SPECIFICATION SHEET

EMC Symmetrix V-Max Storage System

The Virtual Matrix Architecture™ is a new way to build storage systems that transcends the physical constraints of all existing architectures by scaling system resources through common building blocks called V-Max™ Engines.

A single V-Max Engine provides the complete foundation for a high-availability EMC® Symmetrix® V-Max system. Each V-Max Engine contains two Symmetrix V-Max directors and redundant interfaces to the Virtual Matrix™ interconnect. Each Symmetrix V-Max director consolidates front-end, global memory, and back-end functions, enabling direct memory access to data for optimized I/O operations.

V-Max Engines are interconnected via a set of multiple active fabrics that provide scalable performance and high availability. V-Max Engines can be added non-disruptively to provide linear scale-out of Symmetrix system resources. The Virtual Matrix is architected to scale to dozens of engines, geographically dispersed throughout a data center, delivering unprecedented scale of infrastructure services under a single point of management.

V-Max Engine maximum specifications

- 4 Quad-core 2.33 GHz Intel® Xeon® processors
- Up to 128 GB of memory
- Virtual Matrix bandwidth: 24 GB/s

V-Max maximum system specifications

- 8 V-Max Engines
- 1 TB of memory
- Virtual Matrix bandwidth: 192 GB/s

V-Max interconnect

- Industry-standard RapidIO® fabric (Virtual Matrix Architecture is extensible to other standard interconnects.)

Connectivity

Symmetrix V-Max is available in configurations supporting up to eight V-Max engines with a maximum of 128 front-end ports. Optimized hardware logic and data protection encoding ensures end-to-end data integrity with automated channel failover for maximum availability and load balancing. Symmetrix V-Max systems support all popular hardware and operating system platforms, storage area networks (SANs), and high-availability cluster environments. IPv6, IPsec, and compression support are available with GigE ports.

Protocol	Usable System Ports
4 Gb/s Fibre Channel Host/SAN Ports	4–128 per array, 4–16 ports per V-Max engine
4 Gb/s Fibre Channel Remote Replication Ports	2–32 per array, 2–4 ports per V-Max engine
4 Gb/s FICON Host Ports	4–64 per array, 4–8 ports per V-Max engine
1 Gb/s GigE Remote Replication Ports	2–32 ports per array, 2–4 ports per V-Max engine
1 Gb/s iSCSI Ports	4–64 per array, 4–8 ports per V-Max engine

Mixed combinations of the above port types depend upon the configuration. Refer to the EMC Support Matrix at www.EMC.com or contact your local EMC sales representative for specific configuration support.

EMC Symmetrix V-Max systems are available in two- to 11-bay configurations for up to two petabytes of usable storage capacity in a single system. With incremental tiered storage capability for maximum TCO value, Symmetrix V-Max arrays 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.

Disk Drive and Flash Drive Connectivity

The Symmetrix V-Max drive infrastructure is architected with the latest 4 Gb/s dual-ported Fibre Channel drives, Enterprise Flash drives, and SATA drives, each supported by two independent I/O channels with automatic failover and fault isolation.

Available Disk Drives

Capacity	**146 GB**	**300 GB**	**400 GB**	**450 GB**	**1 TB**
Rotational Speed (rpm)	15,000	15,000	10,000	15,000	7,200
Interface	4 Gb/s FC	4 Gb/s FC	4 Gb/s FC	4 Gb/s FC	4 Gb/s SATA
Internal Data Rate (Mb/s)	685–1,142	685–1,142	725–1,211	1,051–2,225	470–1,070
Average Seek Time (read/write)	3.4/3.9 ms	3.4/3.9 ms	3.9/4.2 ms	3.4/3.9 ms	8.2/9.2 ms
Raw Capacity	145.7 GB	292.6 GB	399.9 GB	439.0 GB	1000.2 GB
Formatted Capacity—Open Systems	143.5 GB	288.1 GB	393.8 GB	432.2 GB	984.8 GB
Formatted Capacity—Mainframe	139.3 GB	279.7 GB	382.3 GB	419.6 GB	956.0 GB
Formatted Capacity—System i	141.7 GB	288.2 GB	389.8 GB	435.1 GB	n/a

Available Enterprise Flash Drives

Capacity	**200 GB**	**400 GB**
Interface	4 Gb/s FC	4 Gb/s FC
Internal Data Rate (Mb/s)	800–1,600	800–1,600
Raw Capacity	200.0 GB	400.0 GB
Formatted Capacity—Open Systems	196.9 GB	393.8 GB
Formatted Capacity—Mainframe	191.2 GB	382.3 GB
Formatted Capacity—System i	197.0 GB	389.8 GB

System Capacities in TB

	146 GB Drives		**1 TB Drives**	
	Min.	**Max.**	**Min.**	**Max.**
Number of Drives	96	2,400	96	2,400
Mirrored Capacity				
Open Systems	6.32	168.79	43.33	1,158.14
Mainframe	6.13	163.86	42.06	1,124.28
RAID-5 3+1 Capacity				
Open Systems	9.47	253.19	65.00	1,737.20
Mainframe	9.20	245.80	63.10	1,686.42
RAID-5 7+1 Capacity				
Open Systems	11.05	295.38	75.83	2,026.74
Mainframe	10.73	286.76	73.61	1,967.49
RAID-6 6+2 Capacity				
Open Systems	9.47	253.19	65.00	1,737.20
Mainframe	9.20	245.80	63.10	1,686.42
RAID-6 14+2 Capacity				
Open Systems	11.05	295.38	75.83	2,026.74
Mainframe	10.73	286.76	73.61	1,967.49

Physical and Cooling Specifications

	Height*	Width	Depth	Front and Rear Service Area	Weight	Power	Cooling
	(in/cm)	(in/cm)	(in/cm)	(in/cm)	(lb/kg)	(kVA)	(BTU/hr)
4-Engine System Bay	76.66/194.7	30.2/76.7	41.88/106.4	42.0/106.7	1,830/830.0	4.1	13,700
8-Engine System Bay	76.66/194.7	30.2/76.7	41.88/106.4	42.0/106.7	2,774/1258.3	7.8	26,300
Storage Bay	76.66/194.7	30.2/76.7	41.88/106.4	42.0/106.7	2,144/972.5	6.1	19,800

All dimensions are cabinet/enclosure size without shipping brackets or securing brackets.
Weight, power, and cooling are maximum for a full configuration.
Cooling is front to rear for system bay and front to top for storage bays.
*An additional 18 in. (45.7 cm) is recommended for ceiling/top clearance.

Power Specifications—Storage Bay

	North America 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	CS8365C	Country-specific
User Connector	CS8364C	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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