VNXe1600 BLOCK STORAGE SYSTEM

The DELL EMC VNXe1600™ storage system is a simple, affordable, and efficient block storage array, based on the acclaimed DELL EMC VNXe3200.

All of the capabilities and functionality of the VNXe1600 are compacted into an easy-to-deploy system designed to meet the needs of most entry level virtualized and mixed application workload requirements. The VNXe1600 includes enterprise-class software features, built-in data protection functionality, and high reliability. And its built-in simplicity and ease of use allows it to be both low touch and affordable.

The VNXe1600 includes enterprise features such as FAST™ Cache to boost performance, Fiber Channel and iSCSI (IPv4/6) host connectivity, and MCx™ multicore optimization for increased processor efficiency – all in a very small footprint - to deliver incredible value.

Specifications

BLOCK ARCHITECTURE

The VNXe1600 is a dense, 2U dual-controller block storage system that provides FC and IP connectivity for SAN operations. With it you can:

- Setup for SAN in minutes with new Unisphere wizards.
- Be just one click away from a support specialist via online chat.
- Reduce capacity requirements by up to 50% via thin provisioning.

The VNXe1600's advanced functionality, performance and low $/GB sets a new bar for entry-level block storage.

VNXe PHYSICAL SPECIFICATIONS

	VNXe1600
Min/Max Drives	6 to 200*
Max FAST Cache	200GB
Drive Enclosure Options	25x2.5" Flash/SAS drives (2U) 12x3.5" Flash/SAS/ NL SAS drives (2U)
CPU/Memory per Controller	1 x 2.6 GHz Xeon (Ivy Bridge) Dual Core/ 8 GB
Embedded Host Ports per Controller	2 per Converged Network Adapter (CNA) capable of either 8/16Gb** Fibre Channel or 10Gb Ethernet connectivity.
Max Flex IO Modules per Controller	1
Raid Options	RAID 10/5/6

* 400 TB maximum raw capacity.
** Ports can auto-negotiate to 4/8Gb FC

REDEFINE

SPECIFICATION SHEET

SYSTEM LIMITS AND SUPPORT

Supported Pool LUNs	Up to 500
Maximum LUN Size	16 TB
Total Raw Capacity	400 TB

VNXe1600 CONNECTIVITY

The VNXe1600 provides flexible DAS or SAN connectivity options through Ethernet iSCSI and Fibre Channel ports.

FLEX IO MODULE OPTIONS

IO Modules	**VNXe1600**
1GbE	4 ports per module
10GbE Optical	4 ports per module
8 Gb/s Fibre Channel Module	4 ports per module

BACK-END (DISK) CONNECTIVITY

Each storage processor includes two 6 Gb/s x 4 Serial Attached SCSI (SAS) ports providing connection to additional disk drive expansion enclosures.

MAXIMUM CABLE LENGTHS

SAS Cable Length (enclosure to enclosure): 6 meters

SUPPORTED DISK ARRAY ENCLOSURES (DAEs)

The VNXe1600 supports one or more of the following DAEs:

	VNXe1600 12 Drive Disk Expansion	**VNXe1600 25 Drive Disk Expansion**
Drive Enclosures	3.5” SAS, NL-SAS, Flash (2U)	2.5” SAS, Flash (2U)
Drive Quantity	12	25
Controller Interface	6 Gb SAS	6 Gb SAS

SUPPORTED DISK DRIVES

	100 GB	200 GB	800 GB*	300 GB	600 GB	600 GB	900 GB	1.2 TB	2 TB NL	4TB NL
Interface	6 Gb/s SAS	6 Gb/s SAS	6 Gb/s SAS	6 Gb/s SAS	6 Gb/s SAS	6 Gb/s SAS	6 Gb/s SAS	6 Gb/s SAS	6 Gb/s SAS	6 Gb/s SAS
Capacity (RPM)	100 GB (Flash)	200 GB (Flash)	800 GB (Flash)	300 GB (15,000)	600 GB (15,000)	600 GB (10,000)	900 GB (10,000)	1.2 TB (10,000)	2 TB (7,200)	4 TB (7,200)
Formatted Capacity*	91.69 GB	183.41 GB	733.56 GB	268.37 GB	536.77 GB	536.77 GB	820.58 GB	1,117.8 GB	1823.56 GB	3668.55 GB
Form Factor	2.5", 3.5"	2.5", 3.5"	2.5"	2.5" 3.5"	3.5"	2.5" 3.5"	2.5" 3.5"	2.5" 3.5"	3.5"	3.5"
Height	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"
Data Buffer	N/A SSD	N/A SSD	N/A SSD	16 MB (min.)	16 MB (min.)	16 MB (min.)	16 MB (min.)	16 MB (min.)	128 MB	128 MB
Buffer to/from Media	260 MB/s	260 MB/s	260 MB/s	97 MB/s	150 MB/s	93 MB/s	93 MB/s	93 MB/s	84 MB/s	84 MB/s
SP to/from Buffer	600 MB/s (max)	600 MB/s (max)	600 MB/s	600 MB/s (max)	600 MB/s (max)	600 MB/s (max)	600 MB/s (max)	600 MB/s (max)	600 MB/s (max)	600 MB/s (max)
Average Seek	N/A	N/A	N/A	3.5 ms (Read) 4.0 ms (Write)	3.4 ms (Read) 3.9 ms (Write)	3.7 ms (Read) 4.2 ms (Write)	3.7 ms (Read) 4.2 ms (Write)	3.7 ms (Read) 4.2 ms (Write)	8.2 ms (Read) 9.2 ms (Write)	8.5 ms (Read) 9.5 ms (Write)
Rotation Latency	N/A	N/A	N/A	2.0 ms	2.0 ms	3.0 ms	3.0 ms	3.0 ms	4.17 ms	4.16 ms

* 800GB Flash drives are supported only in Storage Pools and are not supported for FAST Cache.

PROTOCOLS SUPPORTED

iSCSI, Fibre Channel

Routing Information Protocol (RIP) v1-v2

Simple Network Management Protocol (SNMP)

Address Resolution Protocol (ARP)

Internet Control Message Protocol (ICMP)

Simple Network Time Protocol (SNTP)

Lightweight Directory Access Protocol (LDAP)

SERVER OPERATING SYSTEM SUPPORT

Apple MAC O/S 10.8 or greater

Citrix XenServer 6.1

HP-UX

IBM AIX

IBM VIOS 2.2, 2.3

Microsoft Windows Server 2008, Windows Server 2008 R2+

Windows Server 2012, Windows Server 2012 R2

Microsoft Windows 7, Microsoft Windows 8 and Vista

Microsoft Hyper-V

Novell Suse Enterprise Linux

Oracle Linux

RedHat Enterprise Linux

Solaris 10 x86, Solaris 10 Sparc

Solaris 11 and 11.1 supported, SPARC & x86

VMware® ESXi5.x®

VNXe SOFTWARE

VNXe offers support for a variety of advanced storage features. These features are standard or may be purchased via software packages. More information regarding features and packages can be found in the VNXe Software Suites data sheet.

VNXe1600 Base Software Package – Standard integrated management and monitoring of all aspects of VNXe systems including the Operating Environment 3.1.3*, all protocols (as listed above), Unisphere Management with integrated support, FAST Cache, Block Snapshots, Remote Protection – Native Asynchronous Block Replication, and Thin Provisioning.

Optional Software:

Virtual Storage Integrator (VSI)

Allows VMware administrators to manage VNXe1600 storage from within VMware vCenter™.

PowerPath
Intelligent load balancing and multi-pathing software for networked storage environments

*The VNXe1600 Operating Environment is a licensed and priced item.

CLIENT CONNECTIVITY FACILITIES

Block access by iSCSI and FC

Virtual LAN (IEEE 802.1q)

VMWARE INTEGRATION

VMware vStorage APIs for Array Integration (VAAI) for Block improves performance by leveraging more efficient, array-based operations

vStorage APIs for Storage Awareness (VASA) provides storage awareness for VMware administrators

VNXe ELECTRICAL SPECIFICATIONS

Requirement	VNXe1600 Processor Enclosure (3.5" Drives)	VNXe1600 Processor Enclosure (2.5" Drives)	VNXe1600 Expansion Enclosure (12 x 3.5" Drives)	VNXe1600 Expansion Enclosure (25 x 2.5" Drives)
AC Line Voltage	100 to 240 Vac ± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac ± 10%, single-phase, 47 to 63 Hz	100 to 240 V ac± 10%, single-phase, 47 to 63 Hz	100 to 240 V ac± 10%, single-phase, 47 to 63 Hz
AC Line Current	4.21 A max, at 100Vac, 2.27 A max, at 200Vac	5.03 A max, at 100Vac, 2.66 A max, at 200Vac	2.5 A max at 100 Vac, 1.3 A max at 200 Vac	2.5 A max at 100 Vac, 1.3A max at 200 Vac
Power Consumption	421 VA (400 W) max	503 VA (483W) max	250 Vac (240 W) max	250 Vac 230 W) max
Power Factor	0.95 min at full load, low voltage	0.95 min at full load, low voltage	0.98 min at full load, low voltage	0.98 min at full load, low voltage
Heat Dissipation	1.44 x 10^6 J/hr. (1,365 Btu/hr.) max	1.74 x 10^6 J/hr. (1,648 Btu/hr.) max	8.64 x 10^5 J/hr, (820 Btu/hr) max	8.28 x 10^5 J/hr, (785 Btu/hr) max
AC Protection	15 A fuse on each power supply, both phases	15 A fuse on each power supply, both phases	15 A fuse on each power supply, both phases	10 A fuse on each power supply, both phases
AC Inlet Type	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power supply	IEC320-C14 appliance coupler, per power supply
Ride-through Time	12 ms min	12 ms min	30 ms min	30 ms min
Current Sharing	± 5 percent of full load, between power supplies	± 5 percent of full load, between power supplies	± 15 percent of full load, between power supplies	± 10 percent of full load, between power supplies

VNXe PHYSICAL DIMENSIONS (APPROXIMATE)

	VNXe1600 Processor Enclosure (3.5" Drives)	VNXe1600 Processor Enclosure (2.5" Drives)	VNXe1600 Expansion Enclosure (12 x 3.5" Drives)	VNXe1600 Expansion Enclosure (25 x 2.5" Drives)
Dimension (H/W/L)	3.40 in x 17.5 in x 20.0 in/ 8.64 cm x 44.45 cm x 50.8 cm	3.40 in x 17.5 in x 17.0 in/ 8.64 cm x 44.45 cm x 43.18 cm	3.40 in x 17.5 in x 20.0 in/ 8.64 cm x 44.45 cm x 50.8 cm	3.45 in x 17.5 in x 13 in/ 8.76 cm x 44.45 cm x 33.02 cm
Weight (max)	61.8lb/28.1kg	51.7 lb/23.5 kg	52.0 lb/23.6 kg	48.1 lb/21.8 kg

OPERATING ENVIRONMENT
(MEETS ASHRAE EQUIPMENT CLASS A4)

RECOMMENDED RANGE OPERATION	The limits under which equipment will operate the most reliably while still achieving reasonably energy-efficient data center operation.	18C to 27C (64.4Fto 80.6F) at 5.5C (41.9F) dew point to 60% relative humidity and 15C (59F) dew point.
CONTINUOUS ALLOWABLE RANGE OF OPERATION	Data center economization techniques (e.g. free cooling) may be employed to improve overall data center efficiency. These techniques may cause equipment inlet conditions to fall outside the recommended range but still within the continuously allowable range. Equipment may be operated without an hourly limitation in this range.	10°C to 35°C (50°F to 95°F) to 20% to 80% relative humidity with 21C (69.8°F) maximum dew point (maximum wet bulb temperature). De-rate maximum allowable dry bulb temperature at 1°C per 300m above 950m (1F per 547 ft above 3117ft).
EXPANDED ALLOWABLE RANGE OF OPERATION	During certain times of the year, equipment inlet conditions may fall outside of the continuously allowable range but still within the two expanded ranges. Equipment operation is limited to ≤ 10% or ≤ 1% of the annual operating hours in these ranges.	5°C to 10°C and 35°C to 45°C (with no direct sunlight on equipment) at -12°C dew point and 8% to 90% relative humidity with 24°C dew point (maximum wet bulb temperature). Outside the continuously allowable range (10°C to 35°C), the system can operate down to 5°C or up to 40°C for a maximum of 10% of its annual operating hours. Additionally, the system can operate as high as 45°C for a maximum of 1% of its annual operating hours. For temperatures between 40°C and 45°C (104°F to 113°F), derate maximum allowable dry bulb temperature by 1C per 125m above 950m (1.8°F/410 ft above 2953 ft.).
EXCEPTIONS TO EXPANDED ALLOWABLE RANGE OPERATION	When operating in the expanded allowable temperature range, system performance is guaranteed while the system is waiting or being serviced.	Due to certain rare operational modes, it is recommended that service be deferred on the 2.5" and 3.5" Disk Array enclosures when temperatures exceed 40°C.
TEMPERATURE GRADIENT	20°C/hr (36°F/hr)	
ALTITUDE	3050m (10,000ft)	

Statement of Compliance

This Information Technology Equipment is compliant with the electromagnetic compatibility (DELL EMC) and product safety regulations/standards required by the countries in which the product is sold. DELL EMC compliance is based on FCC part 15, CISPR22/CISPR24 and EN55022/EN55024 standards, including applicable international variations. DELL EMC compliant Class A products are marketed for use in business, industrial, and commercial environments. Product Safety compliance is based on IEC 60950-1 and EN60951-1 standards, including applicable national deviations.

This Information Technology Equipment is in compliance with EU RoHS Directive 2011/65/EU.

The individual devices used in this product are approved under a unique regulatory model identifier that is affixed to each individual device rating label, which may differ from any marketing or product family name in this data sheet.

For additional information see https://support.emc.com under the Safety & EMI Compliance Information tab.

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