

Vault X-Series

All-Flash Scale-Out Array

Bring all-flash, scale-out storage to your enterprise applications with Vault X-Series. Purpose-built for flash, Vault X-Series storage arrays are amazingly fast. Delivering high IOPS at less than 1 millisecond latency is just the start. Powered by EMC XtremIO, Vault X-Series helps you harness the power of flash storage by building in innovations like content-based data placement and dual-stage metadata. Perfect for NFV (network function virtualization), the Vault X-Series offers full support for OpenStack, VMware and other leading virtualization platforms, providing the perfect foundation for SDN and the network of the future.

Vault X-Series systems are offered with AC and DC power options, and with optional NEBS, ETSI, and MIL-STD-810F/G compliance for telco, military, and other rugged deployments, providing network operators with a consistent storage product across their entire infrastructure.

Writeable Snapshots: Complete Flexibility, 100% Efficient

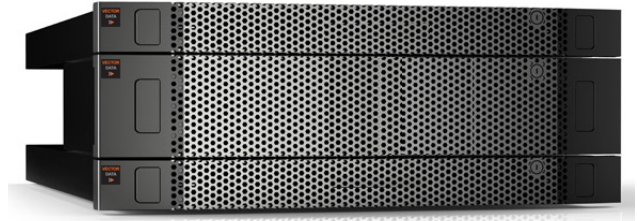
Vault X-Series snapshots optimize the use of array memory and SSD space, thus enabling businesses to achieve petabyte-scale effective capacity in an optimal footprint with unprecedented performance throughout the entire application life cycle:

- Instantly created as full-performance, writeable copies
- Space-efficient with neither data nor metadata bloat
- Enabled with full data services such as inline deduplication, inline compression, encryption, and thin provisioning
- Unlimited in topology – make snapshots of snapshots

Data Reduction: Always-on, Inline, Full-performance, Free

The Vault X-Series utilizes XtremIO Data Reduction, a highly integrated, always-on in-line data optimization architecture that multiplies your overall investment in Flash across a broad and deep landscape of business applications and use cases. Make petabyte-scale flash a viable economic reality through comprehensive data reduction from deduplication, compression, thin provisioning, and space-efficient snapshots.

- Multiply the effective capacity of the Vault X-Series array
- Multiply the performances of applications by minimizing writes
- Multiply the endurance of your flash media, extending its usable lifespan



Key Features

- Scales to more than 1,612 TB effective capacity per cluster
- Inherently load balances data for maximum performance without tuning
- Provides writeable snapshots with space efficiency and zero performance impact
- Delivers truly inline, always-on data deduplication to reduce capacity needs and TCO
- Enables operational and disaster recovery using native replication with EMC RecoverPoint
- Includes XtremIO Data Protection (XDP): more resilient and lower overhead than legacy RAID

Performance

Every part of the hardware and software architecture was purpose-built to maximize enterprise flash performance:

- Linear Scale-out Architecture: The use of N-way active controllers means performance and capacity always scale together to any desired level with Vault X-Series. There are no performance bottlenecks and performance increases linearly with the number of systems in the cluster
- In-memory metadata operations: Vault X-Series systems perform data services and copy services using content-aware, in-memory metadata to eliminate I/O operations to SSDs
- Real-time Inline Global Data Reduction: On Vault X-Series arrays, data reduction is always on and occurs in-line so only unique data is ever placed on flash to minimize I/O activity. This means performance actually improves as data reduction rates increase
- VMware VAAI Integration: Vault X-Series is an all-flash array with complete, in-memory deduplication-enhanced VAAI support allowing instant VM clones and rapid provisioning, plus offloading and acceleration of common VMware tasks

SYSTEM SPECIFICATIONS

	Starter System	1 System	2 System Cluster	4 System Cluster	6 System Cluster	8 System Cluster
N-way Active Controllers	2	2	4	8	12	16
SSD enclosures (25 SSDs each)	1	1	2	4	6	8
Number of SSDs	13 (expandable to 25)	25	50	100	150	200
Battery Backup Units	2	2	2	4	6	8
Infiniband Switches	0	0	2	2	2	8
AC Input Voltage	220V AC	220V AC	220V AC	220V AC	220V AC	220V AC
DC Input Voltage	-40V DC to -72V DC	-40V DC to -72V DC	-40V DC to -72V DC	-40V DC to -72V DC	-40V DC to -72V DC	-40V DC to -72V DC
Power Consumption (typical)	750W	816W	1,749W	3,367W	4,985W	6,603W
Rack Space	6U	6U	13U	23U	33U	43U
Weight (including rack) (kg/lbs.)	252 / 557	255 / 563	349 / 769	502 / 1,106	654 / 1,443	827 / 1,824
Weight (excluding rack) (kg/lbs.)	94 / 208	99 / 213	190 / 419	344 / 756	497 / 1,093	618 / 1,362
Cooling Requirements (BTU/hr)	2,576	2,576	5,500	10,612	15,724	20,836
Performance (100% random IOs, no caching, on preconditioned & prefilled arrays)						
	Starter System	1 System	2 System Cluster	4 System Cluster	6 System Cluster	8 System Cluster
IOPS 70% read, 30% write (8K blocks)	150,000	150,000	300,000	600,000	900,000	1,200,000
Average Latency (ms)	0.5	0.5	0.5	0.5	0.5	0.5
Max. Bandwidth (GB/s)	3	3	6	12	18	24
Host Connectivity (Based on number of systems in the array)						
	Starter System	1 System	2 System Cluster	4 System Cluster	6 System Cluster	8 System Cluster
Fibre Channel Ports (8Gbps)	4	4	8	16	24	32
iSCSI Ethernet Ports (10Gbps)	4	4	8	16	24	32

SYSTEM SPECIFICATIONS

Management	Starter System	1 System	2 System Cluster	4 System Cluster	6 System Cluster	8 System Cluster
Ethernet Ports (1Gbps)	2	2	4	8	12	16
Management IP	1 (XMS) 2 (Array)	1 (XMS) 2 (Array)	1 (XMS) 4 (Array)	1 (XMS) 8 (Array)	1 (XMS) 12 (Array)	1 (XMS) 16 (Array)
XMS Management Server	A single XMS (physical server or VM) manages multiple Vault X-Series arrays					

System Capacity (40TB System)	1 System	2 System Cluster	4 System Cluster	6 System Cluster	8 System Cluster
Raw Capacity (TB/TiB)	40 / 36.4	80 / 72.8	160 / 145.5	240 / 218.3	320 / 291.0
Usable Capacity*	33.6 / 30.6	67.3 / 61.1	134.4 / 122.2	201.5 / 183.3	268.7 / 244.4
Effective Capacity*	201.6 / 183.3	403.1 / 366.6	806.2 / 733.2	1,209 / 1,100	1,612 / 1,466

System Capacity (20TB System)	1 System	2 System Cluster	4 System Cluster	6 System Cluster	8 System Cluster
Raw Capacity (TB/TiB)	20 / 18.2	40 / 36.4	80 / 72.8	120 / 109.1	160 / 145.5
Usable Capacity*	16.7 / 15.2	33.3 / 30.3	66.7 / 60.6	100 / 91	133.3 / 121.3
Effective Capacity*	100.2 / 91.2	200.4 / 182.4	400.8 / 363.6	600 / 546	800 / 728

System Capacity (10TB System)	1 System	2 System Cluster	4 System Cluster	6 System Cluster	8 System Cluster
Raw Capacity (TB/TiB)	10 / 9.1	20 / 18.2	40 / 36.4	N/A	N/A
Usable Capacity*	8.33 / 7.6	16.7 / 15.2	33.3 / 30.3	N/A	N/A
Effective Capacity*	50 / 45.5	100 / 91	200 / 182	N/A	N/A

Starter System Capacity (5.2TB)

Raw Capacity (TB/TiB)	5.2 / 4.7
Usable Capacity*	3.6 / 3.3
Effective Capacity*	21.5 / 19.5

Starter systems may be expanded to 10TB by adding SSDs. They may then be scaled-out to two and four Vault X-Series clusters.

* Usable capacity is the amount of unique, non-compressible data that can be written into the array.

* Effective capacity includes the benefits of thin provisioning, inline global deduplication, inline compression, and space-efficient copies. Datasheet numbers are a representative example at 6:1 and will vary based on each customer's specific application environment and use of the array.

COMPONENT SPECIFICATIONS

Array Controller

AC Input Voltage	90-264V, 47-63Hz single phase
DC Input Voltage	-40V DC to -72V DC
Rack Space	1U
Dimensions (height x width x depth)	43.2mm x 438mm x 709mm (1.7" x 17.25" x 27.9")
Weight	18.1kg (40 lbs.)
Power Consumption (typical)	309W

Battery Backup Unit

AC Input Voltage	160-294V, 50-60Hz
DC Input Voltage	-40V DC to -72V DC
Rack Space	1U
Dimensions (height x width x depth)	43.2mm x 438mm x 709mm (1.7" x 17.25" x 27.9")
Weight	20kg (44 lbs.)

Infiniband Switch (Two Included with Multi System Arrays)

Ports	18 per switch (36 total)
AC Input Voltage	100-240V, 50-60Hz
DC Input Voltage	-40V DC to -72V DC
Rack Space	2U (two 1U switches) + 1U for cabling
Dimensions (height x width x depth)	43.7mm x 428mm x 627mm (1.72" x 16.84" x 24.7")
Weight	18.6kg (41.0 lbs.)
Power Consumption (typical)	65W

Disk Array Enclosure (DAE)

AC Input Voltage	100-240V, 50-60Hz single phase
DC Input Voltage	-40V DC to -72V DC
Rack Space	2U
Dimensions (height x width x depth)	88.9mm x 438mm x 330mm (3.5" x 17.25" x 13")
Weight	20.4kg (45 lbs.)
Power Consumption (typical)	185W

Environmental

Operating Temperature	-5C to 55C
Relative Humidity	5% to 90%
Altitude	Up to 3960m (13,000ft)

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