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EMC Symmetrix DMX-3

The EMC® Symmetrix® DMX-3 delivers scalable capacity and performance to consolidate systems, applications, and/or hosts while maintaining high service levels. Incrementally scalable packaging facilitates the online addition of independent storage bays (currently 2,400 2Gb/s high-performance Fibre Channel disk drives, and more as larger configurations are qualified). The Direct Matrix™ infrastructure accommodates non-disruptive addition of disk directors enabling increased performance when needed.

EMC Symmetrix DMX-3 systems are available in two- to nine-bay configurations for more than one petabyte of raw storage capacity in a single system. With incremental tiered storage capability for maximum TCO value, Symmetrix DMX-3 systems are the highest capacity, fastest, most scalable, most capable storage systems available and serve as the foundation of today's most demanding intelligent information infrastructures.

System Resources

Symmetrix DMX-3 systems are built on the field-proven Direct Matrix Architecture® which provides dedicated, non-blocking interconnects between I/O directors and global memory regions. To support the massive scalability of DMX-3 configurations, the DMX architecture has been expanded and enhanced to deliver higher throughput (1 GB/s links) and increased I/O performance (four dual 1.3 GHz PPC processors per director).

DMX data paths	32–128	8 per I/O director, 16 per Global Memory director
DMX data bandwidth	32–128 GB/s	
DMX message bandwidth	4.0–6.4 GB/s	
PowerPC processors	16–130	Four dual 1.3 GHz processor complexes per director
Global Memory	32–512 GB*	Available in 8, 16, 32 and 64 GB Global Memory directors
Concurrent memory transfers	16–32	4 per Global Memory director
Logical volumes	64,000	

*256 GB effective

Connectivity

Symmetrix DMX-3 is available in configurations supporting up to ten (10) high-speed Channel I/O Directors with four SMP-driven pipeline slices each. Optimized hardware logic and data protection encoding ensures end-to-end data integrity with automated channel failover for maximum availability and load balancing.

Symmetrix DMX™ systems support all popular hardware and operating system platforms, storage area networks (SANs), and high-availability cluster environments.

Protocol	Usable System Ports	Channel Director
2Gb/s Fibre Channel host/SAN ports	2–64	1–8 per Fibre Channel Director
2Gb/s Fibre Channel remote replication ports	2–8	1–4 per Fibre Channel Director
1Gb/s iSCSI ports	2–40	1–4 per Multi-protocol Channel Director
2Gb/s FICON host ports	2–40	1–4 per Multi-protocol Channel Director
1Gb/s GigE remote replication ports	2–8	1–4 per Multi-protocol Channel Director
ESCON host ports	2–64	1–8 per ESCON Channel Director
ESCON remote replication ports	2–8	1–4 per ESCON Channel Director

Mixed combinations of the above port types depend upon the configuration. Higher numbers of usable front-end ports are only supported on configurations with fewer disk channels. Refer to the EMC Support Matrix on EMC.com or contact your local EMC sales representative for specific configuration support. "

Disk Drives & Drive Connectivity

The Symmetrix DMX disk drive infrastructure is architected with the latest 2Gb/s dual-ported Fibre Channel disk drives, each supported by two independent disk I/O directors with automatic failover and fault isolation.

	Min	Max	8 ports per Director
Disk Directors	2	8	Each drive supported by 2 disk channels for redundancy
Disk Channels	16	64	
2Gb/s FC Disk Drives	96	2,400*	
Drives per Channel Pair	4	60	

Available Drives:						
Capacity	73 GB	73 GB	146 GB	146 GB	300 GB	500 GB
Rotational Speed (rpm)	10,000	15,000	10,000	15,000	10,000	7,200
Interface	2Gb/s FC	2Gb/s FC	2Gb/s FC	2Gb/s FC	2Gb/s FC	2Gb/s FC
Internal data rate (Mb/s)	470—944	685—1,142	470—944	685—1,142	470—944	470—944
Average seek time (read/write)	4.7/5.4 ms	3.5/4.0 ms	4.7/5.4 ms	3.5/4.0 ms	4.7/5.4 ms	8.5/9.5 ms
Raw Capacity	73.41 GB	73.41 GB	146.82 GB	146.82 GB	300.00 GB	500.00 GB
Formatted capacity—open systems	73.34 GB	73.34 GB	146.69 GB	146.69 GB	299.76 GB	499.6 GB
Formatted capacity—mainframe	72.40 GB	72.40 GB	144.81 GB	144.81 GB	295.91 GB	493.19 GB
Formatted capacity—iSeries	72. 82 GB	72. 82 GB	145.66 GB	145.66 GB	292.46 GB	n/a

* Capacities greater than 1,920 drives available by RPQ.

System Capacities in TB

	73 GB Drives		146 GB Drives		300 GB Drives		500 GB Drives*	
	Min. Capacity	Max. Capacity	Min. Capacity	Max. Capacity	Min. Capacity	Max. Capacity	Min. Capacity	Max. Capacity
Number of Drives	96	1920	96	1920	96	1920	96	2,400**
Raw Capacity								
Open	7.04	140.82	14.08	281.66	28.78	575.54	28.78	1,103.13
Mainframe	6.95	139.02	13.90	278.04	28.41	568.15	28.41	1,088.96
Mirrored Capacity								
Open	3.52	70.41	7.04	140.83	14.39	287.77	14.39	526.93
Mainframe	3.48	69.51	6.95	139.02	14.20	284.08	14.20	526.93
RAID 5 3+1 Capacity								
Open	5.28	105.62	10.56	211.24	21.58	431.65	21.58	526.93
Mainframe	5.21	104.27	10.43	208.53	21.31	426.11	21.31	526.93
RAID 5 7+1 Capacity								
Open	6.16	123.22	12.32	246.45	25.18	503.60	25.18	525.1
Mainframe	6.08	121.64	12.16	243.29	24.86	497.13	24.86	525.1

Configurations with mixed drive capacities and speeds are allowed depending upon configuration.
24 GB of total capacity will be reserved for internal Symmetrix File System use.
160 to 640 GB of total capacity will be reserved for vaulting data from memory during system power down.
Each system will be configured with 3–12 global hot spare drives.
All capacities are based on 1 GB = 1,000,000,000 bytes.
Actual usable capacity may vary depending upon configuration.
*Usable capacity with currently available memory and 300 GB drives for minimum drive count.

** Capacities greater than 1,920 drives available by RPQ.

Disk Emulation

	Open Systems	3380K	3390-1	3390-2	3390-3	3390-9	3390-27	3390-54
MB/Volume	30,720	1,891	946	1,892	2,838	8,514	27,844	55,688
Bytes/Track	32,768	47,476	56,664	56,664	56,664	56,664	56,664	56,664
Bytes/Cylinder	491,520	712,140	849,960	849,960	849,960	849,960	849,960	849,960
Cylinders/Volume	65,472	2,655	1,113	2,226	3,339	10,017	32,760	65,520

Data Protection Options

RAID 0*: Data striped across two to eight hypervolumes (unprotected)

RAID 1: Mirrored pair of two hypervolumes

RAID 1/0: Data striped across four mirrored pairs of hypervolumes

RAID 5: Data striped on four or eight hypervolumes (with rotating parity)

*Not recommended as a drive failure in a RAID 0 group will result in data unavailability and data loss.

Physical & Cooling Specifications

Cooling	Height**	Width	Depth	Front and Rear Service Area	Weight	Power
	(in/cm)	(in/cm)	(in/cm)	(in/cm)	(lb/kg)	(kVA)
(Btu/hr)						
System Bay 21,502	76.66/194.7	24.02/61.0	41.16/104.5	42.0/106.7	1,626/737.5	5.6
Storage Bay 20,819	76.66/194.7	30.02/76.3	41.88/106.4	42.0/106.7	2,422/1098.6	5.9

All dimensions are cabinet/enclosure size without shipping brackets or securing brackets.
Weight, power, and cooling are typical for a full configuration.
Cooling is front to top of all bays.
**An additional 18 in. (45.7 cm) is required for ceiling/top clearance.

Power Specifications

Redundant main and auxiliary power connections requiring two separate power sources.
2 (N) power zone redundancy in each bay.

	North America and 3-phase (Delta—4 Wire)	International 3-phase (Wye—5 Wire)
Input Voltage (VAC)	200–240	200–240
Frequency (Hz)	50–60	50–60
Circuit Breaker (Amps), recommended	50	32
AC Power Connections	2 per bay	2 per bay
Power Connector	9P54U2T	Country specific
User Connector	9C54U2T	Country specific

Environmental Specifications (operating)

Temperature °F/°C)	50–90/10–32
Altitude (ft/m), max.	7,500/2,286
Humidity (%), non-condensing	20–80
Raised Floor	Recommended

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