

EMC VMAX³ FAMILY - VMAX 100K, 200K, 400K



The newest additions to the EMC® VMAX® family deliver the latest in Tier-1 scale-out multi-controller architecture with consolidation and efficiency for the enterprise. With completely redesigned hardware and software, the new VMAX 100K, 200K, and 400K arrays provide unprecedented performance and scale. Ranging from the single or dual engine VMAX 100K up to the 8-engine VMAX 400K, these new arrays offer dramatic increases in floor tile density with engines and high capacity disk enclosures for both 2.5" and 3.5" drives consolidated in the same system bay. In addition, VMAX 100K, 200K, and 400K can be configured as either hybrid or all flash configurations.

This revolutionary new VMAX³ architecture delivers Virtual Matrix Bandwidth of 175GB/s per engine and up to 1400GB/s across an eight engine VMAX³ array. All new VMAX³ models come fully pre-configured out of the factory to significantly shorten the time to first I/O during installation.

Specifications

UNMATCHED ARCHITECTURE

The Dynamic 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 engines. VMAX engines provide the complete foundation for high-availability storage arrays. Each engine contains two VMAX directors and redundant interfaces to the new Dynamic Virtual Matrix dual InfiniBand® fabric interconnect. Each director consolidates front-end, global memory, and back-end functions, enabling direct memory access to data for optimized I/O operations. Depending on the array chosen, up to 8 VMAX engines can be interconnected via a set of active fabrics that provide scalable performance and high availability.

The new VMAX arrays support the use of native 6Gb/s SAS 2.5" drives, 3.5" drives, or a mix of both drive types in the array. Individual system bays can house either one or two engines and up to the per engine maximum of 6 High Density Disk Array Enclosures (DAEs) available in either 3.5" (60 slot) or 2.5" (120 slot) formats. As a result, each system bay can support up to 720 2.5" drives or up to 360 3.5" drives, or a mix of the two. In addition, all new arrays support subsequent system bay dispersion of up to 25 meters from the first system bay. All new members of the family also support 3rd party racking. Detailed specifications and a comparison of the three new VMAX³ arrays follow.



VMAX³ FAMILY SPECIFICATIONS

COMPONENTS	VMAX 100K	VMAX 200K	VMAX 400K
ENGINE			
Engine Enclosure	4u	4u	4u
CPU	Intel Xeon E5-2620-v2 2.1 GHz 6 core	Intel Xeon E5-2650-v2 2.6 GHz 8 core	Intel Xeon E5-2697-v2 2.7 GHz 12 core
Dynamic Virtual Matrix Bandwidth	350GB/s	700GB/s	1400GB/s
# Cores per CPU/per Engine/per System	6/24/48	8/32/128	12/48/384
Dynamic Virtual Matrix Interconnect	InfiniBand Dual Redundant Fabric 56Gbps per port	InfiniBand Dual Redundant Fabric 56Gbps per port	InfiniBand Dual Redundant Fabric 56Gbps per port
CACHE			
Cache-System Min (raw)	512GB	512GB	512GB
Cache-System Max (raw)	2TBr (with 1024GB engine)	8TBr (with 2048GB engine)	16TBr (with 2048GB engine)
Cache-per Engine Options	512GB, 1024GB	512GB, 1024GB, 2048GB	512GB, 1024GB, 2048GB
XtremCache Support	Yes	Yes	Yes
VAULT			
Vault Strategy	Vault to Flash	Vault to Flash	Vault to Flash
Vault Implementation	2 to 4 Flash SLICs / Engine	2 to 8 Flash SLICs / Engine	2 to 8 Flash SLICs / Engine
IO MODULES			
Max Front-End Ports per Engine	32	32	32
Front-End IO Modules per Engine	8	8	8
Front-End IO Modules and Protocols Supported	FC 8Gbs: (FC, SRDF) FC 16Gbs: (FC) GbE: (SRDF) 10GbE: (SRDF)	FC 8Gbs: (FC, SRDF) FC 16Gbs: (FC) GbE: (SRDF) 10GbE: (SRDF)	FC 8Gbs: (FC, SRDF) FC 16Gbs: (FC) GbE: (SRDF) 10GbE: (SRDF)
BE Interface	6Gbps SAS	6Gbps SAS	6Gbps SAS

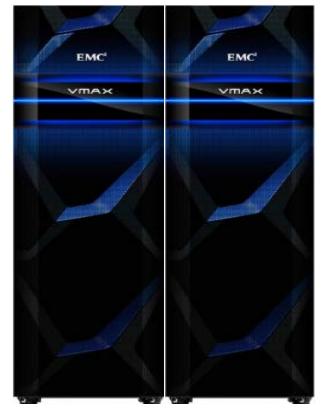
COMPONENTS	VMAX 100K	VMAX 200K	VMAX 400K
CAPACITY, DRIVES			
Max Capacity	500 TB	2 PB	4 PB
Max Drives per System	1440	2880	5760
Max Drives per System Bay	720	720	720
Max Drives per Storage Bay	960-Supported with Dual Engine System bays only	960-Supported with Dual Engine System bays only	960-Supported with Dual Engine System bays only
Min Spares per System	1	1	1
Min Drive Count (1 engine)	4 + 1 spare	4 + 1 spare	4 + 1 spare
DRIVES			
3.5" SAS Drives	<u>3.5" Drives:</u>	<u>3.5" Drives:</u>	<u>3.5" Drives:</u>
	300GB, 600GB, 1.2TB 10K RPM SAS	300GB, 600GB, 1.2TB 10K RPM SAS	300GB, 600GB, 1.2TB 10K RPM SAS
	300GB 15K RPM SAS	300GB 15K RPM SAS	300GB 15K RPM SAS
	2TB 7.2K RPM SAS	2TB 7.2K RPM SAS	2TB 7.2K RPM SAS
	4TB 7.2K RPM SAS	4TB 7.2K RPM SAS	4TB 7.2K RPM SAS
	200, 400, 800GB Flash SAS	200, 400, 800GB Flash SAS	200, 400, 800GB Flash SAS
2.5" SAS Drives	<u>2.5" Drives:</u>	<u>2.5" Drives:</u>	<u>2.5" Drives:</u>
	300GB, 600GB, 1.2TB 10K RPM SAS	300GB, 600GB, 1.2TB 10K RPM SAS	300GB, 600GB, 1.2TB 10K RPM SAS
	300GB 15K RPM SAS	300GB 15K RPM SAS	300GB 15K RPM SAS
	200, 400, 800GB Flash SAS	200, 400, 800GB Flash SAS	200, 400, 800GB Flash SAS
RAID Options	RAID 1 All drives	RAID 1 All drives	RAID 1 All drives
	RAID 5 (3 +1) RAID 5 (7 +1) All drives	RAID 5 (3 +1) RAID 5 (7 +1) All drives	RAID 5 (3 +1) RAID 5 (7 +1) All drives
	RAID 6 (6 +2) RAID 6 (14 +2) 10K, 15K, 7.2K RPM Drives	RAID 6 (6 +2) RAID 6 (14 +2) 10K, 15K, 7.2K RPM Drives	RAID 6 (6 +2) RAID 6 (14 +2) 10K, 15K, 7.2K RPM Drives

COMPONENTS	VMAX 100K	VMAX 200K	VMAX 400K
SYSTEM CONFIGURATION TYPES			
All 2.5" DAE Configurations	2 Bays 1440 Drives	4 Bays 2880 Drives	8 Bays 5760 Drives
All 3.5" DAE Configurations	2 Bays 720 Drives	4 Bays 1440 Drives	8 Bays 2880 Drives
Mixed Configurations	2 Bays 1320 Drives	2 Bays 2640 Drives	8 Bays 5280 Drives
DISK ARRAY ENCLOSURES			
120 x 2.5" Drive DAE	Yes	Yes	Yes
60 x 3.5" Drive DAE	Yes	Yes	Yes
CABINET CONFIGURATIONS			
Standard 19" bays	Yes	Yes	Yes
Single Bay System Configuration	Yes	Yes	Yes
Dual Engine System Bay Configuration	Yes	Yes	Yes
Third Party Rack Mount Option	Yes	Yes	Yes
DISPERSION			
System Bay Dispersion	Up to 82 feet (25m) between System Bay 1 and any other System Bay	Up to 82 feet (25 m) between System Bay 1 and any other System Bay	Up to 82 feet (25) between System Bay 1 and any other System Bay
Dual Engine Storage Bay Dispersion	No	No	No
Power	Single or Three Phase Delta or Wye	Single or Three Phase Delta or Wye	Single or Three Phase Delta or Wye
PRE-CONFIGURATION			
100% Virtually Provisioned	Yes	Yes	Yes
Preconfigured in the Factory	Yes	Yes	Yes
HOST SUPPORT			
Open Systems	Yes	Yes	Yes
IBM i Series Support (D910 only)	Yes	Yes	Yes
HARDWARE COMPRESSION SUPPORT			
GbE/10 GbE	Yes	Yes	Yes
8Gb FC	Yes	Yes	Yes

VMAX³ FAMILY CONNECTIVITY

I/O PROTOCOLS	VMAX 100K	VMAX 200K	VMAX 400K
8 Gb/s FC Host Ports			
Maximum/engine	32	32	32
Maximum/array	64	128	256
16 Gb/s FC Host Ports			
Maximum/engine	32	32	32
Maximum/array	64	128	256
10 GbE SRDF Ports			
Maximum/engine	16	16	16
Maximum/array	32	64	128
GbE SRDF Ports			
Maximum/engine	32	32	32
Maximum/array	64	128	256

SYSTEM BAY DISPERSION



|
|
82 feet / 25 meters
System Bay Dispersion

System Bay Dispersion allows customers to separate any individual or contiguous group of system bays by up to a distance of 82 feet (25 meters) from System Bay 1. This provides unsurpassed datacenter flexibility in solving floor loading constraints or working around obstacles that might preclude fully contiguous configurations.

DISK DRIVE SUPPORT

The VMAX 100K, 200K, and 400K support the latest 6Gb/s dual ported native SAS drives. All drive families (Enterprise Flash, 10K, 15K and 7.2K RPM) support 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.

2.5" DISK DRIVES

PLATFORM SUPPORT	VMAX 100K, 200K, 400K						
	NOMINAL CAPACITY (GB)	200	400	800	300	300	600
SPEED (RPM)	Flash	Flash	Flash	15K	10K	10K	10K
AVERAGE SEEK TIME (READ/WRITE MS)	N/A	N/A	N/A	2.8/3.3	3.7/4.2	3.7/4.2	3.7/4.2
RAW CAPACITY (GB)	200	400	800	292.6	292.6	585.4	1200.2
OPEN SYSTEMS FORMATTED CAPACITY (GB)	196.9	393.8	787.6	288.1	288.1	576.3	1181.7

3.5" DISK DRIVES

PLATFORM SUPPORT	VMAX 100K, 200K, 400K								
	NOMINAL CAPACITY (GB)	200	400	800	300	300	600	1200	2000
SPEED (RPM)	Flash	Flash	Flash	15K	10K	10K	10K	7.2K	7.2K
AVERAGE SEEK TIME (READ/WRITE MS)	N/A	N/A	N/A	2.8/ 3.3	3.7/ 4.2	3.7/ 4.2	3.7/ 4.2	8.2/ 9.2	8.2/ 9.2
RAW CAPACITY (GB)	200	400	800	292.6	292.6	585.4	1200.2	1912.1	4000
OPEN SYSTEMS FORMATTED CAPACITY (GB)	196.9	393.8	787.6	288.1	288.1	576.3	1181.7	1882.7	3939.2

POWER CONSUMPTION AND HEAT DISSIPATION

COMPONENTS	VMAX 100K		VMAX 200K		VMAX 400K	
	Maximum Total power consumption (kVA)	Maximum Heat dissipation (Btu/Hr)	Maximum Total power consumption (kVA)	Maximum Heat dissipation (Btu/Hr)	Maximum Total power consumption (kVA)	Maximum Heat dissipation (Btu/Hr)
SYSTEM BAY 1, SINGLE ENGINE	11.0	37,235	11.1	37,573	11.2	37,911
SYSTEM BAY 2, SINGLE ENGINE¹	10.2	34,432	10.3	34,770	10.4	35,108
SYSTEM BAY 1, DUAL ENGINE	9.9	33,428	10.1	34,104	10.3	34,780
SYSTEM BAY 2, DUAL ENGINE¹	N/A	N/A	9.3	31,301	9.5	31,977

¹Power Values for System Bay 2 and all subsequent System Bays where applicable

PHYSICAL SPECIFICATIONS

COMPONENTS	HEIGHT (IN/CM)	WIDTH (IN/CM)	DEPTH (IN/CM)	WEIGHT (MAXIMUM LBS/KG)
SYSTEM BAY, SINGLE ENGINE	75/190	24/61	47/119	2065/937
SYSTEM BAY, DUAL ENGINE	75/190	24/61	47/119	1860/844

INPUT POWER REQUIREMENTS

SINGLE-PHASE NORTH AMERICAN, INTERNATIONAL, AUSTRALIAN

Specification	North American 3 wire connection (2 L & 1 G) ¹	International and Australian 3 wire connection (1 L & 1 N & 1 G) ¹
Input nominal voltage	200 – 240 VAC +/- 10% L- L nom	220 – 240 VAC +/- 10% L - N nom
Frequency	50 – 60 Hz	50 – 60 Hz
Circuit breakers	30 A	32 A
Power zones	Two	Two
Power requirements at customer site (min)	<ul style="list-style-type: none">• Three 30A, single phase drops per zone.• Two power zones require 6 drops, each drop rated for 30A	

1. L = line or phase, N = neutral, G = ground

THREE-PHASE NORTH AMERICAN, INTERNATIONAL, AUSTRALIAN

Specification	North American (Delta) 4 Wire Connection (3 L & 1 G) ¹	International (WYE) 5 Wire Connection (3 L & 1 N & 1 G) ¹
Input voltage ²	200 – 240 VAC +/- 10% L- L nom	220 – 240 VAC +/- 10% L - N nom
Frequency	50 – 60 Hz	50 – 60 Hz
Circuit breakers	50 A	32 A
Power zones	Two	Two
Power requirements at customer site (min)	Two 50 A, three-phase drops per bay	Two 32 A, three-phase drops per bay

¹ L = line or phase, N = neutral, G = ground

² An imbalance of AC input currents may exist on the three-phase power source feeding the array, depending on the configuration. The customer's electrician must be alerted to this possible condition to balance the phase-by-phase loading conditions within the customer's data center

RADIO FREQUENCY INTERFERENCE

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.