



## EMC Symmetrix DMX Series

### The world's most trusted storage platform

#### The Big Picture

- DMX-3 models enable massive consolidation with incremental scalability
- Incremental tiered storage across all DMX models optimizes resources and minimizes TCO
- Breakthrough architecture surpasses all other designs, anticipates technology advances, maximizes ROI, keeps TCO low
- Information-centric security—built-in—improves compliance and reduces risk to sensitive data
- Exceptional economics through flexible, scalable, modular packaging for low-cost entry to high-end capabilities
- Unrivaled, scalable performance to match today's—and tomorrow's—most enterprise-critical, high-growth, always-available applications
- Proven information availability and system reliability with architectural, hardware, software, non-disruptive upgrade, diagnostic, and service innovations
- Full complement of the world's most extensive and functionally rich suite of proven storage, SAN, NAS, mainframe, open systems, and information management software

#### Enterprise-critical applications demand enterprise-critical storage

Enterprise-critical applications—those which drive the core of any organization—require the highest availability infrastructure to support the most stringent service levels. EMC meets this need with the highest performing, highest capacity, most functionally capable and yet competitively priced high-end networked storage systems ever offered—the EMC<sup>®</sup> Symmetrix<sup>®</sup> Direct Matrix<sup>™</sup> (DMX) series. Delivering these capabilities sets Symmetrix DMX<sup>™</sup> systems apart from any other storage system available in the marketplace.

#### *Information Availability*

- The most advanced and widely deployed business continuity platform

#### *Tiered Storage Consolidation*

- Consolidation of application tiers to meet the widest range of service levels

#### *Performance*

- Supports the world's most-demanding application workloads

#### *Application Integration and Qualification*

- Highest levels of application integration to speed deployment and reduce risk

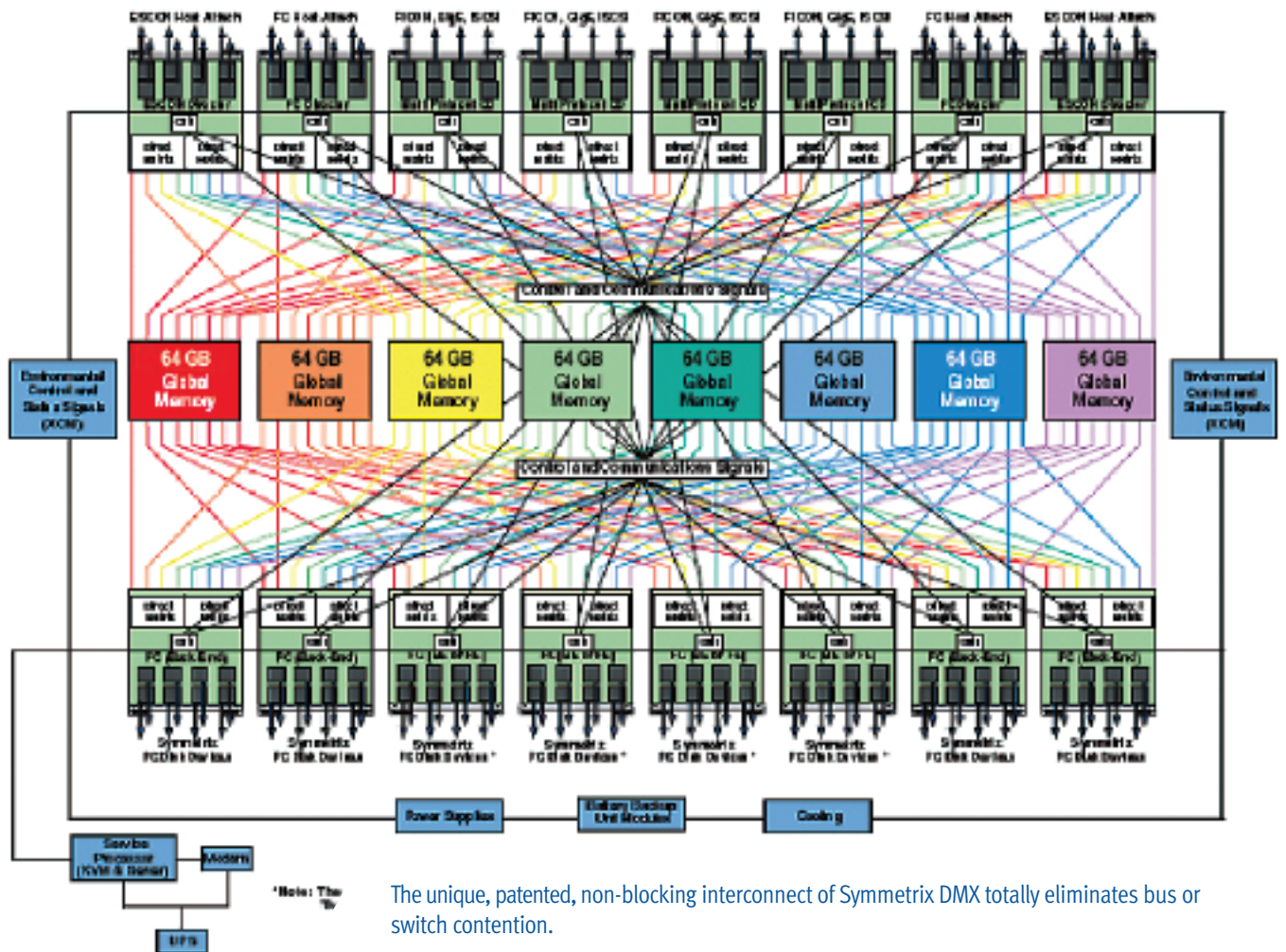
#### *Power Efficiency*

- Best power and cooling efficiency for today's data center requirements

#### *Information-Centric Security—Built-In*

- Advanced security and integrated RSA technology

The EMC Symmetrix DMX series is the industry standard for high-end information storage systems—the unsurpassed market leader for availability, consolidation, performance, application integration, power efficiency, and information-centric security. The DMX series’ future-proof architecture, unequaled performance, and full complement of powerful EMC and third-party-provided software tools define the requirements for—and the service-level expectations of—today’s high-end networked storage systems. The Symmetrix DMX-3 series encompasses the critical dimensions of massive storage consolidation, incremental tiered storage scalability, and uninterrupted application support, enabling these systems to handle the largest, most-demanding, and fastest-growing applications with ease. With a full and flexible range of configuration choices for your enterprise, you’ll be certain of uncompromising service levels to support your information storage and management requirements.



The unique, patented, non-blocking interconnect of Symmetrix DMX totally eliminates bus or switch contention.

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## Symmetrix DMX—a storage architecture for the next decade

The Symmetrix Direct Matrix Architecture® was designed to surmount the barriers to throughput, bandwidth, scalability, and response time inherent in other traditional high-end storage systems. In part, it accomplishes this through up to 128 direct, dedicated data paths—no performance-impeding buses or switches—between channel directors and global memory. In DMX-3 systems, each path has a bandwidth of 1 GB/s for a total system bandwidth of up to 128 GB/s.

Enhanced caching technology ensures rapid-fire transaction throughput unmatched by any other information storage system. The result: your applications always have the information they need, at the time they need it, without waiting. So more work gets done in less time for greater enterprise value.

Symmetrix DMX-3 is managed by powerful 1.3 GHz PowerPC processors—from 16 up to 130, depending upon the model and configuration—and supports a full complement of Fibre Channel, ESCON, FICON, Gigabit Ethernet, and iSCSI connectivity, and all operating under the direction of EMC's industrial-strength, storage operating system, Enginuity™.

Enginuity is the most functionally rich storage operating environment available today, having been continually tested, enhanced, and proven in over 80,000 installations to date in mainframe, open, and iSeries environments. Enginuity is the common thread that enables interoperation—and further investment protection—between Symmetrix DMX and previous generations of Symmetrix systems. While providing an ever-expanding wealth of Symmetrix functionality, Enginuity enables Symmetrix to connect to hundreds of server types, dozens of operating systems and storage software products, and a broad selection of the most popular network connectivity elements and other devices, ranging from HBAs and drivers to switches and tape subsystems.

The DMX architectural design incorporates a two-gigabit (2 Gb) Fibre Channel disk drive infrastructure with 8 to 64 drive loops (4 to 32 redundant pairs) with a maximum of 60 drives per redundant pair; and up to eight-ports per channel director for up to 96 channel connections to over 16,000 network-connected hosts.

## Predictable performance for an unpredictable world

High-end storage performance demands are accelerating faster than ever before. This has mandated a complete rethinking of storage system design, one capable of meeting ever-more-intensive service-level expectations. Symmetrix DMX is that design.

Symmetrix DMX continues to be more than a match for today's processor performance and I/O demands, as well as for increasing storage consolidation needs. For the most information-intensive enterprises that need massive data consolidation, the Symmetrix DMX-3 series enables the highest performance to support the largest capacities without sacrificing high-end functionality. And Symmetrix DMX is uniquely suited to business continuity and disaster protection requirements by enabling local and remote replication of more data, in less time, and with less impact to operational performance and response times. Information storage systems based on past technologies, such as buses and switches, are not up to these challenges.

Symmetrix DMX, with its point-to-point connections, completely eliminates bus arbitration and switching overhead delays present in other designs. Dedicated data paths mean no switch contention and minimal latency in moving data from where it resides to where it's needed—fast.

“Many companies, even entire industries, survive and prosper based on how quickly they can process, store and retrieve enormous quantities of data. The challenge for high-end storage vendors is to provide cost-effective systems with high bandwidth that meet the increasingly stringent service levels and are easy to manage, work across a variety of operating systems and work in multi-vendor environments. A ready market awaits those who can meet these dynamic requirements.”

—Roger Cox  
Chief Analyst  
Gartner Group

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Heavy-demand applications can have their information requirements met by scaling up access for higher performance. Less demanding applications can receive scaled down access levels more appropriate to their needs.

The Symmetrix Direct Matrix Architecture is unique in its ability to sustain information throughput and even absorb bursts in demand without performance degradation. With no bus or switch contention creating slow-downs, your applications realize the maximum value of Symmetrix DMX performance. The result: more work, done in less time, to serve more users, for faster and better decision-making and exceptional SLA attainment.

### **EMC's definition of high-end availability—non-disruptive everything**

A breakthrough architecture and blistering performance are meaningless without uninterrupted information availability. Symmetrix DMX systems come standard with non-disruptive everything. EMC's philosophy has always been to anticipate whatever might disrupt information access and prevent it. Symmetrix DMX systems take this philosophy to an even higher level.

The Symmetrix DMX Enginuity storage operating environment offers enhanced capabilities such as non-disruptive upgrades of Enginuity itself—no storage or application downtime, even as Symmetrix functionality is enriched. Add to this non-disruptive upgrades of EMC software applications, non-disruptive storage configuration changes, and non-disruptive serviceability—all designed to ensure your access to vital information is never in doubt—and your service levels are never compromised.

Securing mission-critical enterprise data is paramount. The latest version of Enginuity features integrated technology from RSA®, the security division of EMC, to deliver built-in security capabilities that reduce risks to sensitive data and improve compliance efforts. The Symmetrix Service Credential, Secured by RSA, prevents unauthorized service actions on the service processor. EMC Certified Data Erasure for Symmetrix disks eliminates exposure to data theft. The enhanced Symmetrix Audit Log provides a comprehensive, tamper-proof view of management and support actions.

At the system hardware level, EMC starts with the most reliable components available. Then we add 100-percent internal redundancy to ensure that no single fault can stop the flow of information. Multiple redundant power supplies connected to independent power sources provide additional protection. Battery backup of all power systems ensures that all data in memory is safely written to disk before Symmetrix initiates an orderly shutdown in the event of complete power loss. Additional reliability features include global hot-spare disks, compensative cooling, and extensive environmental monitoring. And before each Symmetrix DMX system is shipped, it undergoes rigorous thermal, vibration, and operational checks to make sure it arrives fully functional at your data center.

At the software level, advanced integrity features ensure your information is always protected and available. A choice and mix of RAID 0 (unprotected), RAID 1 (mirroring), RAID 10, RAID 5 (3+1 and 7+1), and, with the latest version of Enginuity, RAID 6 (6+2 and 14+2) protection enables you to apply the protection level most appropriate to the value and performance requirements of your information.

The Symmetrix DMX Architecture incorporates messaging and environmental, control, and status networks—independent from the data matrix—to keep track of system operational and health-check parameters without impeding the flow of data. End-to-end data integrity validation and triple module redundancy with majority voting ensure your information is not only always available, but also valid.

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### Symmetrix DMX-3 950

The Symmetrix DMX-3 950 can be configured in a single bay with between 32 and 120 disks and can expand to a two-bay system and up to 360 drives.



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Continuous global memory and on-disk data integrity checking and error detection/correction, fault isolation, non-disruptive hardware and software upgrades, and automatic diagnosis and phone-home capabilities round out the Symmetrix DMX on-board software data integrity features. A variety of local and remote replication software options is available for business continuity and disaster recovery peace of mind.

## Unmatched flexibility to handle any requirement, large or small

Symmetrix DMX system configuration options are as flexible as they are powerful and are designed to meet any mix of workload, budgetary, performance, or capacity criteria. And as the criteria evolve—which they always do—so too can Symmetrix, easily and economically.

## Symmetrix DMX-3—taking high-end networked storage to the highest level

EMC Symmetrix DMX-3 is the world's most powerful networked storage solution—taking the high-end to new levels of performance, availability, functionality, and scalability. Building on the proven success of the Symmetrix Direct Matrix Architecture, Symmetrix DMX-3 takes you much further. It enables massive consolidation, so you get all the benefits of tiered storage on one platform, as well as the flexibility to rapidly address the changing needs of your business. For the most-extreme, most-demanding storage environments in the world, Symmetrix DMX-3 is a powerful solution that's remarkably simple to manage. DMX-3 systems offer:

- **Massive consolidation:** Bring together data from multiple systems to support the largest capacities without sacrificing high-end functionality.
- **Incremental scalability:** Expand capacity up to 2,400 drives, while increasing performance as your requirements change—online and without disruption.
- **In-the-box tiered storage:** Cost-effectively deploy the comprehensive functionality of Symmetrix DMX across multiple application tiers and within a common management infrastructure.

Symmetrix DMX-3 systems are ideal for the most extreme application demands, such as where large-scale consolidation is required by the world's most information-intensive enterprises. The market-proven Direct Matrix Architecture, with its scalable performance and capacity provides the most configurable and flexible high-end storage array so that your enterprise realizes even greater ROI in your EMC investment.

The DMX-3 950 provides a new entry point into high-end storage, delivering high levels of performance and availability in a small footprint for open systems environments. It contains a six-slot backplane, supporting two memory directors with up to 128 GB of mirrored global memory (64 GB usable) and two or four front-end/back-end directors. DMX-3 950 systems are configured around a central system bay capable of holding up to 120 disks along with the addition of one adjacent storage bay to add an additional 240 disks for a total of 360 disks.

### Symmetrix DMX-3

Symmetrix DMX-3 systems are composed of a system bay and independent drive bays containing up to 2,400 disk drives. The Direct Matrix infrastructure accommodates the online non-disruptive addition of disk directors, disk drives, and drive bays for increased performance and/or capacity whenever needed. DMX-3 systems offer up to 512 GB of mirrored global memory (256 usable), up to 64 Fibre Channel host ports or ESCON channels, and/or 48 FICON, Gigabit Ethernet, or iSCSI connections.

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DMX-3 systems can be configured with from 96 to 2,400 disk drives for a maximum capacity of over a petabyte. DMX-3 systems provide up to 512 GB of mirrored global memory (256 GB usable) and up to 64 Fibre Channel host ports or ESCON channels and/or 48 FICON, Gigabit Ethernet, or iSCSI connections. DMX-3 systems are configured around a central system bay with adjacent storage bays of up to 240 disks each.

DMX series systems are available in a wide variety of channel connection, processor power, global memory size, disk drive performance and capacity, and data protection combinations. Your sales representative can assist in determining which Symmetrix model is the most appropriate solution for your high-end storage needs.

## **EMC storage software—the fuel and functionality that power the Symmetrix DMX engine**

EMC Enginuity is the most mature, comprehensive, stable, highly available and proven storage operating environment in the industry. It is designed from the ground up to drive a high-speed, highly available networked storage infrastructure—one capable of meeting today's seemingly infinite needs for growth, speed, and flexibility, while anticipating tomorrow's business requirements. And Enginuity comes equipped to support a full complement of available EMC and ISV-supplied storage protocols and applications (including GDPS, TPF, and PPRC for mainframe environments) to meet virtually any business demand.

Enginuity is what enables simultaneous connection to virtually all mainframe, UNIX, Windows, AS/400, and Linux platforms—the most extensive connectivity choices in the industry—and all validated in EMC's interoperability labs. The result: you can do whatever you want with your information. Centralize it. Re-purpose it. Consolidate it. Replicate it. Share it. Distribute and manage it. Put it to work when and where it's relevant. And do it 24/7 without compromise. With fewer staff and greater speed and efficiency.

Enginuity's adaptive, intelligent algorithms continuously monitor application, network, and storage system health and performance and continuously adjust to changing workloads, assuring continuous, never-fail information availability. And because Enginuity is storage-resident, it never imposes a burden on host resources to slow application processing.

Enginuity is the rock-solid foundation of EMC's storage software offering—and the driving force behind the operational consistency and non-disruptive features across Symmetrix generations.

## **Software functionality that makes storage management simple, automated, and open.**

EMC offers and delivers a complete suite of functional storage software—far more extensive than that of any competitor. Many software offerings are in their fifth or sixth generation of continuously enhanced maturity.

## **Tiered Storage Optimization Software**

EMC delivers two critical software products with the latest version of Enginuity that optimize performance with multi-tiered Symmetrix systems. Dynamic Cache Partitioning provides dedicated memory resource allocation. It enables organizations to segregate cache on a Symmetrix into as many as eight partitions for different applications. Partitions can expand and contract according to policies in order to maximize performance while providing isolation between applications. Symmetrix Priority Controls help manage multiple application workloads by setting priority levels for device groups, allowing higher-priority applications to have faster response times than lower-priority applications. These controls include enhanced support for IBM Workload Manager for priority queuing in mainframe environments.

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EMC's mission is to help our customers get the maximum value from their information while providing them with the best total customer experience in the industry. We help enterprises of all sizes manage their growing volumes of information—from the time of its creation to its archival and eventual disposal—through information lifecycle management. EMC storage and information management solutions, including Symmetrix DMX-3 systems, are the foundation of this mission. An EMC information infrastructure unifies networked storage technologies, storage platforms, software, and services to help organizations better and more cost-effectively manage, use, protect, and share their information assets.

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## Storage management software

Symmetrix Management Console is an intuitive, browser-based GUI for Symmetrix device management for open systems as well as z/OS-attached systems. Symmetrix Management Console features management and monitoring of local and remote replication, as well as the tiered storage optimization tools Symmetrix Priority Controls and Dynamic Cache Partitioning.

The EMC ControlCenter® family of storage management software, meanwhile, provides automated management of your multi-vendor networked storage environment through a single, consistent, information-centric approach. As the industry's only integrated networked storage management family, ControlCenter lets you “see” all the elements of your IT infrastructure (hardware, software, and network), “know” how your infrastructure is performing, and “do” what's necessary to ensure service levels are met—all from a single software interface.

EMC z/OS Storage Manager (EzSM) is a mainframe software product providing discovery and viewing of your Symmetrix environment. EzSM provides facilities to handle volumes, data sets, catalogs, and detailed Symmetrix functionality information.

Industry experts have estimated that EMC storage and information management software can improve storage management efficiency by up to nine-fold\*, allowing you to redeploy valuable IT skills to more productive, revenue-generating activities.

And EMC storage management products aren't limited to just supervising Symmetrix systems. They also manage other EMC and non-EMC storage platforms, networks, and applications to match today's open, heterogeneous IT environments. Use the storage most appropriate to your needs and manage it all centrally from one management interface.

\*Source: IDC

## Information management software

Replicate critical business information, anywhere, any time. The Symmetrix Remote Data Facility (SRDF®) and TimeFinder® families of products deliver the most comprehensive and time-proven replication solutions available in the market. Symmetrix local and remote data replication solutions enable you to balance your performance, availability, functionality, and economic requirements to achieve required service levels for disaster recovery and business continuity.

## Symmetrix local and remote replication software solutions

The EMC TimeFinder and SRDF families of software are the most powerful suites of local and remote storage replication solutions available in the industry; enabling business continuance volumes for parallel processing activities like backup, testing and development, and local restore, as well as remotely replicated copies to guard against primary site disasters and outages. Both the TimeFinder and SRDF families leverage the Symmetrix architecture to offer unmatched deployment flexibility and massive scalability—so you can meet mixed service-level requirements with minimal operational impact. In fact, the TimeFinder and SRDF families are the most widely deployed set of local and remote replication solutions in the industry, and are installed in tens of thousands of demanding environments worldwide.

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**Use the EMC TimeFinder family to improve productivity and enhance online business continuity.**

- Create instantly accessible business continuance volumes (BCVs): mirrors, snapshots, or clones
- Perform backups quickly, frequently, and without disruption
- Reduce time limitations through workload compression
- Eliminate job—step copies to improve batch processing time
- Seamlessly load or update data warehouses
- Provide production data for application development testing without scheduling downtime

**Use the EMC SRDF family to protect your information, accelerate business-critical processes.**

- Host-independent, realtime data replication over distance
- Concurrent compatibility with main-frame, UNIX, Windows, AS/400, Linux, and iSeries systems
- Consistency technology for application restartability
- Native GigE connectivity capabilities to reduce TCO
- Integrated with the TimeFinder family for local replication

***The TimeFinder family of local replication solutions includes:***

**EMC TimeFinder base products**

- **TimeFinder/Clone:** Highly functional, high-performance, full-volume point-in-time business continuance volumes (BCVs) for backups, online restores, and volume migrations.
- **TimeFinder/Snap:** Pointer-based, economical, space-saving snapshot BCVs enabling more frequent recovery points and fast local data restores.

**EMC TimeFinder add-on options**

- **TimeFinder/Mirror:** Highly available, ultra-performance mirror BCV option for the most demanding environments.
- **TimeFinder/Consistency Groups:** Maintain data coherency across TimeFinder-protected application volumes to ensure data consistency and restartability.
- **TimeFinder/Exchange Integration Module and TimeFinder SQL Integration Module:** Integration of the TimeFinder family with Microsoft Exchange and SQL applications for automated backup and restore.

***The SRDF family of remote replication solutions includes:***

**EMC SRDF base products**

- **SRDF/Synchronous (SRDF/S):** High-performance, host-independent, realtime synchronous remote replication from one Symmetrix to one or more Symmetrix systems.
- **SRDF/Asynchronous (SRDF/A):** High-performance, extended-distance, asynchronous replication using a Delta Set architecture for reduced bandwidth requirements and no host performance impact.
- **SRDF/Data Mobility (SRDF/DM):** Rapidly transfer data from source volumes to remote volumes anywhere in the world, permitting information to be shared, content to be distributed, and information to be consolidated for centralized parallel processing activities.

***EMC SRDF add-on options***

- **SRDF/Star:** Provides advanced multi-site business continuity protection. Concurrent SRDF/S and SRDF/A operations from the same source volumes can incrementally establish an SRDF/A session between two remote sites in the event of a primary site outage and can quickly resynchronize the SRDF/S and SRDF/A copies by replicating only the differences between the sessions—allowing for much faster resumption of protected services after a source site failure.
  - **SRDF/Automated Replication (SRDF/AR):** Rapid business restart over any distance with no data exposure through advanced single-hop and multi-hop configurations.
  - **SRDF/Cluster Enabler (SRDF/CE) for MSCS or VCS:** High availability and automated failover through storage-based replication and server clustering.
  - **SRDF/Consistency Groups (SRDF/CG):** Maintain data coherency across an SRDF-based configuration by managing data propagation from the source volumes to their corresponding target volumes to ensure data consistency and restartability.
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## Information mobility software

Copy and move data to where it provides the most value. Symmetrix DMX enables online data mobility and migration while minimizing complexity and disruption. Move data between storage tiers, platforms, and sites—quickly, efficiently, and without disruption.

- **EMC Open Migrator/LM:** Provides host-based, non-disruptive data migration/data mobility—at the volume level—for Microsoft Windows and UNIX servers.
- **EMC Open Replicator for Symmetrix:** Enables remote point-in-time copies to be used for high-speed data mobility, remote vaulting, migrations, and distribution between EMC Symmetrix DMX and qualified storage systems—with full or incremental copy capabilities.
- **SRDF/Data Mobility (DM):** Enables rapid transfer of data from source volumes to remote volumes anywhere in the world.

## Extend Symmetrix DMX value throughout your enterprise

All Symmetrix DMX systems can, when combined with EMC Connectrix® Fibre Channel directors or switches, form the backbone of powerful, virtually unlimited storage area networks (SANs) and network-attached storage (NAS) infrastructures. You can link, manage, share, and protect all of your enterprise-wide information resources, regardless of geography, connectivity, or information-type and apply those resources to your most pressing business and service-level challenges. And by virtue of EMC's extensive interoperability testing—the most complete and comprehensive in the industry—you can do so with the confidence that everything will work together in one unified EMC information infrastructure.

## Maximize Symmetrix DMX series benefits with EMC Services

EMC delivers the full complement of services for EMC Symmetrix hardware and software to ensure that your Symmetrix DMX system performs as expected in your environment while minimizing risk to your business and your budget. Expert planning, design, and implementation services help you quickly realize the value of your hardware and software in your environment, no matter how simple or complex. After implementation, EMC's data migration services can help you plan, design, and safely migrate your critical data over any distance to your new system. EMC will also help you integrate your new system into your information architecture and applications, such as Microsoft Exchange and SQL, Oracle Databases and Applications, and SAP, and manage your new environment when it is complete. Extensively trained professional services personnel and project management teams, leveraging EMC's extensive storage deployment best practices and guided by our proven methodology, accelerate the business results you need without straining the resources you have.

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In addition to uncompromising performance, availability, functionality and economic benefits, Symmetrix DMX customers have access to the world's top-rated customer service and support. The EMC Services organization helps you make the most of your EMC technology investment with a continuum of best-in-class services spanning the entire information lifecycle.

## EMC Services for the IT lifecycle

EMC Services delivers results to our customers throughout the IT lifecycle: Plan, Build, Manage, and Support. Strategic information and storage consulting services from EMC Consulting help companies achieve the maximum value from their information, at the lowest total cost, at every point in the information lifecycle. EMC Technology Solutions professionals deliver product-specific point solutions in addition to comprehensive custom planning, design, implementation, and integration services for EMC technology—everything from consolidation of your current resources to a transformation of your environment to achieve information lifecycle management. EMC Customer Service—five-time winner of the SSPA STAR Award for outstanding mission-critical support—helps you keep your information available 24/7 with an array of services available whenever, wherever, and however you need them. Our eServices capabilities and Remote Support offerings mean support is just a call or click away. And, EMC Education Services drives the value of your investment with a comprehensive training and certification program that assesses your current knowledge, develops and delivers a personalized training plan and curriculum, and finally, validates your knowledge and expertise through certification exams.

Symmetrix DMX systems come standard with a two-year, 24x7, onsite warranty on hardware and the Enginuity storage operating environment, and a 90-day warranty on software. Warranties can be extended with an EMC Service Agreement.\*

Ask your EMC sales representative about the full spectrum of services from EMC that can benefit your organization.

\* Warranties may vary outside the United States. Contact your EMC representative for local warranty and service terms and conditions.



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## Take the Next Step

For more information on the uncompromising performance, unequalled functionality, and unexpected economics offered by the Symmetrix DMX series of high-end networked storage systems, contact your EMC sales representative or authorized EMC value-added systems integrator. You can also visit our website at [www.EMC.com](http://www.EMC.com) or, in North America, call the Symmetrix DMX hotline at 1-866-SYMM-DMX (1-866-796-6369).