

EMC Symmetrix DMX-4 950



Symmetrix DMX-4 950 is a new entry point for high-end storage offering a compact footprint optimized for mainframe and open systems data centers with limited space, power, and cooling.

The EMC® Symmetrix® DMX-4 950 delivers scalable capacity and performance to consolidate systems, applications, and/or hosts while maintaining high service levels. It can be configured with as few as 32 4 Gb/s high-performance Fibre Channel disk drives, up to 120 disk drives in a single cabinet. The DMX-4 950 system's incrementally expandable packaging facilitates the online addition of an additional independent storage bay containing an additional 240 drives for a total system capacity of 360 disk drives providing a maximum raw capacity of over 360 TB. The eight-slot Direct Matrix backplane accommodates configurations of two global memory directors, two or four channel/disk I/O directors, and two front-end/back-end adapters.

System Resources

Symmetrix DMX-4 systems, including the DMX-4 950, are built on the field-proven Direct Matrix Architecture® which provides dedicated, non-blocking interconnects between I/O directors and global memory regions. 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	16–32	8 per I/O director, 16 per Global Memory director
DMX data bandwidth	16–32 GB/s	
DMX message bandwidth	0.6–1.6 GB/s	
PowerPC processors	16–32	Four dual 1.3 GHz processor complexes per director
Global Memory	16–128 GB	Available in 8, 16, 32 and 64 GB increments
Concurrent memory transfers	8	4 per Global Memory director

Connectivity

Symmetrix DMX-4 950 is available in configurations supporting up to four 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
4 Gb/s Fibre Channel host/SAN ports	8–16	8 front-end ports per Channel/Disk Director pair
4 Gb/s FICON host/SAN ports	4–8	4 front-end ports per Channel/Disk Director pair
4 Gb/s Fibre Channel remote replication ports	2–8	1–4 per Fibre Channel Director
1 Gb/s iSCSI ports	2–10	2–4 with two Multi-protocol Channel Directors, 2–10 with four Multi-protocol Channel Directors
1 Gb/s Ethernet remote replication ports	2–10	2–4 with two Multi-protocol Channel Directors, 2–10 with four Multi-protocol Channel Directors

Mixed combinations of the above port types depend upon the configuration. Refer to the EMC Support Matrix on EMC.com or contact your local EMC sales representative for specific configuration support. IPv6 and IPsec support are available with GigE ports.

Disk Drives & Drive Connectivity

The Symmetrix DMX-4 950 disk drive infrastructure is architected with 4 Gb/s dual-ported Fibre Channel disk drives, each supported by two independent disk I/O directors with automatic failover and fault isolation.

	Min	Max	
Disk Directors	2	4	8 ports per Director
Disk Channels	16	32	
2/4 Gb/s FC Disk Drives	32	360	Each drive supported by 2 disk channels for redundancy
Drives per Channel Pair	4	45	

Available Disk Drives:

Capacity	73 GB	73 GB	146 GB	146 GB	300 GB	300 GB	400 GB	500 GB	1 TB
Rotational Speed (rpm)	10,000	15,000	10,000	15,000	10,000	15,000	10,000	7,200	7,200
Interface	2 Gb/s FC	4 Gb/s FC	2 Gb/s FC	4 Gb/s FC	4 Gb/s FC	4 Gb/s FC	4 Gb/s FC	4 Gb/s SATA-II	4 Gb/s SATA-II
Internal data rate (Mb/s)	470-944	685-1,142	470-944	685-1,142	470-944	685-1,142	725-1,211	470-944	470-1,070
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	3.5/4.0 ms	3.9/4.2 ms	8.5/9.5 ms	9.2/10.2 ms
Raw Capacity	73.4 GB	73.4 GB	146.8 GB	146.8 GB	300.0 GB	300.0 GB	400.0 GB	500.0 GB	1 TB
Formatted capacity—open systems	73.3 GB	73.3 GB	146.7 GB	146.7 GB	299.8 GB	299.8 GB	399.7 GB	499.6 GB	999.4 GB
Formatted capacity—mainframe	72.4 GB	72.4 GB	144.8 GB	144.8 GB	292.5 GB	292.5 GB	394.6 GB	493.2 GB	986.6 GB
Formatted capacity—iSeries	72.8 GB	72.8 GB	145.7 GB	145.7 GB	295.9 GB	295.9 GB	399.7 GB	n/a	n/a

Available Flash Drives:

Capacity	73 GB	146 GB
Interface	2 Gb/s	2 Gb/s
Internal data rate (MB/s)	100-200	100-200
Raw capacity	73.4 GB	146.8 GB
Formatted capacity—open systems	73.3 GB	146.7 GB
Formatted capacity—mainframe	72.4 GB	144.8 GB
Formatted capacity—iSeries	n/a	n/a

DMX-4 950 System Capacities in TB

	73 GB Drives		146 GB Drives		300 GB Drives		400 GB Drives		500 GB Drives		1 TB Drives	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Number of Drives	32	360	32	360	32	360	32	360	32	360	32	360
Raw Capacity												
Open	2.3	26.4	4.7	52.8	9.6	107.9	12.8	143.9	16.0	179.9	31.98	359.79
Mainframe	2.3	26.1	4.6	52.1	9.5	106.5	12.6	142.0	15.8	177.5	31.57	355.17
Mirrored Capacity												
Open	1.2	13.2	2.3	26.4	4.8	54.0	6.4	71.9	8.0	89.9	15.99	134.92
Mainframe	1.2	13.0	2.3	26.1	4.7	53.3	6.3	71.0	7.9	88.8	15.79	134.18
RAID 5 3+1 Capacity												
Open	1.8	19.8	3.5	39.6	7.2	80.9	9.6	107.9	12.0	134.1	23.99	142.42
Mainframe	1.7	19.5	3.5	39.1	7.1	79.9	9.5	106.5	11.8	133.2	23.68	142.07
RAID 5 7+1 Capacity												
Open	2.0	23.1	4.1	46.2	8.4	94.4	11.2	125.9	14.0	133.8	27.98	145.17
Mainframe	2.0	22.8	4.0	45.6	8.3	93.2	11.0	124.3	13.8	133.8	27.62	145.03
RAID 6 6+2 Capacity												
Open	1.8	19.8	3.5	39.6	7.2	80.9	9.6	107.9	12.0	134.1	23.99	142.42
Mainframe	1.7	19.5	3.5	39.4	7.1	79.9	9.5	106.5	11.8	133.2	23.68	142.07
RAID 6 14+2 Capacity												
Open	2.0	23.1	4.1	46.2	8.4	94.4	11.2	125.9	14.0	133.8	27.98	145.17
Mainframe	2.0	22.8	4.0	45.6	8.3	93.2	11.0	124.3	13.8	133.8	27.62	145.03

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.

80 to 160 GB of total capacity will be reserved for vaulting data from memory during system power down.

All capacities are based on 1 GB = 1,000,000,000 bytes.

Actual usable capacity may vary depending upon operating system.

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



Symmetrix DMX systems can be integral components of a comprehensive information lifecycle management strategy—a strategy that helps your enterprise attain the maximum value from its information, at the lowest total cost of ownership, at every point in the information lifecycle. Information lifecycle management maps the right service level to the right application at the right cost—at the right time.

Data Protection Options

RAID 0*: Data striped across two to eight hypervolumes

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

RAID 6: Data striped on 8 or 16 hypervolumes with dual rotating parity

Configurable global hot-spare pool

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

**RAID 5 (7+1) is not available in configurations with a limited number of back-end loops.

Physical & Cooling Specifications

	Height**	Width	Depth	Front and Rear/ Service Area		Power	Cooling
(in/cm)	(in/cm)	(in/cm)	(in/cm)	(lb/kg)	Weight (kVA)	(Btu/hr)	
System Bay	76.66/194.7	24.02/61.0	41.16/104.5	42.0/106.7	1,879/852.3	4.7	16,036
Storage Bay	76.66/194.7	30.02/76.3	41.88/106.4	42.0/106.7	2,422/1,098.6	5.9	20,137

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 3-phase (Delta—4 Wire)	International 3-phase (Wye—5 Wire)	North America single-phase	International single-phase
Input Voltage (VAC)	200–240	200–240	208-240	220-230-240
Frequency (Hz)	50–60	50–60	47-63	47-63
Circuit Breaker (Amps), recommended	50	32	30	32
AC Power Connections	2 per bay	2 per bay	2 per bay	2 per bay
Power Connector (2)	CS8365	Country specific	L6-30P	Country specific
User Connector (2)	CS8364	Country specific	L6-30R	Country specific

Environmental Specifications (operating)

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

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EMC Corporation
Hopkinton
Massachusetts
01748-9103
1-508-435-1000
In North America 1-866-464-7381
www.EMC.com