout, but will also face questions from users who might not want to buy systems from one major company and storage subsystems from another. Vendors such as Hewlett-Packard and Sun Microsystems don't currently have major RAID offerings, but that will undoubtedly change if array suppliers start taking storage business away, according to observers.

From Data General's standpoint, RAID products offer diversification from the firm's mainstream minicomputer business. Storage has attracted an enormous amount of attention from systems companies in recent years, since they can sell to both new customers and those who want to upgrade existing systems.

"We view RAID as an enabling technology," said Tom West, senior vice president of advanced systems who will be heading the new business unit. "In much the same way that PCs and workstations brought compute-intensive applications to the user, RAID technology should bring data-intensive applications such as video, voice, imaging and multimedia to the user as well."

DG's Clarion system comes in at a low price, $6/Mbyte for a $150,000 version that stores 24 Gbytes and handles up to 950 reads/second. That creates what appears to be a new low price-point for RAID systems. The most recent low price-points have been about $8/Mbyte.

DG has addressed the mainstream part of the market, using the SCSI-2 I/O channel that's used by most Unix servers. The Clarion system moves data at 20 Mbytes/second, with two 10-Mbyte/s channels. Data is spread across five Fujitsu 500-Mbyte or 1.2-Gbyte drives, with parity split between all five to provide a high level of fault tolerance.

A 25-MHz AMD 29000 RISC processor manages data, running a 40,000-line real-time C kernel. To keep performance high, the subsystem uses six NCR 710 SCSI-2 controller chips, one talking to the host at 10 Mbits/s, five talking to the drives in the array. The system controller board also houses 2 Mbytes of DRAM for buffer data; 2 Mbytes control store for the CPU; 256 kbytes of flash EPROM to store power-up diagnostics; and a DUART that drives an asynchronous line to the host operator for configuration and error reporting. By ganging together a number of the controller boards that house these devices, DG can provide arrays comprised of as many as 20 3½-inch drives.

Though one benefit of arrays is high reliability, DG has addressed the backup issue by developing an array of DAT drives, contending that network managers won't be comfortable without backups of the corporation's entire database.

Five tape drives are teamed together to write data at up to 6 Gbytes/hour, far faster than single-tape drives. Speed of backup has become a key issue in tape drive subsystems over the past year as the volumes of data stored on disks has risen in capacity. File servers often run 24 hours a day, so they are no longer able to spend several hours dumping data onto tape drives during idle night shifts.—*Nicolas Mokhoff contributed to this story.*

SINGLE-BOARD COMPUTER RUNS CLARION'S RAID

RISC processor controls five 10-Mbit/second SCSI channels

In this September 1992 *Electronic Engineering Times* article, Data General CEO Ron Skates said he believed the new CLARiiON division would position DG to participate in an "emerging multibillion-dollar storage market." Hewlett-Packard and Sun Microsystems were not yet selling major RAID products in 1992.

The soul of a RAID machine

Deyesso (now an EMC staff consultant).

As Joe focused on mechanicals and power, his colleague Bob Solomon (now a VP and EMC Fellow) was tapped to lead the software effort.

Bob recalls, "At our first big architectural meeting, I wrote in my notebook that the only way to accomplish our goals would be with multiple spindles, although the approach would lead to problems because when data is striped across disks, the likelihood of failure increases with each additional drive used."

But when Bob heard Mark's proposal to keep spindles independent while retaining the parity concept, "it seemed to be the best of both worlds."

In June 1988—the same month that the Berkeley paper debuted at the annual SIGMOD industry conference—Dave DesRoches, today an EMC consultant software engineer, gave a DG exec a "fail-soft" demonstration. (DG hadn't yet begun using the term "RAID.") During the demo, "the VP pulled the cable on one of the drives. The drive went dead, but the application kept running without data er-

Data General News

March 13, 1991

Data General Delivers Industry Leading Products

"Life Just Got a Whole Lot Easier!"

With that message, Data General today brings to market high performance, high availability, RISC based open systems with the power of mainframe computers for a fraction of the cost.

Customers, consultants, industry analysts, press and employees are participating in the official unveiling of the quad processor board at New York City which is being beamed to Europe, San Francisco and Corporate headquarters in Westboro.

The AViiON 7000 and 8000 systems with DG/UX 5.4 and the High Availability Disk Array give Data General the most powerful commercial RISC system on the market today and a lead in commercial UNIX products. These systems are designed for applications that require large volumes of data and a high number of transactions.

The AV 7000 and AV 8000 systems include high performance, open architecture computing based on Motorola 88000 RISC 32 bit processors. Featuring a quad processor system that reaches 117 MIPS (million instructions per second), the package satisfies the high-transaction processing requirements of today's commercial environment including quick recovery from hardware failures.

"Today's introduction is significant for two reasons," said President Ron Skates. "One, these products open new markets for Data General. We can now service an enterprise's full information needs from a low-cost workstation to a high performance system. But more importantly, Data General offers the power, the flexibility, and compatibility in the most cost effective manner available today for business transaction processing."

The new systems, developed under the code names of "Shotgun" and "Aurora," are currently in production at Data General's Apex, North Carolina plant. First customer deliveries will take place this month.

SHOTGUN – AViiON Quad Processor

AURORA – High Availability Disk Array

Code-named "Aurora," the High Availability Disk Array (H.A.D.A.) was a predecessor to CLARiiON. It boasted 5 ¼" drives.

The soul of a RAID machine

rors. The VP's jaw dropped," recalls Dave. "Looking back, I realize the extent to which we were ahead of, not dependent on, the Berkeley guys in regard to real-world implementation efforts."

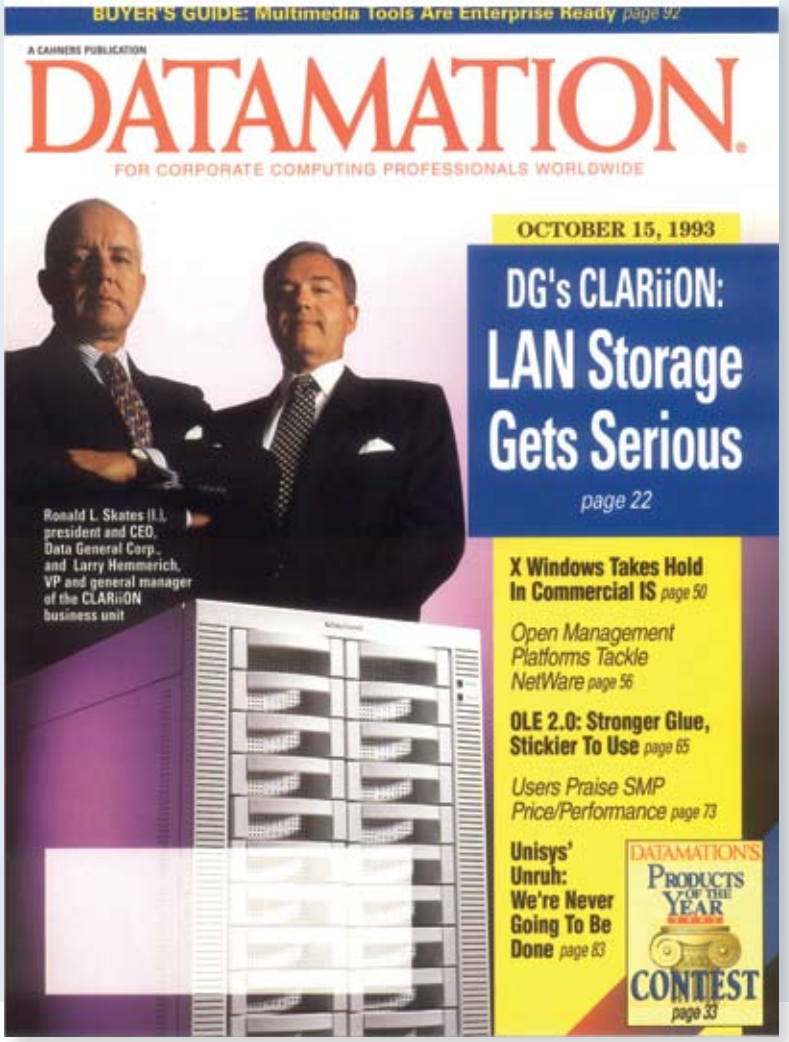
A few weeks later, a member of Engineering VP Tom West's staff suggested rotating parity across the drives. At that point, the collective epiphany was complete. "We'd created what became known as RAID 5," says Bob.

Soon Tom West was presenting the team with a copy of the famous Berkeley paper. As Bob recalls with a chuckle, "He said to us, 'I guess you guys came to the same conclusion.'" But while the Berkeley paper had described the architectural concept of RAID brilliantly, it had not explained how to create a real-life machine. The problems of guaranteeing data integrity and achieving acceptable performance were unaddressed.

By now, Bob's team included young software engineers Steve Todd (today an EMC Distinguished Engineer), and Dave. They were designing and delivering the "RAID Device Executive"—RAID technology with SCSI backend drives for production FLARE.

"Storage was not at all 'sexy' back then," Steve says. "We sort of felt we were at the bottom of the totem pole." But under Bob's guidance, the group

An October 1993 *Datamation* magazine cover story discussed the fault-tolerant, highly configurable, cross-platform features of Data General's new CLARiiON Series 2000 for NetWare. By this time, DG had shipped roughly 2,500 CLARiiON units—systems for client/server environments that supported the IBM AIX, Sun Solaris, and DG-UX variants of the Unix operating system.



The soul of a RAID machine

developed their own esprit de corps. Steve focused on writing and implementing the complex RAID 5 algorithms, while Dave provided the specific multi-step backend SCSI operations they needed (including managing the SCSI drives themselves).

DG was now beautifully positioned to lead the race to bring a RAID product to market. Still, the team was in peril. A slowing economy combined with rapid changes across the computer industry was putting Data General's entire future in doubt. Working for this processor-centric company, the storage team began to worry about job security.

Then, a major contributor to the hardware portion of the project resigned to take a job at another company, taking most of his team with him. Even Mark found the lure of employment elsewhere to be irresistible, accepting a position at Tandem's Array Technology division in Boulder, Colorado (a business unit acquired years later by EMC).

At one point, remembers Paul Suffredini, "I was to meet with someone in senior management to explain what we were doing. I actually found myself in a room with five, largely hostile, vice presidents. That's when I recognized that our project was in a life-or-death situation." Fortunately, Paul must have been persuasive. Or, as Steve Todd speculates, perhaps one of the VPs made a case that Corona technology could help DG sell its Unix-based AViiON servers.

In any case, Corona, and FLARE, were saved. A VME-based system called H.A.D.A. went on sale first; it gave way to the new SCSI-based CLARiiON. Not only did CLARiiON help sell AViiON servers and slow DG's declining fortunes, its SCSI architecture also let it work with servers made by other companies. That concept was revolutionary. "I knew we really had something when people from IBM's RS6000 server division told us this was a product they wanted," says Paul.

OEM sales far surpassed sales accompanying DG's own servers—a development controversial at the time but one that, to a degree, led to the CLARiiON line and DG itself being acquired by EMC in 1999. Almost all of the original FLARE team still work at EMC.

CLARiiON grew to accommodate disk and interface technologies such as Fibre Channel connectivity, SATA, and other enhancements. And without question, what was born at DG in the late 1980s—through a vision that brought to life RAID 5 products with real hot-swap capability by the early 1990s—is alive and well today. ◇

Read Steve Todd's account of the effort

SPARKING A STORAGE REVOLUTION

Inside every CLARiiON system ever shipped—about a quarter of a million units—a bit of "secret sauce" exists. It's FLARE, which helps CLARiiON make intelligent, speedy choices about where to put data and how to keep it safe.

FLARE is an operating system purposed for storage. It moved the intelligence needed for data redundancy and I/O performance out of the server's operating system. For DG, which traditionally valued storage only on a dollar-per-megabyte basis, that was a game-changer. FLARE also challenged the view that storage software must be written in assembly language: It was implemented entirely in "C."

Enhanced continually since its birth two decades ago, FLARE still helps keep CLARiiON and EMC ahead of competitors.

Back then, Mark Lippitt was developing mass storage technology for DG. Today, as EMC's Technical Director for Enterprise Connectivity, he recalls that FLARE was named (and aimed) to set fire to the status quo of storage controller design.

Legends differ regarding the FLARE name. Mark recalls that in August 1983, a preliminary draft of what would become the Small Computer System Interface (SCSI) specification led him to propose a SCSI-based storage product.

Mark's manager assigned him to lead the team and devise a name for the project. He came up empty until he passed a newspaper box in downtown Framingham, Massachusetts. The top story was headlined, "Blaze Destroys Home."

"I was struck by the word 'blaze' to describe a project setting fire to the status quo," Mark says. "SCSI was going to set fire to proprietary disk interfaces."

Ultimately, the name caught on for a whole family of SCSI-based storage products. Blaze was followed by Spark, then FLARE, which extended the fire theme and incorporated the Corona/Aurora projects' stellar nomenclature. (DG also produced the Nova, Supernova, and Eclipse minicomputers.)

Of course, no story is complete without an alternative explanation. At least one source asserts that FLARE stands for the exceedingly less dramatic "Fibre Logic Array Runtime Environment." That assertion is groundless. "FLARE was invented long before anyone was thinking about fibre," says Mark. "It is not an acronym."

The new EMC Community Network fosters innovation and deeper relationships.

Doing more with less

WITH FINANCIAL MARKETS roiling and consumers nervous, how does a company continue to turn customers into loyal advocates? EMC has found an answer: Offer vibrant online communities that prove we are not just listening to our stakeholders, but are inviting them to actively collaborate with us, ensuring that we better meet their needs.

Launched in December 2008, the EMC Community Network (ECN) harnesses collective brainpower to drive improved ways of collaborating and innovating. It is empowering people and already giving EMC a competitive advantage.

Randy Ziegler is responsible for the ECN initiative. He believes the rollout actually could not have been timelier. "Considering the economic pressure our stakeholders feel right now, ECN is helping us to build deeper relationships with them efficiently," he says. "They strongly value that."

ECN was preceded several years ago by the EMC

CANDACE IMMING

Community Developer Susan Zellmann-Rohrer (l.) and Randy Ziegler, who is responsible for the EMC Community Network

New communities go live weekly

Doing more with less

Developer Network (EDN), which Randy also manages. EDN helps developers work together as they design third-party products that interface with EMC technology. EDN has been quite successful, with several communities and more than 60,000 members today.

"It's so lively because its members use it to help *each other*—answering questions, optimizing code, sharing best practices," says Community Developer Susan Zellmann-Rohrer.

EDN became the first "meta-community" of the EMC Community Network. The second, Labs, is a project-oriented community providing carefully controlled early access to new EMC products and technologies. By engaging customers and partners early, EMC is able to gain valuable feedback.

"When you rapidly test a concept with members, you are able to make refinements earlier," says Susan. "Simultaneously, you create a knowledgeable advocate who'll be up-to-speed when the actual product hits the market."

Connect is the third meta-community—a collection of product and advisory forums, user groups, and professional networks.

The fourth meta-community, Partner Network, focuses on program-specific communities designed to build more valuable relationships.

Customers, especially, are loving it. Allen Ward, a Technology Specialist at a Canadian bank, says, "Being able to interact directly with the people who make decisions on the direction of EMC ControlCenter is invaluable. This is the kind of thing every company should do."

Before launching communities, employees submit proposals to ECN Inside on EMC ONE. They are armed with the "ECN Community Blueprint for Success," a proven, crowd-sourced methodology for community development. The entire process is conducted on ECN Inside and is transparent for all to see.

But what *does* make a community thrive? Successful ones "align around specific business initiatives or have a distinct purpose and give sustainable value to members," says Susan. "Communities require lots of planning and 'concierge' service, at least in the beginning. If questions aren't answered, if content isn't interactive or fresh, people leave."

Generally, it takes three months to launch a community and another six months for it to flourish. "Communities take time to develop, and not all will succeed, but we do have a number of high-potential communities in development," Randy says. "ECN's impact will fundamentally change EMC, building stronger relationships at a time when communication is at a premium. Ultimately, it will allow us to do more with less." ◇

Peer-to-peer storage disrupts the conventional data center cost structure.

Can EMC reach new heights with Constellation Computing?

IMAGINE A SPACE to store infinite photos, music, videos, and other personal data that you can share, access from anywhere, and permanently protect for less than the cost of monthly Internet service. EMC is investigating a disruptive personal information management model that may deliver all this by taking cloud computing in a fresh direction.

It's called Constellation Computing, and it is the brainchild of Manu Fontaine, Sr. Director of Consumer Marketing and Business Development. His idea won first place among 984 submissions in EMC's 2008 Innovation Showcase last October.

The concept involves hybridizing the best features of in-home network-attached storage and cloud computing. Consumers control data from a trusted in-home device without contending with the up-front costs or complexities inherent in managing a lifetime of data on a storage appliance that can fill up or fail.

Constellation Computing would instead tap into storage over the Web via shared computer resources, leveraging a unique peer-to-peer structure that would be less expensive *and* more secure than typical cloud-based services.

Cloud computing usually requires data centers. They are costly to build and maintain. Constellation Computing replaces the data centers with a "constellation" of linked in-home devices.

Manu Fontaine (center), with CTO Jeff Nick (right) and Burt Kaliski, received honors for devising a way to give people an "eMC," or "master of ceremonies" for managing their digital lives.

Can EMC reach new heights with Constellation Computing?

Called "eMC," each device would be book-sized, with a built-in router, hard drive, and hookup to the user's broadband connection. Like a NAS appliance, it would let data-using items in a home work together, providing features like streaming music or video.

But it also serves as a "chunk" of the constellation's storage infrastructure, keeping data secure via a built-in security chip much like a mobile phone's SIM chip.

And, marketed much like phones are, the eMC could sell for an appealing $99.95, plus a mere $9.95 monthly subscription for unlimited capacity.

It would let users access personal data from any device, in-home or outside. It also would let users share information with others in the constellation by dragging and dropping files at a recipient's address.

Sharing would be completely secure, eliminating the risks that come with e-mailing personal information.

And if an eMC device breaks, its owner can swap it for another without losing data.

Leo Leung, Strategist in the Office of the CTO, is helping Manu flesh-out the concept. Leo says it bridges the gap between software in the cloud and home devices. "This was No. 1 at the Innovation Showcase because it solves a problem everyone has: managing growing personal data. We consider it a disruptive technology because it may reduce the cost of providing consumers with cloud-like storage by five-fold."

The idea taps into an emerging target market, uses long-theorized peer-to-peer storage, and has a social networking "cool factor," adds Cloud Infrastructure Group SVP Michael Feinberg. He thinks Constellation Computing also might offer enterprise customers lower-cost backup in a peer-to-peer network.

EMC's acquisitions of consumer storage leader Iomega, Mozy online storage, Pi, and RSA Security position it as *the* company to deliver this technology. Jeff Nick's Office of the CTO is leading the concept's incubation, partnering with Manu, Joel Schwartz's Iomega team, and Harel Kodesh's Decho team.

Burt Kaliski, Sr. Director, EMC Innovation Network, says showcase judges unanimously realized Constellation Computing "combines EMC's strengths in a new way: Storage, cloud computing, and personal information management connect in a business model that could realize the full potential of an online information service." ◇

Inside the firewall, read Manu's blog on EMC ONE

IT'S BATTLING THE 'dreaded form letter' and so much more.

EMC Document Sciences elevates the customer experience

EMC won the Banker Technology Awards' 2008 Retail Wealth Management Award for creating a "best-in-class consolidated financial statement" at Santander Private Banking, a division of Grupo Santander, the largest bank in the Euro Zone.

(l. to r.): *The Banker* Technology Editor Michelle Price, Santander Private Banking SVP and Strategic Planning Director Ramiro Lopez Larroy, EMC U.K. and Ireland VP and GM Adrian McDonald, and *The Banker* Editor Brian Caplen.

HAVE YOU EVER received a letter or e-mail message containing incorrect information about you, duplicating something you've already received, or in some way showing it was sent with no knowledge of who you really are?

For too long, the notorious "form letter" has typified and bedeviled business-to-consumer communications. Eventually, most of us come to expect dumb errors. Inappropriate correspondence proves we're just a number to those big organizations.

Actually, businesses know

The Banker TECHNOLOGY AWARDS 2008 WINNER RETAIL Wealth Management

Awards reflect how effective this EMC product is in helping customers to build relationships with their own clients via personalized mass communications and on-demand interactions.

it's a problem. But it's one that is hard to fix. Data-laden applications abound, and everyone—from entry-level sales reps to senior executives—is using that data to attempt to reach out to us. Communicating effectively in high volume has often been incredibly challenging.

But software from EMC Document Sciences called xPression 3 does something remarkable: It coordinates the tools, techniques, and applications that organizations use to connect with audiences on a personal level.

xPression components create personalized, customized communications such as marketing collateral, contracts, policies, relationship statements, and of course, correspondence. The information can be sent out via print, web, e-mail, or other messaging systems. Everything is consistent, accurate, accessible, and attractive.

One company accelerated—by more than 200%—the response time to make and send changes to insurance and financial contracts. Another firm had been using 5,000 different templates each month to send 40,000 customer letters describing various service offerings. That process cost them 43 cents per letter and strained computing resources and staff.

The xPression software suite consolidated multiple systems, leading to more than $20 million in savings for that firm.

Says Douglas Winter, VP and GM of EMC Document Sciences, "xPression not only makes companies look good to their customers, it actually improves the quality of their customer communications. We help elevate the customer experience." ◇

How it works

xPression is actually a suite of components built around a service-oriented architecture and organized in a layered architecture. It is based on industry standards including the Java Platform Enterprise Edition (Java EE), Java Module System (JMS), XML, Web Services, and the Microsoft .NET framework. Its components help users handle document design, assembly, composition, output processing, and delivery.

Some people call xPression a dynamic content publishing system "on steroids." It links and manages databases and document information to let users create relevant, accurate communications for real-time delivery via print, e-mail, web, or mobile device. Bottom line: xPression really lessens the chance that different internal departments are sending inappropriate or conflicting communications to the same customers.

coming up in the next issue

What is customer loyalty? How does EMC's model work, and how is it distinctive from what other companies do? Read how, at EMC, loyalty is driving metrics for making improvements.

Plus, modeling and simulation: Everyone knows flight simulators train pilots to avoid crashes. But what about doctors performing hands-on simulated surgeries? Meteorologists predicting storm tracks? Civil engineers projecting traffic patterns decades into the future? Epidemiologists spotting disease-spread patterns? The range of military, scientific, and business applications of M&S is staggering. Could it be a new, data-intensive market opportunity for EMC?

EMC.now

INSIDE: What does a virtualized IT world look like? Chuck Hollis explains

EMC.now

Listening for Loyalty

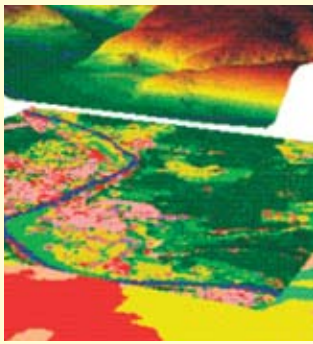
Employees are on a mission to act on customers' needs. And they're getting loyalty-tracking down to a science.

Q2 2009
A QUARTERLY MAGAZINE
FOR THE EMC COMMUNITY
WORLDWIDE

How to mind the future of a mission-critical world

A virtual roadmap to the cloud

Interest in modeling and simulation is accelerating



EMC² where information lives®

editor's desk A labor of loyalty

YOU FIND YOURSELF returning to your favorite, most-trusted hairdresser again and again, even though you must drive farther to do so. You keep faithfully going into Starbucks for your latte or to the Apple Store for your new iPhone, even when cheaper options exist.

You're exhibiting customer loyalty—a behavior that we all display on occasion. But what makes us feel such allegiance? Is it only a matter of the quality of the product or service?

Surprisingly, no ... especially not when it comes to IT customers feeling loyal to their information infrastructure provider. Frank Hauck, EVP of the EMC Storage Division, Global Marketing and Customer Quality, believes that the secret to engendering loyalty from our customers centers on *how easy we make it for them to do business with us*.

His belief is backed up by a dedicated group of employees called the EMC Voice of the Customer team. Led by EMC VP Jim Bampos, they, and the work they do, are the focus of this issue's cover story. These employees are using measurements, including a groundbreaking metric called the Customer Loyalty Index, to anticipate and actually exceed customers' needs and expectations. They are helping EMC to move its customers from satisfaction to loyalty.

This is a very big deal. A 2005 Bain & Co. survey revealed that companies usually misread their markets. Surveying 362 firms, the Bain consultants found that 80% of the firms believed they were delivering a "superior experience" to customers. But Bain surveyed the companies' customers, too. And they found that the customers themselves rated only 8% of the firms as truly delivering a superior experience. The lesson? Keeping customers "satisfied" is easy. Achieving devotion from them is not.

Another fun fact: Loyalty is an indisputable boost to revenue. Industry experts say that for every 10% increase in loyalty, annual revenue jumps 12.5%. Retaining a loyal customer is 10 times less expensive than finding a new customer. And loyal customers are 50% more willing to adopt a company's new technology than non-loyal customers.

As Frank says, "By our definition, customer satisfaction means you've done something well once or twice, and your customer is happy. Customer loyalty means doing it well 50 or 100 times. And if you do it wrong once, you start all over again. Customers who are satisfied might or might not buy from you again. Loyal customers definitely will."

Monya Keane

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features

also inside

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from the tell emc files

THE past quarter's feedback included questions about EMC strategy.

A.G. TELLS EMC: What are the prospects for Content Management and Archiving within EMC?

MARK LEWIS, PRESIDENT, CONTENT MANAGEMENT AND ARCHIVING DIVISION, REPLIES: We're excited about the CMA business because our solutions are addressing key requirements for companies around the world. The CMA division is all about providing policy-based information-centric management and process automation to help customers get maximum leverage from their information. We're focused in two areas: information intelligence and information governance.

Our recently announced SourceOne family of products and solutions changes the game in archiving, e-discovery, and compliance, completely leapfrogging competitive offerings. Attaching policy to information drives efficiency and provides better compliance and management of information, saving companies money in the process.

Our information intelligence solutions, the Documentum-branded products, continue to provide quick, measurable payback. Captiva for document capture, Document Sciences for customer communications management, and the upcoming CenterStage for extended enterprise collaboration are key to our strategy, and we continue to make the Documentum platform easier to use and more robust. We believe CMA's prospects are bright and focused in the right areas.

A.E. TELLS EMC: How will Oracle's recently announced acquisition of Sun affect EMC? In the past, we have been strong partners with Oracle, but given that Sun

Have something to say? If you're inside the EMC firewall, go to: www.channelemc.isus.emc.com/channelemc/Tellemc/toc.asp.

is also a hardware/storage vendor, will our relationship change?

CHUCK HOLLIS, VP AND GLOBAL MARKETING CTO, REPLIES:

I thought I'd offer a consensus view of how these developments are viewed through an EMC lens.

First, it's becoming apparent to many people that the IT industry is consolidating. There will be fewer larger players over time, so in that regard the Oracle/Sun move is not entirely unexpected.

Second, it's also apparent that Oracle may want to be a full-stack IT vendor. Indeed, we've seen Oracle use words around providing complete solutions "from database to disk," and Oracle more recently being very public that it intends to keep Sun's hardware business.

But—stepping back a bit—this is nothing new.

IBM competes by providing a full stack (EMC does pretty well there); HP competes by providing a full stack (EMC does pretty well there as well); system integrators and outsourcers compete by providing a full stack (EMC does well there as well), and so on. If you think back, EMC's entire business was based on being best of breed and competing well against full-line IT vendors.

Will Oracle make some sort of effort to use its database popularity to lock-out other vendors such as EMC? It's not out of the question. But that doesn't mean it's going to work with customers.

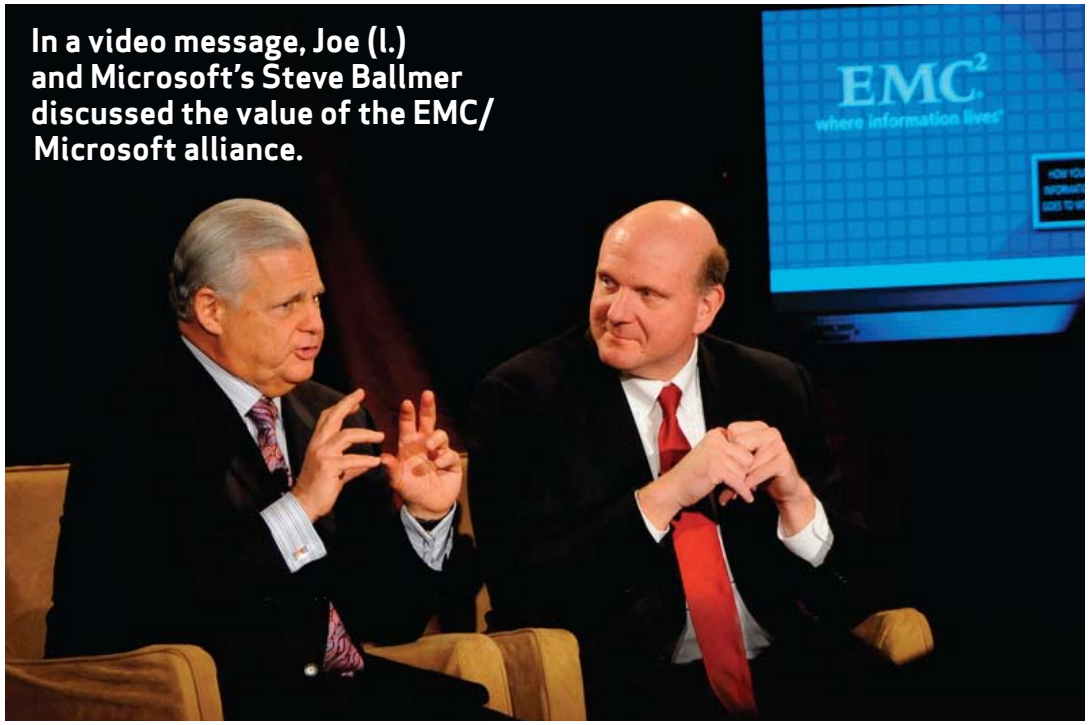
For example, Oracle's two closest competitors (Microsoft with SQL Server and IBM's UDB) offer customers a wide choice of supporting infrastructure. And Oracle customers are accustomed to choosing operating systems, servers, and storage freely to support their Oracle database. Customers are not going to give that up easily!

A more interesting view emerges when you consider the combined Oracle/Sun trying to compete with the likes of IBM and HP. Viewed this way, the combined company is missing some very significant pieces, most notably a large and proficient services arm comparable with HP's EDS or IBM Global Services.

Does this development change the landscape for EMC? Of course it does. Any move this big affects everything else around it. Will we have to react and modify our approaches in certain areas? Of course. That's part of competing in the IT business.

Personally, I'm looking forward to how all this plays out, specifically how the new Oracle/Sun will square off against HP and IBM. You can't say that our business is boring, can you?

recent news Recapping the Q109 achievements of EMC and its people



In a video message, Joe (l.) and Microsoft's Steve Ballmer discussed the value of the EMC/ Microsoft alliance.

At EMC's **STRATEGIC FORUM 2009** in Boston in March, Joe Tucci and VMware President and CEO Paul Maritz explained the long-term vision to more than 100 analysts. Also in March, **EMC** and **CISCO** announced their collaboration on the new Cisco Unified Computing System.

At February's CIO Summit in New York (photo above), Joe and Microsoft CEO **STEVE BALLMER** committed to deeper collaboration to address enterprise customers' needs for server virtualization, content management, and security. They also announced the renewal of the strategic alliance through 2011.

Quarterly earnings

EMC reported first-quarter 2009 consolidated revenue of **$3.15 billion**, a decline of **9.2%** compared with the year-ago period, or **5.7%**, adjusting for impact from currency. First-quarter 2009 GAAP net income was **$194.1 million** or **$0.10** per diluted share, compared with **$251.6 million** or **$0.12** per diluted share for Q108. First-quarter 2009 non-GAAP net income was **$323.7 million** or **$0.16** per diluted share, compared with **$460.1 million** or **$0.22** per diluted share for Q108.

Joe Tucci said, "Within a very tough economy, EMC executed soundly in the first quarter ... We expect IT spending to improve in the second half of 2009. Customers will have better budget visibility [and] be further through their own restructuring programs, and broader stimulus packages should be underway."

AWARDS EMC was the only technology company on FORTUNE's list of the **WORLD'S 10 MOST ADMIRED COMPANIES FOR PRODUCT AND SERVICE QUALITY**. FORTUNE also ranked EMC as an "industry champion" for being the most admired company in its sector for the second consecutive year. EMC ranked #1 in nine attributes including innovation, people management, social responsibility, quality of products and services, and global competitiveness. FORTUNE's Most Admired Companies list is considered the definitive measure of corporate performance and reputation.

Technology analyst firm Frost & Sullivan bestowed a **NORTH AMERICAN PRODUCT LINE STRATEGY OF THE YEAR AWARD** on the EMC Physical Security Solution. Frost & Sullivan presents its best-practice awards to customer-focused companies making outstanding contributions to their industries.

The Great Place to Work Institute named EMC one of the **TOP 50 BEST WORKPLACES IN IRELAND** for 2009. EMC Ireland also received the Outstanding Achievement Award for embracing diversity. The Institute surveys and measures more than 4,000 eligible organizations in Ireland on credibility, respect, fairness, pride, and camaraderie.

Using technology from Microsoft subsidiary **FAST**, EMC Consulting developed a search application in which users grab, move, and launch information using their hands on a screen. For this effort, EMC received a User Experience Solution award at Microsoft's **FASTFORWARD '09 ENTERPRISE SEARCH INNOVATION** awards event.

IN THE U.K., EMC Consulting employees demonstrate how their search application lets users find information using touchpad hand gestures.

TOPS IN TRAINING

EMC received two prestigious awards for its training and development programs for employees, partners, and customers. Corporate University Xchange named EMC University **"BEST OVERALL CORPORATE UNIVERSITY"** over 200 others including the corporate universities of Accenture, KPMG, JetBlue, Infosys, MasterCard, and UBS Investment Bank. EMCU also swept the Alliances, Measurement, Technology, and Marketing categories in this 10th annual competition.

And for the third consecutive year, EMC ranked in the top five on *Training* magazine's list of 125 companies with leading workforce training and development programs.

NEW PARTNER

In Beijing in February, EMC signed a memorandum of understanding with **TRAVELSKY**, the top IT solutions provider for China's airline industry. TravelSky relied on EMC technology to help process almost every airline ticket sold for the 2008 Olympic Games. Under the agreement, EMC is helping TravelSky to reduce operational costs, initiate data center and disaster recovery outsourcing, and become a formal services partner.

NEW BOARD MEMBER

RANDY COWEN, Goldman Sachs' former co-Chief Administrative Officer, Global Head of Technology and Operations, and CIO, has joined EMC's Board of Directors. He serves on the Leadership and Compensation and Mergers and Acquisitions committees.

MILESTONE | In February, EMCers in charge of the Connectrix family of directors and switches celebrated 10 years of product innovation and 100,000 installed systems. The 70 attendees at the Hopkinton ceremony included employees who brought the original Connectrix ED-1032 to market. On display were memorabilia such as the Connectrix business-case proposal, a vintage issue of Sales*Advantage* containing the GA announcement, and a photo of the team with their 1999 President's Award trophy.

PRODUCTS

EMC announced larger-capacity second-generation **ENTERPRISE FLASH DRIVES** for Symmetrix DMX-4 systems. EMC is the only vendor offering Flash technology across a portfolio of high-end and midrange platforms.

New **CELERRA UNIFIED STORAGE** systems with integrated NAS, iSCSI, and Fibre Channel connectivity provide the industry's most comprehensive set of built-in features including file system deduplication and compression, EFDs, VMware tools, file-level retention, and compliance capabilities.

THE EMC CELERRA NS-120 SYSTEM is an affordable, unified storage system that scales to 120 drives.

SUSTAINABILITY

CRO Magazine named EMC to its **100 BEST CORPORATE CITIZENS** list, which ranks Russell 1000 Index companies on performance in environment, governance, and other factors.

EMC Apex Manufacturing is a **"RISING ENVIRONMENTAL STEWARD"** according to the North Carolina Department of Environmental Natural Resources. "We've operated here for more than 25 years, and we're proud of this recognition from the state," says N.C. Operations VP Bob Hawkins.

EMC is sponsoring the **WORLD RESOURCES INSTITUTE'S GREENHOUSE GAS PROTOCOL**, an effort with the World Business Council on Sustainable Development. The protocol is the most widely used accounting tool to understand and manage greenhouse gas emissions.

The Working Mother Experience

EMC published a collection of stories written by EMC women (and one dad) that provides a candid perspective on the challenges of being a working parent in a fast-paced business environment. Ninety-six contributors from 15 countries and five continents provided content. Employees may order a free copy via Literature Express at http://www.overklick.com/marketing_emc/login_smp.aspx/ (Part number H4375; quantities are limited). To download or read the book on emc.com, visit http://www.emc.com/workingmotherexperience.

When customers speak, EMC acts

Hearing voices of loyalty

OUR COLLEAGUES WANT us to hear voices, but not the delusional or supernatural kind.

They want us to hear the voices of customer execs who are seeking faster responses to technical problems ... the voices of data center managers want-

ing simpler maintenance contracts ... the voices of CIOs wishing to collaborate with EMC on technologies for the future.

Every quarter, a group of employees known as the Voice of the Customer (VOC) team taps into thousands of those voices via a unique survey program. The surveys they conduct aren't meant to uncover marketing-related insights. These are customer *loyalty* surveys.

The team uses the results to recommend loyalty-boosting actions that various EMC business divisions can take. Then the VOC team measures how those actions, once implemented, are affecting customer loyalty.

The unique metric they use is called the Customer Loyalty Index. It is part of a groundbreaking multi-year loyalty program to bring about a cultural shift at EMC. Instead of focusing on managing the company from the inside out, people are managing it from the customer in.

That attitude evolved in line with EMC's expanded responsibilities as an information infrastructure provider. "We drove ourselves to be much more consistently customer focused," says Jim Bampos, VP of Information and Quality Management. "We now use metrics to make sure we anticipate and exceed customers' needs and expectations."

On March 16, FORTUNE magazine named EMC to its list of the World's 10 Most Admired Companies for Product/Service Quality. EMC is the only tech company on the list. FORTUNE editors based this recognition on the opinions of surveyed global executives.

SATISFACTION VERSUS LOYALTY

Making sure that customers are happy is definitely not a new concept. Most companies make some kind of effort to gauge customer satisfaction, particularly in economically difficult times. But EMC's customer loyalty effort has several distinguishing features.

First, the program acknowledges that a big difference exists between customer "satisfaction" and customer "loyalty." Jim explains that a customer may be quite satisfied with the way a particular EMC transaction has unfolded, but that satisfaction won't necessarily make the customer feel inclined to repurchase from EMC rather than from a competitor, or even to recommend EMC to other users. Both responses are fundamental components of loyalty.

EMC received a lesson about that distinction in 2004, when it made strides to improve product quality but

didn't get the kind of customer approval it was expecting. Surveys at the time showed customers were very satisfied with EMC's products. But they still gave the company poor grades related to feelings of loyalty.

"We were scratching our heads," Jim says. "We'd provided great products to them. We couldn't figure out why customers weren't seeing us as a single solution to their challenges. Clearly, we weren't understanding the totality of what these customers wanted."

That's when Frank Hauck, EVP of the EMC Storage Division, Global Marketing and Customer Quality, launched the Voice of the Customer team. EMC was already in the midst of a push to be more customer-centric through its Total Customer Experience initiative. TCE helps all employees create the best possible experience for customers in all facets of their interactions with EMC.

TCE, over time, grew to expand beyond a focus on products and features to emphasize non-product attributes that also might create more loyal customers.

But no one had a good way to measure TCE. No one had a way to redirect EMC's customer loyalty strategies. Existing metrics measured product quality.

"We had lots of surveys, but they didn't tell us what we needed," Frank says. "'Satisfaction' was not a good benchmark. We wanted to jump from satisfaction to loyalty. TCE is about the things we do to make people loyal."

Frank asked the VOC team to create consistent metrics that could drive TCE actions and measure results in terms of *customer impact*.

Jim Bampos says that in addition to demanding excellent products and services, customers today are looking to control their IT operational costs by deepening their strategic partnerships with EMC.

THE RIGHT QUESTIONS

Obviously, a new, better survey would be essential. The team first needed to consolidate 27 different customer surveys that various EMC divisions had been conducting in piecemeal fashion.

In those surveys, EMC was asking customers a lot of questions about satisfaction but not tying responses back to metrics, according to Global Accounts Sr. Program Manager Wendy Kane.

The surveys also tended to pose close-ended questions that didn't give EMC insights about why a respondent liked or didn't like something, Frank says.

And the surveys' rankings and method-

ology varied widely. Sr. Program Manager Ed Hardy says, "Some surveys used a 1-5 scale, others, 1-10. We couldn't harvest results in any meaningful way."

With help from a Lean Six Sigma team, the VOC team devised a quarterly customer loyalty survey capable of polling three groups: executives of EMC's 200 largest customers; end-users of EMC's products and services; and representatives of FORTUNE 1000 companies, including non-EMC customers, to gauge EMC's performance against competitors. The survey targets 5,000 people in all.

They're asked multiple questions about their experiences, including some questions customized according to earlier answers. Responses are "mined" for information that can guide TCE.

The survey is the basis for EMC's unique Customer Loyalty Index, or CLI. This index hinges on three questions: (1) Is the customer satisfied overall with EMC's people, products, and services? (2) Is the customer likely to purchase EMC products and services again? (3) Is the customer willing to recommend EMC's products and services?

Customers must answer "yes" to all

Customer Support Management to reinforce loyalty with new program

In the Customer Advancement Program, unveiled by Global Services in April, Customer Support Management team members responsible for EMC's top accounts will meet with targeted customers to talk about issues needing attention. The customers will be chosen with the help of Sales and Global Services teams.

"We want to provide an added dimension to EMC's successful loyalty program," explains Leo Colborne, Global Services SVP. "We'll proactively reach out to these customers to understand where we can improve their experience as they engage with EMC."

The team will forward what it learns from the key customers to a steering committee that is coordinating action plans with the Voice of the Customer program. It also will loop back to customers to provide updates and gauge results.

three questions to be categorized as loyal. The CLI bucks the industry trend of looking at either "satisfaction" or "willingness to recommend." It looks at both, plus intent to repurchase. "We wanted to get the full picture and a real understanding of customer needs," says team member Helen Ham, Lean Six Sigma Black Belt, Enterprise Programs.

Another distinguishing feature of the loyalty program: It is conducted independently of Global Marketing or any other EMC organization. That means survey data won't be accidentally influenced by any particular group's biases or focuses, Jim says.

YOU ASK; WE ACT

The VOC team meets quarterly with every EMC business unit and organization to review survey results. Then the team creates a set of recommendations that become the focus of the quarterly TCE Executive Summit.

Any immediate customer concerns that show up in the surveys—called "hot alerts"—go to relevant business units for immediate action.

This loyalty information is driving changes at EMC. The data is used to set goals for business units and organizations, but in addition, quarterly bonuses to many employees are directly tied to meeting specific customer loyalty metrics related to their area.

Tony Kolish, SVP of Problem Resolution and Escalation Management (PREM) for EMC Global Services, says the loyalty program "has definitely shaped the way we do things in support."

When he took over PREM two years ago, he and his team "were guessing" that a lack of consistency in remote support services was a customer concern. Due to EMC's many acquisitions and expanded product portfolio, too many variations existed relating to service terms and conditions, response times, and sense of urgency in dealing with customer problems.

The loyalty survey confirmed it. Customers wanted us to "get our service act together," Tony says.

PREM set up a tiered system to standardize service practices across the portfolio, clearly defining a process for each customer category. PREM now tracks actions such as the speed with which staff answer phone calls from

"Rather than focusing on advertising and product presentation, [EMC focuses] on assuring relationships, increasing the ease of doing business, and putting resources generally on issues that customer surveys indicate are damaging loyalty. They thus ensure against the risk of competitive displacement."

—Rob Enderle, President and Principal Analyst of the Enderle Group

preferred customers and, of course, how quickly they fix problems. Each quarter, PREM must meet its service-level objectives before its employees receive their bonuses.

Recent loyalty surveys show that PREM's efforts moved the needle in the right direction in terms of making customers happy. "We converted remote support services from dragging down customer loyalty to boosting it and giving us a competitive advantage," Tony says.

In this economy, creating loyal customers is more important than ever, Tony adds. "We've got the opportunity right now to take market share. We're betting we'll see a flight to quality *and* a flight to loyalty."

Loyalty also is an indisputable boost to revenue. Industry experts say that for every 10% increase in loyalty, annual revenue jumps 12.5%. Retaining a loyal customer is 10 times less expensive than finding a new customer. And loyal customers are 50% more willing to adopt a company's new technology than non-loyal customers.

CLIMBING A PYRAMID OF CHALLENGES

As EMC and TCE have evolved in recent years, so too have the challenges related to staying con-

Customers are saying ...

"I HAD NO idea EMC was listening to my successes and concerns as a customer with such a formal program."

"[IT'S] PROOF TCE is working."

"[YOU HAVE] CLEARLY taken product quality seriously as evidenced by your industry-leading reliability and availability, and we see improvements in services."

"LOYALTY IS IMPORTANT for you as a company and me as a customer. The fact that EMC has a formal program that measures loyalty, drives priorities for improvement, and takes action is a differentiator."

"NOT ONLY DOES EMC track the concerns of me as a customer, but you actually measure and goal your organizations?"

nected with—and meeting—customers' needs.

EMC has identified a hierarchical "pyramid" of needs that drive loyalty. Products and services form the pyramid's base, representing the fundamentals of performance and reliability. The middle of the pyramid involves getting customers to elevate their relationship with EMC by focusing on relationship-centric issues of account management (such as consistent communication). The tip of the pyramid, ease of doing business, is how EMC meets customers' tactical needs through factors such as easier technology operation, easy upgrades, straightforward contracts, and adequate support availability.

The initial loyalty survey in 2005 revealed customers who were focused on product quality. They quickly raised their expectation bar.

By 2007, respondents were honing in on both products and services. In 2008 and 2009, Jim notes, customers' priorities embrace an even more complex set of needs. In addition to demanding high-quality products and services, customers are looking to deepen their strategic partnerships with EMC to help control IT operational costs.

EMC's closed-loop customer loyalty model appears to be working well, based on its success in pleasing customers regarding products and services. The team is still working on how best to measure long-term strategic initiatives and partnerships.

CREDIBILITY GAINS

Jim says his team is receiving more requests from other business units for survey information. Customers, too, are pleased that EMC is listening and responding to their feedback.

The loyalty initiative is a hit with industry analysts, one of whom calls it "what may be the most powerful quality program in the technology market."

Steve Bardige, EMC Sr. Director of Analyst Relations, says many analysts who cover EMC realize this isn't just a satisfaction survey under another name. "We track the impact of changes to products and processes through loyalty metrics. For an analyst, that fact separates EMC from competitors who don't have this closed-loop process and are making decisions based on satisfaction surveys and anecdotal information."

Steve deems the loyalty program "critically important to EMC. It has had a profound impact on breaking down internal barriers and on making all of us much more sensitive to customer outcomes." ◆

Next page: Cut hair, grow loyalty >>>>>>>>>>

Cut hair, grow loyalty

Why in the world would any EMC sales rep agree to have the letters "HDS" shaved into his hair? Believe it or not, this is a reflection of the loyalty that his customer feels.

Helsinki-based EMC Account Manager Tommi Keskitalo promised his contacts at Saunalahti, a Finnish mobile phone operator and Internet service provider, a "lifetime entertainment plan" when they bought their first CLARiiON CX500 system.

Four years later, Tommi made another promise. He'd grant permission to defile his hair (temporarily) if Saunalahti purchased a special bundle of Symmetrix DMX-4, Flash drives, CLARiiON CX4-480, CLARiiON CX3, and Avamar. Tommi knew the combined solution would help Saunalahti expand its infrastructure as its own customer base expands.

The customer bought the bundle and sharpened the razor. Behind the camera is Saunalahti team member Juho Kulkas. Cutting Tommi's hair is Saunalahti team member Jussi Silvennoinen. Both gentlemen are valued members of Studio E, EMC's Global Customer Reference Community.

Admittedly, the haircutting exercise was wacky.

But it is an illustration of inventive selling, and it is a wonderful example of how to build a long-lasting relationship with a customer. Humor is a powerful bond.

Tommi, the victim, says, "This customer always teases us about the silly claims that Hitachi Data Systems makes about our storage. That's why my head reads 'HDS.' But really, this is about a responsibility that I take very seriously. It is about going above and beyond for my valued customer. My motto is: 'Never underestimate the bond between customer and account manager.' We are maintaining our external focus and staying closer to our customers than ever before."

EMC counts on insights from its top customers

Your breakfast cereal ... the ATM on the corner ... the airline ticket you bought ... the cellphone that keeps you connected. These things have something significant in common. They all symbolize ways in which the world's largest, most data-intensive companies touch your life.

Those companies have rigorous IT demands, and almost all of them use EMC Symmetrix systems to help support their most important revenue-generating applications. But how does EMC anticipate what kind of storage functionality these customers will be demanding years from now?

It does so by connecting with them on as many levels as possible.

EMC holds frequent Customer Council events exclusively for these high-end customers. It conducts smaller sessions with them on specific technology issues. It holds special executive briefings, sets up one-on-one meetings, maintains daily field contacts, and pursues practically every other thread of communication that might fortify its ties to what is, by any measure, quite a visionary group of storage users.

Using the feedback, the Symmetrix team designs features into a new generation of storage, solving current problems and, hopefully, preventing future ones. (All this communication gives EMC considerable insight into the future trends of the customers' markets.)

Keeping enterprise-scale customers close is what Barry Burke, Chief Strategy Officer for the EMC Storage Division's Symmetrix Product Group, calls the "secret ingredient" to EMC's success in uncovering what the storage technologies of the

future should be.

"We are living with them day in and day out," Barry says. "They spend tens of millions of dollars with us annually, so they have a right to tell us just what they need. The requirements they convey to us are a precursor to what's coming in technology."

STAYING CONNECTED

These are the enterprise customers who helped put EMC on the map decades ago, and EMC has always maintained a close relationship with them. They include FORTUNE 500 banks, securities firms, telcos, broadcast networks, Internet service firms, and transportation, manufacturing, and retail enterprises. Data is mission-critical to these customers. Downtime is unacceptable. Data loss is not an option. Barry hammers that fact home when he points out that, "Our products have carried our customers through major disasters such as 9/11 and Hurricane Katrina. Symmetrix technology has enabled both economies and corporations to get back on their feet more quickly."

Until ten years ago, these customers were EMC's sole market focus. As EMC expanded to serve a much broader information infrastructure market, the Symmetrix team redoubled efforts to make sure it wouldn't lose the close connection to the

ALEX ALMEIDA

CONNECTING WITH THE CUSTOMER: Executives of ACS, a global provider of business process outsourcing and technology, are briefed by Bob Wambach, Sr. Director of Product Marketing for the EMC Storage Division. ACS was in Hopkinton to hear about new EMC offerings including Symmetrix V-Max.

highest of the high end: Not only are they still this company's largest customer segment, but they've kept EMC No. 1 in the enterprise storage market for years, and by a wide margin.

Brian Gallagher, SVP and GM of the Symmetrix Product Group, says keeping these customers happy is important not only to his organization, but also to the company as a whole.

At EMC's Customer Council events, attendees outline their business challenges and priorities, and they tell EMC where they believe IT vendors in general need to partner more closely with them.

Most importantly, the customers get an early view of the ways EMC is proposing to address key requirements. Their feedback has immediate impact on development and design.

As Customer Council events have broadened to represent an ever-expanding range of customers and solutions, EMC's longstanding Symmetrix customers requested a new type of event with Symmetrix as a focal point. Two years ago, the Symmetrix team began hosting customer Technical Advisory Panels (TAPs) just for its users—storage architects and storage administrators.

TAP sessions are deep-dive gatherings in which EMC engineers discuss what EMC is working on relative to what hands-on Symmetrix users want. "The customers taking part in TAP are great because they are not bashful," Brian says. "The feedback we get is unvarnished."

EMC's Symmetrix leadership team has reinstat-

THE MACHINE WITH A VIRTUAL MATRIX ARCHITECTURE

Customers were providing EMC with feedback on these ultra-scalable systems as far back as 2004. Ease of use emerged as a big need, so EMC's employees were determined to make Symmetrix V-Max the easiest enterprise storage array on the market to manage and operate.

ed the Engineering Advocacy Program as well. In it, certain customers are assigned an engineer from EMC who commits to focusing on their technical needs. In turn, the customer's staff participates in EMC residency programs—visiting an EMC lab and training there for 1-2 weeks.

PETER BIXBY

AN ENGINEERING ROUNDTABLE AT THE HOPKINTON EBC: Barry Burke, Chief Strategy Officer for the EMC Storage Division's Symmetrix Product Group, briefs customer executives from the Atlas Consortium/U.K. Ministry of Defence on Symmetrix V-Max and FAST.

Beyond group sessions, EMC's Symmetrix executives make regular visits to top enterprise customers around the world. Each quarter, Bob Wambach, Sr. Director of Product Marketing for the EMC Storage Division, holds many in-person conversations with customers. "There's just no substitute for face time," he says. "That's the thing about the big customers. You want and need to shake their hand and look them in the eye. That effort will make any form of subsequent communication more beneficial."

Bob, Barry, and Brian spend significant time and energy updating customers about what EMC is working on, describing the storage trends EMC is observing, and relaying information about popular best practices in use. In turn, they receive invaluable feedback about whether EMC's product plans are on track.

During the past three years, EMC has significantly increased its communication with high-end

enterprise storage clients. Brian says, "The results have been excellent. We've developed better relationships end to end."

WEIGHING IDEAS

Ideas flowing through all of these customer contact points form the shape of future Symmetrix products years in advance.

In the old days, a handful of EMC Engineering executives determined many of the characteristics of new-generation Symmetrix systems. Now, several cross-functional teams, such as the Innovation Management Team and the Product Planning Team, lead this formalized process. They are composed of Engineering, Development, Manufacturing, and Marketing employees who meet weekly to vet ideas coming from customer feedback and industry and academic sources.

"Ideas actually come to us from *everywhere*," says team member Barry Burke. "We all have our networks of experts, and we get additional ideas from seeing customers' use cases and hearing how their environments are changing. We sometimes even get ideas by listening to wacky, off-the-wall requests that force us to think about what's technologically feasible and what isn't."

Banks and financial institutions with truly enormous information infrastructures provide important input, Barry says, but the team also looks for insights from smaller enterprise accounts that are pushing the envelope of technology use.

He recalls, "At a Customer Council back in 2003, many of EMC's largest customers insisted that they saw no need for thin provisioning. But smaller customers told us virtual provisioning might enable them to consolidate their lower storage tiers onto Symmetrix to drive down costs. That input led directly to the Symmetrix 'in-the-box' tiered storage strategy of today."

The Innovations Management Team turns its insights over to the Product Planning Team, which then figures out what products the Symmetrix organization will develop, and in what timeframe. "Our target is generally three or more years out for

hardware and one to two years for software," Brian says.

Two more teams, the Core Development Team and the Product Management Team, review the execution status of all programs every week. And yet another team meets weekly to make sure the efforts of all the teams are on track to enhance the Total Customer Experience.

"Our record of execution, as a result, has been outstanding," Brian says.

DELIVERING THE FUTURE THEY NEED

Clearly, top enterprise customers have a profound impact on future Symmetrix features.

Several years ago, it was the struggle of these customers to keep pace with ever-expanding amounts of data that helped EMC decide to develop the Virtual Matrix Architecture and the Symmetrix V-Max. That decision, in turn, led to a need for multi-core processors that could handle the increased performance requirements of a virtualized environment while maintaining energy efficiency.

And it was enterprise customers' demand for less-costly and easier-to-use high-end storage technology that led the Symmetrix organization to totally change the way it built its latest storage system, Barry says. Symmetrix V-Max integrates industry-standard components with EMC custom technology to cut manufacturing and maintenance costs. Because customers have been operating their own ever-growing data centers for years and years, ease of use emerged as a big goal for the Symmetrix team. That led to incorporating more automation in the latest system to simplify storage management.

"Customers were telling us, 'I like what you have; it's just too hard to use,'" Barry says. That message, which he considers the single biggest change in customers' priorities in the past several years, sparked EMC's determination to make Symmetrix V-Max the easiest enterprise storage array on the market to manage and operate.

Customers' feedback about needing systems that are flexible but that still provide unparalleled

performance contributed to EMC putting effort into enabling Symmetrix V-Max to scale. With scaling, customers can buy what they need, as they need it.

Through the product development process, enterprise customers provide feedback on everything that is taking shape. They validate what the team has done right, reject what they don't like, and suggest further features that may have been overlooked.

In the case of Symmetrix V-Max, customers provided feedback as early as 2004. In 2006, they did it again, endorsing the scale-out concepts of Symmetrix V-Max as well as some of the policy-based automation concepts of Fully Automated Storage Tiering (FAST). And they validated the Symmetrix V-Max product extensively in 2008.

The road to future products isn't without detours. For example, before the Symmetrix organization decided to use more industry-standard components in V-Max to cut costs, it had pursued a different tactic involving repackaging traditional custom hardware. When the team members realized that this approach wasn't going to shave costs enough to meet customers' demands, they had to make a major course correction.

Solving problems before they occur: EMC is adapting and blending technology to solve future needs while lowering the costs for customers.

The Symmetrix team also finds at times that customers, even the savviest of enterprise customers, don't always know what they want. For instance, Barry says, while enterprise-scale users said they wanted

the ability to do thin provisioning, not all of them actually made use of that functionality when it became available. Instead, he says, they became very happy with the regular allocation process after EMC cut the time needed to set up a terabyte of storage from one hour down to eight minutes. "We must make sure we fully understand what's behind a customer request," Barry says. "In this case, they said 'thin provisioning,' but they really wanted us to make the 'old way' easier."

And sometimes, as in the case of Enterprise Flash Drive technology, customers don't yet know that they need something. Enterprise customers may wave off this much-faster drive technology as an option because they think it's too expensive, Bob says. But when he explains it will save them money, particularly when used with Symmetrix V-Max tiered storage, they change their view. The system's FAST technology, slated for general availability later this year, automatically moves data across storage tiers based on the customer's business and user-access polices. That makes Enterprise Flash an even better fit for large enterprise customers, and it is a good example of how EMC is adapting and blending technology to solve future needs while lowering costs for customers.

"There's a big part of us that is proactive rather than reactive," Bob says. "We spend time looking into the future. Ideally, we solve a future problem before customers realize they'll have that problem."

Translating demanding, high-end customer needs into products that must be planned and developed years in advance is an impressive feat akin to fixing a race car while driving it. "We're driving this car down the road at 90 miles per hour, and we're required to change-out some really important parts," Brian says. "That's because our customers are driving that car down the road, too, and they want the latest and greatest features in it every year."

EMC is determined to keep its pole position in the enterprise storage race by negotiating all the turns ahead with the help of its top customers. ◆

The Santa Clara Innovation Center

Employees create a new link between EMC and customers

(l. to r.) Nandakumar Padmanabhan, Mohit Kshirsagar, Hariharan Kannan, John Masci, Michael Tan (manager), James Wang, and Hong Kwek (director).

Although it's not officially designated as such, the EMC Santa Clara Innovation Center in California is in many ways the R&D arm of EMC's Global Solutions organization. Employees there are developing prototypes and proofs of concept that may turn into EMC Proven Solutions.

It all starts with listening.

Todd Pavone, VP of EMC Global Solutions, says the work underway at this center reminds him of a sales call that he and EMC co-founder Dick Egan made many years ago.

"We were visiting Fleet Bank," Todd recalls. "They asked us how we at EMC come up with such interesting solutions to customers' pain points. Dick told them his secret was 'not to let anyone get between me and my customer.' I believe that Dick was conveying to them that when we listen, then everyone succeeds. When we're told by a customer, 'I wish I could do this or that with your products,' it is an opportunity we just can't ignore."

Projects underway at the Santa Clara Innovation Center flow directly from customers' requests for solutions. Sales and Presales teams can then share with those customers the resulting whitepapers and presentations. Importantly, projects occurring at the center also reach customers in a compelling fashion via Santa Clara Executive Briefing Center (EBC) demonstrations.

The staff of the center understands that technology is worth something only when its users will receive benefits from it.

Some demonstrations absolutely resonate with customers. Those demos then proceed to EMC's Global Solutions Centers for possible development into Proven Solutions. It is an innovate-demonstrate-validate process.

Hong Kwek is the senior director of the Santa Clara Innovation Center. He originally set up the facility in 2006 as a traditional EMC Global Solutions Center to support the Santa Clara EBC. "But my colleague Michael Tan, who is very creative, believed we could use it to offer more than just demos," Hong recalls. "Pretty soon, the team was creating solution prototypes that were as impressive as anything coming out of our labs in Cork or Tokyo."

That got Hong thinking. He says, "Draw a 25-mile circle around our facility's location here in Silicon Valley, and you'll find lots of adventurous companies—companies eager to explore what's possible with IT." Hong transformed the Santa Clara Solutions Center into the Santa Clara Innovation Center in March 2008, and by June, he'd relocated there full-time from Hopkinton.

Innovation Center Architect and Manager Michael Tan says it is important to acknowledge the center's distinctive role. "This is a very specialized form of R&D," he says. "R&D engineers in the IT industry are usually looking outward roughly five years. Our focus is on now, or, at most, a few months from now."

No EMC competitor is operating a facility that does exactly what this one does: combining technology evangelists with a partner- and customer-facing lab "to show customers and partners these integrated solutions that will move data centers forward," Michael says.

It isn't about asking customers to make a potentially disruptive jump to a different technology. Rather, the Innovation Center provides an evolutionary way to introduce revolutionary technologies. The success of the center is measured not by the creation of new products, but by how successfully it integrates existing EMC and partner technologies to address customer needs.

The staff is small; a half-dozen people run the center's two labs. Inside one of those labs, the team builds integrated solutions behind a firewall that permits partners to log-in to work on particular portions of a test environment. In the other lab—the EMC Santa Clara Solutions Center within the Santa Clara EBC—customers and salespeople see demos, proofs-of-concept, and presentations. Both labs make abundant use of software for virtualization, disaster recovery, backup, deduplication, and security, as well as various disk array and interconnect technologies.

"My office is right next door to [Santa Clara EBC Manager] John Morley's," says Michael. "The West Coast EBC plays such a significant role in our success by identifying the right themes, opportunities, and partners for us to work with. The staff at the EBC also keeps us connected with Sales, and they handle

Some examples

Solutions created at the Santa Clara Innovation Center often integrate the most advanced technologies available from EMC and partners. For example, the staff recently worked with employees of EMC Smarts and the EMC SAP Solutions Practice to create a monitoring solution providing a map of an SAP landscape in a virtual infrastructure. It is the first such solution of its kind.

In another project, employees built an infrastructure using servers, fabric, and storage, then applied techniques and technologies to manage and secure it as a virtual data center. That project featured FCoE; Symmetrix V-Max; and RecoverPoint software as well as software from VMware, EMC Smarts, and RSA Security; EMC backup solutions; and EMC Avamar deduplication.

Hariharan Kannan, John Masci, and Nandakumar Padmanabhan at a recent Fibre Channel over Ethernet Virtual Desktop Infrastructure (FCoE VDI) design meeting. To keep things fun during these ultra-technical sessions, John or Hari will occasionally play the guitar.

most customer-facing administrative tasks."

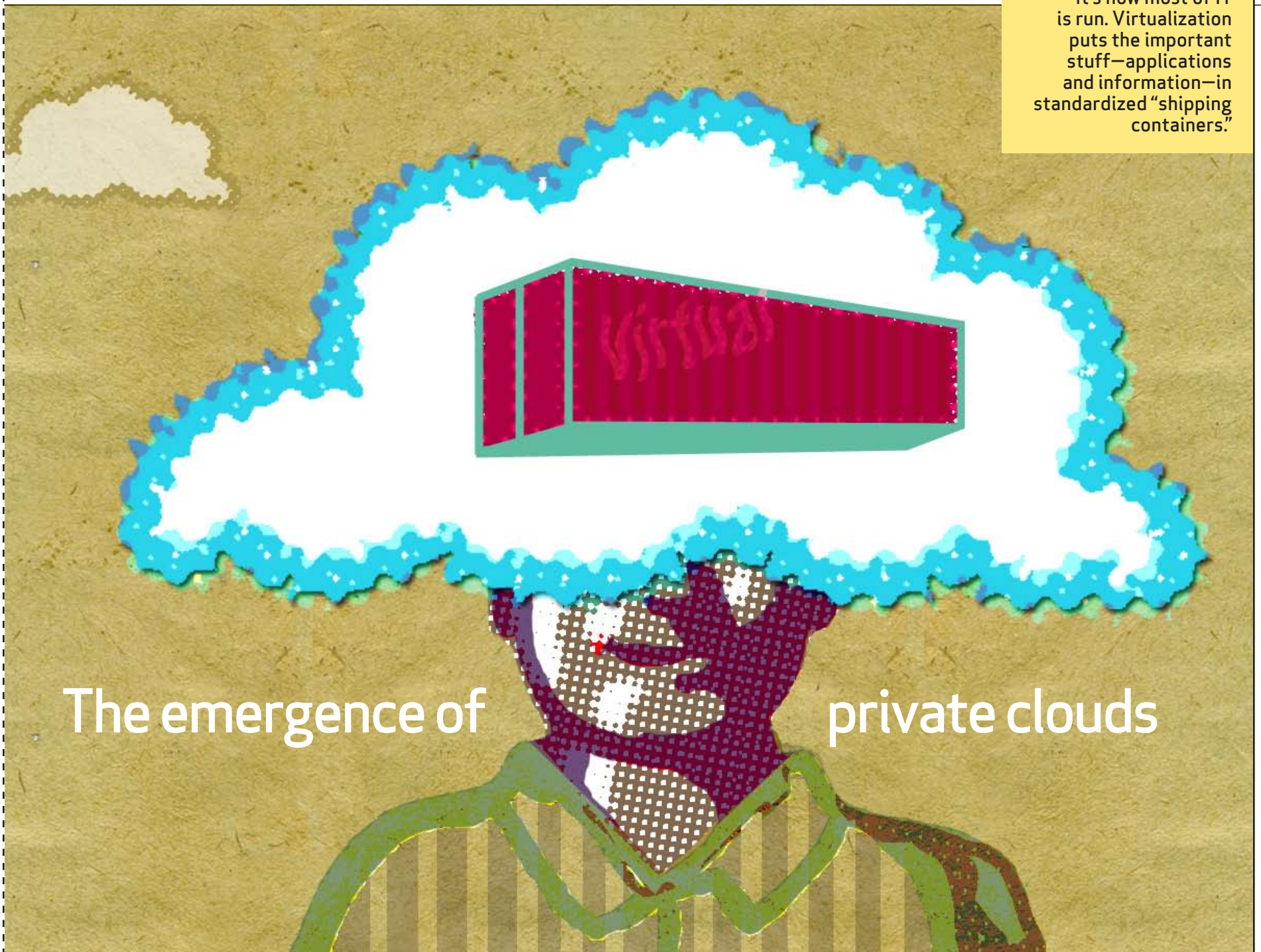
If all of this sounds like an operation of a high-end IT consulting organization, that's not surprising. Most of the people affiliated with the center do come from consulting organizations such as Accenture or IBM Global Services. "We all understand that technology is worth nothing if users can't put it together and receive benefits from it," Michael says. But he and his colleagues also understand that these customers aren't looking to rip and replace. That's where EMC Sales figures into the equation.

Scottsdale, Arizona-based Michael La Fauci is an EMC Technical Business Consultant for the Western Division. He considers the Santa Clara Innovation Center a strategic partner to the Santa Clara EBC. "Ever since we started asking our accounts to go with us to the Santa Clara EBC after it launched a few years ago, we've been quite successful in encouraging the customers to travel there by offering to show them cool stuff," he says. "Now the solution center has become the Innovation Center. And our customers are seeing the emphasis that the staff there place on working with partners to create more sophisticated solutions. One of the first big projects I observed them tackling was virtualizing an SAP environment. If you can virtualize SAP, you can virtualize anything."

Since its inception, the Innovation Center has had a low profile. However, George Cheng of Global Solutions Marketing reports that customers increasingly want to get involved and "every conversation we've had with them has been positive. So we're trying to get word out to our field that the work we do here can be very valuable. We can build and demonstrate to customers a proof of concept in just a few weeks. This shows them that EMC knows how to build solutions." ◆

an enormous opportunity

Could you transport goods without shipping containers, labels, or tracking systems? It's how most of IT is run. Virtualization puts the important stuff—applications and information—in standardized "shipping containers."



The emergence of private clouds

DAVID FLAHERTY

By Chuck Hollis | I've worked in the IT industry my whole professional life, and I can point to major inflection points that changed everything from that point onward. Maybe it wasn't obvious just how important something was when I first saw it, but—before long—it would be.

I got my hands on my first microprocessor-based computer when I was still in grade school. I remember thinking, "Gee, it won't be too long before everyone's going to have one of these things."

Early in my career, an engineer showed me how he could log onto another computer using something called "the Internet." Again, I had to take a moment and think about the implications of a world where every computer could talk to every other computer.

Virtualization is one of those evolutionary steps in IT. Like the Internet, it changes everything.

On March 10, Joe Tucci and Paul Maritz both spoke publicly for the first time about how virtualization is poised to change the very nature of enterprise IT and essentially turn it into a service. They committed EMC and VMware to a new strategy to accelerate this change.

For employees and participants in the IT industry, this is the next transformative event. It's the real deal. I consider myself extremely fortunate to be working for the company that's going to change everything in IT in the next few years. These chances don't come along very often!

So, what's the big deal? Simply put, virtualization puts the important stuff—applications and information—in standardized "shipping containers." It does this not only for applications running in data centers, but desktop experiences as well.

Imagine trying to ship a bunch of stuff without shipping containers, labels, tracking systems, etc.

LEAH FASTEN

Chuck Hollis, VP and Global Marketing CTO, speaks frequently to customer and industry audiences about technology topics and is considered one of the enterprise IT industry's top bloggers. http://chucksblog.emc.com/

It'd be horribly inefficient. Unfortunately, that's how most of IT is run these days.

In recent years, IT organizations have put applications and information into "virtual containers" using VMware and are seeing how much more efficient things can be. Now they're feeling ready for the next step. And it's when the big changes will start.

The first big change is that enterprise IT can start running IT infrastructure as a giant pool of resources. (Today, it's largely one application to one server, which is horribly inefficient.) In a fully virtualized model, all resources are pooled—servers, network, storage. Applications take what resources they need and give back what they don't.

You'll hear people describe this as a "virtualized data center" or perhaps an "internal cloud."

From an EMC perspective, this change alone presents enormous opportunity. For example, storage must be designed and managed differently. New requirements arise for information management products that handle backup, archiving, and business continuity. New tools and processes are required to plan and manage IT resources and ensure information security. From a services perspective, these environments are built and operated entirely differently than today.

There are enormous implied changes for every EMC product and service if you think about it. For example, many EMC products require a dedicated pair of servers. Being able to run that software in virtual containers would bring enormous advantages to our customers and to us.

How much more efficient is the new way compared with the old? The potential is breathtaking—capital and operational costs might be only 30-50% of what customers spend today.

Now, if your IT shop is spending $1 million a year running IT infrastructure, the potential of saving $700,000 per year is attractive. But if your IT shop is spending *$1 billion* a year running IT infrastructure, the prospect of saving $700 million just can't be ignored—period.

The bigger your IT shop, the more compelled you'll be to make this transition sooner than later, especially if the economy isn't doing so well.

This change alone could be enough to get everyone in IT excited. But another aspect could turn how we think about enterprise IT entirely on its head.

Let's go back to our shipping container example. Consider, for a moment, that you can ship stuff without needing to own any trucks, airplanes, or trains, but you'll still know where your stuff might

be or when it's going to get there.

The same will be true in the fully virtualized IT world. When you put important stuff (applications and information) in a virtual container, you don't have to own the plumbing. You could ship your applications to a compatible service provider if you wanted—or take them back again if things change.

If you're an enterprise IT shop, you've got important choices to make about how much IT infrastructure you'd like to own, and how much you'd like to rent.

This isn't true only for server applications; it's true for desktop devices. Imagine being able to use any desktop device, anywhere, any time, and get the exact same user experience with your applications and your files—maybe even your overgrown cellphone—just there!

EMC and other vendors have started to use the term "private cloud" to describe this new model. All applications, desktops, and information live in virtual containers. Enterprise IT organizations can choose either to pool their owned IT assets or federate with external service providers.

If you're an outsourcer, service provider, or telco, you can easily see an enormous opportunity to set up compatible infrastructure—based on virtualization—to meet the needs of these new customers. If you're a systems integrator or consultant, you see an enormous opportunity to help your clients get from the old world to the new one sooner.

The more you think about it, the more excited you get.

Joe and Paul have now publicly committed EMC and VMware to this vision. They also identified Cisco as a key partner in this journey. If you think about it, the network starts to play an even more significant role now, and Cisco has recently entered the market for server infrastructure designed for this new world.

Some long-term implications exist about where IT spending will flow over time. Clouds in general—private clouds specifically—get more efficient the bigger they are. Over time, I wouldn't be surprised if more midmarket IT customers end up preferring to rent IT infrastructure capacity from a service provider or telco, rather than own those servers, networks, and storage.

Is this private cloud model really new? Yes and no. It's new to IT but not to other forms of infrastructure. This model is how we use telephones, how we power homes and factories, how we ship products globally. The transformation of infrastructure into a service is finally catching up to IT. That's pretty exciting! ◆

EMC'S FUTURE

Change just two words in a classic Rolling Stones song, and you have EMC's vision for the future. "Hey, you, get onto my cloud."

A virtual roadmap to the cloud

EMC's future: A virtual roadmap to the cloud

AT ITS HEART, EMC is a technology company with a singular focus on information infrastructure and virtual infrastructure—a strategy that helps companies manage their most valuable asset, their information, by helping them store it, protect it, and make it available when and where it is needed.

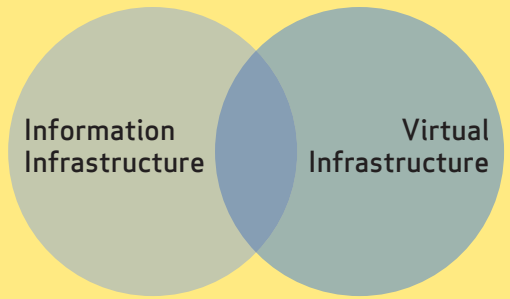
EMC has spent about $7 billion acquiring technology companies over the past six years to strengthen the information infrastructure strategy umbrella. Combined with the roughly 12% of revenue it invests every year in R&D, obviously, the company is focused on coming up with great technology.

"Every company needs a compass," President and CEO Joe Tucci told attendees at the EMC Strategic Forum for Institutional Investors in March. "EMC is a technology company. That has been and will continue to be EMC's focus."

With the pace of change in the technology industry and the slowdown in the economy, EMC views its disciplined focus—its compass—as a key competitive advantage.

EMC's future, though, is in the clouds and cloud computing: a world where data centers will become highly virtualized and users who might be anywhere, on any device, will still have full access

EMC'S TWO REINFORCING CORE STRATEGIES



THE NEXT BIG THINGS IN IT

- Virtual Data Center
- Cloud Computing
- Virtual Clients
- Virtual Applications

CUSTOMERS' STORAGE-RELATED SPENDING PRIORITIES

- Storage consolidation/utilization
- Business continuity
- Backup to disk
- Data deduplication
- Compression

to their information and applications. This information-centric strategy lets organizations spend their time focusing on deploying applications, not wasting time managing the plumbing.

In a cloud environment, you can choose to own or rent IT infrastructure. You provision a workload. When that workload needs resources, they flow down from the cloud. For example, a major retailer might need more resources just before the holidays. Those additional resources come down from the cloud when needed, and only when needed.

It is a more efficient, lower-cost system.

"EMC is a technology company. That has been and will continue to be our focus." —Joe Tucci

INFORMATION GROWTH DRIVING STORAGE NEEDS

More than ever before, cost-efficient, always-available storage is one of EMC's winning strategies, and with good reason.

Despite the global economic downturn, the amount of data worldwide continues to grow. In fact, a new EMC-commissioned IDC study titled "As the Economy Contracts, the Digital Universe Expands" reveals that the amount of information created and replicated worldwide in 2008 grew 3% faster (by 16 million gigabytes) compared with IDC's prior projection. IDC now expects the Digital Universe to double in size every 18 months. In 2012, people and organizations will create five times as much digital information as they did in 2008.

So, storage needs continue to grow, with a number of issues at top-of-mind for customers' IT departments. Those hot-button issues include:

- Storage consolidation and utilization
- Business continuity
- Backup to disk
- Data deduplication

Perhaps the most significant development in storage during the past year has been the introduction of Enterprise Flash Drive technology. Joe has called it the single biggest advance in the industry since the invention of the disk itself. Flash drives offer more performance for less space and power than traditional spinning disk can provide. One key to Flash's success has been EMC's effort to champion the widespread adoption of Flash

Navigating a turbulent economy

In an environment where both global IT spending and the global gross domestic product continue to decline, many customers have instituted "just-in-time, just-enough" IT budgets, posing a possible threat to growth for a technology company like EMC. But the company's unfailing focus on customers and on helping them save money and maximize resources is allowing it to continue to thrive through the current period of "turbulence."

EMC has established seven principles to guide it through 2009:

1. Maintain external focus—staying closer to customers than ever
2. Gain significant market share
3. Retain, attract, and develop key talent (selectively)
4. Institute sharper discipline on costs and preserve cash
5. Sustain and deepen the product technology edge
6. Use an opportunistic merger and acquisition strategy to strengthen EMC's competitive position
7. Communicate, communicate, communicate—internally and externally

By focusing on these principles, EMC will help customers address needs that currently top many companies' lists, including:

- Meeting tight/reduced budgets
- Saving money
- Implementing important strategic initiatives
- Attaining faster return on investment
- Preparing for the next-generation data center/technology revolution

technology to bring down its cost. Flash technology is available across the EMC storage product line.

The new technologies and developments should ensure that EMC can provide customers with cost-effective, high-performance solutions for ensuring that stored information is safe and always available.

TRENDING TOWARD THE FUTURE

SECURITY: Within a cloud computing world, it's going to be doubly important to make sure that the person asking for information is indeed a person entitled to that information.

The RSA Security System lets customers participate in a centralized policy management system. The infrastructure will make decisions based on risk or trust. It enforces controls transparently, triggered by risk.

CONTENT MANAGEMENT: More than 90% of information is now unstructured or semi-structured; it doesn't fit neatly in rows or columns or entry-record fields of a database. To help organizations that are having trouble managing such data, EMC's strategy is to build another layer of metadata information—to add a layer of intelligence on top of the data. EMC will have frameworks for different industries and different workloads.

Information typically sits in a lot of repositories, for example, in a database repository, a content management repository, or an XML file. It's a bad idea to take all that data and dump it into a new database. That decision would be too expensive and time consuming. The answer is going to be to federate multiple repositories with the new true management layer—the policy management, metadata management layer—on top of that.

COMPLIANCE: To minimize risk from an information governance perspective, companies need to comply with hundreds, sometimes thousands, of regulations. Compliance is another opportunity for EMC. EMC can help organizations ensure that e-discovery and compliance are built into their information governance activities and then deliver and enforce the same processes for archiving regardless of platform.

The most efficient, cost-effective way for customers to intelligently access data will be to virtualize their current and future workloads.

THE INTELLIGENT PATH TO THE CLOUD IS VIRTUALIZATION

At the heart of an efficient, available and intelligent information infrastructure is virtualization. The key is virtualization with VMware technology. The most efficient, cost-effective way for customers to intelligently access data will be to virtualize their current and future workloads.

The data centers of today are already turning into virtual data centers. Soon, all applications will be contained and managed from an intelligent virtual "container." It will allow users to be anywhere, on any device, and still have full access to their information and solutions. ◆

Interest in **modeling** and **simulation** is accelerating. Does this bode well for EMC?

Practically the real thing

FOR DECADES, MILITARIES have used computers to solve theoretical problems that have very real life-or-death consequences. The first large-scale modeling and simulation deployment occurred during the Manhattan Project in World War II, when scientists modeled the process of nuclear detonation.

The Pentagon is still the world's biggest modeling and simulation (M&S) player. But starting in the 1990s, more powerful processors and advanced software made it possible to expand these efforts far and wide. While not a replacement for human intelligence, M&S is invaluable and is moving deeper into government, education, public policy, medicine, and many other areas.

As the power of computer systems increased and the quality of graphics improved, M&S capabilities grew. Gartner VP and Fellow Steve Prentice says, "It is a serious and sensible option, and we

will see more of it."

EMC Business Development Manager David Budd points out that M&S applications also are really taking off now because "the economics have changed." For example, using accessible, now-more-affordable M&S tools, a surgeon can model a patient prior to surgery by combining individual risk factors, then can proceed to simulate the surgery based on that data. Risks are reduced; results are improved.

Dr. Juan Montero is a retired thoracic surgeon and a consultant to EMC's healthcare business

What is M&S?

The holodeck in the popular science-fiction television series *Star Trek* is a thing of wonder, manifesting dynamic environments that crew members immerse themselves in as if they are really "there."

Believe it or not, similarly realistic simulations are today being used here on Earth, for example, to prepare soldiers for the battlefield at a fraction of the cost of exercises involving real tanks or aircraft. Simulation software also can mimic the operation of banks and retail stores, predict the value of stock portfolios over time, and foretell the running of everything from factory assembly lines to hospital surgical suites.

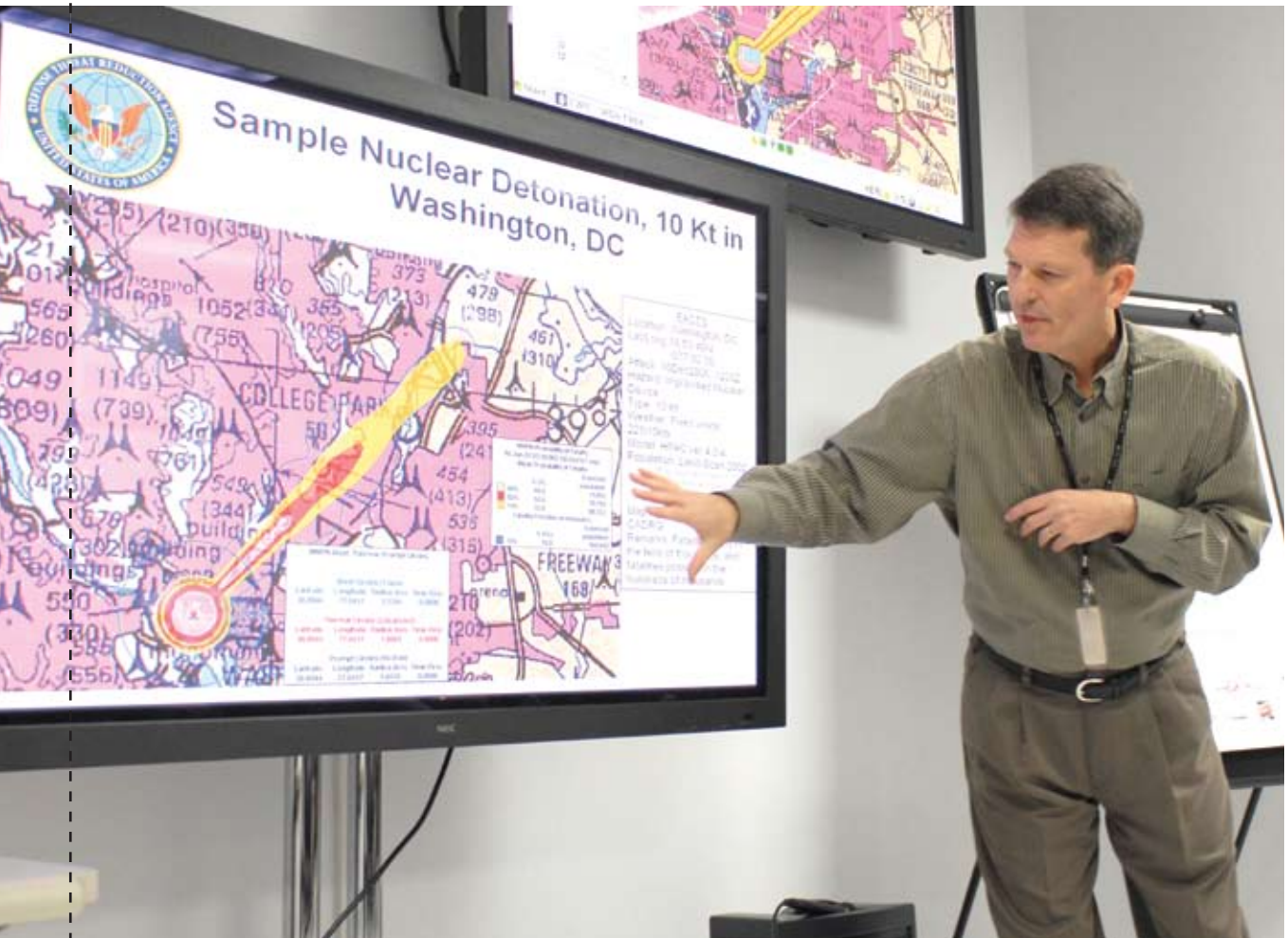
Imagine you're the designer of a new type of network switch. To help it succeed in a competitive market, you must design the switch to yield the highest possible performance at the lowest manufacturing cost. How much memory should you build in? Should you associate that memory with incoming communication links to buffer messages as they arrive, or associate it with outgoing links to hold messages competing to use the same link? And what is the optimum hardware component layout to facilitate mass production? M&S will enable you to answer those questions and others.

You may not be doing your engineering work onboard the Starship Enterprise, but even today, you can safely play out real-world "what-if" scenarios in a pretend world of your own.

(Adapted from an essay by Dr. Hossein Arsham, Wright Distinguished Research Professor, Merrick School of Business, University of Baltimore.)

unit. He says the American College of Surgeons "has already stated quite bluntly that the future of surgery is in simulation."

M&S is storage intensive, and it dovetails with EMC's content management strategy because the techniques often require very rapid access to huge repositories of unstructured data. "Adopting M&S requires users to store all that information. And, at least for the medical applications of M&S, those users must comply with HIPAA requirements, too,"

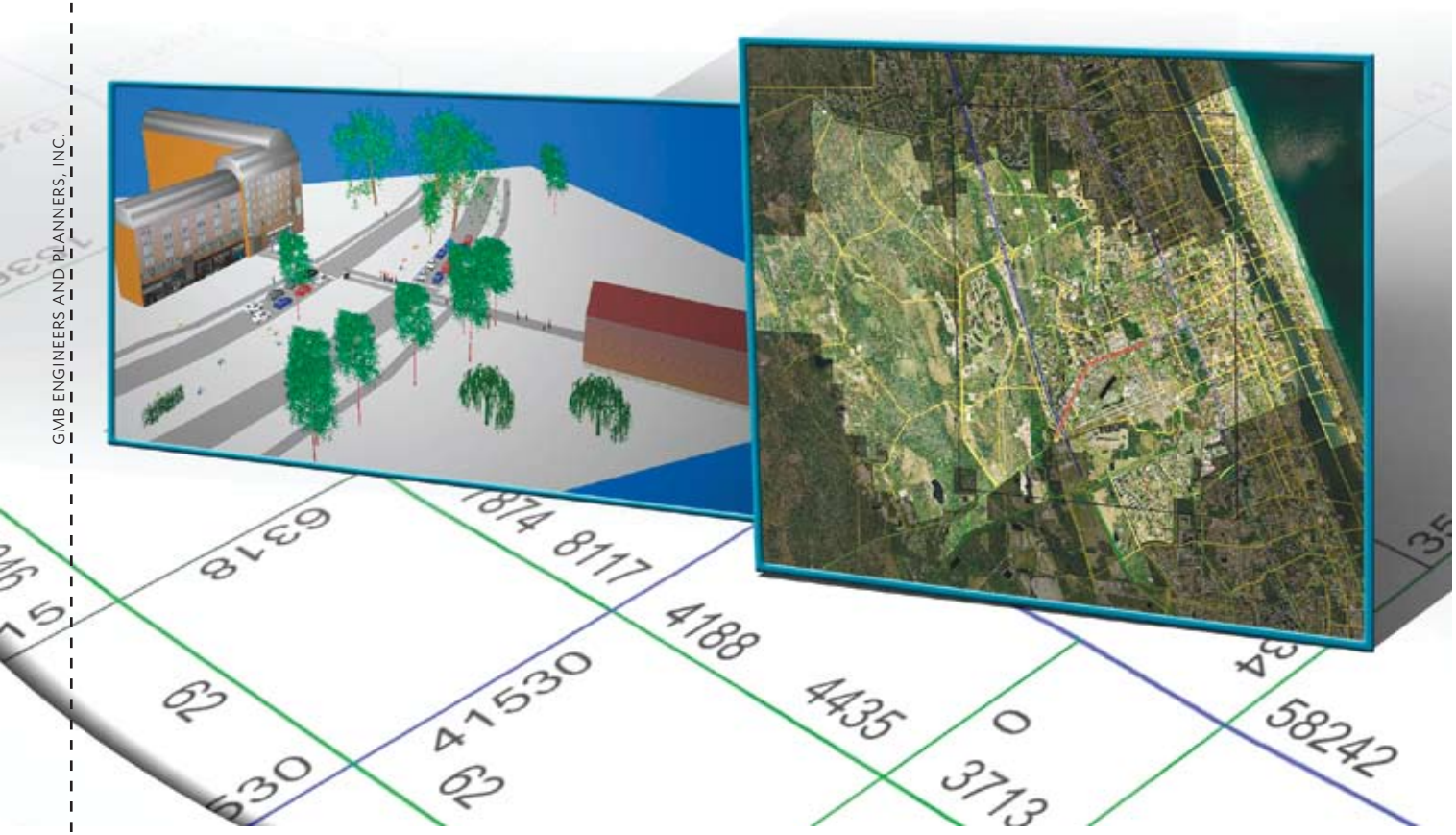


HOMELAND DEFENSE DEMONSTRATION HOSTED BY THE U.S. JOINT FORCES COMMAND'S JOINT FUTURES LAB: *USJFCOM Sr. Systems Analyst Steven Bixler explains how M&S is helping first responders and other officials prepare for a catastrophe caused by an improvised nuclear device.*

David says. "EMC can supply the storage and the full information infrastructure."

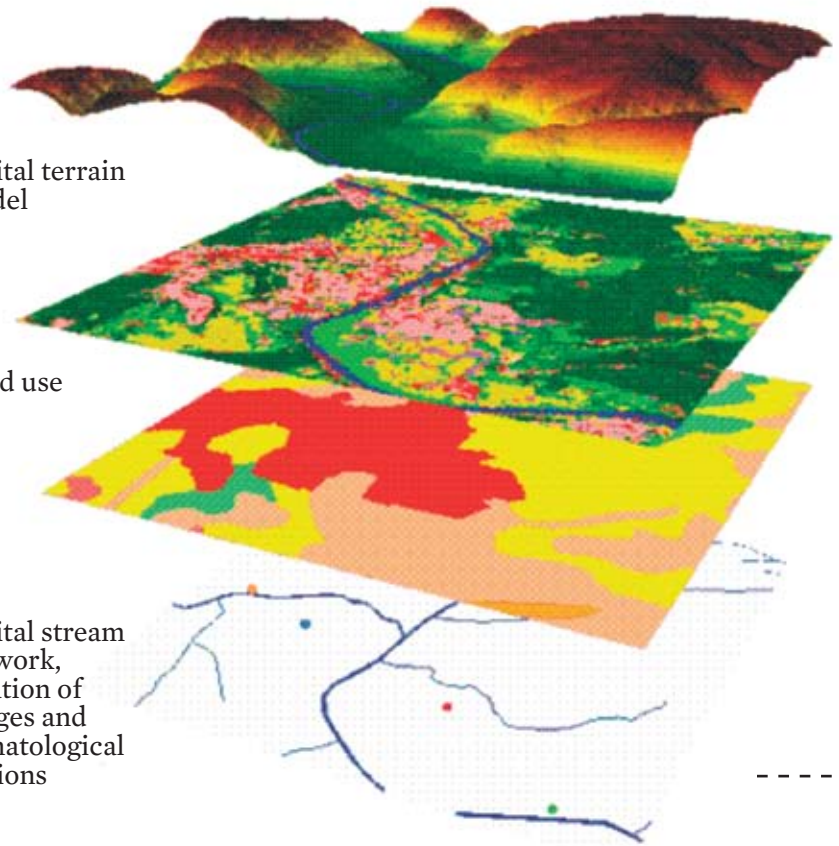
VIRGINIA BECOMING AN M&S HUB

You can enjoy a glimpse of the future of M&S at the Virginia Modeling, Analysis, and Simulation Center (VMASC) at Old Dominion University, where a CLARiiON system is a vital player. According to VMASC Executive Director Dr. Michael McGinnis, the center started in 1997 after a two-year brainstorming period in conjunction with a decision by the U.S. Department of Defense to

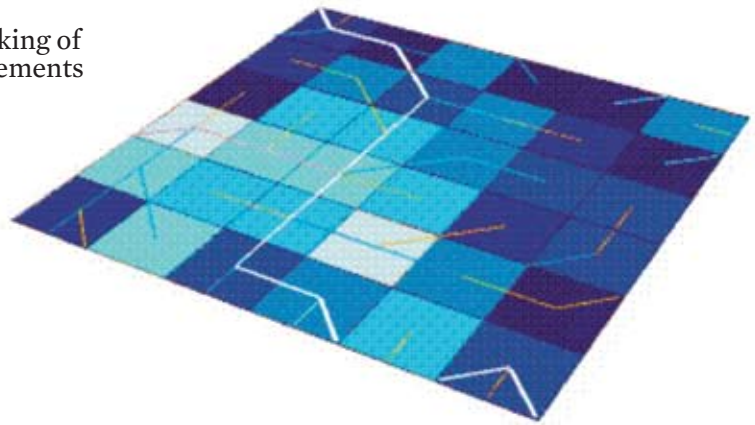


GMB ENGINEERS AND PLANNERS, INC.

ON THE VERGE OF BREAKING OUT OF THE DEFENSE INDUSTRY *and into the everyday lives of people, M&S imaging processes can be used, for instance, to help predict traffic patterns near shopping malls or conference centers prior to construction.*



- Digital terrain model
- Land use
- Digital stream network, location of gauges and climatological stations



- Crosslinking of raster elements

RISIKOMANAGEMENT EXTREMER HOCHWASSERE REIGNISSE (RIMAX)

establish the Joint Forces Command in Norfolk, Virginia.

The center's staff began providing engineering and various other student-faculty services to the DoD. Those services remained their main focus until 2006, when, Dr. McGinnis says, "We decided to look at the future of M&S" and create several clusters of emphasis: military/homeland security, medical, transportation, social science, computation/artificial intelligence, game-based learning, and enterprise engineering.

VMASC now employs 75 people whose research has been spawning more private-sector work throughout the area. Today, M&S projects at VMASC and other local employers cover areas

IN A LARGE AREA RUNOFF SIMULATION MODEL, *scientists combine rainfall, snowfall, evaporation, and water runoff levels with ground slope models. The results help them gauge the potential for destructive flash-flooding events in regions such as Baden-Württemberg in Germany, where rainwater catchment basins rise rapidly.*

such as supply chain and inventory, distribution and warehousing, education, medicine, homeland security, and transportation. VMASC has pursued research projects examining large-scale civil-evacuation situations, general road usage and capacity planning, and other multidimensional issues. "As we grow, we hope to attract to our region more companies that want to focus on M&S for solving problems," Dr. McGinnis says.

GETTING AHEAD OF THE TRAFFIC JAM

The Commonwealth of Virginia's automobile traffic models used to have only rudimentary analytical capabilities. Today, VMASC (and CLARiiON) host a modeling environment encompassing not only streets, but also railroad transportation hubs, cargo handling, and a multitude of variables about the people using those systems.

VMASC helped Virginia weigh alternatives

ADVISING POLICY MAKERS

"M&S represents a great opportunity for EMC to assist with economic development," Doug Cornell reports. (l. to r.): Doug Cornell of EMC, U.S. Congressman Randy Forbes, Dr. Juan Montero of Old Dominion University, and Dave Budd of EMC.

Some of the many uses of M&S

- Analyzing air pollutant dispersion
- Designing aircraft, factories, and refineries
- Creating barriers for roadway noise mitigation
- Training pilots
- Educating military personnel to interact with Afghan and Iraqi village elders
- Forecasting weather
- Limiting animals harmed in product-toxicity testing
- Predicting financial market activity
- Analyzing the behavior of buildings or industrial parts under structural stress
- Engineering traffic patterns for new or re-planned roads
- Modeling car crashes to test safety mechanisms of new vehicles

Take a look at M&S in a nutshell, courtesy of this VMASC video: http://www.youtube.com/watch?v=-tRKIb0KFUA

for allocating $8-10 billion dollars in anticipated transportation funding over the next 20-25 years. Dr. McGinnis says, "We incorporated population dynamics and social networking to model the use of 30,000 road segments, including identifying the potential benefits of the alternatives we're recommending."

Dr. McGinnis and his staff want to see this phenomenon grow, and certainly, M&S seems to be the right solution at the right time.

EMCers now involved in the effort also want to expand it. According to Account Manager Doug Cornell, M&S represents a great chance for EMC employees who are based near Virginia to assist with their area's economic development.

Gartner's Steve Prentice says, "What I see at the moment is the whole spectrum and whole concept of serious games and simulations, all improving by leaps and bounds. In some cases, these options would have been dismissed 6-9 months ago. But now, with our economic situation, we have no alternative but to consider them." ◆

Next page: The future of M&S >>>>>>>>>>

A simulating future

M&S bloomed most spectacularly near Washington, D.C., not far from the military command centers that first propelled its development. Now, with the help of Congressman Randy Forbes (R-Va.), Congressman Bobby Scott (D-Va.), and former Congresswoman Thelma Drake (R-Va.), the technology can grow further.

M&S-related language was included in H.R. 4137, the Higher Education Opportunity Act, which passed a House vote on July 31, 2008, and became law less than a month later. It provides competitive grants to encourage the study of M&S at institutions of higher education across the United States.

Few universities now have such programs; the bill provides funding for those hoping to establish or expand them.

"The traditional typecasting of simulation training as a defense industry tool is being broken," Rep. Forbes says. "Myriad industries have not only caught on to M&S, but also have tailored it to make it work for them."

The healthcare industry in particular is embracing M&S. The result has been money—and lives—saved. In recent years, for instance, researchers have simulated the efficacy of drugs for treating life-altering diseases like HIV.

In the realm of homeland security, Rep. Forbes says M&S allows federal, state, and local emergency responders to undergo realistic training for hurricanes, tornadoes, flooding, and flu outbreaks.

In February, the 4th Annual Modeling and Simulation Leadership Summit, hosted by the National Training and Simulation Association and the Congressional Modeling and Simulation Caucus, was held in Norfolk, Virginia. It brought together leaders from government, industry, and academia to advise policy makers on issues related to the M&S industry. The event highlighted regional initiatives and focused on using M&S to accelerate economic recovery and re-establish scientific, technological, and industrial leadership in the United States.

"M&S is a technology that provides unparalleled advancements in American competitiveness and brings high-tech jobs and economic prosperity to our communities," says Rep. Forbes. "I founded the Congressional Modeling and Simulation Caucus to raise awareness of this industry by showcasing initiatives and serving as a forum to understand the policy challenges facing this important, growing, versatile technology."

Rep. Forbes hopes the initiative will help to create up to 50,000 jobs in the Tidewater region of Virginia alone.

RECORD-SHATTERING performance proves the mettle of Documentum 6.5

Largest-ever benchmark

IN NOVEMBER 2008, a Content Management and Archiving (CMA) team set out to prove that EMC's Documentum 6.5 Content Management platform can handle anything a major enterprise can dish out. They weren't aiming high. They were shooting for the stratosphere. Working with staff from EMC partner Microsoft and competitor HP, these performance engineers would show that the new platform manages complex transactions from a vast number of users over an extended time.

It's messy; it's confusing, but this initial configuration diagram germinated the world's largest-ever ECM benchmark.

Largest-ever benchmark

The torture test they designed became the largest enterprise content management (ECM) benchmark of its kind.

100,000 USERS

To prove performance and scalability, IT vendors conduct benchmark tests simulating conditions in a typical enterprise. Benchmarks help ensure that a product will stand up to pressure.

In early 2008, before Documentum 6.5 launched, the team had conducted a much smaller platform benchmark simulating 4,000 users. After months of subsequent fine-tuning, they would now subject it to 12 continuous hours of processing transactions from 100,000 simulated users. "FileNet [now part of IBM] ran an ECM benchmark of 7,000 users. That one was the largest we knew of, until ours," says CMA Performance Engineer

The EMC/Microsoft team gathers in Redmond (l. to r.): Surdeep Sharma (Microsoft), Pat Kirby (EMC), Vishnu Badikol (EMC), Joseph Isenhour (Microsoft), and Gordon Newman (EMC).

Patrick Kirby.

Patrick and his colleagues also knew they'd have to prove Documentum 6.5 (sp1) handles complex transactions. "Benchmarks often simulate simple activities, such as page-views, which won't strain the platform," explains CMA Performance Engineer Vishnu Badikol. "We wanted to establish that 6.5 handles all the transactions that real users make."

The benchmark simulated eight business processes: log-on, check-in, check-out, importing, inbox tasks, navigation, subscribing, and log-out. The team would stress the platform with those processes for hours.

"We wanted to prove the platform's performance, reliability, *and* sustainability," says CMA Performance Team Manager Gordon Newman. "So, it had to withstand pressure not for the one- or two-hour duration you'd see in a typical benchmark, but for 12 hours. Most large businesses operate in multiple time zones, so we were representing a real business day."

IT TAKES A TEAM

Making ambition reality involved help from friends at Microsoft and the HP server division. HP supplied an Integrity Superdome server running Microsoft Windows Server 2008 and SQL Server 2008, as well as 48 blade servers to simulate the 100,000 users' workloads. Microsoft hosted the test at its Enterprise Engineering Center (EEC) in Redmond, Washington.

"This test is just what we built EEC to do," says Joseph Isenhour, Microsoft EEC Program Manager. "Our state-of-the-art servers and networking equipment replicate customers' environments very well. And we use EMC CLARiiON here, so we were in familiar territory." A 22-terabyte CLARiiON CX3-80 system supported the test.

Planning lasted five months. Team members held many conference calls that "geared us up to nonstop action," Patrick says.

One week before the event, Gordon, Pat, and Vishnu traveled to Redmond. Of course, a few obstacles cropped up: A major snowstorm kept key people away during a critical setup period, forcing them to perform tasks remotely. An odd equipment outage also resulted in a data-recovery timeout.

But in the end, something amazing occurred. The platform performed 750,000 transactions hourly, totaling 9 million during the sustained 12-hour test. Says Vishnu, "We proved it. Documentum 6.5 handles the strains of real business." ◆

coming up in the next issue

The EMC Innovation Network is expanding its research collaboration: To conduct great IT research for EMC, you need a large research vision—and a way to connect with the many advanced technology and research groups already in place. The researchers who participate in the EMC Innovation Network may not be delivering near-term products or closing deals, but they are definitely providing some valuable insights to those who do.

Plus, what's going on with EMC in the emerging markets of Eastern Europe? Slovakia, Slovenia, Romania, Albania, Croatia, Serbia, Montenegro, Macedonia, Bosnia and Herzegovina, Bulgaria, the Balkans ... EMC is in all of those places. Why? Because even with a global economic recession in full swing, all of those places are investing.

INSIDE: Look there! EMC adds a new option to its e-conferencing toolbelt.

EMC.now

Meet the introducers

Are Burt Kaliski and Rob Masson trying to disrupt EMC's business model—by helping it to uncover things that nobody has even *thought of* yet?

Q3 2009
A QUARTERLY MAGAZINE FOR THE EMC COMMUNITY WORLDWIDE

EMC²
where information lives®

editor's desk Getting innovative about innovation

A few months ago, colleagues alerted me to two eye-catching headlines: "IBM Throws $100 Million at Mobile" on GigaOM.com, and "H-P Throws More Cash at Scientists" on WSJ.com.

With the headlines came a question: Is IT innovation growing ever-more expensive?

According to conventional wisdom, conducting the most advanced forms of far-reaching technology research does first require throwing a lot of cash at a corporate laboratory or think-tank. You know the places I mean—those impressive standalone technology-creation centers sited on landscaped campuses that, for decades, have unleashed upon us the transistor, the laser printer, Ethernet networking, the graphical user interface, the computer mouse, fiber-optic systems, and a thousand other game-changing technologies.

But at EMC, some advanced IT thinkers are proving that being innovative doesn't have to cost millions. These employees have been creating a research program that finds, shares, and creates knowledge without a lot of cash.

In this issue's cover story, you'll learn how the EMC Innovation Network is becoming a true IT research function for the 21st century—members are investing in academic partnerships and are using social networking to structure linkages throughout EMC and beyond it.

In doing so, they are creating a work-benefit/career-development engine for a lot of EMC people, they are fulfilling a competitive necessity, and they are likely shaping customers' perceptions of EMC in some very nice ways.

EMC operates in dozens of countries, many of them with cities boasting renowned technology-research or university districts. An innovation infrastructure already exists. EMC is making the most of it.

Our company has grown in large part by acquisition, and we now have a heterogeneous culture well-suited to being innovative about innovation. When a company is this full of people looking at different problems in different ways and bringing different viewpoints to the information they are being exposed to, it can translate into a real competitive advantage.

We have the ability to do so much more for customers and the IT industry by forming these connections within our walls and outward to the scholarly world—networking our product development groups, our advanced technology teams, and our innovation forums.

So, must sophisticated IT research cost millions? I think I'm seeing the catalyst for a very disruptive answer to that question.

Monya Keane

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also inside

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COVER PHOTOGRAPH BY ASIA KEPKA

from the tell emc files

THE past quarter's feedback included a question about Data Domain and the effect of the economy on EMC's recent acquisition activity.

S.T. TELLS EMC: Given how tough the economy has been and the cost-reduction efforts we've undertaken as a company, how can the business justify buying Data Domain for approximately $1.9 billion in cash? Where do we see Data Domain fitting in, long term, with our primary storage offerings?

B.J. JENKINS, SVP OF GLOBAL MARKETING, REPLIES:
Running a sustainably successful business means balancing the short term with the long term. At EMC, we strike a balance between meeting our near-term needs—for example, reducing our cost structure when the global economy is forcing customers to lower their IT spending—with investing for our long-term competitiveness and prosperity. EMC has been on a clear path toward becoming one of a handful of strategically vital IT partners for organizations of all types and sizes.

The purchase of Data Domain exemplifies EMC's effort to balance short-term needs with long-term prosperity.

This path requires understanding major trends and disruptive technologies and investing in both our own internal R&D and in the acquisition of key technologies to ensure that we can provide what our customers need. From this perspective, I think the question really is, "Can a global leader like EMC afford not to make strategic investments like this?"

Bringing Data Domain into EMC will help accelerate our growth by building our strength

Have something to say? If you're inside the EMC firewall, go to: www.channelemc.isus.emc.com/channelemc/Tellemc/toc.asp.

in what we believe will be one of the largest and fastest-growing market opportunities in IT—the next generation of backup, recovery, and archive solutions—a market that's expected to exceed $10 billion next year.

Data Domain is a technology, product, and market leader in deduplication storage systems. Deduplication technology eliminates redundant data, significantly shrinking storage requirements, increasing bandwidth efficiency, and improving service levels with faster backups and restores. This technology is permeating the entire storage infrastructure and transforming the way our industry stores, protects, and archives information. Data can be deduplicated at the source (or client), so that a backup application sends only new, unique segments across the network to the storage device. That's what our Avamar technology does, identifying redundant data at the client, minimizing backup data before it is sent over a local or wide area network. Data can also be deduplicated as it reaches its target, whether a server or storage system. That's what Data Domain does, eliminating redundant data across multiple applications, workloads, and sites for tape consolidation and network-efficient disaster recovery.

By making Data Domain an integral part of the EMC family, we now have the industry's best and broadest portfolio of deduplication systems and software. Just as important, we'll be able to speed the execution of our strategy to provide next-generation backup, recovery, and archiving solutions for our customers. In addition, when combined with the rest of our information infrastructure solutions, these powerful deduplication technologies will help us execute our vision of cloud computing. To function properly, next-generation data centers will require a new way of backing up, recovering, and archiving information that may reside in several places: a physical data center, a new virtualized data center, or within an external cloud computing infrastructure. Customers will need the ability to automatically tier, deduplicate, and compress their enormous volumes of information.

Data Domain is forming the foundation of a next-generation backup, recovery, and archiving product division within EMC's storage business. With Data Domain as a valued member of EMC's global family, we are going to change the storage marketplace and create new opportunities for sustainable growth.◆

Symmetrix DMX returned to the silver screen in **TRANSFORMERS: REVENGE OF THE FALLEN.** The systems (rear) lent authenticity to the set of a futuristic military facility. EMC loaned the empty cabinets to the production in a subtle, economical brand-exposure effort. Last year, systems from EMC appeared in the films **EAGLE EYE** and **BODY OF LIES.**

Quarterly earnings

EMC reported second-quarter 2009 consolidated revenue of **$3.26 billion**, an increase of **3%** sequentially. Second-quarter 2009 GAAP net income was **$205.2 million**, an increase of **6%** sequentially. Joe Tucci called it "another quarter of solid execution," adding, "EMC is focused on four of the hottest, fastest-growing areas of IT spending—next-generation fully virtualized data centers; cloud computing; virtualized desktops and clients; and next-generation backup, recovery, and archive solutions. When IT markets return to more normal spending rates, we expect EMC to resume generating double-digit revenue growth."

Awards and recognition

EMC received **CISCO**'s 2008 "Multi-theatre Partner of the Year Award," which recognizes exemplary channel partners across several regions. EMC and Cisco are collaborating on creating information infrastructures combining EMC and VMware technologies with Cisco's intelligent network and Unified Computing System.

For the 10th consecutive year, EMC Global Services Customer Support Centers achieved certification under the prestigious **SERVICE CAPABILITY AND PERFORMANCE SUPPORT STANDARD**. The standard quantifies the effectiveness of customer service according to stringent performance standards and industry best practices.

THE HONG KONG ICT (information and communication technologies) Silver Award in the Best Professional Development category went to EMC APJ's Partner Enablement Program, which trains EMC partners to sell EMC's products and solutions successfully. Says Program Director Ann Yau, "It is an honor that, in the second year of rolling out this program in APJ, EMC is being recognized by the industry for its efforts."

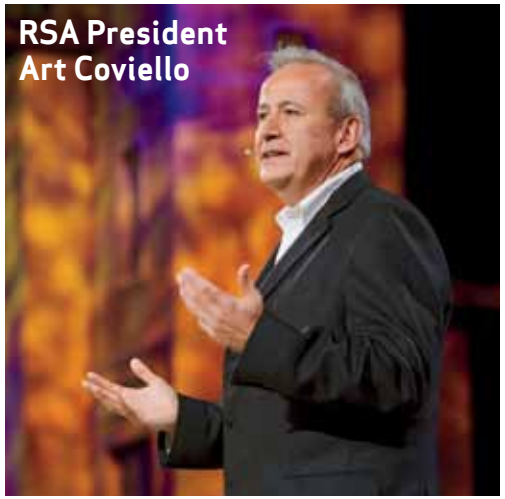
Eugene Demigillo, Manager, and Ann Yau, Director, Partner Enablement Program for EMC APJ, receive the HKICT award.

PRESIDENT'S AWARD

The 22-member Enterprise Flash Drive team captured the 2008 President's Award, EMC's highest honor. These technologists, developers, and strategists delivered flash storage for EMC Symmetrix, CLARiiON, and Celerra platforms starting in early 2008, taking the industry by storm. Joe Tucci and Vice Chairman Bill Teuber acknowledged the team's success at the Q109 Employee Quarterly Review in Southboro, Massachusetts.

CONFERENCES

Customers, partners, analysts, and journalists converged at **EMC WORLD 2009** in May. The event focused on ways to save money, maximize resources, build new service-delivery models, and align IT with business requirements. Joe Tucci and VMware President and CEO Paul Maritz discussed mega-trends shaping the industry, including cloud computing enabled by virtual data centers. In Orlando, EMC released its third sponsored IDC study tracking information growth, showing the digital universe continues to boom, despite the downturn. EMC also unveiled cloud storage service and information management offerings and expanded data deduplication and backup and recovery technologies.



Nearly 15,000 security professionals attended **RSA CONFERENCE 2009**, the largest information security event of the year held in April in San Francisco. In his keynote, RSA President Art Coviello outlined the forces leading to "inventive collaboration" in the industry: escalating global cyber threats, online fraud threats, intellectual property theft, internal attacks, and vandalism due to the economic downturn.

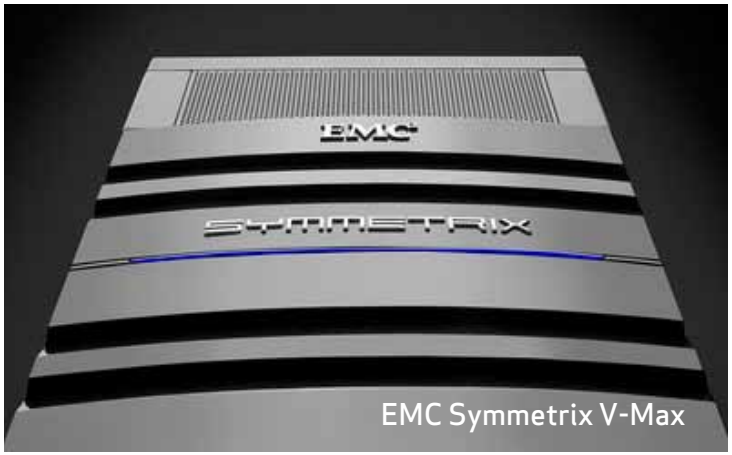
STRATEGY

EMC completed the acquisition of **Data Domain, Inc.**, on July 20. Data Domain President and CEO Frank Slootman said, "We are pleased to see the merger with EMC becoming a reality. We envision a great opportunity to accelerate our business through EMC's massive worldwide distribution network and customer base, and we can't wait to begin seeing that play out in the marketplace."

EMC acquired **Configuresoft**, a provider of server configuration, change, and compliance management software, with whom EMC had built a successful OEM relationship. EMC Server Configuration Manager and EMC Configuration Analytics Manager, formerly Configuresoft products, have been rebranded as **EMC Ionix** along with EMC ControlCenter and technologies from earlier acquisitions Smarts, nLayers, Voyence, and Infra—all previously parts of the Resource Management Software Group.

THEY RAN AS ONE

Team EMC fulfilled its goal to "Run as One," completing the 113th running of the famed Boston Marathon. The 18 employees, one customer, and one partner hailed from 12 countries, forming EMC's first truly global marathon team. All the team members completed the race and crossed the finish line. Their contributions, matched by EMC, raised $114,500 for the Michael Carter Lisnow Respite Center, a Hopkinton-based non-profit organization.



EMC Symmetrix V-Max

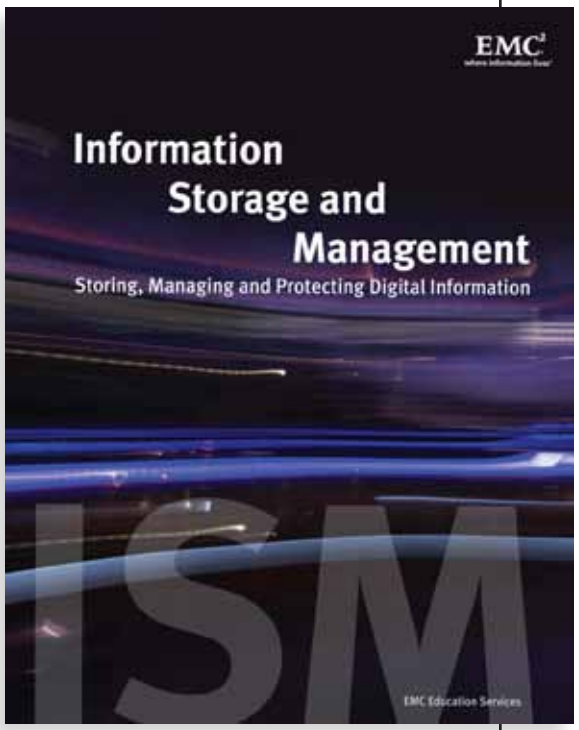
NEW PRODUCTS

On April 14, EMC unveiled the **EMC VIRTUAL MATRIX ARCHITECTURE**, an advanced storage architecture supporting virtual data centers, and **SYMMETRIX V-MAX**, a powerful, high-end storage array. With Enterprise Flash, Fibre Channel, and SATA drives, V-Max meets the widest range of requirements for high-performance, high-capacity storage in a single system.

Also in April, EMC introduced integrated information governance through **EMC SOURCEONE**—products and solutions for archiving, e-discovery, and compliance—replacing EmailXtender in the e-mail archiving market. Employees beta-tested SourceOne in Q1, providing vital information to development and support teams pre-release.

REFERENCE BOOK

Forty EMCers from Education Services, the CTO Office, and Engineering collaborated with tech publisher John Wiley & Sons to produce *Information Storage and Management*, a reference book for IT administrators. Content focuses on concepts, rather than products, and is intended to educate current and future storage professionals.



SUSTAINABILITY: In May, EMC published its "Looking Inward, Outward, Ahead" sustainability report. The report describes how EMC employees contributed to the sustainability of the company, environment, and community in 2008 and presents goals for 2009 and beyond. Read it at: www.emc.com/about/global-citizenship/2008-sustainability-report.htm.

Research collaboration expands

The EMC Innovation Network takes its next steps

BY BURT KALISKI AND ROB MASSON

ASIA KEPKA

BURT KALISKI (L.) AND ROB MASSON are, respectively, Senior Director of the EMC Innovation Network and Director of EMC Research Cambridge. Their two-part research mission is to expand knowledge and strengthen relationships.

THE GREAT THING about starting a corporate research program in the 21st century is that right away, the researchers in the program begin using teleconferencing and social media to transfer their knowledge to colleagues all around the world. That's certainly what happened when the EMC Innovation Network was started by our CTO, Jeff Nick, two years ago.

Today, our research groups connect into the company from any location; thus, we don't need to locate them physically near a corresponding product development organization. (The best "cross-cutting" research usually influences more than one development organization anyway.)

At EMC, we're not building multi-million-dollar advanced development centers. We're placing our advanced researchers near the universities that can help us understand what's on the information technology horizon and connecting them to the company's already remarkable R&D.

KNOWLEDGE TRANSFER ON A GLOBAL SCALE

The first new research group in the Innovation Network—EMC Research China—shows us that this approach works. Directed by Dr. Wenbo Mao in Beijing, EMC Research China is based near large universities in the Zhongguancun district, known as China's "Silicon Valley."

The Innovation Network program follows a simple model: "Expand knowledge locally; transfer it globally." A clear connection exists between the advanced research underway at EMC Research China and the product R&D happening at EMC labs in Beijing, Shanghai, Santa Clara, Seattle, Cambridge, and Hopkinton.

Around the world, EMC has access to top local

talent inside and outside the company. We make the most of that access by pursuing research in each region that matches that region's strengths. And we network the results together.

Our advanced researchers wear two hats. First, they expand EMC's collective knowledge in strategic areas of technology (such as cloud information management or trusted virtual infrastructure, two areas EMC Research China is exploring). Second, they transfer knowledge to EMC's product-development teams. For instance, they'll inject insights about trusted infrastructure into proofs of concept being built to test utility computing practices.

What they *study*—often in the context of university collaboration—can be general. What they *teach* is specific, and it is targeted to the development organization responsible for a particular EMC technology.

This continual flow of knowledge to different audiences in different timeframes and in different styles defines our research mission. Our researchers are not developing products; they're not closing business. Rather, they're providing valuable insights to employees who do perform that important work for the company.

We do not need a large research organization to conduct advanced IT research really well. What we need is a large research vision blooming within EMC's even larger, established, product-focused R&D operations. We need EMC's advanced technology researchers and its product developers to work with each other and with academic institutions to accelerate innovation.

KNOWLEDGE WORKS

The goal of all this "knowledge work" is straightforward: to cost-effectively infuse the company's decision-making with privileged insights into emerging technologies and trends.

The insights are "privileged" because, although much of the information we gather is available to other companies, it's complicated to determine how to put that information into practice. The problem in the research community isn't a lack of information about what's coming next; actually, there's too much information. The way to sort through it is to be there as it's being produced.

For example, EMC Research China has worked for a few years on the Daoli Trusted Infrastructure research project—collaborating with Fudan University, Huazhong University of Science and Technology (HUST), Tsinghua University, and Wuhan University. The research effort explores how, in a multi-tenant computing environment such as a cloud, tenants can be protected from one another

and the platform itself can be protected from the tenants. (Multi-tenant environments are a bit like "apartment buildings of IT." Rather than providing shelter, they supply IT platforms to large numbers of independent tenants.)

Today, for the most part, those tenants rely on the reputation of the cloud provider to keep them and their platforms secure. But as more cloud providers start competing with each other on cost, a good reputation won't be enough.

Our researchers are collaborating with these Chinese universities to understand new ways to protect tenants by, for instance, combining trusted computing with virtualization.

The Daoli project manifests itself in various ways. A public wiki (www.daoliproject.org) contains research material. University and industry collaborators discuss developments unfolding in the field. And participants sponsor academic events such as the Asia Pacific Trusted Infrastructure Technologies Conference organized in China by HUST in October 2008. Members of the EMC Innovation Network are continually present in the collaborations, interfacing the new knowledge to the rest of EMC.

In July 2009, EMC officially joined the MIT Media Lab as a Consortium Sponsor. Efforts are focusing initially on new models for data ownership and usage, interfaces for social and business transactions, and technologies to help consumers take control of their healthcare management. As part of the sponsorship, EMC gains full access to the lab's research environment.

BRIAN KEEGAN

APPLYING LESSONS FROM CHINA

Lately, we've turned our attention to Cambridge, Massachusetts. EMC has strong, long-term relationships with many Massachusetts universities, so our technology collaborations in the Boston area aren't new. But our model is improved.

In China, we saw first-hand the value of having a research-exploration group that is separate from product and business development teams. In our Innovation Network model, this group doesn't need to be large; it just needs to be focused and chartered.

We're applying those principles to our Boston-area presence.

Beyond learning about emerging technologies and trends, we want to get to know the people investigating them. We're building a people-network in the Boston academic world. We have tremen-

dous supporters who introduce us to their academic colleagues and show us where interesting things are happening. We'll expand our contacts and continue to gather information, meeting with faculty and students, attending seminars, and visiting labs.

The culture at MIT is especially helpful. We've been greeted warmly and been invited to work and socialize with faculty and students in various labs. We're also inviting university researchers to speak at EMC's offices—local events that have global outreach via videoconferencing, wikis, blogs, and other mixed media.

Our Innovation Network already is a collaboration among advanced technology groups from different EMC business units. In Cambridge and Boston, we're going a step further, as business units around EMC are placing some of their people into our advanced research group on a part-time basis. They complete a core group headed by the corporate CTO Office, which includes Dr. Ari Juels' team from RSA Labs sponsored by the RSA Security division. We've partially implemented this model in China, too.

These "virtual" research positions demand, at present, a one-day-per-month commitment. (Despite being a virtual team, we do have physical meetings.) In Cambridge, team members will attend seminars, talks, and luncheons focused on

What's EMC doing at the Massachusetts Institute of Technology?

Boston's universities offer so many academic connection points. We'll pursue them one step at a time.

Our EMC Research offices at 11 Cambridge Center, are, in fact, mere steps from the campus of one of the world's most well-regarded research institutions—MIT.

So that's where we're starting. We are linking ourselves into the breadth of information-related research programs happening at the MIT Media Lab, the MIT Sloan School of Management, the MIT Computer Science and Artificial Intelligence Lab, and MIT's other famous labs, with varying degrees of sponsorship.

It's natural that we'd want to devote lots of attention to interacting with MIT; it offers us a huge set of interesting, even visionary information-infrastructure topics to explore.

areas of relevance to their business unit. They'll involve their colleagues at EMC when possible and report back to their business units what they see and hear. This tight connection:

- Bridges gaps between EMC Research and EMC's product development groups.
- Helps our technologists evangelize to the product groups the advances happening in academic labs, and, ultimately, influences our product roadmaps positively.
- Exposes university researchers to real-life use-cases revealing the commercial opportunities their advanced research might someday spur.
- Finds opportunities for our employees to work with the world's top university researchers and perhaps even co-author papers.

Obviously, really deep technology explorations require full-time researchers. We anticipate that organizations motivated by the initial engagements will want to try-out, over time, a combination of

Beijing's Zhongguancun district is known as the Silicon Valley of China. More than 12,000 high-tech firms operate in the district's technology parks, including EMC Research China, the first research group in the EMC Innovation Network, based at the EMC China R&D center.

CHARLIE FONG

internships and rotational assignments to increase the engagement level.

We want to partner with other companies, too, to align or combine funding to increase the investment in exploring the same base of knowledge. Accordingly, we're inviting corporate strategic partners to join us. As we sponsor research together, we pursue conversations on the side about how our companies can mutually take advantage of the lessons learned.

Similarly, as we network with academic researchers, we're likely to hear about startups and early-stage efforts to commercialize research results. Our own business-development teams can help raise those activities to the next level, perhaps by providing venture capital, or maybe through a strategic partnership.

We'll also conduct business planning and market assessments to keep ourselves on track with the commercial potential of advanced IT research happening at universities and will look for opportunities to accelerate sales via those connections.

LOOKING BEYOND THE HORIZON

Within the context of R&D, there is always an activity of exploration and discovery. The resulting knowledge then flows into the engineering and development of new products.

What we are doing is focusing entirely on that "R" in R&D. Those of us in EMC Research are not building anything or identifying what the next generation of a product should be. Instead, we're asking, "What can we help EMC to explore?" "What can we help EMC to discover?"

We see ourselves as the facilitators—the introducers—to connect the company's R&D with university research. Like a ship's radar screen looking beyond the visible horizon, pinpointing where obstacles and opportunities are, our mission is to help EMC chart the best course to the future. Academic IT researchers at universities don't think about "product categories" or launch dates; they think about how the entirety of IT is evolving. We are connecting their dots of inspiration with EMC's.

At a time when EMC must get more from its current monetary investments, the research program must be innovative about how it moves beyond what the company looks like today. If EMC is to be effective with the resources it already has, then it must align those resources internally and externally.

It can be done—as we chart a course together toward the next horizon of technology. ◆

➜ READ MORE: http://www.xconomy.com/boston/2009/06/24/emc-opens-research-arm-in-cambridge-joins-mit-media-lab-as-sponsor/

Taking a cross-company look at how we all spend.

Ready, set, save

John Herrera is one of the people driving the EMC-wide cost-reduction strategy. He's been focusing on rapidly adjusting the company to current economic conditions while establishing long-term ways to keep expenses under control. *EMC.now* caught up with the company's VP of Global Delivery to get an inside view of what EMC is doing to save pennies, dollars, euros, yen, etcetera—all around the globe.

WHEN AND HOW DID WE LAUNCH THE COST TRANSFORMATION PROGRAM?

John: Many of EMC's cost-saving programs have been in place for more than a year; however, we kicked off the full Cost Transformation Program in mid-2008. It was designed to focus primarily on all of our non-people-related expenses. The program as a whole is sponsored by our CFO David Goulden and supported by senior EMC leaders and teams globally. I manage the program.

We went to work very rigorously analyzing all of our current expenses, and we looked for opportunities to reduce costs in the short term. However, we also saw a big transformational opportunity in front of us if we could succeed in accomplishing long-term adjustments of cost for the company in ways that still enable us to scale up when the downturn is over.

HAVEN'T SIMILAR EFFORTS HAPPENED IN THE PAST?

Yes, there have been other efforts, including the creation of the Office for Cost Efficiency, in the past. But nothing has been as extensive as CTP. Most previous efforts tended to be more departmentalized, and they focused on specific functions.

CTP is not only more all-encompassing, it also is unfolding at a more rapid pace. Above all, we are extremely interested in achieving systemic change, rather than simply taking a Band-Aid approach.

JOHN HERRERA, VP OF GLOBAL DELIVERY (R.), WITH GLOBAL EXPENSE OPTIMIZATION MANAGER MICHAEL LEBLANC.
John says, "We believe the opportunity is greatest when we focus on long-term improvements rather than just on short-term targets. In the end, we believe, the biggest benefits will come from transformational changes."

BUT HOW DO YOU FIND THE RIGHT BALANCE? HOW DO YOU HELP EMC SAVE THE MONEY WITHOUT HURTING PEOPLE'S PRODUCTIVENESS?

We didn't set out with a predefined approach or a specific balance of short-term versus long-term goals. As much as possible, we have tried to assess each spending area individually. Obviously, when we found areas where we believed we could make short-term adjustments that wouldn't negatively affect our people or our business, we have pursued them.

Nonetheless, we believe the opportunity is greatest when we focus on long-term improvements rather than just on short-term targets. In the end, we believe, the biggest benefits will come from transformational changes.

WHEN YOU ARE RUNNING A LARGE PROGRAM LIKE THIS, ONE THAT TOUCHES SO MANY PEOPLE, HOW DO YOU ATTAIN BUY-IN AND ONGOING SUPPORT?

Communication. From the start, we have tried to talk to everyone about the impact of all the small changes. However trivial all those "little" achievements may seem individually, taken together, they represent a substantial amount of money. David has been writing and sending detailed messages to everyone on this theme, and by engaging with employees early and repeatedly, he is reinforcing the importance of CTP and reminding us of the rewards it is delivering to our company as a whole.

DOES CTP GENERATE FAN MAIL, HATE MAIL, OR BOTH?

In general, the feedback has been positive. Employees really do understand that we are trying to make changes with as little impact as possible. In one recent message about CTP, David made the point that these changes can save additional jobs. So, in general, everyone has been supportive.

We have received negative feedback only when some kind of implementation hiccup occurred or when people felt the changes had brought about unpleasant challenges. For example, we changed the wireless phone policy and received dozens of questions and comments. We promptly made a few adjustments and sent out a clarification FAQ.

We do learn a lot from those kinds of communications. And, when we respond quickly to feedback like that, it is received very well.

TRAVEL-POLICY MODIFICATIONS SEEM LIKE A MICROCOSM OF HOW CTP WORKS. CAN YOU EXPLAIN WHAT KINDS OF CHANGES YOU HAVE MADE AND WHAT THEY HAVE ACHIEVED?

Among other things, our analyses uncovered suboptimal hotel-spending patterns. While we already had a number of preferred hotels when we started

CTP, we found that there was an opportunity for EMC to better leverage its corporate volume-buying power because no one had really approached these vendors in a formal, structured way to negotiate better rates.

Through strategic reductions in our number of preferred hotels per city, aggressive negotiations, and increased internal compliance, we found substantial opportunity for sustained savings. We are now averaging about a 20% lower room rate than previously—obviously, that's a very significant reduction. And we accomplished it without lowering the quality of the accommodations.

WHAT ABOUT NON-TRAVEL CHANGES?

We are seeing successes in all of the CTP work streams and in interesting ways. For example, one initiative underway in the IT space involves completely leveraging VMware technology to reduce 1,600 old physical servers to 40 large servers running virtual machines. This is saving us not only costly data center space, but also high-cost electricity.

We have implemented new purchasing programs to better leverage EMC's spend globally, and we have developed a strategy to better utilize our facilities and enhance our collaboration by forming R&D hubs on the Metrowest campus.

ISN'T ANOTHER CHALLENGE TO EXTEND CTP GLOBALLY?

We are a global company, so we have to put the right policies in place everywhere. We do sometimes need to tailor the program to different geographies. Travel policies, for example, often must be adjusted regionally because of significant differences in local practices and local accommodations.

HOW DO YOU THINK CTP HAS PERFORMED SO FAR, AND WHAT'S ON THE HORIZON?

The results of all of this, so far, have been very promising. At the start of 2009, David announced an estimated savings of $350 million for FY 2009, and we have expectations of $500 million in savings for 2010. Specific achievements include more than $50 million in travel and telecommunications savings, $25 million in contract labor savings, and $7 million in savings from field-office consolidations.

As far as looking forward goes, we know that a lot of this effort centers on changing EMC's underlying cost structure so that as the economy recovers, we can grow aggressively again without losing all of those savings. ◆

Next page: Way beyond bean counting >>>>

Way beyond bean counting

When companies need to adjust spending, it is not uncommon to hear some people dismiss the effort as "bean counting"—a metaphor that implies a rather trivial, even pointless effort.

But there's nothing trivial about the work being done by Michael LeBlanc, a manager in EMC's Global Expense Optimization (GEO) organization, who is tasked with improving the company's travel spending.

Indeed, according to Michael, the kind of work he and his team do is in many ways as leading-edge as the work done by people in charge of IT thought-leadership marketing. "We are constantly researching how EMC is spending money and trying to understand how all of us could spend it more effectively," he says.

Michael is working with other members of GEO, for example, to build a travel-spending data repository to give managers information and tools to see how much money is being spent and how that spending correlates with their goals.

"In the past, we were asking executives to 'do a better job of controlling expenses' without giv-

Way beyond bean counting

ing them sufficient visibility into how these extremely multi-faceted budgets were being spent," he says. With the travel-spending repository, managers will have better points of comparison and tools for analysis—and they'll be able to alter that spending more quickly. "We can then build-in more accountability—that way, when business conditions change, we can adapt better," Michael says.

EMC CFO David Goulden emphasizes the creative aspects of the CTP effort. "Costs exist at multiple levels," he says. "But because people are tied to particular organizations, they tend to see costs through those particular organizational silos." With that fact in mind, David's organization took a cross-company, independent "view of the world" that aimed to provide similar points of comparison: a common vantage point for looking at spending in areas as disparate as IT and real estate.

Almost like a research project, they stepped back from the usual boundaries to really understand how the company spends its money. It was no longer about "costs," it was about finding opportunities to invest in efficiency, or as David puts it, "It's not so much about slashing spending as it is about spending strategically."

For example, EMC is investing in advanced videoconferencing capability (see next story) because it's a proven way to make people more productive. That is not just a matter of saving airfares; it is a matter of making better use of people's time.

Still, Michael admits, change can be difficult. "You have to empathize with people and pick your battles," he says. "Some people will always say, 'What's the big deal? You are nickel and diming me.' However, overall, in this economic environment, people know it needs to be done. Our challenge is to demonstrate that the effort is succeeding, so that employees can see the savings and understand that the work we are doing isn't at all about putting pain into anyone's work life."

Virtually no illusion...

SEEING *really is* BELIEVING

E-conferencing is helping far-flung EMCers meet face to face without ever leaving the office.

PLEASANTON, NICE TO SEE YOU:
The Rockies conference room at EMC headquarters in Hopkinton underwent remodeling to meet optimal specifications for a three-screen TelePresence setup. The room is now sound insulated and features blackout curtains, non-reflective walls, and special lighting. It, along with similar rooms at EMC's offices in Brentford, U.K., and Pleasanton, California, went live on June 22, 2009.

Seeing really is believing

AS LATE AS the 1920s, the telephone was still so alien to the business world that many people avoided phones entirely in favor of in-person visits ... despite the extra time that travel involved. Talk wasn't cheap back then, in any case. When AT&T launched commercial transatlantic two-way radio service to London in 1927, the charge was US$75 (equivalent to $919 today) for a three-minute call.

Since then, phones, cellphones, conference calling, e-mail, and texting have become economical and pervasive. In the late 1980s, the first quasi-practical videoconferencing systems emerged.

Today, EMC uses the videoconferencing gold standard of the 21st century. Cisco TelePresence systems—the newest jewels in EMC's e-conferencing crown—will save EMC a lot of money and time while shrinking its carbon footprint.

Michelle Kerby is a Sr. Manager of Global Expense Optimization, supporting EMC's Cost Transformation Program. She says the company has made significant investments in deploying TelePresence centers across 11 sites globally, trying to enhance communication internally and with customers while cutting travel costs and making people more efficient.

The systems feature three high-definition monitors and dedicated communication channels that eliminate latency and certainly provide the illusion of meeting across a table rather than hundreds or thousands of miles away. EMC's rooms are set up identically, making the impression even more believable.

Two rooms have run at EMC (and have received rave reviews) for two years—they are located in the Hopkinton and Santa Clara Executive Briefing Centers. Now more sites are either operating or about to launch, including rooms at 176 South St., 228 South St., Cork, Pleasanton, Shanghai, Singapore, Brentford, Bangalore, and McLean, Virginia. Plans call for 11 three-screen systems and 14 one-screen systems, 25 in all. Locations are selected based on their money-saving potential.

Kathy Merz has managed the Hopkinton EBC site since the room was built. "I had no previous experience with running anything like this, and actually, managing it is just a small part of my job," she says. "But I quickly found it very easy to use."

EMC looks for every way to keep employees efficient. Traveling by air is not efficient. The systems enable people to accomplish more in less time—namely, in less travel time. "This is a huge factor for our briefing centers," Kathy notes. "We can 'send' a Hopkinton-based EMC expert to a Santa Clara customer briefing without having to fly them there."

Provocative stats

EMC's American Express booking data from Q308 to Q209 offers clear evidence that e-conferencing makes sense. According to the data:

17% of tickets booked by employees were for travel between existing or planned TelePresence locations. Videoconferencing will be a viable substitute.

23% of trips to now-planned TelePresence locations were same-day trips, and another **15%** covered just a night's stay—these trips may be avoidable.

INCREDIBLY REALISTIC

Users quickly become comfortable with the system. Still, Kathy likes to seat new EBC presenters in the TelePresence room before customers arrive to give them time to move beyond the "wow" factor. First-time presenters usually need a minute or two to become accustomed to looking into a camera rather than directly at peoples' screen images. After that adjustment, it all seems natural, just like being in a regular room.

"The first time we spoke with people in Santa Clara, I remember being amazed at how detailed everything was, from the audio clarity to the carbonation bubbles rising in someone's drinking bottle. It was as if I were right there," Kathy says. (Ed. note: Food and drink are no longer permitted in the rooms.)

Kathrin Winkler, Sr. Director of Corporate Sustainability, says, "A year or two ago, I participated in a TelePresence event involving EMC and another company. By chance, months later, I was introduced to one of the participants in person. He said, 'Haven't we met? You presented to us, but I can't remember if it was at our site or yours.' I replied, 'We did meet, through a screen, at both of our sites!'"

MORE THAN VIDEO

E-conferencing—audio, web, and video—is obviously strategically important to EMC, a company with physical facilities in more than 60 countries, with 40% of employees working outside the U.S., and doing business in 100 countries.

"We have to be able to connect effectively," Michelle says. "The experience of meeting in person

will never be supplanted, but it can be supplemented."

Only a few TelePresence centers have been installed at EMC so far, and the company continues to offer employees Microsoft Live Meeting and Polycom audioconferencing setups.

Altogether, Cisco TelePresence, Microsoft Live Meeting, and Polycom support internal and external meetings nearly everywhere EMCers work. These systems dramatically reduce the time required of participants, and they are slashing EMC's travel costs.

"From a strategic standpoint," says EVP and CFO David Goulden, "Our subject-matter experts will engage with each other and with our customers in more ways, and in more locales, than ever before. In 2008, we held more than 300 meetings using Cisco TelePresence alone, saving 3,000 hours of employee travel time. Every day, 500 hours of virtual meetings are conducted around EMC using Microsoft Live Meeting and Polycom, cutting even more nonproductive travel time."

Just as telephones appealed only to the business world's early adopters 100 years ago, videoconferencing, still rather uncommon, will eventually be widespread. "At the moment, the technology really only works within our firewall and with a small number of partners around the world," Michelle admits. "But we are working with a vendor that is helping us to connect to customers and prospects via TelePresence, and that will really open the floodgates."

IT'S COOL TO BE GREEN

Then there are the environmental benefits—an increasingly important measuring stick for any business initiative. Says Kathrin, "E-conferencing provides a very effective alternative to business travel, which is a major source of greenhouse gas emissions regardless of whether the traveling occurs by car or plane." Indeed, thanks to travel policy changes, increased e-conferencing, and the overall money-saving ingenuity of employees, EMC's travel-related carbon emissions declined by 29% in 2008 from 2007 levels.

Kathrin says acceptance of the technology is part of the challenge ahead: "People tend to resist change, and it is true that in certain situations, being there in person can be crucially important. But as people get comfortable with this technology, they broaden their vision of what they can accomplish with it—they mentally expand what they see as being possible."

On a recent trip to Dubai, for instance, Kathrin joined a web conference in which six people participated remotely (albeit for some, at 3:30 a.m., with one person wearing the inventive dress-shirt/tie/

pajama-bottom combo). The right experts were present, the interaction was flowing, and Kathrin in Dubai was providing the in-person touch. "It was the best of both worlds," she says.

On another occasion, the IT industry organization The Green Grid, which Kathrin supports as board member and EMC representative, held several meetings via Cisco TelePresence. (More than 400 organizations globally use TelePresence.) "We met with people in Austin, Texas; San Jose, California; and Boxborough, Massachusetts," she recalls. "We accomplished an amazing amount of work. Nobody had to travel more than an hour by car."

Slowing climate change will require changing how people conduct business and how they lead their lives. Technology itself isn't an obstacle, Kathrin believes, rather, it is how we use technology: "It's not a matter of just driving more efficiently; it is a matter of driving less." In that context, e-conferencing can help establish new norms, as phones did decades ago. "Over time, people will view face-to-face meetings as being less necessary and potentially wasteful. I do think we'll witness that cultural shift," she says.

David Goulden adds, "The tools for meeting virtually just keep getting better. And with all their advantages, we are committed to expanding their use globally at EMC." ◆

Because business travel can be no fun at all

E-conferencing connects customers and partners with EMC execs and subject-matter experts, and it lets employees meet with their colleagues around the world to deliver presentations, hold staff meetings, conduct interviews, take training, view webinars, and more.

Next page: Where the screens are >>>>

Where are these rooms?

Meetings are necessary, but spending time traveling to them is not, especially when face-to-face collaboration requires crossing borders and oceans. Instead, more EMC employees are using the company's extensive set of e-conferencing tools to conduct meetings.

INDICATES
a one-screen or a three-screen system at that site.

LOCATIONS

1. *Hopkinton, Ma.*
2. *McLean, Va.*
3. *Atlanta, Ga.*
4. *Dallas, Tx.*
5. *Los Angeles, Ca.*
6. *Santa Clara, Ca.*
7. *Pleasanton, Ca.*
8. *Seattle, Wa.*
9. *Chicago, Il.*
10. *New York, N.Y.*
11. *Bedford, Ma.*
12. *Cambridge, Ma.*
13. *Cork, Ireland*
14. *Brentford, U.K.*
15. *Paris, France*
16. *Tel Aviv, Israel*
17. *Beijing, China*
18. *Tokyo, Japan*
19. *Shanghai, China*
20. *Hong Kong, China*
21. *Sydney, Australia*
22. *Singapore*
23. *Bangalore, India*

Ready to ride a new wave of growth after hiatus

Ljubljana, Slovenia, is one of the Central European cities that EMC serves. Industries—notably pharmaceuticals, petrochemicals, and food processing—are among the city's most important employers.

DAMIEN SMITH

EMC in the emerging markets of Central Europe

Perhaps there are as many ways to define Central Europe as there are historians and geographers studying the region.

Some academics look to the Middle Ages, with one noting in Wikipedia that a "criterion for defining Central Europe is by using the frontiers of medieval empires and kingdoms that largely correspond to the religious frontiers between the Roman Catholic West and the Orthodox East." Others say Central Europe is the area once dominated by the traditions of the Habsburg Empire and Empire of Hungary, or that it is simply "the place where East and West collide."

But for EMC, historian Charles Ingrao's characterization rings true. He calls the region "one of the [world's] richest sources of creative talent."

That richness is helping to drive EMC's recently intensified interest in the region, says Els Willems, Human Resources Manager for Central Europe. "This area's workforce is highly educated and very tech-savvy," she says. "No one disputes the excellence of universities across the entire region. The people who are graduating from those institutions definitely have the knowledge and skills that we need at EMC."

Paul St. John, EMC's Regional Director for Central Europe, reports that tremendous enthusiasm is ubiquitous among young people in Central Europe. "And their parents, many of whom survived terrible political and economic crises, are very encouraging. They view getting a position at a global company such as EMC as a huge opportunity for their kids."

MINING THE REGION'S WEALTH

EMC is hardly alone in its bid to leverage the wealth of talent and the business prospects of Central Europe. In fact, since the Iron Curtain fell in 1989-1992, businesses from all over the world have sought to take advantage of the region's unique energy and growth potential.

From the mid-1990s through 2007, the area enjoyed fantastic economic growth—8% or 9% year-to-year growth was common across the region, a result of the establishment of vibrant market economies.

But just as the rest of the world suffered

The major Central European industries that EMC serves include:

- Public sector
- Banking/financial
- Telecommunications
- Healthcare
- Energy
- Manufacturing (specifically automotive)

in the current recession, Central Europe saw its GDP growth rates erode to nothing, with some areas actually experiencing alarming declines of 12% to 13% in the first two quarters of 2009.

However, some analysts (including those from the World Bank and Swedbank) now expect to see significant improvement throughout 2010 and are forecasting a return to growth in 2011.

EMC serves these Central European countries:

- Albania
- Austria
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Czech Republic
- Estonia
- Hungary
- Kosovo
- Latvia
- Lithuania
- Macedonia
- Montenegro
- Poland
- Romania
- Serbia
- Slovakia
- Slovenia

It's a tumultuous time. But opportunities do remain for companies that understand the culture and needs of this region.

"Customers and prospects will continue to invest in order to cut costs and increase profit," Paul confirms. When an IT solution fills a business need (for example, EMC's Content Management and Archive solutions) and when it cuts costs (for example, EMC's storage or network management solutions), companies will invest.

As companies buy the solutions that can help them transform their IT organizations from cost centers to profit centers, many companies are "looking at more services, consulting, and productivity tools, beyond just hardware," Paul says. "Clearly, the purchasing pace dipped in 2009. But it is expected to rebound next year, and in fact, we are already seeing an increase in year-over-year business for EMC in places such as the Czech Republic, the Balkans, and the Adriatic region."

Funding and investment by European Union countries are making an impact on Central European public-sector projects, including projects tied to healthcare and the military. Some of the investments involve IT infrastructure build-outs and improvements.

Also, the International Monetary Fund expanded its crisis funding to help Central European countries keep their heads above the waves of economic uncertainty. Two countries quite hard-hit by the recession, Hungary and Latvia, have already received €10 billion in IMF emergency funding.

A LOWER COST OF DOING BUSINESS

As EMC's Prague-based Czech Country Manager Michal Fiser points out, other conditions, too, are working to help the region extricate itself from the recession's grip.

"IT is still underdeveloped in the Central Europe-

an region, and these companies need to continue to invest—not just to function efficiently, but also to meet certain standards, including, of course, European Union membership requirements," he says.

Michal explains that a low cost of doing business provides another moderating factor. "In an effort to find cost-saving opportunities, some companies headquartered in Western Europe and the U.S. are moving data centers and manufacturing to Central Europe," he says. "Those activities, in turn, create opportunities for us."

One example of the trend is the establishment of dozens of new auto and auto-parts manufacturing facilities across the region. According to a 2008 report by KPMG International, the region as a whole "is expected to double production [of autos] in the decade between 2001 and 2011, eventually topping six million a year for the entire region. In comparison, global production will grow by 4% overall, and manufacturing in Western Europe is expected to remain flat, and possibly decline slightly."

It's notable that people in Central Europe have been reacting somewhat distinctively from much of the rest of the world to the worldwide economic crisis.

Paul says, "Here, people have a different view of what constitutes a 'crisis.' In the not-so-distant

MASTI

WARSAW'S TELEKOMUNIKACJA POLSKA S.A. TOWER. EMC already serves all of Poland's major telcos and 18 of its 20 largest banks, but the country's commercial segment is offering fresh soil for cultivating new business.

Jasmina Stritar, leading by example

The team led by Southeastern Europe Area Manager Jasmina Stritar is leading by example. The team works very hard to be perceived as a force for driving change.

"That's the best kind of recognition we could ever want," Jasmina says. "This is not just about collecting revenue. We should see customers as being with us forever. Therefore, we treat these relationships as the valuable, long-term connections that they should be. I believe the technologies and opportunities for innovation that we and our partners bring to this region are incredibly important—they are important to our customers and to improving life for so many people in our area."

past, a tremendous amount of conflict coincided with the end of the Soviet influence and the Balkan crisis. People know how to deal with, and respond to, crisis situations. There isn't, therefore, the same sense of panic you see elsewhere. Regardless of this, we still observe much more planning and scrutiny going into every purchase."

Bernhard Grubelnig, EMC Technology Solutions Manager, Central Europe, believes it is the power of EMC's relationships within the region that will help the company continue to build business in the region, despite that increased scrutiny.

"In this recession, it has been vitally important that EMC had built long-term relationships with the biggest and most valuable customers in the region," he says.

BUILDING RELATIONSHIPS TO BUILD BUSINESS

EMC's approach to the Central European market is now all about building even stronger relationships.

EMC's business activity in Poland serves as an example. In that country, the first quarter of 2009 was particularly rough. Poland's currency, the złoty, had lost 60% of its value. Because people and businesses alike had borrowed quite a few dollars and euros, they suddenly owed a lot more. So, businesses were afraid to make any purchases at all.

The Polish currency devaluation made information technology—which is generally priced in dollars or euros—much more expensive. Now, EMC invoices its Polish customers in złotys to make their purchases more feasible. This move is just one way the EMC team there is partnering with customers to help them get through the global financial crisis.

Paul says, "We're working much more closely with customers now, helping them to analyze their

EPA PHOTO/CTK/LIBOR ZAVORAL

AN ASSEMBLY LINE AT CZECH CAR PRODUCER ŠKODA IN MLADÁ BOLESLAV, CZECH REPUBLIC.
IT spending by Czech Republic companies recently rose after contracting severely in the recession.

businesses, rather than just 'selling to them.' It is definitely a more personal, customized exercise. We have treated this downturn as a time to invest in solid customer relationships, so that when the collective mind-shift toward spending occurs again, we'll have a wider, more secure customer base."

Across the region, teams are building the base by reaching out beyond traditional enterprise customers to the commercial segment composed of relatively smaller businesses. In Poland, for example, EMC already serves all the major telecommunications firms and 18 of the 20 largest banks. The commercial space offers fresh soil for cultivating more business.

Also, Central European teams have been building partner and channel partner relationships more actively, and with good reason. As Paul points out, 100% of EMC's revenue in the region is formally recorded via partners.

Right now, EMC teams are working particularly closely with counterparts at Cisco and VMware to help spread the virtualization doctrine.

"We want our customers to know how important virtualization is in aiding cost-cutting," Paul says. "As the recession winds down and businesses start to refocus on optimizing for efficiency, we believe virtualization will become even bigger."

THE BEST AND THE BRIGHTEST

EMC Central Europe has been using the downturn period to refine business operations and recruitment strategies. This activity should help the company compete more effectively when the recessionary cloud lifts.

"In the high-growth years," Els says, "we were always just trying to keep up with the deal activity. It was run, run, run. This recession has actually, finally, given us some time to reflect on where we are and where we're going as a region—and to move forward and make changes with confidence."

In Central Europe before the crisis, "it was a lot easier to sell storage, and there was a lot of money with which to buy it," says Paul. "We didn't do much 'solution selling'; we were able to sell bright, shiny boxes without much effort. Now, with the crisis, and we believe it will continue after the crisis, every purchase will have to be based on a business case: What's the impact to the business? What's the risk of doing nothing? What's the return?, etc.

"The changes brought by the crisis will be transformational, as we will focus much more on services and consulting, solutions, and strategy—including virtualization—in order to survive. We are setting up that strategy now. We are optimizing our organization for this reality." ◆

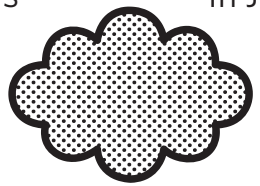
Virtualization services expand

EMC is helping customers enter a virtual world

As they move to 100% virtualized data centers, customers are looking for vendors with fresh technologies and an emphasis on service levels. EMC's capabilities in this area are growing dynamically.

WHEN A MAJOR U.S. bank needed to complete a physical-to-virtual conversion of 2,500 servers in just 18 months and define a new virtual data center model, it turned to EMC Consulting. When a major Israeli utility wanted to create a disaster-recovery system to safeguard its VMware environment, it relied on EMC Global Services. When a U.S. energy provider needed to automate recovery of its VMware Exchange environment, EMC Consulting designed the solution.

As organizations make these leaps toward a private cloud, EMC Global Services and VMware are providing resources and guidance. EMC Infrastructure Consulting Practice Marketing Lead Dave Buffo says, "Actually, the scale of our joint services and solutions does surprise people."



PRIVATE CLOUD: *An infrastructure that provides hosted services to people behind a firewall.*

LONG-TIME PARTNERSHIP DEEPENS

EMC has nurtured its VMware relationship since acquiring the company in 2003—integrating storage, data protection and management, and services with VMware server and desktop virtualization solutions.

In January 2009, EMC strengthened its alignment by becoming a gold-level VMware Authorized Consultant. (The program is now called the VMware Partner Network.) The affiliation made it easier for EMC to deliver VMware products and services and to incorporate VMware technology more broadly across its portfolio.

By June, EMC had launched more consulting, implementation, education, and residency services including the VMware vCenter Site Recovery Manager (to automate data recovery) integrated with EMC business continuity products. Additionally, hundreds of Global Services employees have been VMware certified since January. EMC also is now a VMware-authorized training center, offering courses to customers on how to use VMware technologies with tailored EMC solutions.

Steve Meyers, EMC Consulting Director, Enterprise Infrastructure, says, "Our virtualization services now extend from basic strategy to migration planning to the building out of end-state production envi-

ronments."

By working together, VMware and EMC also extend their market reach and their relationships with other big IT companies. "This services-focused partnership is helping us become an even broader IT infrastructure player," Dave confirms.

Adds Virtualization Global Competency Lead Martin Snellgrove, "We partner so openly and extensively now. And it's hard to view a premier VMware partner as 'just an enterprise storage company.'"

PRIMED FOR OPPORTUNITY

Years after the concepts of server and storage virtualization first piqued the interest of the IT world, companies were still behaving more optimistically than realistically about how much transition work would be needed. Unfortunately, "some of the world's biggest companies still are nowhere near meeting the virtualization goals they'd set for themselves two or three years ago," Steve says. "It's a huge opportunity for EMC and VMware right now."

Virtualization invariably brings cost and energy-use reductions, but despite that fact, most companies have virtualized only 20–30% of their IT environments. According to Dave, they often "hit a speed bump" while trying to adapt processes, procedures, and personnel for a virtualized environment. "Technically speaking, a server admin can create a virtual machine easily," he says. "But then procedures, employee skill sets, and management all must adapt, and the rest of the IT team must figure out how to backup the data and track the changes to the environment."

That's where EMC Global Services comes in. Its growing number of professionals with VMware expertise help companies at any stage of a virtualization journey.

EMC Consulting experts analyze customers' data sets and business objectives, then they design a virtualization roadmap with conversion activities chunked into three-year increments. Customers get advice about adapting procedures and processes for a virtualized environment, as well as business continuity and disaster-recovery solutions.

Importantly, EMC Consulting also helps with the cultural aspects of going virtual. "Stakeholders are letting go of a physical IT environment that they'd pampered for years," says Steve. "A mindset change must take place."

Martin agrees, estimating that the act of virtualizing an IT environment is actually only 30–40% technical. "The rest involves implementing processes and convincing stakeholders and manage-

ment to buy into those processes," he says. "We do a lot of people-work on the ground. When competitors treat data center virtualization merely as a technical effort, they miss that vital piece."

Looking beyond the infrastructure layer, EMC Consulting employees also have been answering customers' questions about how to virtualize applications, how to tie private clouds to third-party clouds, and how to use a virtual IT environment to drive new business models. (The organization's Infrastructure, Application, and Business Consulting capabilities help there.)

And when a client asks that EMC Consulting collaborate with other service providers, the organization's partner ecosystem provides the most comprehensive breadth of virtualization services available.

CRAFTING THE TRANSITION

After customers have a virtualization roadmap in hand, EMC's Global Services Technology Solutions

STEVE MEYERS:
"Stakeholders are letting go of a physical IT environment they'd pampered for years. A mindset change must take place."

and EMC's residents create a design, install the tools, oversee the physical-to-virtual migrations, train the customer's team to maintain the infrastructure, and if engaged to do so, they stay onsite as residents to help manage day-to-day operations.

Helping customers to feel comfortable with virtual technology's newness—such as losing the ability to "reach out and touch" a computer rack if something goes wrong—is part of the job. "We teach them to use the right tools to pinpoint where a problem is and to deploy the correct automatic recovery features," says Marisol Arroyave, TSS Offer Marketing Manager, Global Services.

EMC's security, deduplication, and disaster-recovery solutions provide an edge in building a virtual environment. Specifically, EMC offers EMC Proven Solutions for VMware, which are rigorously tested combinations of products, applications, and services to speed VMware deployments of virtualized mission-critical applications such as Microsoft Exchange, SharePoint, or SAP.

EMC Ionix (a collection of IT management products including EMC Smarts, nLayers, Voyence, Infra, EMC ControlCenter, and Configuresoft technologies) provides management across the physical and virtual data center.

And if customers want help in operating their virtual environment, including hearing about proactive recommendations and best practices, EMC Residency Services for VMware will provide formally certified experts.

EASING THE WAY INTO THE CLOUD

On August 31, EMC extended the portfolio further by launching a collection of services to accelerate a customer's journey to a private cloud.

The new offerings combine EMC's consulting, implementation, residency, and education services to address such customer challenges as virtualizing tier 1 (crucial, performance-intensive) applications; developing architectures for next-generation compute, network, and storage infrastructures; and integrating critical operations in a virtual environment, such as management, security, and data protection.

"Customers are starting to ask us, 'How do I optimize my data center for virtualization to take that big step into the private cloud?'" Dave says. "We're using our expertise to give them all the answers." ◆

➔ READ MORE On EMC.com: "Leading Global Energy Supplier Protects its Microsoft Exchange Environment with Help from EMC Consulting" http://www.emc.com/collateral/emc-perspective/h6319-global-energy-ep.pdf

Since 2007, a secure system has fulfilled a big commitment.

Locking up storage security

A few years ago, EMC created a better way for people to obtain temporary service-access to a Symmetrix system. The tool, called the Secure Service Credential (SSC), Secured by RSA, prevents someone from performing any unauthorized actions on a Symmetrix system's service processor.

By integrating RSA SecurID authentication technology with customization to control and track activity by EMC and partner technicians, SSC became another proof-point that Symmetrix is the most secure enterprise storage platform on the market.

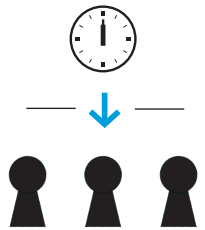
At EMC, a server receiving those access requests generates a distinct credential per user, per hour, per unit, controlling which personnel can access which Symmetrix systems, for what duration, and for what operation.

SHARPENING AN EDGE

SSC was the outcome of the first collaboration between EMC IT and RSA Security, a company acquired by EMC during SSC's development. It was an early manifestation of the desire to build product security in rather than "bolting it on."

All Symmetrix systems built since 2007 boast SSC capability, and 2–3 credentials are issued every minute of every day.

SSC addresses customers' data security concerns and helps them comply with regulatory requirements. SSC also gives EMC an edge over competitors who still rely on more rudimentary password-based access for their high-end arrays.



On average, EMC is issuing 2–3 security credentials via SSC, every minute of every day.

"SSC tells customers that we're serious about security," says Dan Reddy, Product Manager in the EMC Product Security Office. He adds that SSC has become a selling point in customers' decisions to upgrade their Symmetrix systems. The technology can be adopted by platforms across EMC so they, too, can differentiate their products in this security-sensitive market.

FAILURE NOT AN OPTION

EMC organizations including IT, Global Services, Symmetrix Engineering, Product Security, the Global Security Organization, and RSA collaborated to develop SSC.

EMC was expanding its focus on helping customers secure their data, and in fact, EMC's Product Security Office was responding to customers' urgently communicated requests that EMC improve service-personnel authentication.

Previously, service professionals had used a uniform set of static passwords for access, and their subsequent actions were not restricted or tracked.

Kathie Lyons, VP, Global Services Operations, led the 30-person team that created the secure system, as mandated by executives including Joe Tucci.

The team had eight months to create SSC "starting from something akin to a napkin sketch," recalls IT Program Manager Steve Doherty. SSC would launch with Enginuity operating system release 5772 for Symmetrix DMX-3 in Q107, so it *had* to be done on time.

"Our mantra was 'failure is not an option,'" recalls team member Steve Thompson, Program

THEY'RE USING EMC'S SECURE SERVICE CREDENTIAL, SECURED BY RSA. Via this Symmetrix V-Max system's service processor, IT Program Manager **Steve Doherty** (l.) and Project Architect **Sean Ward** test the log-in procedure that is being used thousands of times daily by service professionals worldwide.

Manager in Global Services Security. The project was even nicknamed FINAO by Brian Gallagher, SVP and GM of the Symmetrix Product Group.

Not only could SSC development problems have delayed the release of Enginuity 5772, but bugs could have meant disaster, too. "If SSC didn't work," says Steve, "our guys would be standing in front of boxes, at customer sites, unable to get in. Nor would remote access work. We'd even be halting Manufacturing, Customer Service, and some parts of Engineering and QA."

As the SSC team thought more and more about how the solution would benefit customers, Kathie says, "they really were energized." Team members extensively analyzed business processes, says Matt MacNeil, Platform Security Support Manager in Global Services, calling the result "a fantastic example of user-centered design."

ONLY EMC HAS IT

Some installed Symmetrix units are deliberately not phone-home connected and thus would never be able to access a central system to confirm authorization, notes Arnie Adelman, Security Consul-

tant for EMC's Global Security Office. Therefore, SSC would have to operate separately. RSA technology enabled the team to develop this authentication system totally independent of any network.

"No one else in the market has this capability," says Project Architect Sean Ward, an application development consultant in EMC IT. "Credentials are bound to the proper at a specific point in time, for a specific task, with a password for a specific user."

Users request a credential then use it, plus their own SSC password, to log-in for service. Sixteen levels of access conform to various job descriptions. For example, a service partner who handles routine drive replacements is allowed to perform only that function, while a diagnostic engineer has more extensive access.

More than 100 employees were beta testers. Pre-release training also was extensive.

Everyone vividly recalls the go-live. "This was a big shift," says Christopher Grondin, Global Services Sr. Manager, Security Operations. "You can't turn it off or work around it."

SSC launched on time with just a handful of hiccups, including a very brief disruption due to the shift to Daylight Saving Time.

This technology addresses an important customer need beyond service-centric security. Many customers are legally required to track who accesses their storage systems. With thousands of EMCers and partners performing onsite and remote service, Arnie says, keeping such logs "can become a horrendous burden." SSC lets customers automatically audit access. "In a way, we've offloaded a customer responsibility," he says.

EMC is now integrating SSC into other products, extending its commitment to provide information-centric, not perimeter-centric, security to customers. ◆

NEW: *SSC goes mobile*

Service technicians working on Symmetrix systems anywhere in the world now can obtain authorization codes via text message. Previously, these professionals would connect to the Web or call a live support line when they needed short-term access to a unit. Now, they receive their SSC authorizations within a minute via their pre-registered mobile phones.

Still brand new, the SMS Text Credential Request tool will likely save EMC hundreds of labor hours, resulting in significant productivity increases and major cost savings. And only EMC has it.

EMC extends its customer-service heritage with online improvements.

Global Services, IT, Marketing, all rewarded for an intense effort

PEOPLE FROM THREE EMC organizations work together to dramatically improve customer-support services delivered on the Web. Their multiyear collaboration turns into a perfect melding of ONE EMC and the Total Customer Experience. It also puts a new award into the EMC trophy case.

The Association of Support Professionals has named EMC's site as one of its "2009 Ten Best Web Support Sites," thereby giving to EMC one of the most prestigious honors attainable from the support industry.

After announcing this year's winners, the association's Executive Director Jeffrey Tarter said, "EMC has done a brilliant job of integrating support content from its acquisitions, at the same time that it undertook a large-scale upgrade of the online support tools on the Powerlink site. This was a remarkably ambitious project, but the effort produced one of the best web support sites we've ever seen."

Industry recognition is important, of course. But helping EMC's loyal customers is the real reward. And EMC's customers definitely are using these web-based support services.

According to Global Services Senior Vice President Tony Kolish, in the past two years, EMC has observed customer adoption rates double for Powerlink, EMC's online customer support portal. That growth is gratifying because "we've always set out to make Powerlink the preferred destination for customer service," Tony says.

What did EMC improve? In the past year, enhancements brought live chat, multiple support forums, and an ever-growing collection of support-by-product pages.

The upgrades are 100% customer driven. For example, the new support-by-product pages followed customers' requests for a more direct route

An ambitious project produced one of the best web support sites that the Association of Support Professionals has ever seen.

to getting help.

"Symmetrix customers should be able to go to a Symmetrix-centric page and find in one place all the support and documentation they need," says Tony. "You shouldn't have to navigate through any pages unrelated to your product or problem."

CUSTOMERS DELIGHTED

Sr. Systems Administrator Aran Hoffmann works for a major provider of U.S. workers' compensation solutions. He says, "We avoid a majority of problems in deploying apps simply by reading documentation beforehand on Powerlink.

"The fact that EMC constantly refreshes the material is a key factor; it sets this site apart. Going directly to product pages is a fantastic springboard for our problem-solving."

Aran has a warm spot in his heart for HEAT, the Host Environment Analysis Tool. Uploaded from a host to the online tool, HEAT analyzes a collection of diagnostic files, even warning of potential problems and how to fix them. "In minutes, we get the information we need. It is a huge time-saver," Aran says.

He's also a fan of the E-Lab Interoperability Navigator, which he calls "an amazing feature of Powerlink. You can drill down so specifically to learn if components in your environment are supported. I think it's unique to EMC."

And Aran regards the new support forums as "a great way to bounce ideas around with storage administrators from all over the world. Where else could I find that kind of collaboration?"

The work of Global Services, IT, and Global Marketing is far from complete, however. Through 2010, they will add more improvements, including enhanced search capabilities.

"Everyone's done a great job to ensure consistent quality," Tony says. "We all want customers to view Powerlink as being as dependable as a dial tone." ◆

EMC CUSTOMER
Aran Hoffmann says he's been avoiding problems and saving a lot of time by using the support forums.

coming up in the next issue

Accelerating a worldwide recovery: Governments are investing in creating good jobs immediately while laying the groundwork for a long-term economic revival. EMC wants to help make the planet and our global society better, standing shoulder to shoulder with the people now using stimulus funds to repair transportation infrastructures, create anti-pollution technologies, improve education, and more.

Plus, what is EMC Ionix? Managing IT for a virtualized environment is a pretty big deal: It is fundamentally different from managing a traditional physical environment. Learn how the new EMC Ionix family ushers in the next generation of IT management and how it fits into a Private Cloud strategy.

EMC.now

INSIDE: How EMC is promoting education to close the storage skills gap

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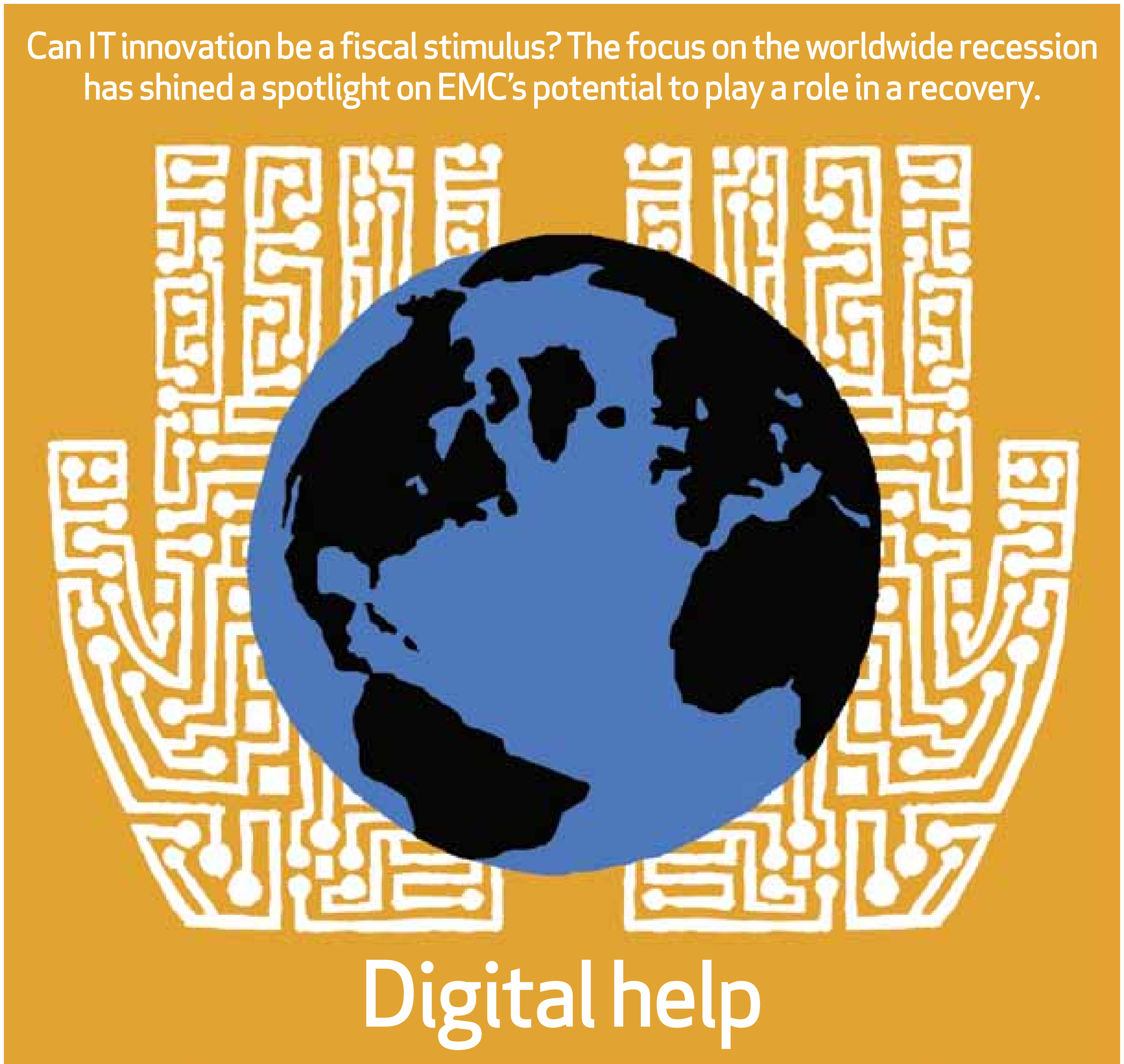
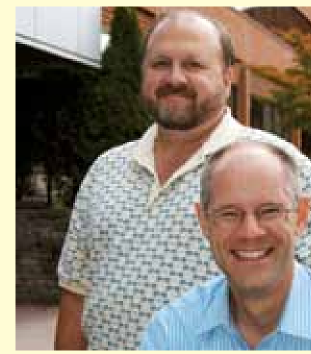
Q4 2009
A QUARTERLY MAGAZINE FOR THE EMC COMMUNITY WORLDWIDE



Taking it to the street: New Iomega products should turn some heads.

Keeping Centera leading edge: Teamwork brings about impressive outcomes.



EMC at 30: The company marks a major milestone as a year-long celebration wraps up.

EMC²
where information lives®

editor's desk It's a recovery that might make us all feel better

This issue's cover story describes some ways that EMC is supporting global stimulus investments in areas that create jobs and lay the foundation for long-term economic growth.

But why is IT infrastructure investment part of a stimulus conversation? Aren't stimulus efforts supposed to rescue the auto industry, help education and the environment, and so on? What kind of IT upgrade could create as many jobs or be as beneficial as, say, supporting wind-energy technology, funding repairs to crumbling bridges, or fixing the housing market?

Well, according to experts, stimulus-funded IT infrastructure projects can create lots *and lots* of jobs and improve conditions in the world dramatically.

The Information Technology and Innovation Foundation (ITIF), a public-policy think tank, claims digital expansion is actually "vital" to humanity's productivity and progress. ITIF cites healthcare: e-prescriptions, computer order-entry, and harnessing vast quantities of data now locked in paper medical records could save many lives and help researchers identify effective treatments faster. Plus, ITIF estimates a $10 billion investment in healthcare IT could create up to 212,000 U.S. jobs.

Dr. John Halamka, CIO of Boston's Beth Israel Deaconess Medical Center, optimistically states, "My grandparent's generation was known as the 'Greatest Generation.' We will be the 'Greatest Healthcare IT Generation.'"

But healthcare isn't the only proof-point. ITIF's estimation of the number of U.S. jobs to be created or preserved through funding broadband networks and electricity-delivery smart grids is stunning.

If the numbers are accurate, they instill hope in me and pique my curiosity about how much of a role we at EMC will play. The Great Recession is teaching us quite a few things, including the lesson that our company has a remarkable road ahead of it.

Monya Keane

ITIF believes nearly a million U.S. jobs would be created or preserved through IT infrastructure stimulus efforts. →

	Jobs created or retained in one year	With this stimulus investment
Broadband	498,000	$10 billion
Healthcare IT	212,000	$10 billion
Smart grids	239,000	$10 billion
Total	**949,000**	**$30 billion**

Read how ITIF arrived at its job-creation estimates: itif.org/files/roadtorecovery.pdf (Robert D. Atkinson, Daniel Castro, and Stephen J. Ezell, "The Digital Road to Recovery: A Stimulus Plan to Create Jobs, Boost Productivity and Revitalize America.")

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features

also inside

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COVER ILLUSTRATION BY ADAM MCCAULEY

from the tell emc files

FEEDBACK FROM the past quarter included questions about using outside consultants and creating a help desk dedicated to cloud computing issues.

M.Y. TELLS EMC: I wonder why we spend money on consulting firms such as McKinsey & Company to help us with cost transformation and other operational initiatives. Shouldn't we be using our own employees who are passionate about driving business and operational excellence and who are equipped with facilitation skills, analysis tools, and deep knowledge about how our company operates? We are a global company that should have an organization focused on best practices for business and operational excellence based on lean principles, data-driven decisions, accountability, continuous improvement, and collaboration.

JOHN HERRERA, VICE PRESIDENT OF GLOBAL DELIVERY, REPLIES:

Thank you for your interest in helping make EMC stronger. All of our projects, including the Cost Transformation Program, are run by EMC employees, and all of them depend on our in-house skills to assist with every step.

Like most global companies, EMC will occasionally use consulting firms such as McKinsey to help attack a new business challenge.

We do this not because our employees don't have the skills, but because we want to take advantage of the wealth of best practices and industry benchmark information these consulting companies bring to the table.

They work with many large, multinational companies simultaneously. Although they cannot share company-specific

Have something to say? If you're inside the EMC firewall, go to: www.channelemc.isus.emc.com/channelemc/Tellemc/toc.asp.

confidential information, they do bring a great perspective to EMC.

F.S. TELLS EMC: Now that VMware, Cisco, and EMC (collectively VCE) are collaborating to bring cloud computing to life for customers—and as more and more solutions are combining these vendors' offerings—wouldn't it be a good idea to create a central help desk?

Customers then could call-in any problem related to any VCE product. The help desk would diagnose the issue, generate a ticket, and route the call to the appropriate vendor's help desk. A small group of experts with a broad knowledge of customer installations could address crossover problems not solvable by vendor-specific customer service staff.

Focusing on problem resolutions with a joint escalation center would (1) increase TCE, (2) prove we're not just talking but acting, (3) help customers deploy cloud computing infrastructures more rapidly and with more confidence, and (4) spread our message to external audiences.

TONY KOLISH, SENIOR VICE PRESIDENT OF GLOBAL SERVICES PROBLEM ESCALATION & RESOLUTION MANAGEMENT, REPLIES: Your suggestion is a good and timely one. Although we are not creating a central help desk per se, we've been working with Cisco and VMware to provide collaborative support for VCE customers since February 2009. We will soon launch the first phase of the formal program.

In a nutshell, we are innovating on processes and technologies to foster seamless collaboration among our support organizations.

Customers will still start with the company with whom they have their primary relationship. For issues requiring cross-company collaboration, the support organizations will engage designated support teams who will take it from there.

In August, Scott Bajtos (VMware SVP of Global Support Services), Bob Ulrich (Cisco VP of Technical Services), and I sent a joint memo to our support organizations outlining the new VCE support initiative. Our unified mission is "to deliver a single service experience to our combined virtual data center customers and partners using collaborative tools, people, and processes to exceed their delivery expectations."

Stay tuned for more information to come. ◆

recent news Recapping the Q309 achievements of EMC and its people

CEREMONIAL LAMPLIGHTING

(l. to r.) EMC India CoE VP and General Manager Sarv Saravanan, EVP of HR Jack Mollen, and CFO David Goulden watch as India's Honorable Chief Minister Shri B.S. Yeddyurappa marks the inauguration of the India Center of Excellence campus in Bangalore. The center is EMC's first LEED (Leadership in Energy and Environmental Design) Gold certified facility. It unites the R&D, Global Services, and IT organizations from four locations in two cities. EMC also announced it will increase its investment in India by $1.5 billion over the next five years.

Quarterly financial results

EMC reported third-quarter 2009 consolidated revenue of **$3.5 billion**, an increase of **8%** sequentially, which exceeded company expectations. Third-quarter 2009 GAAP net income was **$298 million**, an increase of **45%** sequentially.

EMC CEO Joe Tucci said, "EMC made additional progress optimizing its cost structure, expanding its product portfolio, strengthening the partner ecosystem, and positioning itself to capitalize on four of the high-growth, multi-billion-dollar market opportunities around fully virtualized data centers, cloud computing, virtualized desktops and clients, and next-generation backup and recovery."

IN MEMORIAM

Dick Egan

EMC mourned the passing of co-founder **DICK EGAN**, the "E" in EMC, in late August, days after EMC's 30th anniversary. As EMC's CEO until 1992 and Chairman of the Board until 2001, Dick led the company on a path to become the global IT leader it is today. Joe Tucci called Dick "the guiding spirit of our great company," and said EMC's customer-first mantra and other core, enduring values all grew out of Dick's approach to life and work.

PEOPLE

In September, 30-year Intel veteran **PAT GELSINGER** joined EMC as President and COO of Information Infrastructure Products. He leads the Information Storage, RSA, Content Management and Archiving, and Ionix divisions. Pat most recently served as SVP and Co-General Manager of Intel's Digital Enterprise Group.

HOWARD ELIAS is now President and COO of Information Infrastructure and Cloud Services. He, with Pat Gelsinger and CFO David Goulden, join Joe Tucci and Vice Chairman Bill Teuber in the newly expanded Executive Office of the Chairman.

NEW DIVISION

Frank Slootman now heads EMC's new **BACKUP RECOVERY SYSTEMS** Division. The division combines EMC's backup and recovery products and teams from Data Domain, Avamar, NetWorker, and the Disk Library family into one 1,700-person organization.

EMC LEGEND INSPIRES BOOK

The approach that EMC's late, great patriarch of sales Jeff Goldberg took to communications is the inspiration for *SO WHAT? How to Communicate What Really Matters to Your Audience*, a new book from author and sales consultant Mark Magnacca.

STRATEGY

EMC has acquired privately held **KAZEON SYSTEMS, INC.**, an eDiscovery software provider for corporations, legal service providers, government entities, and law firms. Kazeon strengthens EMC's SourceOne eDiscovery, archiving, and compliance portfolio.

EMC has acquired **FASTSCALE TECHNOLOGY, INC.**, a provider of software for next-generation IT. The acquisition extends EMC's Ionix offerings for automating IT management across a unified infrastructure of storage, computing, network, and virtualization resources.

MILESTONE

EMC's innovative third-party reseller program **EMC SELECT** celebrated its fifth anniversary.

EMC AND THE U.N.

In Monterrey, Mexico, in September, EMC Director of Global Sourcing Tom Broderick (center) represented EMC at the United Nations Global Alliance for ICT and Development (GAID) strategy council and other sessions. EMC joined U.N. GAID in 2008 to better understand the challenges of deploying IT at a large scale in the developing world.

From offering a few tape libraries and connectivity products, its portfolio expanded to include 50 products from more than 30 partners. Ten thousand customers have embraced EMC Select, and it has generated more than $850 million in revenue.

SUSTAINABILITY:

For the third consecutive year, the **CARBON DISCLOSURE PROJECT** (https://www.cdproject.net/en-US/Pages/HomePage.aspx) included EMC on its Leadership Index, commending EMC for its comprehensive greenhouse gas emission and climate change strategy reporting.

EMC ranked 18th in the technology industry on *Newsweek*'s **500 GREEN COMPANIES** list. Rankings are based on environmental performance, policies, and reputation among corporate social responsibility professionals and academics.

Vice Chairman Bill Teuber announced EMC's global **COMMUNITY SERVICE AWARD** program, which recognizes the time, energy, and talent employees dedicate to nonprofit organizations around the world. All employees are eligible, particularly those whose involvement goes beyond the norm. EMC will donate monetarily to the charity of each winner's choice.

Sr. Account Manager Bob DeLeone (l.) accepts EMC's top supplier award from Mike Wallace, MRO Manager of Honda of America Manufacturing, Inc.

KUDOS

For the fifth straight year, **TRIANGLE BUSINESS JOURNAL** named EMC one of the best places to work in North Carolina's Research Triangle area, calling it the "#1 Best Place to Work" in the Large Company category.

EMC received a **2009 NETWORK MIDDLE EAST INNOVATION AWARD** for "Best Storage Solution Range." The annual awards recognize companies that contribute most significantly to the region's IT networking market.

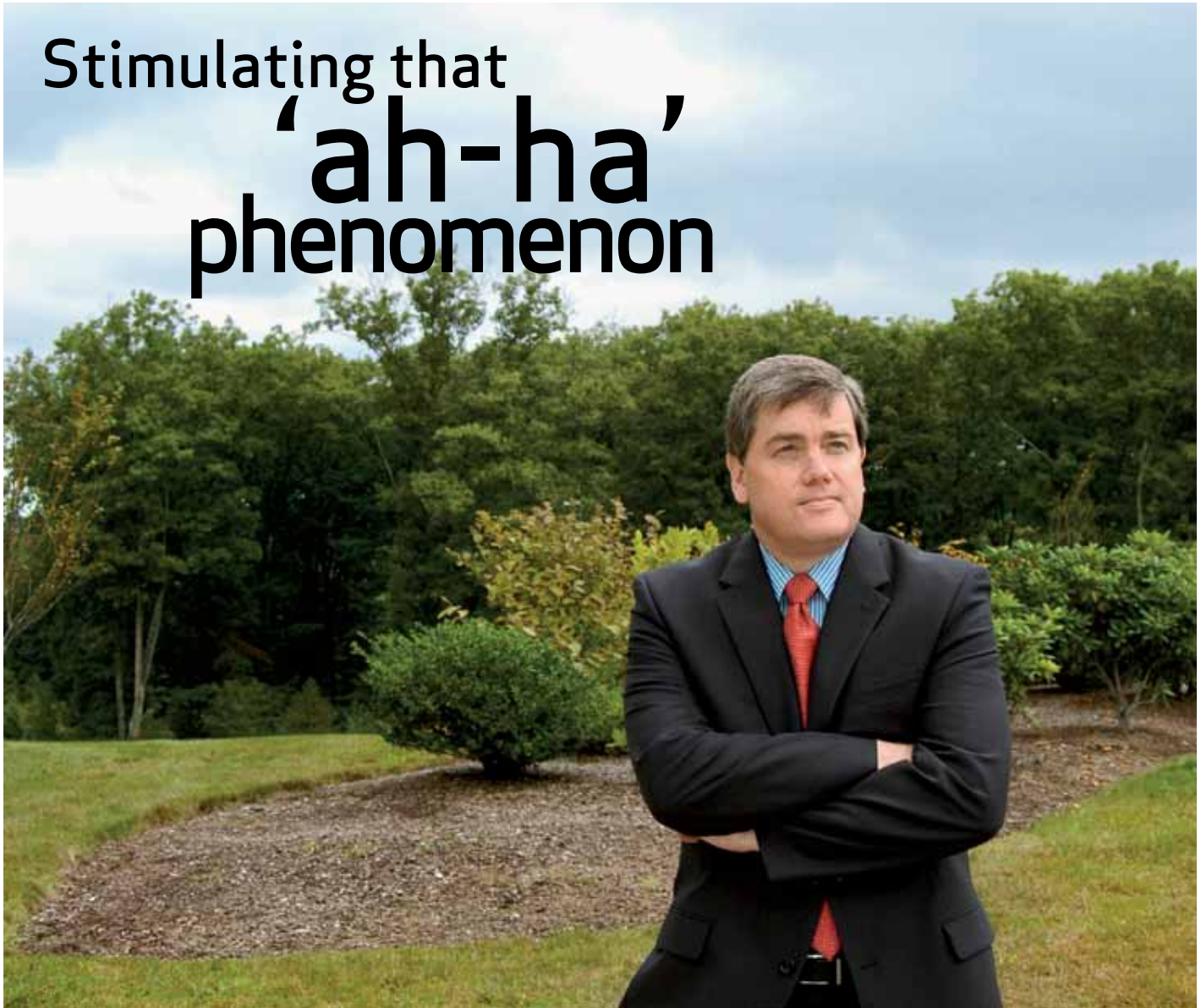
In August, international telco giant **VODAFONE** chose long-time strategic supplier EMC as its preferred storage solution partner in Europe. Vodafone uses EMC systems, software, and services in its global data centers. Vodafone and EMC subsidiary Decho also announced a strategic partnership to develop cloud-based services for businesses and consumers.

EMC earned its 19th **MICROSOFT PARTNER OF THE YEAR** award, for delivering NoteSwitch Complete, a fast way to transition Lotus-based applications to the Microsoft platform.

HONDA MANUFACTURING honored EMC with a Supplier of the Year award for surpassing Honda's standards for quality, cost, and delivery. EMC was the only IT vendor to achieve this tribute. ◆

A focus on the worldwide economy is spotlighting EMC's capabilities.

Stimulating that 'ah-ha' phenomenon



"EMC technologies can contribute to creating smarter electricity grids, greener government IT infrastructures, better information access for law enforcement professionals, tracking systems for education, improved justice-system case management … the list goes on and on."

MARK GREENLAW, SR. DIRECTOR, EMC GLOBAL STIMULUS PROGRAMS

Stimulating that 'ah-ha' phenomenon

Economic stimulus efforts around the world are setting the stage for a new dialogue with customers—conversations in which employees describe how EMC's products and services can support stimulus programs tied to creating and preserving jobs in transportation, education, healthcare, carbon-emission reduction, and more.

Stimulus packages are driving what Peter Berkel, EMC Public Sector Director, calls "an ah-ha phenomenon" with customers. "I think we can create a greater appreciation for EMC's capabilities," he says. "I've met with customers who have told me, 'I thought you were just storage guys. I didn't know EMC could even offer what you're describing to me.'"

Right now, teams all over the U.S. are talking to state officials about how EMC information infrastructure supports education, criminal justice, or transportation initiatives. In China, EMC has forged a relationship with the Ministry of Railways that may result in providing storage and backup to 15,000 railroad stations.

Government stimulus funding represents investments totaling $2 trillion worldwide, notes Mark Greenlaw, Sr. Director, EMC Global Stimulus Programs. EMC is interested in supporting IT functions that will be part of those packages. As Mark emphasizes, EMC's primary intent is to help stimulus-funded efforts succeed: These programs have an incredible potential to improve conditions in our world now and long into the future.

"As a company, we're in the business of making enterprises more efficient and lowering their costs," Mark says. "If we help a hospital network improve its IT infrastructure via a stimulus project, we will, by extension, be helping that hospital network to serve more patients with better care."

SIZING UP POTENTIAL

In December 2008, EMC began prepping the field and customers for what was coming. The $787 billion American Recovery and Reinvestment Act (ARRA) was enacted the following February.

By June, Mark had been appointed to oversee the EMC Global Stimulus Programs group. He

works with a virtual team of product, sales, and partner organizations, developing strategies "to put EMC's best foot forward" in a competitive stimulus climate.

EMC is most focused on ARRA, Mark says, because its priorities best align with the full breadth of EMC's technologies. China's stimulus plan, in contrast, funds mostly brick-and-mortar projects (*see sidebar*), but Mark is working with EMC China employees to dig deeply to identify potential projects. In Europe, meanwhile, stimulus plans vary by country.

EMC sees three key opportunities in the United States. With the first—short-term projects to be funded in the next six to 18 months—EMC is striving to help governments achieve their goals with current EMC technology. These efforts don't require EMC to make product or go-to-market changes. Examples include improving energy conservation, IT for government agencies, education technology, and physical security.

A second, longer-term opportunity involves an aspect of ARRA's multi-billion-dollar healthcare spending allocation: the creation of an electronic healthcare record system. EMC's experience in healthcare information technology positions it to play a major role here. EMC is integrating its solutions and combining them with partners' applications to meet the initiative's very specific requirements.

The third area offering long-term promise is the U.S. Department of Energy's Smart Grid initiative. ARRA allocates $4.5 billion toward efforts that include computerizing the nation's electricity grid in the coming years. EMC has information management, information security, physical site monitoring, systems resource management, and performance monitoring technologies and services to contribute significantly.

Traditionally, according to Mark, too many government agencies "viewed us as a synonym for 'storage boxes.' This is our opportunity to re-introduce ourselves as the premier provider of security, information management, and systems management."

PREPARING THE FIELD

Many of the ARRA projects most suited to EMC won't hit full speed until 2010. Right now, EMC is preparing sales teams to uncover opportunities.

Peter says, "We're offering training; we're writing playbooks; we're continually engaging the field. Our teams must build rapport and help customers with their funding applications right now. Otherwise, we miss the boat."

Jennifer Axt, EMC VP for State and Local Gov-

ernment, became interested in ARRA early and built a small virtual team that created collateral and drove the training. Under leadership from Jennifer, her team began early by matching EMC's solutions to the transportation, public safety, and education areas targeted to receive federal stimulus funds. That exercise showed EMC's solutions for IT efficiency, data protection, content management, and physical security could apply to many state and local stimulus priorities.

Under usual circumstances, public-sector customers don't have spare funds to pursue IT improvements whenever they wish. Only when they receive funds can they issue an RFP.

Because ARRA has increased certain public-sector budgets, the field can now engage these agencies more proactively and help them prepare stimulus grant applications requesting IT improvement funds. The U.S. government is distributing a lot of stimulus money through pre-existing grant programs—programs that EMC monitors but which lacked funding in the past.

EMC's public-sector specialists have spent months briefing salespeople on (1) starting stimulus-related conversations, (2) using the playbooks that describe how specific EMC technologies can help state and local government agencies, and (3) determining which grants might apply.

For example, one sales team helped a large metropolitan agency win a multi-million-dollar grant from which EMC earned a deal worth nearly $7 million.

The team had worked for months crafting a proposal to consolidate this agency's IT operations, virtualize its Exchange environment, upgrade its applications, and improve disaster recovery.

When EMC's proposal was rejected due to a lack of funds, the team helped the agency apply for a small portion of the $4 billion in stimulus money that was earmarked nationally for U.S. Department of Housing and Urban Development projects. That federal grant came through. EMC's gear was onsite within a week.

NEW WAYS TO CREATE JOBS

EMC's technology portfolio gives it an edge in supporting job-creation or job-preservation projects. Take the example of a public-documents warehouse: EMC technology could help digitize the material, automate its management, lower non-personnel administrative costs, make the data safe and secure, help people share it more effectively, eliminate duplication, and even reduce fraud.

EMC sales teams are using the company's collective experience in public agency support to illustrate what EMC can do globally today. Two

years ago for the state of Kansas, an EMC team created an RSA-based security system to support an 8,000-person law-enforcement organization. That effort now helps other sales teams discuss similar solutions with law enforcement agencies in cities worldwide.

EMC also is more active in supporting markets not actively pursued in years past. It recently teamed with IT reseller partner CDW to make inroads in helping community health centers. Other employees are partnering with electricity meter manufacturers to help bring smart grids to life.

The whole effort is prompting EMC to examine how its technologies and services can make a positive difference in the world.

"We're looking at our capabilities in a new light," Mark says. "This is a serious opportunity for us to think harder about everything we could do as a company to bolster employment, economies, societies, and our planet's health." ◆

Local focus in China

Helping the country grow jobs

EMC's locally focused approach in China makes it a natural candidate to support that government's more-than $586 billion fiscal stimulus program.

EMC has always strived to be a local company committed to China for the long term, says Steve Leonard, SVP and President of EMC APJ. Almost all of EMC China's 1,000-plus employees are Chinese, and they work with more than 1,000 Chinese partner entities. EMC, intensely interested in


Denis Yip

helping China grow jobs, has invested more than $1 billion there so far.

With upgrades underway for China's transportation, hospital, and school infrastructures, EMC will do more of what it is already doing—although, perhaps, faster and with more resources, Steve says.

EMC China's local workforce has advantages in interacting with the Chinese government and a personal interest in helping to stimulate the economy. "But it's not because a stimulus package is now in place," Steve says. "That package is putting money into important projects that we would be, and should be, supporting in any case."

EMC recently signed a memorandum of understanding with SinoRail Information Engineering Group, the IT solutions

Local focus in China

provider owned by the Ministry of Railways of the People's Republic of China. EMC has created a railway-dedicated consulting team, and "we absolutely want to be a bigger player in supporting this agency," says Steve. "Again, we are a local company. When this government is putting money into something that will enhance infrastructure and generate jobs for people, then, of course, we feel privileged to play a part."

Denis Yip, President of EMC Greater China, says that rather than using playbooks in China, the company is pursuing stimulus business one opportunity at a time.

For the most part, opportunities appear to be within EMC's core storage, backup, and recovery businesses. In some cases, stimulus funds are augmenting projects that EMC already was actively supporting.

Of the $586 billion the government is investing between 2009 and 2011, roughly 45% is for new-infrastructure building, 25% is for infrastructure reconstruction, and 30% is for various other environmental or civil improvements. Probably 4% of the money, overall, will be spent on information technology.

China tends to take a long-horizon view; opportunities being explored now may take years to complete. For now, EMC is targeting IT opportunities in several areas.

The first is telecommunications, an industry receiving hundreds of millions of dollars in stimulus funds to expand and upgrade infrastructure and data centers. EMC is hoping to help by providing storage, backup and recovery, archiving, and Ionix-based network and systems management.

In healthcare, EMC is partnering with General Electric and Chinese software maker NewSoft to provide IT infrastructure to 500 of China's most advanced hospitals. Prior to the stimulus, EMC had only about 80 installations in Chinese hospitals.

Third, EMC is supporting stimulus projects related to the railway, state electric grid, and law enforcement.

"It's not that a stimulus package creates a whole new engine," Steve says. "Rather, China's stimulus funding is like oil flowing in an engine's parts to reduce wear. It smoothes things that otherwise would be a little bit clunky." ◆

Does EMC have what it takes to help deliver smart grid technologies?

The U.S. stimulus package includes $4.5 billion for utilities to start replacing aging electricity-delivery systems with a smart grid computerized system capable of optimizing usage. Some European countries also are working on this innovation.

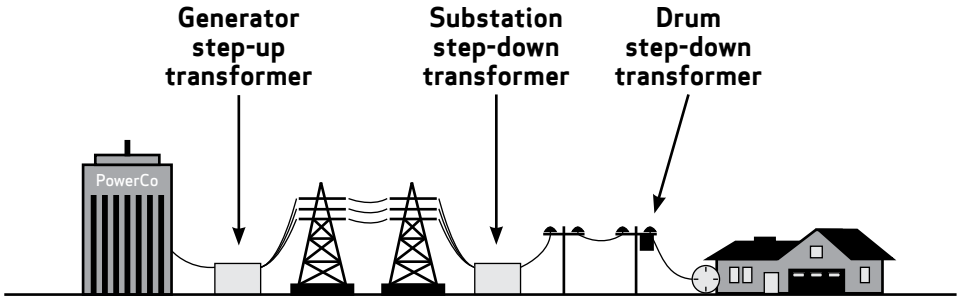
A smart grid would track usage every 15 minutes or every hour, rather than once per month. Utilities and customers could spot usage peaks and valleys and see what power sources and price levels filled them. Storage needs of utilities will expand due to this increase in data and the new requirements to give customers more usage-related information online.

The idea: Enable customers to make choices about when to use power and what to pay for it, and to let utilities adjust power supplies based on real-time demands.

However, says Corporate Strategy VP Rona Newmark, it's a complex data-related situation. A smart grid essentially changes the electricity-delivery system into a com-

Today's Energy Grid

THE PROBLEMS: Today's electrical grids present many pain points, including a one-way power flow from traditional sources, rudimentary interactions, and limited visibility and communication.



DATA COLLECTION, BACK OFFICE

- Manual meter reading is costly.
- Utilities cannot control demand.

GENERATION

- Renewable energy sources cannot be integrated.

TRANSMISSION AND DISTRIBUTION

- Aging infrastructure causes frequent outages that are hard to identify and fix.

METER AND HOME

- Customers cannot monitor and manage energy consumption.

munications network. And communications networks have inherent management and security needs.

Fortunately, technology from EMC Ionix can monitor and manage the equipment that makes a smart grid run. Utilities can automate visibility and systems control across physical and virtual data centers. Ionix could offer the best management portfolio across storage, networks, servers, and applications.

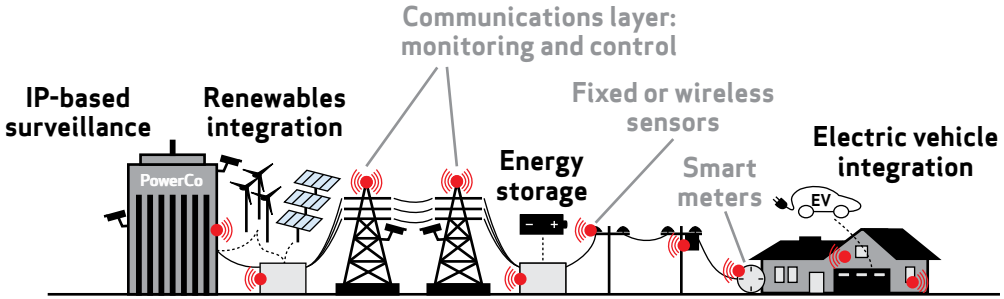
EMC's RSA Security division also offers technologies utilities can use to protect customers' privacy. This is important, because any power utility that wants to receive stimulus funding must be able to demonstrate that they are investing in security and that they have a consistent approach to security intended to meet the requirements of the emerging standards in this space.

The smart grid presents a new way to put EMC technology to work to make a positive difference for the environment and the economy.

"We have the right kinds of automation, and we have proven products," Rona says. "We can help make something very important happen here."

The Smart Grid

THE SMART GRID SOLVES THOSE PROBLEMS: This fully automated, integrated power delivery network will ensure a two-way flow of electricity and information between power plant and appliances—saving energy, reducing costs, and increasing reliability.



DATA COLLECTION, BACK OFFICE

- Automated billing
- Innovative pricing
- Customer portal
- Cross- and up-selling opportunities

GENERATION

- Fully integrated energy sources including renewables and biomass
- Load balancing

TRANSMISSION AND DISTRIBUTION

- Real-time outage notification
- Resilient and self-healing
- Protected
- Geographic information system for efficient crew dispatch
- Mini-generation within grid

METER AND HOME

- Demand response management
- Smart appliances
- Remote energy management and control
- Electric vehicle support

IN THE CONSUMER and small business marketplace, the latest Iomega products are turning heads.

Taking it to the street

When EMC acquired Iomega in Q208, the market for consumer multimedia was growing fast, in line with everyone's equally fast-growing digital stockpiles. People wanted better ways to access, organize, and protect scattered video, music, and photo files. Small businesses wanted the competitive edge that efficient information management can bring.

COURTING THE CONSUMER

Iomega products benefit from EMC's engineering experience in network attached storage and data backup. They also have Iomega's brand recognition and established distribution channels, and VMware's compatibility certification.

But these products compete in a crowded global market against devices from companies such as Western Digital, Seagate, Netgear, and Buffalo Technology. "These vendors are attracted to the fact that adoption rates for network storage and home media networks didn't weaken during the downturn," notes Bill Hansen, Iomega Global Product Manager for Network Storage Products.

Today's consumers and small businesses want an information management product that is affordable, easy to use, and capability rich. Enhancements to several Iomega products should make them even more appealing.

Iomega StorCenter ix2-200 (two-drive) and ix4-200d (four-drive) NAS servers, for example, have faster processors that use less power. They have more file storage capacity. They boast an upgraded look and feel and are incredibly easy to install. Says Bill, "You can set these up with four mouse clicks."

The boxes also have a QuikTransfer button that provides one-touch data synchronization between media devices, making it easy to transfer data

These movie posters are designed for display in central areas of EMC offices.

from a USB drive or to run a replication job without needing a PC. The QuikTransfer feature could be especially welcomed by small firms or any company with multiple locations that wants to copy data to other onsite devices or to remote devices for disaster recovery or cloud computing.

PLAY IT AGAIN, SAM

Loren Bryner is Iomega's Global Product Manager for Multimedia Products. He reports that the market for those products "has absolutely exploded in the last two years, especially in Europe."

Iomega has been shipping multimedia systems for a couple of years; now the company is introducing a whole new generation of technologies.

The new media players in Iomega's ScreenPlay family are completely refreshed with features such as 1080p high-definition, new codecs, and online media access.

The affordable TV Link Director Edition, at one end of the spectrum, makes use of already-owned storage. Users connect a USB port, flash drive, or camera to enjoy movies, music, and photos on a TV.

At the other end of the spectrum is the new Iomega ScreenPlay Plus. With a terabyte of capacity, it can be the primary storage and player for home media files.

The feature-rich ScreenPlay Director, also with 2TB of storage, offers high-definition cinema-quality digital resolution and network storage.

Users can access online content from sites such as YouTube and Flickr, as well as from Internet radio, podcasts, and RSS feeds. In U.S. versions, there's even a link to CinemaNow.com to rent or buy feature-length films, shorts, music concerts, and TV shows.

NEW MARKETING CAMPAIGN

Developing and releasing a consumer NAS or multimedia product is a process different from what's involved in developing and releasing an enterprise-scale IT system.

For example, the "STAR IS BORN" marketing campaign for the new Iomega ScreenPlay Director is noticeably different from conventional storage-system product launches. "Can you imagine mailing out tubs of gourmet popcorn to partners to promote a new Symmetrix system? It's a different world, with a different approach to product promotion," says Iomega Marketing Manager Kathy McMahon.

The world of storage and multimedia products for homes and small firms is well worth exploring. Senior leaders in the Iomega organization expect to sell close to a million multimedia units in 2010. That's a figure no one should ignore. ◆

CERTIFIED: Iomega's StorCenter NAS device family is the first collection of consumer-scale storage solutions to pass VMware's rigorous certification process.

Just in time for the holidays

As of November 30, the following refreshed Iomega products have launched. Below are some features and prices.

The 1TB StorCenter ix2-200 is available in the Americas and Europe for $269.99; the 2TB model costs $369.99, and the 4TB model costs $699.99.

The Iomega ix4-200d NAS appliance is the first Iomega product designed from the ground up specifically for small businesses since Iomega was acquired by EMC.

IOMEGA STORCENTER IX2-200 AND STORCENTER IX4-200D NETWORKED STORAGE SOLUTIONS

- iSCSI block-level access for efficient storage utilization
- RAID 1 configurations for optimized data protection
- Windows Active Directory support
- A new front-panel QuikTransfer button for easy copying of selected files
- User-replaceable hard drives
- Multiple IP security camera support
- VMware certification for virtualization installations
- Serves as a Time Machine target for Apple computer backups
- Built-in torrent support for file-sharing without the need for a dedicated PC
- Bluetooth capability for uploading all kinds of digital content from a smart phone
- New LCD screen on the ix4-200d

Just in time for the holidays

IOMEGA SCREENPLAY FAMILY OF MULTIMEDIA PLAYERS

ScreenPlay Director and TV Link Director Edition:

- Compatible with many codecs and file types including H.264 and .mkv
- Direct online access
- 1080p high-definition media
- Store and share files over a network (Storage is not available with TV Link, which is designed for users with existing storage.)
- Ability to attach USB hard drives or a camera
- Data and computer protection with Iomega Protection Suite anti-virus and backup software (no software on TV Link)
- Can be used with PCs and Macs
- WiFi ready (WiFi adapter sold separately)

ScreenPlay Plus:

- 1TB of storage
- PC only
- 1080i high-definition
- Ability to attach USB hard drives or a camera
- ScreenPlay TV Link is available in the Americas and Europe for $129.99; ScreenPlay Plus costs $169.99, and ScreenPlay Director costs $249.99.

The Iomega ScreenPlay TV Link is an ultra-compact multimedia player that lets consumers watch and listen to movies, music, and photos by connecting a TV to a USB hard drive or flash drive.

EMC's Engineering and Global Services organizations collaborate

Keeping Centera leading edge

Bob Kumlin (standing) and Mark O'Connell represent two of many Global Services and Engineering employees who figured out how to make Centera support more efficient while reducing support-related costs. They're not done, either: The team is continuing to identify opportunities for improvements.

When you're the company that introduced the world's first and best content addressable storage (CAS) solution, the only way to go is "up."

That's been the situation since 2002 for EMC's Centera family—CAS systems that store and retrieve data according to content, rather than folder or directory location. CAS systems offer economical and trustworthy archiving of unchanging or infrequently changing information.

EMC's latest large-scale Voice of the Customer survey revealed that Centera Gen 4 users report very high levels of performance, scalability, and ease of use, resulting in strong satisfaction ratings. "It is a very upbeat response," says Kate Woodcock, EMC Sr. Program Manager, Loyalty Relationship Programs.

Centera continues to attract thousands of customers, and EMC has been seeing year-over-year growth of more than 60% in cumulative petabytes installed.

ACCEPTANCE DOESN'T OCCUR IN A VACUUM

Centera owes its quality in large part to joint efforts by EMC Global Services and EMC Centera Engineering employees.

The product was introduced seven years ago as a deep-archive alternative to tape. But in today's era of shrunken IT budgets and exploding data quantities, storing more for less is imperative. And for a lot of customers, economical, sturdy Centera became an extension of primary storage—an evolution that EMC had been observing and actively spearheading.

For example, with guidance from EMC, customers began using Centera to build "production archives" for storing information that doesn't change much (or at all) but is accessed frequently, such as hospital patients' x-rays.

Now much more than a deep archive, Centera would have to be faster and offer 99.999% availability. EMC Engineering would accelerate its development of enhancements, while Global Services would ramp-up support capabilities.

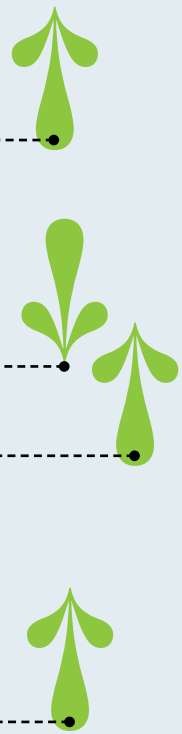
"We never intended to rest on our laurels in any case," Centera Chief Architect Mark O'Connell points out. "We were always pursuing enhancements. But now, we'd make improvements in cooperation with EMC Global Services."

A GLOBAL SERVICES TRANSFORMATION INITIATIVE

A team from the Global Services Planning organization conducted a total lifecycle cost (TLC) study. They hoped to find out how to make Centera support more efficient while reducing support costs. If

As EMCers eliminated millions of dollars in costs, they greatly improved customer satisfaction:

This collaboration has saved EMC **$35 MILLION** so far. While the Centera install-base is growing, total service costs are shrinking. EMC has seen an amazing **90%** drop in high-severity Centera cases and a **39%** improvement in customer satisfaction with "time-to-resolve" issues for PREM (related to Centera service requests). Centera also has achieved the **99.999%** measure of availability.



the team could figure out which factors influence remote and onsite Centera service activities, perhaps they could uncover a way to reduce the time it takes for Global Services to resolve incidents while improving the end results.

The data this team gathered turned out to be more useful, and the collaboration with Centera Engineering ultimately was more successful, than anyone had envisioned.

Centera's engineers already had been thinking about potential areas for engineering development. The TLC study results, however, "helped us shift to being data-driven rather than subjective in how we respond to concerns," recalls Jay Mastaj, former GM and VP of Centera Global Engineering.

The engineers previously had received their customer-service data from one group—the Rapid Response Team, part of EMC's Problem Resolution and Escalation Management, or PREM, organization. But rapid-response data drives only 20% to 30% of Centera's perception in the field.

As communication between Global Services and Engineering improved, "We realized we could go beyond those rapid-response issues traditionally identified to us and get right down to fixing the root causes of concerns," Jay says.

The approach worked. Specific engineering achievements resulted. And EMC has saved $35

million in Centera support costs so far. Essentially, even as the Centera install-base grew, service costs shrank. EMC is supporting more Centera systems, more effectively, without needing more people.

"The most positive outcome was that everyone came to the table and worked as a team," says Jay. "Their teamwork has directly improved the Total Customer Experience."

DATA, THE KEY TO SUCCESS

Bob Kumlin has led TLC program activities for Global Services for the past two years. A Senior Manager of Service Planning for the Centera and EMC Disk Library products, Bob and his colleagues in Service Planning work with fellow employees representing PREM, EMC Maintenance and Support Services (field service), Engineering Development, and Level 3 (the EMC Engineering team that handles the escalation of problems communicated from the Global Services support team).

Together they identify the causes of service costs and create ways to reduce those costs. "The key to our success is to have good data—data that lets us measure service-cost drivers accurately," he says. "Then we compare the benefits of driving down those service costs against the corresponding up-front engineering costs that will be necessary to resolve the issue."

One service-cost challenge involved deploying new code releases. Global Services' traditional code-upgrade procedures were somewhat lengthy, with a customer engineer (CE) performing many manual steps.

"We were faced with a large percentage of Centera customers running an obsolete version of Centera's CentraStar operating system because the upgrade process had been rather time-consuming and occasionally prone to error," says Bob. "The customers, therefore, had been reluctant to allow further CentraStar code changes. And as a result, they were still being unnecessarily affected by issues that we'd already fixed in those later software releases."

Global Services analyzed the upgrade steps, and Centera Engineering developed an automated procedure.

These days, a CE executes a few simple commands to automatically run pre-upgrade tasks, load code, save configuration files, and execute post-upgrade activities.

The automation has saved CEs' time onsite and helped them gain customer support. Those improvements, in turn, have led to an increased willingness by customers and CEs alike to deploy newer versions of CentraStar.

Centera Engineering VP Bob Thibault says, "With all the positive activity, we are not only seeing reduced costs, but we are also seeing our customers' 'pull' for our latest software upgrades. They are confident that their experience with the product will continue to improve in ways that are meaningful to them."

PRESCRIPTION FOR TCE—THE CENTERA DOCTOR

The Centera Doctor (C-doctor for short) has been another high-impact outcome of the Global Services and Centera Engineering collaboration.

C-doctor is an automated tool. It embeds best practices and insights from Engineering into a knowledgebase to speed diagnoses and repairs in the field.

"This team effort improved TCE and established a great process for working cross-functionally using a very good database of knowledge," says Joe Spiewak, Sr. Director, Global Services Planning & Operations. "Through this effort, we were able to get everyone's agreement on how we approach issues and work to get results."

EMC Global Services may now replicate a "C-doctor-like" knowledge-collection approach for other EMC systems. "It will become part of the standard for services, especially for remote services, over the next few years," Joe says.

"The service-planning success we see with Centera is not just about reducing costs. It's about improving TCE, time to resolution, and, ultimately, being preventative. When done well, driving cost out and driving TCE up are two sides of the same coin."

—*Howard Elias*, President and Chief Operating Officer, EMC Information Infrastructure and Cloud Services

Thus, EMC's support professionals will be able to identify and resolve even complex problems without having to go through as much advanced training. The process will also further strengthen the new bridges being built between EMC Engineering and EMC Global Services.

According to Bob Kumlin, the Centera C-doctor exemplifies how much benefit the EMC Total

Lifecycle Cost program can offer. In this case, when a Centera issue arises, a RAP (recommended action plan) provides corrective actions. That RAP "greatly simplifies the troubleshooting process and provides a common methodology to all support personnel," Bob says.

Similarly, when a Centera system alerts EMC of an issue via its phone-home connection, an appropriate Primus Solutions knowledgebase entry is now appended directly into the service request (SR) as it is created.

This enhancement allows Wipro Technologies, an EMC partner that integrates solutions and services to help customers, to immediately get to the appropriate corrective actions. And that leads to reduced resolution times.

SYR automated alert handling is yet another collaboration success story. SYR is EMC's internal systems reporting application for configuration reporting, dial-home processing, and dial-in/remote automation for EMC products running at customer sites.

"Now, when our SYR system receives certain alerts from a cluster, it will automatically dial back into that cluster and run a script to take corrective action," says Bob. If the script is successful, the incident is closed with no human involvement needed at all. With automated alert handling in place, Global Services can easily plug-in future functionality as more automation scripts are developed.

"The reason these Centera upgrades have been succeeding so well is that people in Global Services and people in Centera Engineering are using data to make their decisions and prioritize initiatives," says Bob. "Hard data eliminates emotion and bias and clearly identifies the areas we should address."

And they're not done; this cross-functional team continues to monitor Centera data points to identify opportunities for future improvements.

The outlook is bright, and Brian Mahan, Centera Director of Product Management, is upbeat about the fruits of this collaboration. He says, "This is not just a short-term effort. Now that the relationships are in place, we are building upon them. Both sides did a lot of heavy lifting to move from the moment of inspiration to the actual delivery of improvements."

And in that time span, EMC has seen an amazing 90% reduction in high-severity Centera cases, and a significant improvement in time-to-resolution for all problems.

"To put it another way, we're living proof that 'an ounce of prevention yields a pound of cure,'" Brian says. ◆

EMC IS RAISING awareness, promoting education

Closing the storage skills gap

What EMC is doing to grow a new generation of information storage pros

CHARLES KRONAUER

EDUCATION SERVICES DIRECTOR G. Somasundaram (l.) and Sr. Director of EMC Education Services Alok Shrivastava co-edited the book *Information Storage and Management*, which coalesces the knowledge of 40 EMC experts in all.

Alok Shrivastava began his IT career 25 years ago at one of Asia's largest data centers. Filling one hallway were 16 hulking blue DASD subsystems with a combined capacity of 40 gigabytes. Allocating that capacity to various applications was a laborious manual task, not a simple automated one. And disaster recovery meant making tape-reel copies.

Today, 2,048 gigabytes will rest gently in one's hand, and many information management and protection processes have completely transformed.

But one thing hasn't changed. Organizations still need people on staff *who know what they are doing*.

Unfortunately, demand for information storage and management (ISM) expertise has outpaced the number of people trained in it. Alok, now Sr. Director of EMC Education Services, says that many organizations still don't grasp how essential strong ISM skills are to them. "Appreciation for storage technology is still pretty low," he says.

That's why EMC is raising ISM awareness and promoting education to create more storage experts around the globe.

Three years ago, for example, EMC Education Services designed and started offering an ISM open curriculum to employees, partners, customers, IT consultants, and universities. It was also the beginning of the EMC Academic Alliance.

Just six months ago, Wiley Publishing and EMC published the most comprehensive reference book ever written on the subject of data storage, *Information Storage and Management*.

At more than 300 universities worldwide, an estimated 14,000 students have completed the ISM program. Another 4,000 are now participating in the current semester. EMC has issued 45,000 certifications through its EMC Proven Professional Certification Program, including 9,800 ISM-specific certifications.

But the knowledge gap is still widening.

LOTS OF WORK AHEAD

EMC began focusing hard on the storage skills gap four years ago, when it was having trouble finding well-trained storage professionals to hire. Often, EMC ended up hiring—then training—people whose backgrounds were in other IT specialties, such as databases, operating systems, or network administration.

EMC surveyed its customers and discovered that they, too, were struggling with the same storage-skill shortages.

Nor could EMC find even one university, anywhere in the world, that was offering an educational track dedicated expressly to ISM. Schools were teaching storage concepts, of course, but only as a section of their broader-scope computer science courses. There weren't even any textbooks in print comprehensively covering the complete range of ISM principles and technologies used by real-life organizations.

A market leader educates. Thus, EMC would address the problem.

First, EMC Education Services designed a com-

prehensive ISM curriculum centered on technology principles, not vendor-specific products. A small Education Services team began reaching out to top-tier universities, encouraging them to adopt this open curriculum through the EMC Academic Alliance (EAA) program.

At the same time, EMC was forging partnerships with major independent training organizations that serve IT professionals.

Importantly, in 2006, EMC also added the ISM curriculum to its EMC Proven Professional Certification Program for customers, employees, and partners.

Most recently, EMC created *Information Storage and Management*, the only book in print that provides a beginning-to-end examination of ISM. Alok and G. Somasundaram (Somu), EMC Education Services Director, co-edited the book, which coalesces the knowledge of 40 EMC experts in all. It serves wonderfully as a reference text for a broad range of information storage and management technologies.

The book is now available around the world through major retailers such as Wiley Publishing, Amazon, Barnes & Noble, and Borders. A Chinese translation is slated to appear by the end of 2009, and the book will be released later in other languages as well. Such widespread availability will help *Information Storage and Management* touch parts of the globe that are far from EMC or its partners' learning centers.

"The idea is to extend the book outward to every part of the world," Somu says. "We are partnering with many external organizations as well; two or three can't solve this problem all by themselves."

Mind the gap

Despite progress, EMC's latest annual survey of 1,450 storage professionals has revealed that the storage skills gap won't fade away easily.

While the survey's respondents plan to increase their staffs by 17% on average over the next 12 months, they expect to continue to endure a chronic shortage of qualified people. Meanwhile, that great challenge—managing explosive data growth—will only heighten the problem.

On the upside, awareness of storage technology's importance has increased. Four years ago, Alok notes, only 40% of organizations had a formal storage group. Now, 60% do.


Manoj Chugh

HELPING CUSTOMERS KEEP UP

The efforts have been well received. ISM classes held at EMC and at offsite training centers are attracting more than 100 employees, partners, and customers every week, Alok estimates, with 55 additional customers typically participating online.

Matthew Imel is the Global Storage Management–NAS and Archive Storage Architect for Eli Lilly and Company. He received his EMC Proven Professional Certification in December 2008 and is one of many customers using EMC's help to train storage teams.

Eli Lilly must manage more than a petabyte of data at present. Matthew says that like his employer, all companies are challenged with managing rapid information growth and fast-changing technology in ever-more efficient ways. "Today, those of us working in IT must have a deeper and broader skill set," he says. "Eli Lilly knows this, and it offers us the right opportunities to train as new technologies arise."

Eli Lilly, headquartered in Indianapolis, looks to EMC to help it stay on top of trends including virtualization and deduplication, Matthew says. And because EMC offers these classes at its local Indianapolis field office, they are convenient and economical.

INDIA INROADS

Globally, more and more universities are using EMC's open curriculum, particularly in India. Manoj Chugh, President of EMC India and SAARC (South Asian Association for Regional Cooperation) and Director of Global Accounts for APJ, says in India, where digital information is growing at 60% a year, an acute gap exists between storage-expertise supply and demand. EMC India has, therefore, seen an "overwhelming response" to its EMC Academic Alliance overtures.

Since EMC began recruiting Indian universities in 2006, storage-curriculum enrollment has grown

Gap-related statistics

Storage managers estimate approximately ONE-THIRD of their teams are "very capable," but the other two-thirds require further development.

Digital information that will be created in 2012: 2,502 EXABYTES (compared with 2008's 486 EXABYTES).

U.S.-based storage design and implementation professionals earn an average salary of $98,400. Certified EMC Proven Professional Technology Architects earn around $109,060. In contrast, the typical U.S. IT professional's salary is, on average, $88,640.

SOURCES: 1. EMC SURVEY "MANAGING INFORMATION STORAGE: TRENDS, CHALLENGES, AND OPTIONS, 2009–2010." HTTP://WWW.EMC.COM/COLLATERAL/EMC-PERSPECTIVE/H2159-MANAGING-STOR-TRENDS-CHALLENGE-OPTS-07-08.PDF. **2.** IDC **3.** CERTIFICATION MAGAZINE 2008 SALARY SURVEY

to more than 150 institutions and 8,500 students. A flood of universities have sought to partner with EMC, but EMC has limited participation to the nation's top schools.

One is the NMAM Institute of Technology in Karnataka State, India, which added the ISM curriculum in 2008. Vice Principal Dr. Niranjan Narayan Chiplunkar reports that 12 students were ISM certified that year, 10 more were certified in 2009, and seven are now working on certification.

The EMC ISM reference book actually helps attract enrollees: "When students examine the contents of that book, they fall in love with the topic," Dr. Chiplunkar says.

EMC India has launched auxiliary academic programs as well. One involves EMC mentors visiting member universities. And, in the Student Ambassador Program, students become liaisons between their schools and EMC.

Demand for the graduates is strong. "Indian engineers are traditionally well-trained in computer architecture, operating systems, applications, and databases," Manoj says. "Information storage and management represent the missing fifth pillar that EMC took a lead role in fulfilling. I have no doubt that over the next few years, engineers trained through the EMC Academic Alliance will fill the hallowed portals of the world's best organizations." ◆

Computer science and IT professors in the EMC Academic Alliance give *Information Storage and Management* **enthusiastic reviews**

"I had very little experience with storage before reading this book. Now I feel that I've been properly armed with the basics such that I could get into the depth of the subject and be able to teach it to students."

ASST. PROF. NILESH
INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY, PUNE, INDIA

"… The book's 'open' approach covers concepts, principles, and deployment considerations—rather than product specifics—across all technologies used for information storage and management. I strongly recommend this book to all trainers, faculties, and students."

PROF. R.T. SAKTHIDARAN
DEAN (ACADEMIC) & HEAD OF IT, KLN COLLEGE OF ENGINEERING, MADURAI, INDIA

"… This book is the most systematic and comprehensive one in the category of storage technology at present. It is an invaluable piece that can be used as textbook for college education; meanwhile, it's a great fit for the industry professionals."

DR. WANG DONGSHENG
PROFESSOR, TSINGHUA UNIVERSITY, CHINA

"… [It] fills the gap of authoritative reference books on network storage technology. This book can provide students and engineering technicians with good understanding of professional knowledge and skills."

DR. LIANG ZHENGPING
ASSOCIATE PROFESSOR, SHENZHEN UNIVERSITY, CHINA

The company marks a major anniversary milestone

EMC at 30

A company in its prime

THE PAST YEAR was a time of festivity and reflection at EMC. It began with employees devising a plan to wrap anniversary events into a cohesive year-long whole, and it was highlighted by a celebration at the Q309 Employee Quarterly Meeting on October 22.

The new EMC Digital Tapestry—a 100-square-foot mural composed of thousands of individual and group photos of EMC employees from around the world—will be one outcome of the anniversary.

Another is the "EMC Is 30 Rock Rally," with employee-created music videos now making their way to YouTube. (http://www.youtube.com/watch?v=ImD0B3_kSgQ)

EMC also will launch *Innovation, Passion, Success*, a book recounting the story of EMC Corporation, and it has produced a special anniversary video available on Channel EMC. (http://education.emc.com/main/internal/quarterly_review/q309/_streaming/)

A CENTERPIECE OF THE *QUARTERLY* CELEBRATION: EMC Sodexo executive chefs Adam Hicks (l.) and Joseph Pina baked a massive anniversary cake composed of 750 devil's food and yellow cupcakes.

GLOBAL CELEBRATION

Looking at EMC's three decades of IT industry leadership and accomplishment, it was easy for planners to decide that the theme of the year-long

JOE TUCCI was one of an estimated 1,000 employees who added their signatures to EMC's 30th anniversary banner, which now hangs in the inner lobby of EMC's Hopkinton headquarters. The banner-signing gave the company's Massachusetts-based people a chance to be recognized both symbolically and tangibly for their contributions to the company's legacy and future.

celebration should be "innovation, passion, and success." As Joe Tucci puts it, "Thanks to the passion of our people, EMC has evolved into an innovative, results-driven culture where the 'customer-first' mantra is a way of life."

The anniversary was a global celebration, and that's where the Digital Tapestry—a photo mosaic—comes in. Employees worldwide have contributed literally thousands of EMC-related jpegs representing EMC's multicultural character. (EMC Italy and EMC Brazil employees were especially generous, submitting a huge number of photos.) EMC plans to unveil the completed tapestry in January 2010.

ACADEMIC EXCELLENCE CELEBRATED AS PART OF ANNIVERSARY

The company has supported math and science education for years. In keeping with that commitment and as part of the anniversary celebration, EMC in late August created the EMC Information Honors program for students studying information storage and management in the 2009/2010 academic year.

Jack Mollen, EVP of HR, says, "These students and their peers have the potential to produce knowledge vital to advancing information storage and management."

Top-performing students at more than 300 universities in the EMC Academic Alliance will receive Iomega StorCenter ix2-200 network storage appliances and two-year Mozy Unlimited online data backup subscriptions.

A SOLEMN REMEMBRANCE

The passing of EMC co-founder Dick Egan on August 28 was a solemn note to EMC's year of

celebration.

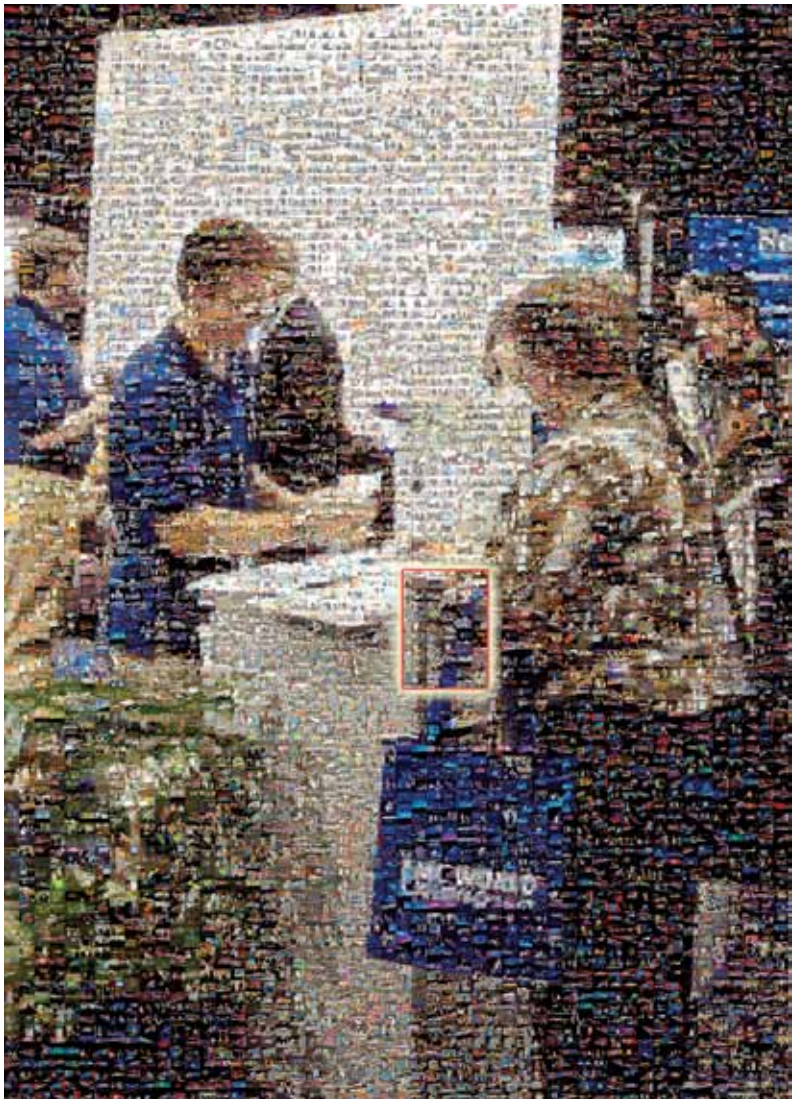
At the memorial on September 3rd, EMCers joined thousands of other people in paying tribute to a technology and business visionary and respected public- and private-sector leader. It is almost impossible to overstate Dick's contribution to EMC, the IT industry, and his community.

As *Boston Globe* writer Steven Syre noted in his September 1 column, "Egan remained a guiding force at EMC until he retired as chairman in 2001. The business he built stands as one of the towering business accomplishments in Massachusetts and beyond."

THE NEXT 30 YEARS

Building on the first foundation set by Dick and fellow co-founder Roger Marino in August 1979, the EMC global community—now 42,000 strong—has built a company ready to face the future.

"We have the best product lineup in the company's history," Joe Tucci says, "and we're well situated to take advantage of the hottest trends in IT, including the next generation of virtualized data centers; cloud computing; virtualized desktops and clients; and the next generation of backup, recovery, and archive solutions. Our focus on efficiency and innovation is positioning us for even more success." ◆



THE EMC DIGITAL TAPESTRY is a photo-mosaic montage of small digital photographs of employees that will blend together to form one large image. The tapestry will become a wall mural on prominent display at headquarters.

"Hey, I'm the big guy upstairs you were calling ..."

EMC Revenue Operations Analyst Michael Valanzola officially became an employee five years ago. His experience as an EMCer, however, extends back to his earliest childhood and the early days of EMC.

From the time he was an infant, Michael was brought to EMC's offices for occasional visits to see his Aunt Laura (bearer of EMC badge#13).

On one such visit, preschooler Michael had to be gently scolded to "stop playing with the buttons" on the office phones after Dick Egan, leaving for the evening, made a quick detour downstairs to find out exactly who had been repeatedly calling his speed-dial number all afternoon and hanging up on him.

SIXTY-TWO YEARS OF COMBINED EMC TENURE: (l. to r.) Ted Torosian started at DG in 1989; Linda Valanzola started at EMC in 1997; Laura (Perkins) Aubut started in 1984; and Michael Valanzola (son of Linda and nephew of Laura) started in 2004.

IT'S A SENSIBLE way to get talented new employees off to a strong start

The Global Services Associate Program goes international

AS PART OF EMC's global cost-cutting efforts, the Global Services Associate Program (GSAP) has expanded to EMC's Centers of Excellence around the world.

The GSAP has always been a cost-effective model for recruiting, hiring, and training Global Services talent. Now, EMC is saving even more costs—travel costs, that is—by holding GSAP training "boot camps" in the Centers of Excellence where these associates are already based.

A critical mass of Global Services talent exists among employees in the company's global CoE network.

The first boot camp occurred in Q209 at the CoE in Bangalore, India, for new Problem Resolution Escalation Management (PREM) team members there. Twelve associates gained foundation-level certifications and a strong understanding of EMC's offerings and organizational culture.

Instead of traveling from support centers spread around the world to the U.S. for their training boot camps, those 12 associates were the first to experience GSAP right in their own CoE, according to GSAP Sr. Manager Janine Caputo.

The employees now hold full-time service positions in Bangalore-based product groups. They join more than 150 associate technical support engineers worldwide who have participated in the PREM GSAP program since 2006.

What is GSAP?

The Global Services Associate Program recruits, trains, and mentors associate-level EMC Global Services employees. Launched in 2004 specifically for associate implementation specialists, it subsequently grew to offer nine distinct training tracks. More than 1,500 associates have participated in the 24-month-long GSAP, a reflection of the company's commitment to investing in its future customer-focused leaders.

WHAT'S NEW? EMC's Partner Services Associate Program, which trains/mentors partners' service-focused entry-level employees using GSAP principles. Watch for coverage in the next *EMC.now*.

THE BANGALORE GSAP GRADUATES were selected from 1,700 applications gathered by EMC during on-campus visits to Indian universities.

Associates are part of GSAP for 24 months. During that time, they attend their training boot camp, are paired with a formal mentor, and are closely monitored every six months to ensure they are progressing adequately.

Making new associates accountable for their own success is paramount. The goal is to ensure that an associate's early experiences with EMC are helpful, and that all training aligns with EMC's culture and values. "Associates create strong bonds and stay in touch with each other long after their high-intensity boot camp training is over," says Janine.

Based on the positive results in Bangalore, the GSAP team is now delivering locally based GSAP training in other parts of the world. Good team leaders have been crucial to the expansion's success.

In Bangalore, that team leader was Sathish Thiruvengadam, who was supported and mentored by GSAP Team Lead John Ewald remotely from Franklin, Massachusetts. John coached Sathish on establishing a learning-friendly environment, using creative training techniques, managing a classroom, and managing performance.

Janine reports that she is pleased with the early results of the internationalization effort and is planning to hold the next GSAP boot camp in Cairo, Egypt. "It's been interesting to work with people in other countries and cultures," she says. "I expected to find a lot of differences among associates, but my biggest lesson was that very few differences exist. These new associates are just as motivated, just as excited, and just as hungry for a challenge." ◆

"Our expansion globally has been one of the most rewarding, exciting aspects of the GSAP program. It has been a unique experience to partner with the CoEs to make this a consistent aspect of their hiring, developing, and mentoring processes."

LAURA THOMPSON, DIRECTOR, STRATEGIC HR PROGRAMS

coming up in the next issue

What is EMC Ionix? Managing IT for a virtualized environment is a pretty big deal: It is fundamentally different from managing a traditional physical environment. Learn how the EMC Ionix family ushers in the next generation of IT management and how it fits into a Private Cloud strategy.

Plus, what do you do when your channel partners want to offer more value-added services to small and midsize customers? First, you give them a great new way to transform their own entry-level people into highly skilled, certified implementation specialists. For partners, EMCers have duplicated the success of an internal employee training program, and so far, the results have been *perfect*.

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