EMC VMAX 10K

EMC® VMAX® 10K delivers a true Tier-1 multi-controller, scale-out architecture with consolidation and efficiency for the enterprise. The VMAX 10K utilizes the same revolutionary EMC Virtual Matrix Architecture as the VMAX 20K and VMAX 40K systems.

Specifications

ARCHITECTURE

The Virtual Matrix Architecture enables IT departments to build storage systems that transcend the physical constraint of competing array architectures. The architecture allows scaling of system resources through common and fully redundant building blocks called VMAX 10K engines. A single VMAX 10K engine provides the complete foundation for a high-availability storage array. Each engine contains two VMAX 10K directors and redundant interfaces to the EMC Virtual Matrix interconnect. Each director consolidates front-end, global memory, and back-end functions, enabling direct memory access to data for optimized I/O operations. Up to four VMAX 10K engines can be interconnected via a set of multiple active fabrics that provide scalable performance and high availability. VMAX 10K engines can be added non-disruptively to provide performance scale-out of system resources.

VMAX 10K systems support use of 2.5" drives, 3.5" drives, or a mix of both drive types in the array. Individual system bays house one engine and up to 10 Disk Array Enclosures (DAEs) with 3.5" or mixed configurations, or up to 12 DAEs in 2.5" configurations. Optional storage bays (used with 3.5" and mixed configuration arrays) house up to 12 DAEs. A single-engine VMAX 10K can start with as few as 24 drives and scale up to four engines supporting 1,560 drives for a maximum usable capacity of up to 1.5 PB. A four-engine array provides up to 512 GB of cache memory (128 GB per engine) and up to 64 host or replication network ports including Fibre Channel (FC), iSCSI, FCoE, and SRDF (maximum number of ports varies by connection type).

MAXIMUM SPECIFICATIONS

- Up to four VMAX 10K engines
- Up to 512 GB cache / 128 GB per engine
- Up to eight six-core 2.8 GHz Intel® XEON processors / two per engine
- Up to 1,560 drives with up to 1.5 PB of usable capacity
- Virtual Matrix bandwidth: 200 GB/s

INTERCONNECT

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

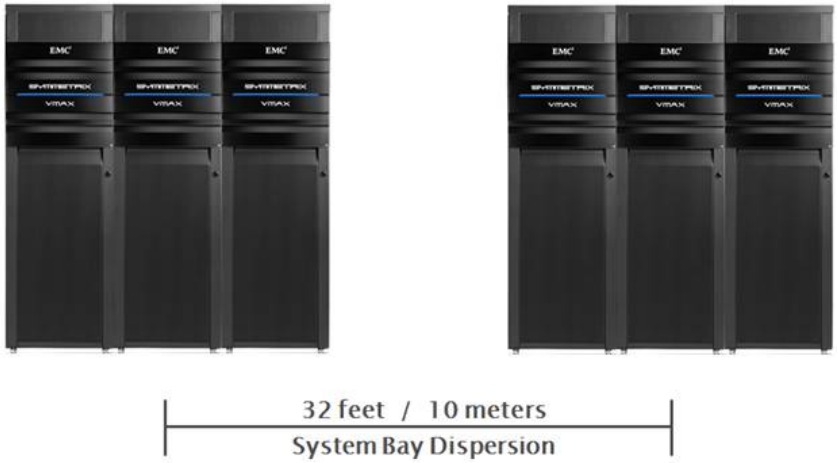
CONNECTIVITY

VMAX 10K systems are available in configurations supporting up to four VMAX 10K engines with a maximum of 64 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. VMAX 10K systems support all popular hardware and operating system platforms, storage area networks (SANs), and high availability cluster environments. IPSec is supported on 1Gb/s Ethernet iSCSI and remote replication ports. IPv6 is available on 1 Gb/s and 10 Gb/s Ethernet iSCSI host or remote replication ports. VMAX OS software compression is supported on 1Gb/s and 10Gb/s Ethernet replication ports.

SRDF ports are for replication. The total number of SRDF ports available per VMAX 10K array is eight. The total number of supported connections with mixed port types depends upon the configuration. Refer to the EMC Support Matrix at www.EMC.com, or contact your local EMC sales representative for specific configuration support.

VMAX 10K USABLE SYSTEM PORTS		
PROTOCOL	**PER ENGINE**	**PER ARRAY**
2 Gb/s FC Host/SAN Ports	8–16	8–64
4 Gb/s FC Host/SAN Ports	8–16	8–64
8 Gb/s FC Host/SAN Ports	8–16	8–64
16 Gb/s FC SAN Ports	4–8	4–32
1 Gb/s iSCSI Host Ports	4–8	4–32
10 Gb/s iSCSI Host Ports	4–8	4–32
10 Gb/s FCoE Host Ports	4–8	4–32
8 Gb/s FC SRDF Ports	2–4	2–8
10 Gb/s GbE SRDF Ports	2–4	2–8
1 Gb/s GbE SRDF Ports	2–4	2–8

SYSTEM BAY DISPERSION



System bay dispersion allows customers to separate a single VMAX 10K array into two physical clusters to solve floor-loading problems, or to work around obstacles in the data center. The two clusters may be dispersed by up to 10 meters (32 ft 10 inches).

DISK DRIVE SUPPORT

The VMAX 10K drive infrastructure is architected with the latest 4 Gb/s dual ported Fibre Channel drives, Enterprise Flash drives, and SAS drives, each supported by two independent I/O channels with automatic failover and fault isolation. Check with your EMC sales representative for the latest list of supported drives and types. Configurations with mixed-drive capacities and speeds are allowed depending upon the configuration. All capacities are based on 1 GB = 1,000,000,000 bytes. Actual usable capacity may vary depending upon configuration.

3.5" DISK DRIVES

CAPACITY	300 GB SAS	300 GB FC	450 GB FC	600 GB SAS	600 GB FC	600 GB FC	900 GB SAS	2 TB SAS	3 TB SAS	4 TB SAS
SPEED (RPM)	10K	15K	15K	10K	10K	15K	10K	7.2K	7.2K	7.2K
INTERNAL DATA RATE (MB/S)	1219-2232	1051-2225	1051-2225	1219-2232	1010-1840	1051-2225	1219-2232	470-1070	470-1070	470-1070
AVG. SEEK TIME (R/W IN MS)	3.7 / 4.2	3.4 / 3.9	3.4 / 3.9	3.7 / 4.2	3.8 / 4.4	3.4 / 3.9	3.7 / 4.2	8.2 / 9.2	8.2 / 9.2	8.2 / 9.2
RAW CAPACITY (GB)	292.7	292.6	439.0	585.4	585.4	585.4	894.9	1912.1	3000.5	4000
OPEN SYSTEMS CAPACITY (GB)	288.1	288.1	432.2	576.3	576.3	576.3	881.1	1882.7	2954.4	3939.2

2.5” DISK DRIVES

CAPACITY	300 GB SAS	300 GB SAS	600 GB SAS	900 GB SAS	1 TB SAS
SPEED (RPM)	10K	15K	10K	10K	7.2K
INTERNAL DATA RATE (MB/S)	1219-2232	1554-2267	1219-2232	1219-2232	673-1304
AVG. SEEK TIME (R/W IN MS)	3.7 / 4.2 ms	2.8 / 3.3 ms	3.7 / 4.2 ms	3.7 / 4.2	7.7 / 8.7 ms
RAW CAPACITY	292.6 GB	292.6 GB	585.4 GB	894.9	1,000.2 GB
OPEN SYSTEMS CAPACITY (GB)	288.1 GB	288.1 GB	576.3 GB	881.1	984.8 GB

ENTERPRISE FLASH DRIVES

CAPACITY	100 GB	200 GB	400 GB
FORM FACTOR	2.5", 3.5"	2.5", 3.5"	2.5", 3.5"
INTERNAL DATA RATE (MB/S)	800-1600	800-1600	800-1600
RAW CAPACITY	100.0 GB	200.0 GB	400.0 GB
OPEN SYSTEMS CAPACITY	98.4 GB	196.9 GB	393.8 GB

MAXIUMUM SYSTEM CAPACITIES IN TB

RAID TYPE	OPEN SYSTEMS USABLE CAPACITY
Mirrored	1389 TB
RAID 5 (3+1) Capacity	1491 TB
RAID 5 (7+1) Capacity	1489 TB
RAID 6 (6+2) Capacity	1491 TB
RAID 6 (14+2) Capacity	1489 TB

DATA AT REST ENCRYPTION (D@RE)

Data at Rest Encryption is delivered through a unique VMAX 10K engine model with built-in, hardware-based data encryption. Data is encrypted when written to drives and decrypted when read from drives with no impact on performance or local and remote replication. VMAX Data at Rest Encryption addresses security and compliance concerns regarding data exposure when drives are removed or arrays are replaced.

PHYSICAL SPECIFICATIONS

BAY TYPE	**PHYSICAL DIMENSIONS** Inches / cm	**SERVICE AREA** Inches / cm	**WEIGHT** lb / kg
STORAGE BAY 2.5"	Height: 75" / 190.5 cm Width: 24" / 61.0 cm Depth: 42" / 106.7 cm	Front and Rear 42" / 106.7 cm	872 / 395
STORAGE BAY 3.5"			1160 / 526
SYSTEM BAY 2.5"			1398 / 634
SYSTEM BAY 3.5"			1550 / 703

Storage Bay 2.5" is only supported with mixed DAE configurations. An additional 18 inches (45.7 cm) is recommended for ceiling/top clearance. All dimensions are cabinet/enclosure size without shipping or securing brackets. Weight is for a full configuration.

POWER CONSUMPTION AND COOLING SPECIFICATIONS

BAY TYPE	**POWER** (KVA)	**HEAT DISSIPATION** (KBTU/HR)
STORAGE BAY 2.5"	4.1	12.6
STORAGE BAY 3.5"	3.9	12.3
SYSTEM BAY 2.5"	4.2	13.0
SYSTEM BAY 3.5"	4.0	12.8

Storage Bay 2.5" is only supported with mixed DAE configurations. Power and cooling are maximum specifications for a full configuration. Cooling is front to rear for system bays and storage bays. Consult EMC Power Calculator at http://PowerCalculator.emc.com for specific configuration information.

RADIO FREQUENCY INTERFERENCE (RFI)

Electro-magnetic fields which include radio frequencies can interfere with the operation of electronic equipment. EMC Corporation products have been certified to withstand radio frequency interference in accordance with standard EN61000-4-3. In Data Centers that employ intentional radiators, such as cell phone repeaters, the maximum ambient RF field strength should not exceed 3 Volts /meter.

REPEATER POWER LEVEL (WATTS)	RECOMMENDED MINIMUM DISTANCE (FEET/METERS)
1	9.84 ft (3m)
2	13.12 ft (4 m)
5	19.69 ft (6m)
7	22.97 ft (7m)
10	26.25 ft (8m)
12	29.53 ft (9m)
15	32.81 ft (10m)

CONTACT US

To learn more about how EMC products, services, and solutions can help solve your business and IT challenges, contact your local representative or authorized reseller—or visit us at www.EMC.com .