EMC VMAX 10K BLOCK AND FILE

EMC® Symmetrix® VMAX® 10K File combines File and Block in a true Tier-1 multi-controller, scale-out architecture with consolidation, high availability and efficiency for the enterprise. The VMAX 10K File delivers optimal density in a single cabinet for both file and block. Each X-Blade supports up to 256TB of file data.

Specifications

ARCHITECTURE

The Dual 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.

The VNX VG50 Gateway components support flexible X-Blade configurations, from 2 to 4 blades. X-Blade configurations are deployed in N+M Primary/Standby mode with N active blades and M pooled failover blades for flexible hardware availability protection (i.e., X-Blade failover). They are available in all dense, standard, or mixed VMAX 10K configurations.

MAXIMUM SPECIFICATIONS - VMAX 10K FILE

- 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 1,460 drives with up to 1.5 PB of usable capacity
- Virtual Matrix bandwidth: 200 GB/s
- 2-4 VG50 X-Blades
- 24 GB of DDR3-DRAM
- One six-core 2.8 GHz Intel® Xeon processor per X-blade
- 2 ports of 8 Gb FC direct attached to VMAX 10K File engines
- 2 ports of 8 Gb FC for tape connect
- Up to four EMC UltraFlex™ slots are available for adding any mix of the following I/O modules:
    - Four ports 10/100/1000 BaseT, two ports 10Gb BaseT, and two ports 10GbE Optical

INTERCONNECT

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

CONNECTIVITY

Symmetrix VMAX 10K File platforms 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 File platforms support all popular hardware and operating system platforms, storage area networks (SANs), and high availability cluster environments. IPsec is supported on 1 Gb/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. Enginuity software compression is supported on 1 Gb/s and 10 Gb/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.

For the table below, each VG50 X-Blade consumes two 8 Gb/s FC Host/SAN ports.

VMAX 10K FILE USABLE SYSTEM PORTS (FILE AND BLOCK)		
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 Host/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

DISK DRIVE SUPPORT

The Symmetrix VMAX 10K File 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
SPEED (RPM)	10K	15K	15K	10K	10K	15K	10K	7.2K	7.2K
INTERNAL DATA RATE (MB/S)	1219-2029	1051-2225	1051-2225	1219-2029	1010-1840	1051-2225	1219-2029	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
RAW CAPACITY (GB)	292.7	292.6	439.0	585.4	585.4	585.4	894.9	1912.1	3000.5
OPEN SYSTEMS CAPACITY (GB)	288.1	288.1	432.2	576.3	576.3	576.3	881.1	1882.7	2954.4

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)	1219-2029	1554-2267	1219-2029	1219-2029	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

Data at Rest Encryption (D@RE) 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. D@RE addresses security and compliance concerns regarding data exposure when drives are removed or arrays are replaced.

PHYSICAL SPECIFICATIONS - FILE

Storage Bay 2.5" is only supported with mixed DAE configurations. All dimensions are cabinet/enclosure size without shipping or securing brackets. Weight is for a full configuration. Refer to the EMC Symmetrix VMAX Family Physical Planning Guide for detailed information.

BAY DESCRIPTION	WEIGHT	HEIGHT (IN/CM)	WIDTH (IN/CM)	DEPTH (IN/CM)	CLEARANCE FOR SERVICE, AIRFLOW, FRONT AND REAR
SYSTEM BAY **STORAGE BAY**	1,548 lb (702 kg)[1] 1,034 lb (479 kg)[2]	75 in (190.5 cm)	24 in (61 cm)	42 in (106.7 cm)	42 in (106.7) front/rear 18 in (45.7 cm) top

1 System bay 1 with VMAX 10K File components

2 Storage bay 1A with VMAX 10K File components

POWER CONSUMPTION AND COOLING SPECIFICATIONS - FILE

DESCRIPTION	TOTAL POWER CONSUMPTION (KVA)	HEAT DISSIPATION (KBTU/HR)
SYSTEM BAY 1 WITH VMAX 10K FILE COMPONENTS (SYSTEMS WITH HIGH DENSITY	5.35	16,700
STORAGE BAY WITH VMAX 10K FILE COMPONENTS (SYSTEMS WITH STANDARD AND MIXED STANDARD AND HIGH DENSITY BAYS)	3.9	12,200

POWER SPECIFICATIONS—STORAGE BAY AND SYSTEM BAY

The following table contains specifications for North American, International and Australian single-phase power transmission. Data centers with systems must conform to the corresponding specification.

SPECIFICATIONS	NORTH AMERICAN 3 WIRE CONNECTION (2 L + 1 G)*	INTERNATIONAL. AND AUSTRALIAN 3 WIRE CONNECTION (1 L + 1 N +1 G)
INPUT NOMINAL VOLTAGE	200-240 VAC +/- 10% L-L nom	220-240 VAC +/- 10% L-N nom
FREQUENCY	50-60Hz	50-60Hz
CIRCUIT BREAKERS	30 A	32 A
POWER ZONES	Two	Two
Power requirements at customer site (Minimum		
SYSTEM AND STORAGE BAY WITH VMAX 10K FILE COMPONENTS	Four 30 A, single-phase drops per bay	Four 32 A, single-phase drops per bay

*L= line or phase; N = neutral; G = ground

ENVIRONMENTAL SPECIFICATIONS (OPERATING)

CONDITION	SYSTEM AND STORAGE BAYS
Operating temperature extremes	50°— 90° F (10° to 32° C) [1]
Operating altitude (at 32°)	7,500 ft (2,286 m)
Operating altitude (maximum)	10,000 ft (3,048 m) 1.1o derating per 1,000 ft
Operating relative humidity extremes	20% to 80% noncondensing
Raised floor environment	Recommended, but not required
Operating rate of temperature change	9° F/Hr (5°C/Hr)
Condition	System and storage bays

1 These values apply to the inlet temperature of any component within the Symmetrix bay.

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 .