On

LIFE IN INFORMATION

EMC²
where information lives

Symmetrix DMX
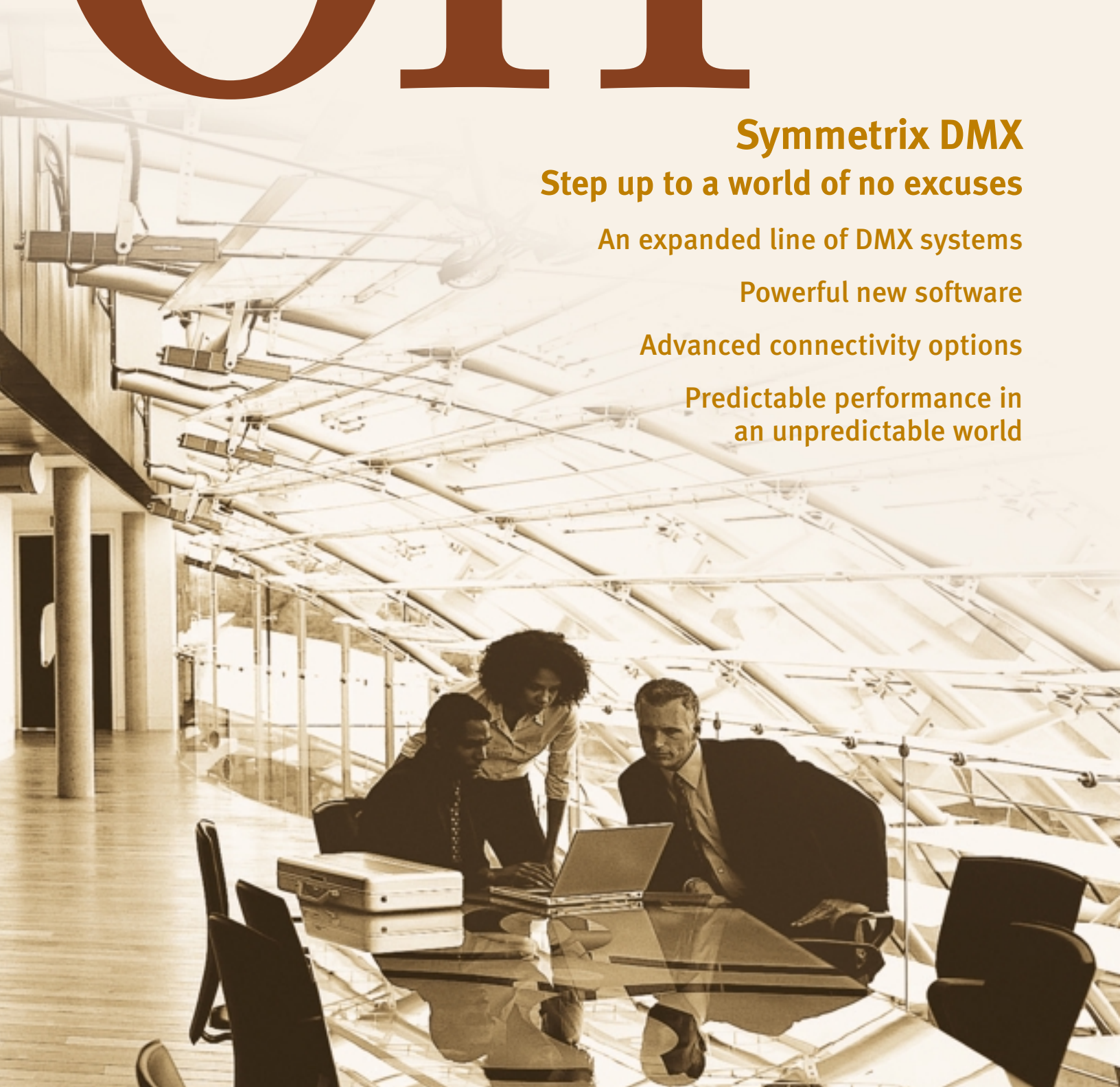### Step up to a world of no excuses

An expanded line of DMX systems

Powerful new software

Advanced connectivity options

Predictable performance in
an unpredictable world

Contents

THE INDUSTRY STANDARD FOR HIGH-END STORAGE

What does it take to successfully maintain exceptional service levels for your high-end business-critical applications?

It takes continuous availability regardless of upgrades, configuration modifications, or servicing. It takes solid performance you can count on for complex, high-end workloads running round the clock. It takes automated, streamlined storage management across the entire environment. It takes the flexibility to scale capacities up and down and support easy integration of new technologies. It takes an ability to replicate any amount of information across any distance, without impact to ongoing operations.

It takes end-to-end management of applications, servers, networks, and storage functionality. *It takes Symmetrix® Direct Matrix Architecture (DMX) high-end storage solutions*.

Just six months ago we introduced our advanced Symmetrix DMX™ series to an industry that has welcomed the new technology with open arms. In fact, in the full first quarter of availability, over 80 percent of Symmetrix sales were DMX purchases.

"Customers are telling us with a loud and clear voice: Information is not a commodity. Nearly all companies have a critical set of information that demands the highest service levels. The value that information can deliver back to the business is only as good as the storage environment it lives in. Today's announcements clearly show how Symmetrix DMX systems and software remain the best equipped to serve customers' high-end storage requirements."

David Donatelli
Executive Vice President
Storage Platforms Operations
EMC Corporation

High satisfaction ratings and widespread adoption of our Direct Matrix Architecture™ have prompted a second wave of innovation designed to further address your high-end storage needs with more choices, features, functionality, and economy than ever before.

So what's new?

• A top-end DMX3000 system with up to 576 drives and 73.5 terabytes of usable capacity in a single configuration

• A new entry-level configuration for the DMX800 that boasts a 30 percent lower entry price

• Non-disruptive upgrades to Enginuity™ 5670

• The ability to mix and match any combination of iSCSI, FICON, and Gigabit Ethernet connectivity ports within any Symmetrix DMX system

• The fastest FICON in the world for the entire DMX series

• SRDF/Asynchronous—the highest performance, long-distance replication product available

• EMC Snap™—cost- and space-saving local replication software for high-end storage

• Enhanced mainframe compatibility with the IBM mainframe feature set

• Mainframe-based fixed content with Centera™

The DMX series expands by two

There are two new DMX system offerings that broaden the series at the high and low end. Introducing the Symmetrix DMX3000 and entry-level Symmetrix DMX800 systems.

With up to twice the capacity and up to twice the performance for certain applications, count on the new triple-bay Symmetrix DMX3000 to handle dynamic, large-scale workloads with ease—even as they grow. In addition, with up to 576 drives for a maximum raw capacity of over 84 terabytes, and a usable capacity up to 73.5 terabytes, DMX3000 is unequalled when it comes to addressing major consolidation initiatives and growth.

Our new entry-level DMX800 system breaks price/performance barriers with a starting price that is 30 percent lower than the previous Symmetrix DMX800 storage offering. The entry-level system delivers raw capacities that scale from 580 gigabytes to more than 17 terabytes—and like the entire DMX series, delivers unsurpassed functionality.

"Symmetrix DMX is ideal for those instances where we need absolute uptime assurance, top performance under any load, and the ability to scale performance linearly with the architecture. Our benchmarking has shown that Symmetrix DMX runs certain functions six times faster than other systems. This dramatic acceleration has reduced some of our batch windows from eight hours down to four and sped up our backup process by 300 percent. Our billing operations are running faster, ensuring we can invoice our growing customer base in a timely manner. Our massive data warehouse queries are processed more quickly, which allows business users to analyze and solve business problems faster."

Ronald Williams
Senior Manager, Infrastructure Operations
Architecture

EarthLink, Inc.

EMC Symmetrix DMX800

EMC Symmetrix DMX3000

Solutions to address all of your high-end data replication needs

Replicating data across long distances has always meant high telecommunications costs, poor performance, and cumbersome manageability—until now. Today, high-end storage customers wishing to reduce costs, extend distances, and increase the number of local and remote replications to support continuous business operations have two powerful new software tools at their service: SRDF/Asynchronous (SRDF/A), offering the world's fastest extended-distance replication functionality; and EMC Snap, the only space-saving local replication software for high-end storage available anywhere.

> **"Through its multi-dimensional approach to the high end, EMC is delivering customer benefits across multiple points of deployment—open, mainframe, and the entire enterprise. With the addition of SRDF/A and EMC Snap, EMC has amassed a suite of replication offerings that sets a new design point for the industry."**
>
> **Michael Fisch**
> **Director of Storage and Networking**
> **The Clipper Group**

SRDF/A highlights

Based on the market-leading SRDF® software, SRDF/A employs EMC's patented Delta Set technology which provides the ability to maintain a recoverable and restartable remote copy of data at all times, at any distance, and with no host application impact. At the same time, it helps customers leverage existing management capabilities and minimize potential risks to data.

Advanced Delta Set technology allows applications to re-write to tracks hundreds of times before transmitting. Since only the last set of writes is transmitted to the target, bandwidth utilization and costs are reduced. Early tests in customer environments show an average 30 percent reduction in bandwidth requirements.

EMC Snap highlights

With new EMC Snap software, Symmetrix DMX customers have an economical, space-saving alternative to full-volume copies. Available for both mainframe and open systems environments, EMC Snap requires only a fraction of the capacity (typically 30 percent) of the source volume needed to make full-volume copies.

With EMC Snap and EMC TimeFinder™ full-volume replication software on board, Symmetrix DMX users can now easily satisfy mixed service levels by offering full-copy and space-saving replication solutions—something you won't find in other high-end storage solutions.

Promoting iSCSI's adoption, EMC strategic partner Microsoft Corporation recently announced the availability of its iSCSI software driver for the Microsoft Windows 2000, Windows XP, and Windows Server 2003 family of products, including Windows Storage Server 2003.

"The combination of Microsoft's iSCSI support in Windows and EMC's Symmetrix DMX provides enterprise customers with the right pieces to begin utilizing and managing their iSCSI SANs. EMC's delivery of native iSCSI for the Symmetrix DMX series lends credibility to the protocol as enterprise-ready."

Rakesh Narasimhan
General Manager of the
Enterprise Storage Division
Microsoft Corporation

EMC's new iSCSI connectivity also supports Cisco's vision of multi-protocol storage area networks and the multi-protocol support offered in the Cisco MDS 9000 family of directors and switches.

New connections bring it all together better, faster, and more cost effectively than ever before

Through the world's first multi-protocol channel director, EMC is enabling customers to mix and match any combination of iSCSI, FICON, and Gigabit Ethernet connectivity ports within any Symmetrix DMX system.

The world's first native iSCSI connectivity for high-end storage

A low-cost method for consolidating and networking, EMC's native iSCSI connectivity for Symmetrix DMX delivers the value of networked storage without the cost of host bus adapters and Fibre Channel switch ports. This is particularly welcome news to customers who have found the cost of Fibre Channel server connections a barrier to their ability to integrate many of their servers into a SAN environment.

"We operate a diverse mainframe and open systems environment. We're very excited about the connection flexibility we'll enjoy through EMC's ability to mix and match FICON, Gigabit Ethernet, and iSCSI on a single board."

Richard Gounaris
Vice President of Technology
Infrastructure Services
AdvancePCS

In addition, EMC E-Lab™ Tested solutions for iSCSI, accompanied by EMC-provided assessment and support services, will help ensure streamlined deployment of iSCSI for immediate benefit.

Cost-effective IP replication through Gigabit Ethernet

New Gigabit Ethernet SRDF connectivity for Symmetrix DMX facilitates remote replications through SRDF—without costly conversion devices. In addition, multiple SRDF replications can share the same low-cost Gigabit Ethernet port for even greater efficiency and cost savings.

The highest performance 2-Gb FICON connectivity available

EMC also supports 2-Gb FICON connectivity which allows mainframes to use Fibre Channel networks for storage and tape I/O. FICON uses the same cabling and transmission technologies as the more familiar open system Fibre Channel networks and provides speed, capacity, and distance benefits over ESCON.

Gigabit Ethernet

iSCSI

FICON
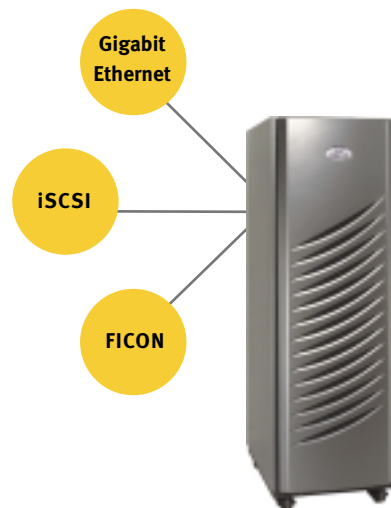
Improved mainframe compatibility

The Symmetrix DMX series now offers enhanced compatibility with the IBM mainframe feature set through EMC's Symmetrix DMX-based implementation of IBM's XRC Version 3 replication software. EMC's capability enables IBM XRC customers to deploy Symmetrix DMX series systems as either a source or target storage system with no disruption to their existing replication solution.

IBM XRC

EMC Symmetrix

Symmetrix DMX mainframe support also includes:

• Enhanced support for IBM's Geographically Dispersed Parallel Sysplex (GDPS) clustering and failover solution

• Support for the TPF operating environment

• The world's highest performance 2-Gb FICON connectivity

• Advanced replication through SRDF/A and EMC Snap software

• The lowest entry point in the industry for high-end mainframe storage with the new four-controller Symmetrix DMX800

• Symmetrix DMX support for Fibre Channel connectivity to IBM iSeries servers

EMC OpenScale—now with automated billing

Want a way to preserve cash, match payments to utilization, avoid technology obsolescence, and streamline the often lengthy procurement process? Look no further than EMC's OpenScale™ program offered through EMC Global Financial Services (GFS).

Pay as you go

With the most advanced storage asset and financial management offerings available, OpenScale is the industry's only program that delivers fully automated billing for a complete SAN/NAS infrastructure— from Symmetrix or CLARiiON® storage arrays to SAN ports, data movers, and key storage software applications.

With OpenScale, you don't need to buy storage ahead of actual requirements. Additional capacity and functionality are pre-positioned. Just deploy—and pay for it—as you need it. Billing is done automatically, without vendor intervention or extra work for your staff.

OpenScale also offers adaptable payment schedules, along with options for on- or off-balance sheet accounting. In addition, OpenScale pricing is flexible, so you don't miss out on the cost benefits as storage price/performance improves over time.

To learn more, please call: 866-464-7381.

MAINFRAME-BASED FIXED CONTENT WITH CENTERA

A unique, industry-leading solution for solving the challenges of managing open-systems-based fixed content (such as document images, e-mail, X-rays, and medical records), Centera now brings that functionality into the mainframe arena. This is particularly significant when an estimated one-third of all fixed content resides in mainframe environments.

"Until recently, online access to fixed-content archives had been impossible in mainframe environments. Now, through Centera mainframe connectivity, the hundreds of petabytes of mainframe data currently stored on tape and optical media can reap the benefits of CAS, such as online accessibility, object-level data control, and management."

Tom Heiser
Vice President and
General Manager
Content Addressed Storage
EMC Corporation

EMC AND OPEN STORAGE MANAGEMENT

EMC Vice President Tony Marzulli discusses EMC's open storage management strategy and how customers benefit.

What is EMC's overall strategy for open storage management?

The overall strategy provides software to help customers manage their entire heterogeneous storage environment. Most of our customers live in a heterogeneous world, so our value proposition is to provide a "single pane of glass" that presents a single view of the entire infrastructure. This allows customers to discover it, provision for it, manage it, change it, grow it, and consolidate it.

Tony Marzulli

What's an example of the kind of processes this strategy addresses?

If customers want to provision more storage because they've just acquired a new module for their SAP application, they have to determine their current asset utilization. This is typically done by manually going from device to device and running a command line interface to determine the availability of storage. In a heterogeneous environment, the tools to accomplish this task would be different for each device, which further complicates the task. Then, if storage is available, customers must define the paths from application server to the various storage devices. This is typically a very complex and error-prone process that can take days—if not weeks.

Our EMC ControlCenter™ family of products provides the solutions and tools that enable customers to quickly and automatically provision storage based on business requirements.

How has EMC's open storage management strategy shifted over the past few years and why?

Storage environments have dramatically changed. Customers continue to consume more storage by more vendors; SANs have increased in complexity and market popularity; and the need for storage has grown because application use has expanded exponentially.

Dramatic change requires dramatic solutions to help manage that change. So, we've moved from driving software strategies that just manage EMC devices to having a heterogeneous view of the world. This really has been the foundation for the shift in our strategy.

How are you addressing this need for heterogeneous support?

The best way to enable heterogeneous support is through standards and openness, which is why we have fully embraced the world of open software in APIs and standards. We chair and participate in several standards committees and we are active supporters and drivers of the Storage Management Initiative (SMI) standards. In addition, we've made an incredible investment in interoperability testing to ensure these solutions work and are supported. This is what our customers expect from us.

How are customers using EMC ControlCenter today?

Customers are using our ControlCenter family of products to easily track, manage, plan, and provision their ever-growing, complex storage infrastructures across a variety a hosts, databases, files systems, applications, backup systems, storage networks, and storage arrays.

ControlCenter products enable customers to increase utilization rates, leverage storage assets more efficiently, automate tasks such as provisioning, and grow with their businesses—without increasing storage administration costs.

Where are customers getting the most value and why?

Our customers are not in the business of running data centers: They're in the business of using a data center to support their line of business. If you're able to tell a line of business quantitatively how they are using IT assets and what it costs, you're better able to facilitate billing and automatic chargeback for that line of business within a corporation—which is critical. The best way to do that is through ControlCenter's StorageScope™ software, which quickly and easily identifies the storage on the floor, how it's used, and by what applications; and EMC AutoAdvice™ subscription software which provides Web-based access to customized performance and resource analysis.

What does information lifecycle management mean for customers?

For customers, information lifecycle management means the intelligent placement and use of information according to their business policies so they can maximize the use of the asset in the most cost-effective manner. It's also about the recovery of information in a very timely manner. Traditionally, customers have always focused on backup when in essence, the real business driver is about recovery. Time-to-recover is crucial in mission-critical application environments. Information lifecycle management is about the entire lifecycle—from placement, to appropriate use, to recovery, and archiving.

What differentiates EMC's ability to address information lifecycle management with our solutions?

Automation. We believe automation is powerful—it eliminates today's manual processes for customers, based on business rules according to application need. So application awareness is very important. It's important to place the data where it's needed based on the cost the business is willing to pay for availability, performance needs—and characteristics the business has over the lifecycle of the

application and that specific piece of data. The data should migrate according to the needs of the business. The key to this is to establish business rules and let the infrastructure do its job. And we're going to enable that intelligence throughout the network.

Why is PowerPath important to information lifecycle management?

PowerPath® provides complete network-aware, end-to-end path management. It enables customers to use their infrastructure intelligently to ensure that business-defined performance and service-level requirements are met. In addition, PowerPath is instrumental in virtualizing the data's physical location by abstracting its location from the applications. A significant aspect of information lifecycle management is the ability to mobilize "the data without the application being aware of this data mobility. When implemented properly, information lifecycle management ensures that the business—through applications—has access to data regardless of where this data may physically exist at any given point in time. PowerPath provides the ability to abstract the data path, the data's location, and enable its mobility. These are key capabilities that help enable the information lifecycle management strategy.

Can you comment on the industry's rate of adoption of ControlCenter products?

ControlCenter adoption and deployment has grown dramatically over the past year as we've made it easier to deploy and use in our customers' environments. By adding increased heterogeneous array support, more usability features, and a deeper integration across our software—all from a "single pane of glass," we're showing our customers how to increase their productivity, and allow them to fully exploit their investments. This type of promise, delivery track record, and demonstrated leadership have driven up production deployments of ControlCenter dramatically.

That said, the general category of Storage Resource Management (SRM) is the fastest growing market segment today—and will be for the next five years—as

noted by Gartner. Customers are asking for these kinds of solutions. From Gartner's perspective, EMC is leading the SRM space in the "vision and execution" categories.

What is EMC doing to change customers' perceptions of EMC as a hardware company?

The key is in delivering solutions that address our customer needs. As customers' storage usage continues to grow, better solutions in storage tracking, utilization and reporting, provisioning, and performance management are required.
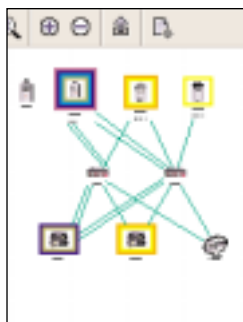
The cornerstone of getting customers to see EMC as a software company is giving them demonstrable proof that our software can deliver value—just like we've always been able to do with our platforms (arrays). Today, customers can view software demos from anywhere in the world and see first-hand that we're doing a lot of great things. To date we've had nearly 1,000 customers attend these online demonstrations and presentations.

In the coming months, our reference program will provide information on the increased number of customers validating open software value in their data centers. A good example is EMC

customer Florida Power and Light, which has seen a phenomenal 256 percent ROI within the first five months. We have nine other case studies in the cue for publication with similar compelling results.

Finally, we need to turn up the volume—to ensure that the marketplace hears our message through all aspects of the marketing mix.

Are there any final comments you'd like to make?

EMC is the only company fully dedicated to automated networked storage. Nobody else can stake that claim. We provide open, heterogeneous software that can be managed and deployed on EMC and non-EMC platforms and networks.

We are also in a unique position in storage history in that we have a large customer base and a tremendous set of technologies for platforms and networks from which to launch our open software initiative. We believe we are uniquely qualified to deliver value to our customers in the world of open software. It's our singular focus to provide solutions that matter to our customers. It's what we do.

LEGATO acquisition expected to accelerate EMC Information Lifecycle Management software capabilities

EMC has recently announced plans to acquire Legato Systems, Inc.

LEGATO's strengths in heterogeneous information protection and recovery, HSM (hierarchical storage management), automated availability, and e-mail and content management are expected to accelerate EMC's ability to deliver the industry's most complete information lifecycle management solutions—helping customers get the maximum value from their information at the lowest total cost at every point in the information lifecycle.

LEGATO's software-focused sales expertise, extensive channel partner relationships, and strong service capabilities will also complement EMC's distribution strategy and enhance its ability to serve customers of all sizes around the globe.

"This combination is all about improving the access, management, and protection of an organization's core asset—information—through its complete lifecycle. We're combining best-of-breed storage technology, two winning employee populations with similar reputations for customer focus, and two experienced management teams with highly complementary visions for the future of information management. This represents a significant win for both companies' customers, employees, partners and stockholders, accelerating the evolution of EMC as the company that offers the most comprehensive, open, and integrated information storage solutions."

Joe Tucci
President and CEO
EMC Corporation

"LEGATO's current shareholders, employees, customers, and partners will see tremendous benefits from EMC's extensive R&D resources, expertise in networked storage, global distribution and customer reach, and overall financial strength. We will now have additional resources to further accelerate the development and delivery of solutions to the market in order to fulfill our mission of delivering the software and services that protect and manage customers' information, assure the availability of their applications, and provide immediate access to business-critical information."

David B. Wright
Chairman and CEO

LEGATO Systems, Inc.

For full news release details:
www.emc.com/news

EARTHLINK, INC.

Symmetrix DMX to strengthen performance and ease management amid explosive data growth

Catering to the internal operations of one of the world's largest Internet service providers, EarthLink, Inc.'s IS department is continually challenged to maintain high performance and adequate storage in an environment where exponential data growth has been the norm for several years running.

"Performance and manageability were key reasons we looked seriously at EMC, and in particular the new Symmetrix DMX release, which we feel has the performance edge over competitors," says Ronald Williams, senior manager, Service Operations. "DMX brings a tremendous amount of performance into one cabinet. We can decommission smaller, slower functioning storage arrays and consolidate data within a centrally managed system for increased performance and improved manageability. Consolidation through DMX has also helped us reduce costs from the previous generation of storage by almost 80 percent."

Another key Symmetrix DMX benefit relates to enhanced storage utilization. Prior to DMX deployment, storage utilization was about 50 percent. As it approached 60 to 65 percent, more storage would be purchased.

"With DMX we feel comfortable that storage can run at near-capacity and still perform very well," says Williams.

Maximizing availability and performance of key billing system processes

At EarthLink, customers can choose between fixed-rate or metered-usage service plans and they can check their monthly accrued minutes. The nature of this interactive system requires reliability and high availability. DMX storage tracks these calculations—keeping information available to customers without interruption.

"Availability has been 100 percent since we've had DMX on the floor," says Williams. "One of the reasons we chose DMX was because it has a true fault-tolerant architecture—which is important for these customer-facing billing systems and to the business."

An additional advantage is the dramatic jump in the billing system's batch processing performance. Very large batch jobs must be run every night to ensure that customers are billed properly. By repositioning batch processing under DMX storage, batch jobs complete about 50 percent faster due to improved IOs/sec delivered from both the disks and the improved DMX cache throughput. Downtime also has been minimized.

"With the previous system, batch jobs took so long to run that if a problem occurred, the process would bleed into the next day's business," says Williams. "That impacted users and slowed down

the batch job even more, sometimes taking us 24 hours to recover. Today, if problems occur, we can recover more quickly because DMX storage has significantly improved the underlying performance of those batch jobs."

Backup times improve dramatically without impacting production

Earthlink's substantial storage growth also drives huge backup requirements. To effectively address these requirements—without impacting production—the company needed a storage system that could serve both backup and production needs simultaneously. DMX was the answer. In addition, the company is better positioned to protect its data because backup is faster than ever before.

"We know backups have improved 300 percent, and this was on a three terabyte database," says Williams.

Expedient decision-making

The internal data warehouse (comprising a three-terabyte database running Oracle) is also successfully supported by the new DMX platform. A master data store of business activity, the data warehouse is an integral component in enabling the company to address key business issues such as "customer churn," which relates to the number of customers who leave during any given month.

The data warehouse provides a vital link to the information EarthLink needs to identify and understand the root cause of such issues and make the best decisions to help reduce them. It also enables the company to track other customer data

(e.g., number of accounts sold in a day, where they came from, and who were the best referrals) and use that information to better position the business for greatest success.

"Since deployment, we've seen queries run up to six times faster," says Williams. "That allows the business users who are running those queries to do more analysis in a day and solve business problems easier, a little quicker."

A multi-tiered approach to storage

In addition to DMX, which the company designates as tier-one storage for mission-critical, high-end applications that require maximum levels of performance and availability, EarthLink, Inc. employs several tiers of EMC storage for internal operations.

EMC's CLARiiON® CX600 networked storage systems are positioned as tier-two storage for applications that still require superior performance and reliability, but need less than three to four terabytes of storage. They are being used to consolidate Compaq Windows and Sun storage. Consolidation also includes Microsoft SQL Server and some Oracle databases.

"We're looking for high-performance, yet cost-effective solutions," says Williams. "We feel the CX600 fits that bill nicely. This platform will be supporting corporate IS applications primarily for call centers that assist about 3,500 employees and the applications they use."

At tier three, an EMC Celerra® NS600 network-attached storage system is being deployed to consolidate five NT file servers that have direct-attached storage. Five more will be consolidated in the near future. EMC's dedicated, centralized NS600 network-based file server is expected to improve user availability and reduce system administration workload through centralized management.

"We feel Celerra NS600 performs better than other products in its class," says Williams. "The CLARiiON architecture that it's built on has a proven history; the platform supports rapid deployment; and the price is excellent. And by leveraging EMC's common set of management tools, administration is a lot easier for us."

A fourth tier, a storage area network (SAN), is underway as well. CLARiiON CX600 with integrated ATA drives will be used handle low-performance requirements that call for maximum amounts of storage (such as QA data that needs to be archived) as well as a mirror line backup solution to support faster recovery.

Tape is at the last tier and is covered by Advanced Digital Information Corporation (ADIC), an EMC partner.

> **"DMX brings a tremendous amount of performance into one cabinet. We can decommission smaller, slower functioning storage arrays and consolidate data within a centrally managed system for increased performance and improved manageability. Consolidation through DMX has also helped us reduce costs from the previous generation of storage by almost 80 percent."**
>
> **Ronald Williams**
> **Senior Manager**
> **Service Operations**

EMC's storage management software helps better manage storage costs

Earthlink, Inc.'s EMC infrastructure also includes EMC ControlCenter™ storage management software, PowerPath path management software, and EMC TimeFinder backup software. CLARiiON storage is supported by Navisphere® management software and SnapView™ software, which captures snapshots of production data.

"ControlCenter enables us to manage other vendors' equipment and centrally manage all of the EMC tools," says Williams. "ControlCenter's StorageScope product is something we've been looking for. It helps us understand what applications are using what storage, which enables us to go back to the business groups to get additional funding to buy more storage. It's one of the things we had limited ability to track before. StorageScope is helping us get the answers so that we can better manage our storage costs."

Superior service and support

EMC Global Services, in conjunction with Dell, assisted EarthLink's IS staff by providing comprehensive support in the areas of layout design, implementation, and data migration. They also provided the insight and expertise to facilitate greater performance.

"EMC support and service has been outstanding," says Williams.

The best solution at the right price

Competing against some of the top names in the industry, EMC won EarthLink's business with its ability to bring a cost-effective mix of solutions (the DMX, CX600, and NS600 platforms along with leading-edge software) together in one package to best meet the company's needs.

"We did a pretty aggressive bake off between IBM, Hitachi, and EMC," says Williams. "EMC won the business by providing a better product set, more usable terabytes for the money, and much better business value in general."

ADVERTISING.COM

Advertising.com, Inc. replaces its hosted storage solution with a Symmetrix DMX800 platform

The leading provider of Internet-enabled direct marketing solutions, Advertising.com, Inc.'s interactive advertising network is the largest in the industry, reaching over 145 million Web visitors and e-mail subscribers.

In the five years since it has been in business, Advertising.com, Inc. has experienced phenomenal growth. The success of the company's online advertising model has drawn the interest of a rapidly growing and increasingly sophisticated client base, which has propelled a demand for bigger, flashier, and more targeted "creatives" and delivery. As a result, backend processing needs have exploded in terms of the storage and bandwidth required to manage and disseminate the media, as well as to support analytical, statistical, and accounting processes that target the best markets and track results.

Advertising.com began to explore alternative solutions to gain more control over a costly provider-supplied managed storage area network (SAN) that failed to live up to serviceability and performance needs. An interim decision was made to acquire the EMC Symmetrix based storage, bring it in-house, and add an EMC Celerra network server.

"EMC understood our situation, stepped up to the plate to help, and offered insight into possible solutions—and that, of course, bred goodwill," says Charles Butler, Director of Network Operations.

Of particular interest to the organization was the new DMX800 platform, which appealed to the company on many levels. DMX provided transparent movement upward in the Symmetrix line which meant that the company would have no migration issues. In addition, it offered exceptional power for Advertising.com, Inc.'s time-critical, performance-intensive, and system-heavy demands. Its ability to easily scale, as well as EMC's solid reputation in the industry for reliability and serviceability, were also significant assets to a company growing by 30 percent a year with 24x7x365 operations.

High marks were also given for the DMX system's small footprint and low power requirements, which would conserve valuable floor space and save tens of thousands of dollars a year in energy costs.

These attributes, combined with the platform's highly competitive price, cinched the deal and a decision was made to deploy.

DMX: performance on the floor

Many of Advertising.com, Inc.'s computational adjustment processes are time-dependent in that they need to execute on time, and in order, to produce sets of variables which other processes require to carry out such actions as rollups, payouts, and ad decisioning. Prior to the DMX implementation, Advertising.com, Inc. felt that the ability of these decisioning processes to complete necessary cycles in the time required was not up to its standards.

Today, with DMX in place, it takes production systems (on average) 67 percent less time to perform a read operation and 83 percent less time to perform a write operation. These percentages and the average read and write times associated with them have allowed Advertising.com, Inc. applications to perform an average of 23 percent faster—outperforming all expectations.

"Since decisioning is one of the lynch-pins of our advantage in the market-place, the ability to easily make our decisioning process windows success-fully feed all other processes is, in and of itself, a big deal," explains Butler.

Business as usual during deployment and beyond

In collaboration with EMC Services, Advertisting.com, Inc.'s technical staff used VERITAS DMP cluster capabilities to mirror the company's Symmetrix 5930 over to the DMX800 system through the hosts.

"This was a very transparent and pain-less process for us," says Butler. "Basically we unplugged ourselves from our provider, migrated our Symmetrix storage to the DMX platform with a new architecture and a new layout, and right away we were up and running. We really didn't have to change anything on our site. And we have every reason to believe that with the way the solution is laid out, mirrored, and strengthened with EMC support, that we won't ever experience downtime—notwithstanding a disaster."

Eventually, the company plans to further augment its business continu-ance strategy with Symmetrix Remote Data Facility (SRDF) software, an online, host-independent, mirrored data solution that duplicates production site data on a separate Symmetrix system.

The tools to take control

Recently deployed, EMC ControlCenter software is expected to bring automation and excep-tional visibility for reporting and array management to the envi-ronment.

"The biggest advantage is that there is a huge savings in terms of manual manipulation and administration that is no longer required because the processes are executing in tandem, and on time, as designed," says Butler.

Part of the ControlCenter family of prod-ucts, EMC's Symmetrix Optimizer soft-ware will also be used to support automatic tuning and data placement functionality for optimum Symmetrix DMX performance.

"With Symmetrix Optimizer we can take the Symmetrix to its absolute possible capability," states Butler. "And by automating that performance, knowing

our traffic and knowing our behaviors, we can build in the most amount of on-the-fly intelligence."

In addition, EMC's extended support for advanced connectivity is expected to be of value as the company moves more of its applications out of a server farm envi-ronment and into NAS- and SAN-based shared storage.

"We are very confident that we have a lot of the right products in front of us," concludes Butler. "Not only can we easily manage our storage infrastructure, but we can also manipulate it and expand its architecture moving forward."

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>
> **Charles Butler**
> **Director**
> **Network Operations**

EDB TEAMCO AS

EMC Symmetrix DMX storage brings scalability, economy, and performance to EDB Teamco's high-end storage environment

Supported by a work force of 1,100 employees, EDB Teamco AS (a wholly owned subsidiary of EDB Business Partner ASA) is one of the largest and most respected suppliers of computer operating and print services for the banking, finance, and telecommunications industries in the Nordic region. It nets NOK 2.7 billion in revenues annually.

A satisfied EMC customer for over eight years, EDB Teamco's extensive EMC storage infrastructure consists of approximately 30 EMC Symmetrix systems, a CLARiiON FC4700, and a large Connectrix™ installation with approximately six directors.

High performance, large capacity, and exceptional economy

To consolidate its data to better and more cost-effectively accommodate the growing demands of its customers, EDB Teamco recently deployed EMC's industry-leading Symmetrix DMX2000 and DMX800 storage platforms at its Oslo and Bergen sites.

Well received for their ability to dramatically improve the economics, performance, and capacity of the company's high-end storage applications, Symmetrix DMX storage now takes the place of 10 legacy Symmetrix systems which were previously used to support mission-critical billing and data warehousing operations.

"Symmetrix DMX is cutting-edge and the market's leading technology," says Nils Flatjord, Storage Architect. "Our successful history with EMC's products, combined with the most impressive uptime, many cost benefits, and the flexibility and scalability to accommodate the needs of new customers makes EMC and Symmetrix DMX storage the right choice for our high-end operations. Symmetrix

DMX has dramatically improved the economics, performance, and scalability of our mission-critical billing and data warehousing operations. EMC's expanded support for advanced connectivity, like iSCSI and the ability to mix and match with Gigabit Ethernet, FICON, and others will facilitate more flexibility and reduce our overall costs."

EMC ControlCenter storage management software (including StorageScope, Workload Analyzer, and SAN Manager™), PowerPath path management software, and Symmetrix Optimizer software are in the process of being deployed. This state-of-the-art, highly automated complement of software functionality is expected to further streamline storage management and boost high availability to even greater levels.

Coverage for the next three to five years

When EDB Teamco invests in a solution, it considers the ability of that solution to support the requirements of the company, and the total cost of ownership over a period of three to five years. EMC's Symmetrix DMX storage is the industry leader in its capability to provide the kind of scalability, performance, reliability, flexibility, and cost effectiveness that EDB Teamco requires to sustain optimum operations within its dynamic and growing IT infrastructure.

Last year, the company's open systems environment experienced exceptional growth in the range of 70 to 80 percent. Currently at 19 terabytes, EDB Teamco's DMX2000 storage gives the company room to grow with a capacity to accommodate up to 76 terabytes. And by trading 10 Symmetrix systems for two, the company has freed up valuable floor space in the data center as well as reduced maintenance costs.

EDB Teamco also expects EMC's expanded support for advanced connectivity (which allows customers to mix and match Ethernet, FICON, and iSCSI) to help facilitate more flexibility and result in a positive cost benefit.

"One of the key reasons why Symmetrix DMX is a favorable solution here is that it's cutting edge and it's the leading technology in the marketplace right now. Our successful history with EMC's products, combined with 99.999 percent uptime, multiple cost benefits, and the flexibility and scalability to accommodate the needs of new customers makes EMC and Symmetrix DMX storage the right choice for our operations," says Flatjord.

"Symmetrix DMX is cutting-edge and the market's leading technology. Our successful history with EMC's products, combined with the most impressive uptime, many cost benefits, and the flexibility and scalability to accommodate the needs of new customers makes EMC and Symmetrix DMX storage the right choice for our high-end operations. Symmetrix DMX has dramatically improved the economics, performance, and scalability our mission-critical billing and data warehousing operations. EMC's expanded support for advanced connectivity, like iSCSI and the ability to mix and match with Gigabit Ethernet, FICON, and others, will facilitate more flexibility and reduce our overall costs."

Nils Flatjord
Storage Architect

EMC's Symmetrix DMX storage provides the kind of scalability, performance, reliability, flexibility, and cost effectiveness that EDB Teamco requires to sustain optimum operations within its dynamic and growing IT infrastructure.

Symmetrix DMX2000

News highlights covering new products, enhanced functionality, and new connections over the last several months document our ongoing mission to better serve our customers.

Quarterly News Roundup

More offerings, enhanced functionality

May 2003

- EMC opens a new era in information management with the announcement of new online capabilities for the EMC ControlCenter family of open storage management software. Through new online access and new subscription-based software, EMC is giving customers—for the first time—a single management environment and software solutions that reach from their specific infrastructure directly into EMC's collective knowledge bases and intelligence engines.

- Part of new online EMC ControlCenter management, EMC introduces EMC SAN Architect™—Web-based software for SAN design, modeling, and validation. The new SAN Architect extends EMC's lead in automated networked storage by enabling end-users and integrators to reduce the risk and time associated with SAN planning, design and change management.

- EMC introduces EMC AutoAdvice, powerful subscription-based software that provides customers with Web-based access to customized analysis of performance and resource utilization across their applications, servers, databases, and storage systems.

July 2003

- EMC unveils the next major wave of Symmetrix DMX systems, software, and related technologies. These products include: a new top-end DMX3000 system; an entry-level DMX800 configuration; non-disruptive upgrades to Enginuity 5670; SRDF/A, the world's highest-performance extended-distance replication software; EMC Snap, the world's only space-saving replication software for high-end storage; and the world's first native iSCSI support for high-end storage.

- EMC introduces the industry's first automated billing capability for storage infrastructure. An integral component of EMC's OpenScale storage asset and financial management program, the new billing capability takes customers a step beyond traditional "capacity on demand" models and provides automated billing for their entire networked storage infrastructure including storage capacity, SAN switch ports, NAS servers and storage software.

Strength through strategic alliances

May 2003

- EMC, Brocade, CommVault Systems, Dell, Emulex Corporation, NetIQ Corp., KVS Inc., and Nortel Networks announce the first partner-led Microsoft Systems Architecture blueprint for the Enterprise Data Center (EDC). The EDC Blueprint for Replication and Recovery is a pre-tested solution that provides implementation guidance for a proven, integrated IT infrastructure delivering scalability and high availability in Microsoft Windows Server environments.

June 2003

- EMC makes public a new multi-tiered channel partner program that increases its ability to attract and support partners. EMC's new Velocity[2] Partner Program combines certification, training, sales, marketing, and technical support with financial incentives to make it easier for resellers and integrators to offer EMC Automated Networked Storage™ solutions to end user customers.

- Dell and EMC extend their five-year, multi-billion dollar strategic alliance by two years, reinforcing both companies' commitment to deliver the best networked storage solutions for organizations of all sizes. Since forming the alliance, more than 4,100 customers worldwide have chosen Dell/EMC storage systems.

July 2003

- EMC and BMC Software, Inc. announce a global sales, marketing and technology partnership. At the foundation of this partnership, EMC has acquired rights to BMC Software's PATROL Storage Manager software, and BMC Software will resell EMC's ControlCenter family of products as its exclusive storage resource management offering through its MarketZone program.

Acquisitions

July 2003

- EMC announces plans to acquire LEGATO Systems, Inc. to accelerate information life-cycle management software capabilities and improve customers' ability to access, manage, and protect, information from inception to archive to disposal.

Positive Feedback

May 2003

- EMC's CLARiiON CX series of networked storage systems receives the MVP (Most Valuable Product) award at this year's Storage World Conference—a customer event focused on data storage networking and management.

June 2003

- EMC is once again the world's #1 provider of external controller-based disk storage and networked information storage in 2002, according to new findings released by Gartner Dataquest at Gartner's Planet Storage Conference in Las Vegas.

- EMC Celerra NS600 network attached storage system wins NAS Product of the Year at the UK's Networking Industry Awards 2003.

July 2003

- Customers embrace Symmetrix DMX. Widespread adoption leads to the fastest high-end product ramp and the most successful product transition in EMC history. In its first full quarter of availability, Symmetrix DMX represented more than 80 percent of all Symmetrix system revenues.

Certifications

June 2003

- Setting the pace for regulated electronic records storage solutions, EMC announced that Centera Compliance Edition content addressed storage has achieved major compliance milestones in three of the most strictly regulated industries: financial services, federal government, and life sciences.

- EMC announced that the CLARiiON CX series of networked storage platforms received Network Equipment Building System Level 3 certification—a standard developed by the telecommunications industry that qualifies equipment under extreme environmental conditions and requires specific levels of technological resiliency.

EMC AD GETS A THUMBS-UP IN *B TO B* MAGAZINE'S "GLOAT" OR "GOAT" AD COMPETITION

In the August 11 issue of *B to B*, editors critiqued two competing ads, categorizing one as "Gloat" and the other as "Goat".

Interestingly enough, the ads critiqued were EMC's "My bodyguard" ad and StorageTek's "IT guys in isolation" campaign.

Bestowed with the "Gloat" distinction, EMC received a favorable review from the editors. "There's no human presence in this ad, and maybe that's just as well. The hero of the ad is the EMC CLARiiON system. Stolid and substantial looking, the storage unit is well paired with the headline: 'My Bodyguard'. In workmanlike fashion, the subhead states: 'Protect your information with EMC.' Generous white space allows the reader to focus on the simple message."

StorageTek's ad did not fare as well in the editors' estimations, earning it the less than desirable "Goat" moniker.

BECAUSE YOUR INFORMATION
IS NOT A COMMODITY.

The New Symmetrix DMX