



GOBIERNO DE PUERTO RICO  
ADMINISTRACIÓN DE SERVICIOS GENERALES

Hon. Luis G. Fortuño  
Gobernador

Carlos E. Vázquez Pesquera  
Administrador

21 de junio de 2011

  
Sra. Mónica Estela Hoyos Pacheco  
Administradora Auxiliar  
Área de Adquisiciones y Contratos  
Administración de Servicios Generales

  
Edgardo A. Torres Concepción  
Analista/Programador de Sistemas de Información  
Oficina de Informática

**ANALISIS DE LOS CAMBIOS PRESENTADOS POR SESCO TECHNOLOGY SOLUTIONS  
PARA EL CONTRATO 72-230 PARA EL RENGLÓN 7.**

Conforme a la documentación provista en carpeta por el Sr. David Habibe, Presidente de **SESCO Technology Solutions**, y recibido en la agencia el 16 de junio de 2011 certifico que las especificaciones cambiadas correspondientes al **Renglón 7, Partidas 1, y 2** cumplen con el requisito de igualar o mejorar la oferta hecha originalmente.

En todos los cambios se cumplió con la necesidad de actualizar los modelos y precios del hardware ofrecido.

Para más información o aclarar alguna duda, se me puede contactar en el 787-759-7676 extensión 2000.

eatc



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Subasta 72-230  
Contrato de Selección Múltiple de Adquisición de Equipo de Informática para las Agencias Gubernamentales, Municipios y Corporaciones Públicas del Gobierno de Puerto Rico

**REGLON 7 - NETWORK STORAGE SOLUTIONS**

Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
<b>Partida 1</b>	<b>Entry Level</b>	<b>VNXE3300;2XSP DPE;15X3.5 DS;6X2TBSAS;AC;NO RACK</b>	<b>EMC VNXe 12TB &amp; 24 PORTS FC SWITCH</b>	<b>\$ 55,000.00</b>
	500GB Usable	4X 1 GB ULTRAFLEX IO MODULE		
	2TB RAW per Storage Subsystem	12 TB TOTAL CAPACITY / 240 TB MAX		
	Fibre Channel Fabric	VNXE3300 SOFTWARE FEATURES		
	16 Fibre Channel Optic Ports	VNXE3300 UNISPHERE-INCLUDED IN BASE SW		
	32Gb/sec	VNXE3300 ISCSI-INCLUDED IN BASE SW		
	Yes	VNXE3300 LOCAL PROTECTION SUITE		
	2Gbps	VNXE3300 THIN PROVISIONING INCLUDED IN BASE SW		
	Non Blocking	VNXE3300 NFS INCLUDED IN BASE SW		
	F_Port	VNXE3300 CIFS-INCLUDED IN BASE SW		
	E_Port	VNXE3300 FILE DEDUPLICATION-INCLUDED IN BASE SW		
	G_Port	VNXE3300 BASE SW INCLUDING OE V2.0, DUAL SP (EMC ECOSYS)		
	Self-discovery based on connection type.			
	DAS, NAS and SAN	LOCAL PROTECT IMPLEMENT PKG - VNXE BoE Complete : YES		

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**RENGLON 7 - NETWORK STORAGE SOLUTIONS**

Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
	Fibre Channel FO, Gigabit Ethernet FO	RACK; STACK AND IMPLEMENT FOR VNXE BoE Complete : YES		
	20,000 I/Os per second			
	200MB per second throughput	PREMIUM SOFTWARE SUPPORT - PLATFORM/ELM Includes months 1-36 @ \$ 135/mo.		
	1 (200 MB/s Fibre Channel Arbitrated Loop)	PREMIUM HARDWARE SUPPORT - WARR UPG		
	DAE2-ATA 15HDD Disk Array Enclosure: 5 x 320GB ATA HDD - \$24,750	DAE 15HDD Disk Array Enclosure (MAX 7 PER SYSTEM)		\$ 9,995.00
	73GB at 15K RPM \$2,495.00	2TB 7200 RPM SAS Hard Drive		\$ 1,395.00
		600GB 15K RPM SAS Hard Drive		\$ 1,495.00
		100GB FAST CACHE SAS FLASH		\$ 3,495.00
		15X3.5IN DPE/DAE		
	16 Fibre Channel FO Ports \$19,995.00	Cisco MDS 9124		\$ 9,995.00
	Port Activation License	24 Fibre Channel FO Ports		
	4GB Fibre Channel SFP \$2,995.00	8-Port Activation License		\$ 2,440.00
	Fibre Channel FO HBA (DELL, HP, IBM, SUN)	4GB Fibre Channel SFP		\$ 1,495.00
		Fibre Channel FO HBA (DELL, HP, IBM, SUN)		\$ 1,595.00
<b>Partida 2</b>	<b>Mid Range Level</b>	<b>Mid Range Level</b>	<b>EMC VNX 5300 31TB &amp; 2x24 PORTS FC SWITCH</b>	<b>\$ 129,995.00</b>

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Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
	1TB Usable	VNX5300 DPE; 15X3.5 DRIVES EMC RACK 8X600GB 15K		
	6TB RAW per Storage Subsystem	31 TB TOTAL CAPACITY / 120TB READY / 240 TB MAX		
	Fibre Channel Fabric	VNX 40U RACK WITH CONSOLE		
	32 Fibre Channel Optic Ports	3x 3U DAE WITH 15X3.5 INCH DRIVE SLOTS WITH RACK		
	64Gbps End to End	VNX5300 CONTROL STATION - EMC RACK		
	2Gbps	VNX5300 CONTROL STATION - 2ND CS - EMC RACK		
	Non Blocking	2x 1GBE DM MODULE 4 PORT FOR VNX5300		
	F_Port	VNX5300 ADD ON DATA MOVER+FC SLIC-EMC RACK		
	E_Port	VNX5300 DME: 1 DATA MOVER+FC SLIC-EMC RACK		
	G_Port	10x 600GB 15K SAS DISK DRIVE		
	Self-discovery based on connection type.	10x 2TB 7200RPM 6GB SAS DISK DRIVE		
	DAS, NAS and SAN	2x 100GB FAST CACHE SAS FLASH 15X3.5IN DPE/DAE		
	Fibre Channel FO, Gigabit Ethernet FO	ADDITIONAL 8 GB FC SFP		
	60,000 I/Os per second	RACK-40U-60 PWR CORD US		
	600MB per second throughput	DOCUMENTATION KIT FOR VNX5300		

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Renglon, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
	DAE2-ATA 15HDD Disk Array Enclosure: 5 x 320GB ATA HDD - \$24,750	DAE 15HDD Disk Array Enclosure (MAX 7 PER SYSTEM)		\$ 9,995.00
	73GB at 15K RPM \$2,495.00	2TB 7200 RPM SAS Hard Drive		\$ 1,395.00
		600GB 15K RPM SAS Hard Drive		\$ 1,495.00
		100GB FAST CACHE SAS FLASH 15X3.5IN DPE/DAE		\$ 3,495.00
	16 Fibre Channel FO Ports \$19,995.00	Cisco MDS 9124		\$ 9,995.00
	Port Activation License	24 Fibre Channel FO Ports		\$ 2,440.00
	4GB Fibre Channel SFP \$2,995.00	8-Port Activation License		\$ 1,495.00
	Fibre Channel FO HBA (DELL, HP, IBM, SUN)	4GB Fibre Channel SFP		\$ 1,595.00
		Fibre Channel FO HBA (DELL, HP, IBM, SUN)		\$ 1,995.00
		VNX 40U RACK WITH CONSOLE		\$ 1,500.00
		VNX5300 CONTROL STATION - 2ND CS - EMC RACK		\$ 2,495.00
		2x 1GBE DM MODULE 4 PORT FOR VNX5300		\$ 1,795.00
		VNX5300 ADD ON DATA MOVER+FC SLIC-EMC RACK		\$ 995.00
		ADDITIONAL 8 GB FC SFP		\$ 495.00
		RACK-40U-60 PWR CORD US		\$ 795.00
		2ND OPTIONAL SPS FOR VNX 51/53		\$ 2,495.00
		VNX5300 4 PT 1GBASE-T ISCSI IO MOD PR		\$ 2,995.00
		VNX5300 4 PORT 8G FC IO MODULE PAIR		\$ 2,995.00

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**REGLON 7 - NETWORK STORAGE SOLUTIONS**

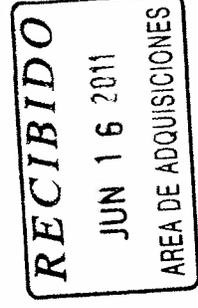
Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto

Nota: Deberán entregar literatura técnica y disco compacto con la información provista de las tablas Excel.

Aprobado por:

Fecha de recibo

Firma del Jefe de la Agencia o su Representante Autorizado



# EMC VNXe SERIES

## ESSENTIALS

- Compact 2U or 3U network storage systems consolidate all of your file and application data
- Power-on to provision-ready in less than 10 minutes
- Application-driven storage that works the way you do
- Powerful provisioning wizards for the application storage you need in minutes
- Unified management that provides seamless access to all of your storage
- Advanced built-in data management features including thin provisioning, file deduplication, and local/remote replication
- Seamless integration with VMware and Hyper-V virtualization
- Latest six-Gb/s SAS technology for expandability and performance
- Comprehensive support ecosystem



The EMC VNXe 3300



The EMC VNXe 3100

The EMC<sup>®</sup> VNXe™ series redefines networked storage for the small business to small enterprise user, delivering an unequaled combination of features, simplicity, and efficiency. These unified storage systems provide true storage consolidation capability with seamless management and a unique application-driven approach that eliminates the boundaries between applications and their storage.

EMC VNXe—Storage. Click. Done.

## VNXe STORAGE PLATFORMS

With scalability from six up to 120 disk drives and 240 terabytes of capacity, the VNXe series is ready to meet the needs of growing organizations with increasingly complex storage requirements. The VNXe3100™ is an ideal platform for businesses with physical server infrastructures, as well as those making the move to server virtualization to drive consolidation and greater efficiency. The VNXe3300™ includes all of the ease of use and application-driven management features of the VNXe3100, along with increased performance, scalability, and I/O expandability. Both systems share a comprehensive set of features including exceptional capacity utilization, data protection and availability solutions, and advanced support capabilities.

## STORAGE CONSOLIDATION ON YOUR TERMS

Deploying a highly functional shared storage system should be an on-ramp to efficiency for your IT infrastructure, not a roadblock to greater productivity. Too often, however, the increased capabilities of advanced network storage come at the price of new interfaces to master, new terminology to decipher, and new processes to learn. VNXe systems take a fundamentally different approach, aligning storage management with applications, avoiding arcane storage terms for plain language, and embedding storage and application best practices into the user interface for a faster, simpler user experience in completing everyday administrative tasks.

## SIMPLICITY AND EFFICIENCY, UNIFIED

Whether the task at hand is consolidating storage to better manage resources and protect data, or improving IT resource utilization with server virtualization, the VNXe series provides the ready answer. VNXe systems are uniquely capable of delivering unified IP storage for NAS and iSCSI while simplifying operations and reducing management overhead. Application-centric management and provisioning wizards result in immediate familiarity for users, while integration of snapshot and replication with storage management workflows results in streamlined operations and uniform data protection coverage.

**Compact storage platforms**—The VNXe's unified IP architecture results in lots of capability in a small package. High-availability, dual controller designs fit in only 2U or 3U of rack space.

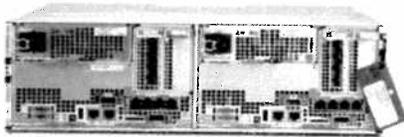
**Simple capacity management and growth**—By organizing raw capacity into pools of high-performance 15,000 rpm SAS drives and high-capacity 7,200 near-line SAS drives, VNXe systems take the complexity out of storage management. Easily provision new applications from available pools and expand pools with convenient disk packs.

**Advanced storage efficiency**—Less can be more when you create new storage with VNXe's thin provisioning capability (simply enable as you create new volumes or storage for new applications such as email). Add to the efficiency with file-level deduplication and compression to reduce physical capacity needs by 50 percent or more.

## MANAGEMENT PHILOSOPHY IS SIMPLE

VNXe systems were designed with a management philosophy in mind: keep it simple. It's storage from the application's point of view with one clear way to handle any task—from initial installation to creating storage for virtual servers. You can shift from managing file shares to creating application storage without missing a beat. The bottom line: you can save time and steps. Provisioning storage for 500 mailboxes or 100 gigabytes of virtual server storage can be done in less than 10 minutes. Application-driven provisioning and management enables you to easily consolidate your storage. VNXe systems understand how many mailboxes you are creating, for example, and manage storage for server virtualization and file share so you can focus on your business-critical applications.

The EMC VNXe 3300 (rear view)



The EMC VNXe 3100 (rear view)



## VNXe: DESIGNED TO BE HIGHLY FLEXIBLE AND AVAILABLE

**It begins with the hardware**—high availability, scalability, and adaptability to future needs, to name a few. The VNXe hardware platforms take advantage of the latest processor technology from Intel, and include features that help you meet future needs for growth and change head on.

**Flex I/O expansion**—VNXe systems come with one-Gb/s Ethernet connections standard for NAS and iSCSI, plus Flex I/O slots that provide additional one-Gb/s ports to expand connectivity and performance. The VNXe3300 also supports the option of 10-Gb/s connectivity.

**Six-Gb/s serial-attached SCSI (SAS) drives and enclosures**—The latest SAS interface delivers the industry's highest transfer rates along with simple capacity expansion, enterprise performance, and end-to-end data integrity features.

**Start small**—VNXe systems give you the flexibility to buy only what you need today—whether that means capacity, performance, or features. When growth comes, you'll be ready. The VNXe3100 can also start as a single controller system and be upgraded to a dual controller system as demands dictate.

**Availability and data protection**—The VNXe's high-availability design, including mirrored cache and dual active controllers, is architected to eliminate single points-of-failure. If an outage occurs, data in the VNXe write cache is safely stored in Flash memory, eliminating time-limited battery backup and external power supplies.

## VNXe SOFTWARE—WHAT WILL YOU NEED TO DO NEXT?

IT environments everywhere are constantly under pressure to improve productivity while meeting service levels and keeping costs down. Whether managing one or multiple sites, simple and efficient delivery of storage services for the IT ecosystem ensures the business is optimizing virtualized applications, improving utilization and ensuring valuable data is protected and secure.

Every VNXe unified storage platform comes with base software solutions, including EMC Unisphere™ for application-aware management, file deduplication with compression for increased efficiency, thin provisioning for adding storage on-demand, as well as CIFS and iSCSI. The VNXe3100 also includes NFS as well as snapshots for local data protection.

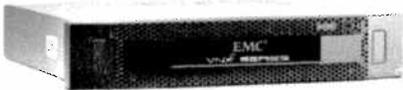
To address needs ranging from disaster recovery to application backup and restore, EMC has packaged unique and powerful add-on storage software into easy-to-use suites to ensure maximum protection and security for your VNXe unified storage platforms. With this approach, VNXe software suites simplify enablement of storage services, while dynamically moving, securing, and protecting production data for unified block and file storage—all managed through, and integrated with, EMC Unisphere. For even greater simplicity, purchase the VNXe3100 Total Value Pack or the VNXe3300 Total Protection Pack.



# EMC VNXe SERIES UNIFIED STORAGE SYSTEMS



The EMC VNXe 3300



The EMC VNXe 3100

EMC® VNXe™ series unified storage systems deliver exceptional flexibility for the small-to-medium business user, combining a unique, application-driven management environment with a complete consolidation solution for all IP storage needs.

## Specifications

### ARCHITECTURE

EMC VNXe utilizes a compact system with built-in disk storage to provide multi-protocol IP connectivity for concurrent NAS and iSCSI SANs. The VNXe3100™ is equipped with either one or two controllers, while the VNXe3300™ includes two controllers.

### VNXe PHYSICAL SPECIFICATIONS

	VNXe3100	VNXe3300
<b>Min/Max Drives</b>	6 to 96	6 to 120
<b>Drive Enclosure Options</b>	12 x 3.5" SAS/NL SAS drives (2U)	15 x 3.5" SAS/NL SAS/Flash* drives (3U)
<b>CPU/Memory per Controller</b>	1 x Xeon Dual Core/4 GB	1 x Xeon Quad Core/12 GB
<b>Base 1 GB/s IP Ports per Controller</b>	2	4
<b>Max Flex IO Modules per controller</b>	1	1
<b>RAID Options</b>	10/5/6	10/5/6
<b>Management Ports</b>	2 x 10/100/1000 Copper GbE	2 x 10/100/1000 Copper GbE

### SYSTEM LIMITS AND SUPPORT

<b>Supported LUNs</b>	Up to 128/256 (single/dual)	Up to 512
<b>Maximum LUN Size</b>	2 TB	2 TB
<b>Maximum File System Size</b>	16 TB	16 TB
<b>Total Raw Capacity</b>	192 TB	240 TB
<b>Maximum File Systems</b>	128/256 (single/dual)	512

\*Delayed availability

### VNXe CONNECTIVITY

The VNXe series provides flexible connectivity options via Flex IO modules for adding Ethernet ports to support additional NAS and iSCSI host connectivity.

### FLEX IO MODULE OPTIONS

IO Modules	VNXe3100	VNXe3300
Copper 10/100/1000 Base T 1 Gb/s Module	NAS/iSCSI, 4 ports per module	NAS/iSCSI, 4 ports per module
Optical 10 Gb/s Ethernet	N/A	NAS/iSCSI, 2 ports per module



## MAXIMUM CABLE LENGTHS

SAS Cable Length (enclosure to enclosure): 6 meters

## BACK-END (DISK) CONNECTIVITY

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

## SUPPORTED DISK EXPANSION ENCLOSURES (DAEs)

Each member of the VNXe family supports one or more of the following DAEs:

	VNXe3100 Disk Expansion (2u)	VNXe3300 Disk Expansion (3u)
Drive Types Supported	3.5" SAS, NL-SAS	3.5" SAS, NL-SAS, and Flash
Drive Quantity	12	15
Controller Interface	6 Gb/s SAS	6 Gb/s SAS

## SUPPORTED DISK DRIVES

Available on:	100 GB	300 GB	600 GB	1 TB NL	2 TB NL
VNXe3300	X*	X	X	X*	X
VNXe3100		X	X	X	X
Interface	6.0 Gb/s SAS	6.0 Gb/s SAS	6.0 Gb/s SAS	6.0 Gb/s SAS	6.0 Gb/s SAS
Capacity (RPM)	100 GB (Flash)	300 GB (15,000)	600 GB (15,000)	1 TB (7,200)	2 TB (7,200)
Formatted Capacity (520 Bytes/Sector) 1 MB–1,000,000 Bytes	93.16 GB	272.59 GB	545.195 GB	931.5 GB	1,852 GB
Form Factor	3.5"	3.5"	3.5"	3.5"	3.5"
Height	1.0"	1.0"	1.0"	1.0"	1.0"
Data Buffer	N/A	16 MB	16 MB	32 MB	32 MB
Buffer to/from Media	260 MB/s	97 MB/s	150 MB/s	42–85 MB/s	84 MB/s
SP to/from Buffer	600 MB/s (max)	600 MB/s (max)	600 MB/s (max)	600 MB/s (max)	600 MB/s (max)
Access Time:					
Average Seek	N/A	3.5 ms Read 4.0 ms Write	3.4 ms Read 3.9 ms Write	8.2 ms Read 9.2 ms Write	8.2 ms Read 9.2 ms Write
Rotational Latency	N/A	2.0 ms	2.0 ms	4.17 ms	4.17 ms

\*Delayed availability

## PROTOCOLS SUPPORTED

CIFS (SMB 1 and SMB 2), NFSv2 and v3, iSCSI  
Network Lock Manager (NLM) v3, v4  
Routing Information Protocol (RIP) v1-v2  
Simple Network Management Protocol (SNMP)  
Network Data Management Protocol (NDMP) v1-v4  
Address Resolution Protocol (ARP)  
Internet Control Message Protocol (ICMP)  
Simple Network Time Protocol (SNTP)  
Lightweight Directory Access Protocol (LDAP)

## SERVER OPERATING SYSTEM SUPPORT

Microsoft Windows Server 2003  
Microsoft Windows Server 2008, Windows Server 2008 R2+  
Microsoft Windows 7 and Vista  
Microsoft Hyper-V  
VMware® ESX®  
RedHat Enterprise Linux  
Novell Suse Enterprise Linux  
Solaris 10 x86

## VNXe SOFTWARE

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

**EMC Unisphere™ for VNXe**—Standard integrated management and monitoring of all aspects of VNXe systems

- Thin Provisioning: Enables logical sizing and physical provisioning
- VNXe Deduplication and Compression: File-based deduplication with compression

**Local Protection Suite**—Snapshots for file systems and iSCSI volumes (standard on VNXe3100)

**Remote Protection Suite**—Replicate file data over IP for disaster recovery, backup, and/or testing

**Application Protection Suite**—Application integration and replica management

**Security and Compliance Suite**—VNXe File-Level Retention—Enterprise, Event Enabler

<b>Optional Software</b>	<b>VNXe3100 Suites</b>	<b>VNXe3300 Suites</b>
	Application Protection	Local Protection
	Remote Protection	Application Protection
<b>Total Value Pack</b>	Security and Compliance	Remote Protection
<b>Total Protection Pack</b>		Security and Compliance

## CLIENT CONNECTIVITY FACILITIES

File access by NFS, CIFS protocols  
Block access by iSCSI  
Link Aggregation (IEEE 802.3ad)  
Failsafe networking  
Virtual LAN (IEEE 802.1q)  
Network Status Monitor (NSM) v1  
Portmapper v2  
Network Information Service (NIS) client  
Supports Microsoft DFS as Leaf node or Root Server  
Native Windows 2000/2003/2008 R2 support  
LDAP signing for Windows  
Microsoft Windows Server 2003 Access-based Enumeration (ABE)

## VMWARE INTEGRATION

- VNX Plug-ins for VMware: For provisioning, management, cloning, and file deduplication

## VNXe ELECTRICAL SPECIFICATIONS

Requirement	VNXe3100 Processor Enclosure	VNXe3100 Expansion Enclosure	VNXe3300 Processor Enclosure	VNXe3300 Expansion Enclosure
AC Line Voltage	100 to 240 VAC $\pm$ 10%, single-phase, 47 to 63 Hz	100 to 240 VAC $\pm$ 10%, single-phase, 47 to 63 Hz	100 to 240 VAC $\pm$ 10%, single-phase, 47 to 63 Hz	100 to 240 VAC $\pm$ 10%, single-phase, 47 to 63 Hz
AC Line Current	4.0 A max at 100 Vac, 2.0 A max at 200 Vac	2.5 A max at 100 Vac, 1.3 A max at 200 Vac	4.8 A max at 100 Vac, 2.4 A max at 200 Vac	2.8 A max at 100 Vac, 1.4 A max at 200 Vac
Power Consumption	395 VA (380 W) max	250 VA (240 W) max	480 VA (455 W) max	280 VA (235 W) max
Power Factor	0.98 min. at full load, low voltage			
Heat Dissipation	1.37 x 10 <sup>6</sup> J/hr, (1,300 Btu/hr) max	8.64 x 10 <sup>5</sup> J/hr, (820 Btu/hr) max	1.64 x 10 <sup>6</sup> J/hr, (1,560 Btu/hr) max	8.46 x 10 <sup>5</sup> J/hr, (800 Btu/hr) max
AC Protection	15 A fuse on each power supply, both phases	15 A fuse on each power supply, both phases	12.5 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 supply			
Ride-through Time	30 ms min	30 ms min	30 ms min	30 ms min
Current Sharing	$\pm$ 15% of full load, between power supplies	$\pm$ 15% of full load, between power supplies	$\pm$ 10% of full load, between power supplies	$\pm$ 10% of full load, between power supplies

## VNXe PHYSICAL DIMENSIONS (APPROXIMATE)

	VNXe3100 Processor Enclosure	VNXe3100 Expansion Enclosure	VNXe3300 Processor Enclosure	VNXe3300 Expansion Enclosure
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 20.0 in./ 8.64 cm x 44.45 cm x 50.8 cm	5.25 in. x 17.5 in. x 24.0 in./ 13.3 cm x 44.5 cm x 61.0 cm	5.25 in. x 17.5 in. x 14.00 in./ 13.34 cm x 44.5 cm x 35.56 cm
Weight (max)	60.5 lb/26.4 kg	52.0 lb/23.6 kg	96.4 lb/43.8 kg	72 lb/32.6 kg

## OPERATING ENVIRONMENT

<b>Temperature:</b>	50–104 degrees F (10–40 degrees C)
<b>Temperature Gradient:</b>	19 degrees F/hr (10 degrees C/hr)
<b>Relative Humidity:</b>	20% to 80% (non-condensing)
<b>Altitude:</b>	8,000 ft (2,438 m) @ 104 degrees F (40 degrees C) max 10,000 ft (3,048 m) @ 98.6 degrees F (37 degrees C) max

## ELECTROMAGNETIC EMISSIONS AND IMMUNITY

FCC Class A EN55022 Class A  
 CE Mark VCCI Class A (for Japan)  
 ICES-003 Class A (for Canada) AS/NZS 3548 Class A (for Australia/New Zealand)  
 EN55024 Immunity, ITE BSMI Class A (for Taiwan)

## 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](http://www.EMC.com).

## QUALITY AND SAFETY STANDARDS

UL 60950; CSAC 22.2-60950, FN 60950  
 Manufactured under an ISO 9000-registered quality system  
 ETSI EN 300 386

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# EMC VNXe SERIES SOFTWARE PACKS

## Simple data protection and more

### ESSENTIALS

- Attractively priced value packs and software suites
- Centralized management via EMC Unisphere™
- Comprehensive application support including Microsoft Exchange, SQL, VMware®, and Hyper-V
- Backup consolidation with integrated EMC NetWorker™ Fast Start and third-party solutions like Symantec Backup Exec or Commvault Simpana
- Integrated with Microsoft Active Directory® and other third-party anti-virus solutions
- Comprehensive data protection, recovery, security, and compliance

Data protection for business continuity, internal governance, external compliance, and security is quickly becoming a priority for small businesses to small enterprise users. IT generalists are increasingly challenged in meeting backup windows. They are also finding tape unacceptably unreliable for backup and restore. In addition, in today's DAS environments, each application manages its backup independently with its own tape target making management of these backup functions increasingly difficult.

### EXTRA SAVINGS WITH VNXe SERIES SOFTWARE PACKS

EMC® has packaged unique and powerful add-on storage software into two attractively priced, easy-to-order software packs: Total Value Pack and Total Protection Pack available for the VNXe™ 3100 and VNXe3300 respectively, ensuring maximum protection, security, and compliance. With this approach, VNXe software packs offer full capabilities to dynamically move, secure, and protect production data for unified block and file storage—all managed through EMC Unisphere.

		VNXe3100	VNXe3300
<b>Base</b>	<b>Base Software</b>		
	<ul style="list-style-type: none"> <li>• Unisphere</li> <li>• File deduplication with compression</li> <li>• Protocols and thin provisioning</li> <li>• Local protection: snapshots</li> </ul>	Included Included Included Included	Included Included Included
<b>Suites</b>	<b>Local Protection Suite</b> —Practice safe data protection and repurposing	Base software	Optional
	<ul style="list-style-type: none"> <li>• Snapshots</li> </ul>		
	<b>Remote Protection Suite</b> —Protect data against localized failures, outages, and disasters	Optional	Optional
	<ul style="list-style-type: none"> <li>• Remote replication</li> </ul>		
	<b>Application Protection Suite</b> —Automate application copies	Optional	Optional
	<ul style="list-style-type: none"> <li>• Replica management</li> </ul>		
	<b>Security and Compliance Suite</b> —Always know your data is safe	Optional	Optional
	<ul style="list-style-type: none"> <li>• Event enabler (anti-virus only)</li> <li>• File-level retention (enterprise)</li> </ul>		
<b>Packs</b>	<b>VNXe3300 Total Protection Pack</b> includes:	NA	✓
	<ul style="list-style-type: none"> <li>• Local Protection Suite</li> <li>• Remote Protection Suite</li> <li>• Application Protection Suite</li> <li>• Security and Compliance Suite</li> </ul>		
	<b>*VNXe3100 Total Value Pack</b> includes:	✓	NA
	<ul style="list-style-type: none"> <li>• Remote Protection Suite</li> <li>• Application Protection Suite</li> <li>• Security and Compliance Suite</li> </ul>		

\*Note: the Local Protection Suite is included with base software for VNXe3100.

## SOFTWARE SUITES

In addition to the all-inclusive value packs, users have the flexibility of purchasing individual, modular software suites a la carte.

## LOCAL PROTECTION SUITE

Practice safe data protection and repurposing. The Local Protection Suite gives you point-in-time recovery with snapshots for business continuity, enabling you to get your production applications up and running within minutes. Increase productivity with snapshots of production data for development, testing, decision support tools, reporting, and backup acceleration. All of this is available through EMC Unisphere's centralized management platform.

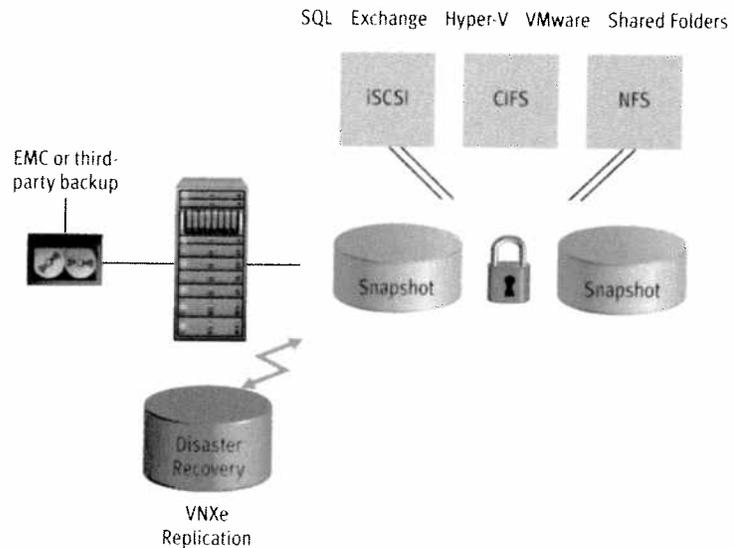


Figure 1. Local copies for instant recovery and repurposing

## REMOTE PROTECTION SUITE

The Remote Protection Suite enables you to protect data against localized failures, outages, and disasters. It lets you deliver disaster recovery protection for production applications. Replicate data remotely to one or many file systems for assured disaster recovery. All of this is available through EMC Unisphere's centralized management platform.

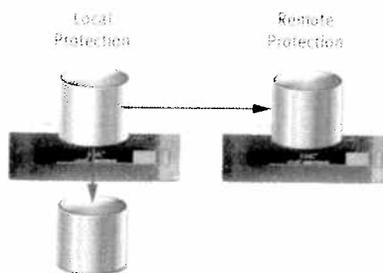


Figure 2. Immediate disaster recovery at a remote site or restore back to production

## APPLICATION PROTECTION SUITE

With the Application Protection Suite, you can automate application-consistent copies with user roles, enabling self-service copy management. The suite simplifies the management of EMC point-in-time replica technologies and coordinates the user's entire replication process—from discovery and configuration to the management of multiple disk-based replicas. Replicas can be repurposed for backup acceleration and restoration of table spaces and file systems, or to simplify and automate data refreshes for testing and reporting. Users can put the right data in the right place at the right time—on-demand or based on schedules and policies that they define. This suite provides intelligent replication by integrating with Microsoft® VSS/VDI to create application consistent copies of Microsoft Exchange, SQL® and SharePoint® for recovery, backup acceleration, and repurposing. Application consistency assures that you will be able to recover and restart the application from the copy in the event of a service interruption. Similar to the Local and Remote Protection Suites, the Application Protection Suite is also managed through EMC Unisphere.



### Application Integration

- Automate copies
- Identify recovery gaps
- Prove compliance

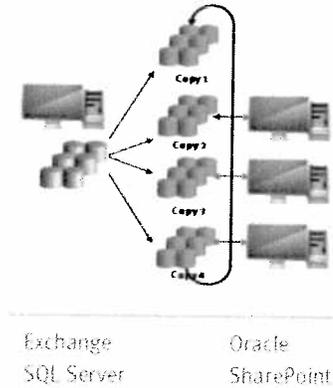


Figure 3. Automate application copies

## SECURITY AND COMPLIANCE SUITE

The Security and Compliance Suite helps you ensure that data is protected from unwanted changes, deletions, and malicious activity. Enforce retention at the file-level for increased corporate governance and to meet regulatory compliance requirements. This suite supports file-level retention periods with disk-based WORM, delivers alerts upon file system actions, and allows integration with third-party anti-virus checking applications for added data protection, security, and peace of mind.

## BASE SOFTWARE

Every VNXe Series comes standard with EMC Unisphere for application-aware management; file deduplication with compression for increased efficiencies; thin provisioning for adding storage on-demand; and various protocols (including iSCSI, CIFS, and NFS).

## CONTACT US

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**EMC<sup>2</sup>**  
where information lives<sup>®</sup>

# EMC VNX FAMILY

## Next-generation unified storage, optimized for virtualized applications

### ESSENTIALS

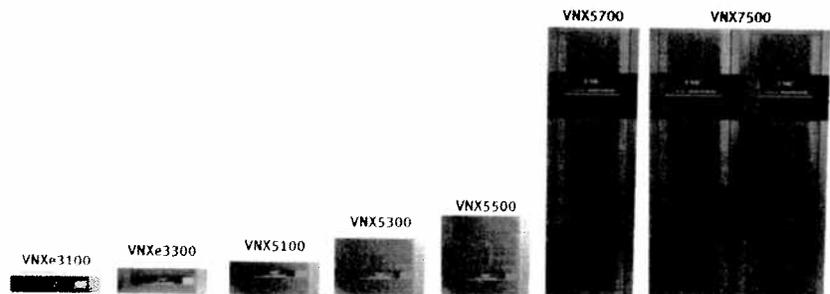
- Unified storage for multi-protocol file, block, and object storage
- Powerful new multi-core Intel CPUs with 6-Gb/s SAS backend
- Administration simplicity with EMC Unisphere™
- Flash-optimized with auto-tiering to ensure superior performance
- Easy storage provisioning from the #1 provider\* of storage for virtualized environments
- Affordable with real-world configurations starting at less than \$10K

\*Source: Enterprise Strategy Group, ESG Research: 2010 Server Virtualization Survey Results, August 2010

Organizations of every type rely on the timely retrieval of information to facilitate transactions and decision making. While a typical organization is experiencing double-digit data growth, IT budgets, staffing, and traditional storage capabilities are not keeping pace. As a result, IT organizations are under constant pressure to employ more efficient storage strategies and increase the amount of data their staff can manage without additional headcount. Customers are looking to storage vendors for innovations to solve these challenges in the same way that server virtualization has enabled them to experience greater efficiency by pooling server resources and dynamically provisioning compute power according to business needs. The storage imperative is not only to move information dynamically according to business activity, but also to make the process fully automated and self-managing.

The EMC® VNX™ family delivers industry-leading innovation and enterprise capabilities for file, block, and object storage in a scalable, easy-to-use solution. This next-generation storage platform combines powerful and flexible hardware with advanced efficiency, management, and protection software to meet the demanding needs of today's enterprises.

All of this is available in a choice of systems ranging from affordable entry-level solutions to high-performance, petabyte-capacity configurations servicing the most demanding application requirements. The VNX family includes the VNXe series, purpose-built for the IT manager in smaller environments, and the VNX series, designed to meet the high-performance, high-scalability requirements of midsize and large enterprises.



### VNX Family

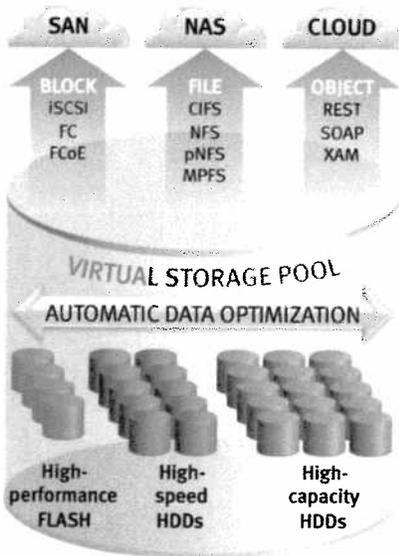
#### THE VNXe SERIES—SIMPLE, EFFICIENT, AND AFFORDABLE

The VNXe series was developed with the IT manager in mind, and provides an integrated storage system for small to medium businesses as well as remote offices and departments in larger enterprise businesses. Starting at less than \$10,000, the VNXe series provides true storage consolidation with a unique application-driven approach that eliminates the boundaries between applications and their storage.

It takes just two minutes of the IT manager's time to provision storage for 500 Exchange mailboxes or a one-terabyte VMware datastore.

This simple, application-driven approach to managing shared storage makes the VNXe series ideal for IT managers and application administrators who may have limited storage expertise. EMC Unisphere™ for the VNXe series enables easy, wizard-based provisioning of storage for Microsoft® Exchange, file shares, iSCSI volumes, VMware®, and Hyper-V™. Built-in efficiency capabilities, such as file deduplication with compression and thin provisioning result in streamlined operations and can save up to 50 percent in upfront storage costs. Software packs aimed at facilitating backup, remote data protection, and disaster recovery include features such as easy-to-configure application snapshots.

The VNXe series supports high availability by using redundant components—power supplies, fans, and storage processors—as well as dynamic failover and failback. Additionally, the VNXe series supports the ability to upgrade system software or hardware while the VNXe system is running. It even delivers single-click access to a world of resources such as comprehensive online documentation, training, and how-to videos to expand your knowledge and answer questions.



## THE VNX SERIES—SIMPLE, EFFICIENT, AND POWERFUL

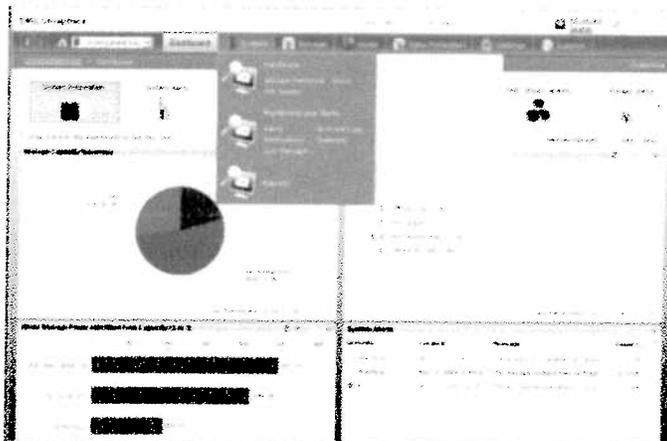
A robust platform for consolidation of legacy block storage, file servers, and direct-attached application storage, the VNX series enables organizations to dynamically grow, share, and cost-effectively manage multi-protocol file systems and multi-protocol block storage access. The VNX operating environment enables Microsoft Windows® and Linux/UNIX clients to share files in multi-protocol (NFS and CIFS) environments. At the same time, it supports iSCSI, Fibre Channel, and FCoE access for high-bandwidth and latency-sensitive block applications. The combination of EMC Atmos™ Virtual Edition software and VNX storage supports object-based storage and enables customers to manage web applications from EMC Unisphere.

The VNX series next-generation storage platform is powered by the Intel Quad Core Xeon 5600 series with a 6-Gb/s SAS drive back-end and delivers demonstrable performance improvements over the previous generation mid-tier storage:

- Run Microsoft SQL and Oracle 300 percent faster
- Enable 2X system performance in less than two minutes—non-disruptively
- Run data warehouses 300 percent faster

## MANAGE, MONITOR, AND TUNE YOUR STORAGE ASSETS WITH EASE

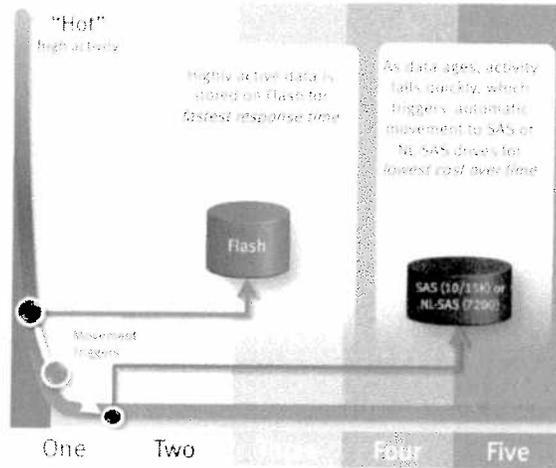
EMC Unisphere makes it easy to manage VNX systems from anywhere with a simple, integrated user interface for distributed storage environments. The Unisphere dashboard is a single screen for at-a-glance management and reporting, enabling administrators to gain instant and actionable knowledge about what's occurring across the entire environment. Unisphere's single sign-on automatically discovers all VNX, EMC CLARiiON®, EMC Celerra®, and EMC RecoverPoint SE installations in the environment for seamless configuration.



Automatically optimize for the highest system performance and the lowest storage cost with auto-tiering.

## FLASH-OPTIMIZED TO BOOST SYSTEM PERFORMANCE

The VNX series has been expressly designed to take advantage of the latest innovation in Flash drive technology, maximizing the storage system's performance and efficiency while minimizing cost per gigabyte. When even a few Flash drives are combined with the EMC FAST Suite—an unrivaled set of software that tiers data across heterogeneous drives and boosts the most active data to cache—customers receive the optimal benefits of a FLASH 1<sup>st</sup> strategy.



FLASH 1<sup>st</sup>, available only through EMC, ensures customers never have to make concessions for cost or performance. Highly active data is served from up to two terabytes of Flash drives with FAST Cache, which dynamically absorbs unpredicted spikes in system workloads. As that data ages and becomes less active over time, FAST VP (Fully Automated Storage Tiering for Virtual Pools) tiers the data from high-performance to high-capacity drives in one-gigabyte increments, resulting in overall lower costs—regardless of application type or data age. Perhaps best of all, this all happens automatically based on customer-defined policies, saving application and storage administrators time and money by intelligently doing the work associated with pre- and post-provisioning tasks.

Recapture capacity and reduce the data footprint up to 50 percent.

## USE STORAGE CAPACITY MORE EFFICIENTLY—AUTOMATICALLY

The VNX series is delivered with built-in features to help ensure redundant, inactive, or anticipated data doesn't consume valuable storage resources. Block compression, intended for relatively inactive LUNs such as backup copies and static data repositories, automatically compresses data, enabling customers to recapture capacity and reduce the data footprint by up to 50 percent. File-level deduplication/compression reduces disk space used by up to 50 percent by selectively compressing and deduplicating inactive files. Because these features operate as background tasks, there is minimal system performance overhead.

## THE BEST STORAGE FOR VIRTUAL ENVIRONMENTS

The VNX series is the ideal mid-tier system for virtualized application environments. Whether the customer environment is VMware, Microsoft Hyper-V, or Xen-based, VNX is fully certified for all supported protocols to ensure successful deployments of virtualized infrastructures through all phases of implementation.

No longer do storage and server administrators operate in the dark. The tight integration of Unisphere with VMware vCenter™ through VAAI (vStorage APIs for Array Integration) provides both administrators with visibility into the entire environment—end-to-end. Each can use their familiar management interface to view both virtual and physical resources, transparently provision storage, integrate replication, and access and offload all storage functions to the array.

- Provision storage from VMware vCenter in just two clicks.
- The EMC VNX Plug-in for VMware leverages best practices to ensure optimal utilization and resiliency between storage and VMware.
- Hardware accelerated Fast Clones rapidly provision new virtual machines in seconds.
- On-demand VMDK compression for NFS Datastore reduces storage consumption by up to 50 percent.
- EMC Proven™ solutions and reference architectures, jointly developed with VMware, accelerate virtualization of mission-critical applications.

## THE INDUSTRY'S MOST EXTENSIVE STORAGE SOFTWARE OFFERINGS

The VNX series software is available in two comprehensive packages to ensure customers have all of the necessary capabilities to protect and manage their information. The VNX Total Protection Pack includes replication capabilities, point-in-time recovery features such as snaps and clones combined with automated application copies for assured recovery, along with monitoring and alerting for compliance with protection policies. The VNX Total Efficiency Pack includes all of the protection features plus “set it and forget it” performance optimization. All VNX software is managed through Unisphere.

The VNX software is also available in modular suites:

- **FAST Suite**—Automatically optimize for the highest system performance and the lowest storage cost, simultaneously
- **Security and Compliance Suite**—Keep data safe from changes, deletions, and malicious activity
- **Local Protection Suite**—Practice safe data protection and repurposing
- **Remote Protection Suite**—Protect data against localized failures, outages, and disasters
- **Application Protection Suite**—Automate application copies and prove compliance

VNX Series Packs		VNX Series Suites
		FAST
		Security & Compliance
VNX Total Efficiency Pack		Local Protection
	VNX Total Protection Pack	Remote Protection
		Application Protection

Features of Suites and Packs may vary depending on the system. See the EMC VNX Series Total Efficiency Pack data sheet for details. VNXe Series Software Packs deliver simplified data protection; see the EMC VNXe Series Software Packs data sheet for more information.

## CONTINUOUS AVAILABILITY TO KEEP THE BUSINESS RUNNING

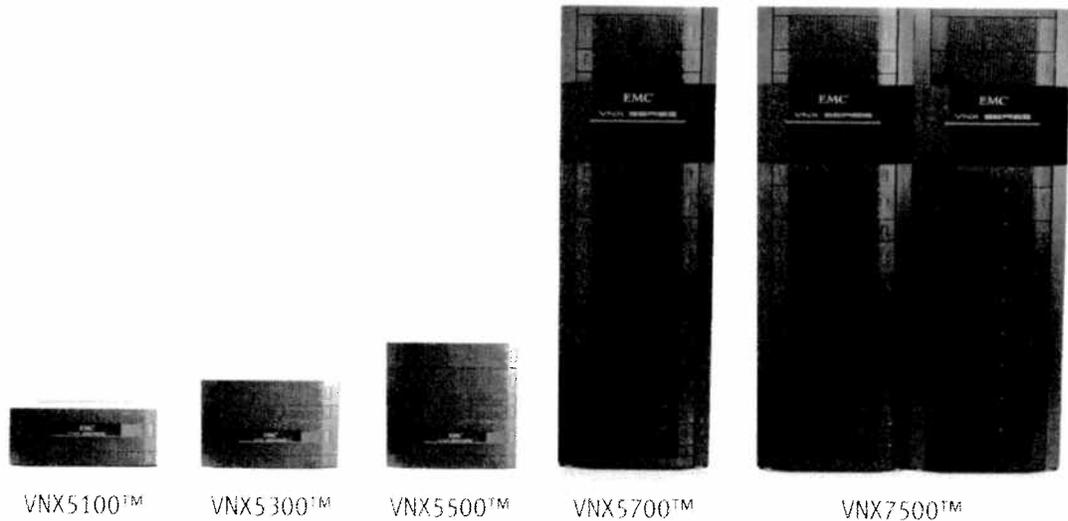
The VNX series is architected to provide five-nines availability in mission-critical business environments. VNX availability and redundancy features include:

- Up to 12.8 gigabytes of mirrored write cache, where each storage processor contains both primary cached data for its LUNs and a secondary copy of the cache for its peer storage processor
- Battery backup to allow for an orderly shutdown and cache de-staging to vault disks to ensure data protection in the event of a power failure



# EMC VNX SERIES UNIFIED STORAGE SYSTEMS

EMC® VNX™ series unified storage systems deliver uncompromising scalability and flexibility for the mid-tier while providing market-leading simplicity and efficiency to minimize total cost of ownership.



## Specifications

### ARCHITECTURE

Based on the powerful new family of Intel Xeon-5600 processors, the EMC VNX implements a modular architecture that integrates hardware components for block, file, and object with concurrent support for native NAS, iSCSI, Fibre Channel, and FCoE protocols. The series delivers file (NAS) functionality via two-to-eight X-blade data movers and block (iSCSI, FCoE, and FC) storage via dual storage processors leveraging full 6 Gb SAS disk drive topology. The unified configuration includes the following rack-mounted enclosures:

- Disk processor enclosure (holds disk drives) or storage processor enclosure (requires disk drive tray) plus standby power system to deliver block protocols
- One or more data mover enclosures to deliver file protocols (optional)
- Control station (optional)



## VNX PHYSICAL SPECIFICATIONS

BLOCK COMPONENTS	VNX5100	VNX5300	VNX5500	VNX5700	VNX7500
<b>Min/Max Drives</b>	4/75	4/125	4/250	4/500	4/1000
<b>Array Enclosure</b>	3U Disk Processor Enclosure (Holds 15x3.5" or 25x2.5" SAS/Flash drives)	3U Disk Processor Enclosure (Holds 15x3.5" or 25x2.5" SAS/Flash drives)	3U Disk Processor Enclosure (Holds 15x3.5" or 25x2.5" SAS/Flash drives)	2U Storage Processor Enclosure (No drives)	2U Storage Processor Enclosure (No drives)
<b>Drive Enclosure Options (DAE)</b>	25 x 2.5" SAS/Flash drives – 2 U 15 x 3.5" SAS/Flash drives – 3 U	25 x 2.5" SAS/Flash drives – 2 U 15 x 3.5" SAS/Flash drives – 3 U	25 x 2.5" SAS/Flash drives – 2 U 15 x 3.5" SAS/Flash drives – 3 U	25 x 2.5" SAS/Flash drives – 2 U 15 x 3.5" SAS/Flash drives – 3 U	25 x 2.5" SAS/Flash drives – 2 U 15 x 3.5" SAS/Flash drives – 3 U
<b>Standby Power System</b>	1U 1.2KW	1U 1.2KW	1U 1.2KW	1U 1.2KW	1U 1.2KW
<b>Raid Options</b>	0/1/10/3/5/6	0/1/10/3/5/6	0/1/10/3/5/6	0/1/10/3/5/6	0/1/10/3/5/6
<b>CPU/Memory per Array</b>	Intel Xeon 5600/8 GB	Intel Xeon 5600/16 GB	Intel Xeon 5600/24 GB	Intel Xeon 5600/36 GB	Intel Xeon 5600/48 GB
<b>Max Block UltraFlex IO Modules per Array</b>	0	4	4	10	10
<b>Embedded IO Ports per Array</b>	8 FC ports and 4 SAS ports (2 BE SAS buses)	8 FC ports and 4 SAS ports (2 BE SAS buses)**	8 FC ports and 4 SAS ports (2 BE SAS buses)**	0	0
<b>Max Total Ports per Array</b>	8	24	24	24	32
<b>2/4/8 Gb/s FC Max Ports per Array</b>	8	16	16	24	32
<b>1 GBaseT iSCSI Max Total Ports per Array</b>	N/A	8	16	16	16
<b>10 GbE iSCSI Min/Max Total Ports per Array</b>	N/A	4	8	12	12
<b>Max FCoE Total Ports per Array</b>	N/A	4	8	12	16
<b>6 Gb/s SAS Buses (4 Lanes per Bus) for DAE Connections</b>	2	2	2	4	4 or 8 (consumes 2 or 4 UltraFlex IO modules per array)
<b>FILE COMPONENTS*</b>					
<b># File X-Blades</b>	N/A	1-2	1-3	2-4	2-8
<b># Control Stations</b>	N/A	1-2 x 1U Server			
<b>X-Blade: CPU/Memory</b>	N/A	Intel Xeon 5600/6 GB	Intel Xeon 5600/12 GB	Intel Xeon 5600/12 GB	Intel Xeon 5600/24 GB
<b>Max File UltraFlex IO Modules per X-Blade</b>	N/A	3	4	4	5
<b>Min/Max 2/4/8 Gb/s FC Ports per X-Blade</b>	N/A	4	4	4	4
<b>Max IP Ports per X-Blade</b>	N/A	8	12	12	16
<b>Max 1 GBaseT Ports per X-Blade</b>	N/A	8	12	12	16
<b>Max 10 GbE Ports per X-Blade</b>	N/A	4	6	6	8
<b>OTHER</b>					
<b>Management</b>	LAN 2 x 10/100/1000 Copper GbE	LAN 2 x 10/100/1000 Copper GbE	LAN 2 x 10/100/1000 Copper GbE	LAN 2 x 10/100/1000 Copper GbE	LAN 2 x 10/100/1000 Copper GbE
<b>FUNCTIONAL LIMITS</b>					
<b>Max Raw Capacity</b>	150 TB	240 TB	480 TB	984 TB	1,974 TB
<b>Max SAN Hosts</b>	512	2,048	4,096	4,096	8,192
<b>Max Number of Pools</b>	10	20	40	40	60
<b>Max Number of LUNs</b>	512	2,048	4,096	4,096	8,192
<b>Max LUN Size</b>	14 TB (Virtual Pool LUN)	14 TB (Virtual Pool LUN)	14 TB (Virtual Pool LUN)	14 TB (Virtual Pool LUN)	14 TB (Virtual Pool LUN)
<b>Max File System Size</b>	N/A	16 TB	16 TB	16 TB	16 TB
<b>Maximum Usable File Capacity per X-Blade</b>	N/A	200 TB	256 TB	256 TB	256 TB
<b>OS Support</b>	Block OS's see EMC E-Lab™ Navigator on EMC Powerlink™	Block OS's Plus File OS's see E-Lab Navigator and NAS Support Matrix on Powerlink	Block OS's Plus File OS's see E-Lab Navigator and NAS Support Matrix on Powerlink	Block OS's Plus File OS's see E-Lab Navigator and NAS Support Matrix on Powerlink	Block OS's Plus File OS's see E-Lab Navigator and NAS Support Matrix on Powerlink

\* The file components are not required when ordering a block-only system.

\*\*4 embedded FC ports per array are reserved for file connectivity

## VNX CONNECTIVITY

The VNX series provides flexible connectivity options via UltraFlex IO modules for both the file X-blades for NAS connectivity and the block storage processors for FC and iSCSI host connectivity (see above table for number of modules supported per blade or SP).

### BLOCK-TO-HOST CPU (SP-BASED) ULTRAFLEX IO MODULE OPTIONS

IO Module	Description
<b>Four-Port Fibre Channel Module</b>	FC module with four ports auto-negotiating to 2/4/8 Gbps; uses optical SFP and OM2/OM3 cabling to connect directly to host HBA or FC switch
<b>Four-Port 1 Gb/s iSCSI Module with TOE</b>	iSCSI module with four 1 GBaseT RJ-45 copper connections to Cat 6 cabling to Ethernet switch; includes TCP offload engine
<b>Two-Port 10 Gb/s iSCSI Module with TOE</b>	iSCSI module with two 10 Gb/s Ethernet ports and choice of SFP+ optical connection or active twinax copper connection to Ethernet switch; includes TCP offload engine
<b>Two-Port 10 GbE FCoE Module</b>	FCoE module with two 10 Gb/s Ethernet ports and choice of SFP+ optical connection or active twinax copper connection to converged enhanced Ethernet switch

### FILE-TO-NFS/CIFS CLIENT (X-BLADE-BASED) ULTRAFLEX IO MODULE OPTIONS

IO Module	Description
<b>Four-Port 1 GBase-T IP Module</b>	10/100/1000 BaseT module with four ports supporting RJ-45 copper connections to Cat 6 cabling to Ethernet switch
<b>Four-Port 1 GBaseT and 1 GbE Opt IP Module</b>	IP module with two ports of 10/100/1000 Base-T and two ports 1 GbE optical
<b>Two-Port 10 GbE Opt IP Module</b>	IP module with two 10 Gb/s Ethernet ports and choice of SFP+ optical connection or active twinax copper connection to Ethernet switch
<b>Four-Port 8 Gb/s Fibre Channel Module</b>	FC module with four ports auto-negotiating to 2/4/8 Gbps; uses optical SFP and OM2/OM3 cabling to connect directly to captive array and to provide NDMP tape connection

## MAXIMUM CABLE LENGTHS

Shortwave optical OM2: 50 meters (8 Gb), 100 meters (4 Gb), and 300 meters (2 Gb)

Shortwave optical OM3: 150 meters (8 Gb), 380 meters (4 Gb), and 500 meters (2 Gb)

## BACK-END (DISK) CONNECTIVITY

Each storage processor connects to one side of each of two or four (or optionally eight for the VNX7500) redundant pairs of four-lane x 6 Gb/s Serial Attached SCSI (SAS) buses, providing continuous drive access to hosts in the event of a storage processor or bus fault. VNX models require a minimum of four "vault" drives (SAS or Near-line SAS) and support a maximum of 1000 disk drives in up to 67 disk expansion chassis. Approximately 200 GB per vault drive is consumed by VNX operating environment software and data structures.

## DISK ARRAY ENCLOSURES

	15x3.5" Drive DAE	25x2.5" Drive DAE
<b>Drive Types Supported</b>	3.5" Flash 3.5" 15K Rotating 2.5" 10K Rotating (in 3.5" carrier) 3.5" Near-line Rotating	2.5" 10K Rotating
<b>Drive Mixing</b>	No limitations	No limitations
<b>Controller Interface</b>	6 Gb SAS	6 Gb SAS

**DISK DRIVES FOR 15 X 3.5" DRIVE DISK PROCESSOR ENCLOSURE/DISK ARRAY ENCLOSURE**

Nominal Capacity	100 GB Solid State Drive	200 GB Solid State Drive	300 GB 15K Drive	600 GB 15K Drive	300 GB 10K Drive	600 GB 10K Drive	2 TB 7.2K Drive*
Formatted Capacity*	93.1 GB	186.31 GB	272.59 GB	545.19 GB	272.59 GB	545.19 GB	1,852.09 GB
Drive Form Factor	3.5"	3.5"	3.5"	3.5"	2.5"	2.5"	3.5"
Height	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"
Rotational Speed	Solid State	Solid State	15,000 rpm	15,000 rpm	10,000 rpm	10,000 rpm	7,200 rpm
Interface	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS
Data Buffer	N/A SSD	N/A SSD	16 MB min				

**ACCESS TIME**

Average Read	N/A	N/A	3.4 msec	3.4 msec	3.6 msec	3.7 msec	8.5 msec
Average Write	N/A	N/A	3.9 msec	3.9 msec	4.2 msec	4.2 msec	9.5 msec
Rotation Latency	N/A	N/A	2.0 msec	2.0 msec	3.0 msec	3.0 msec	4.16 msec

**NOMINAL POWER CONSUMPTION (WATTS)**

Operating Mode	4.97	4.97	12.92	16.35	6.15	5.6	12.2
Idle Mode	1.36	1.36	8.74	11.68	3.5	3.1	8.0

**DISK DRIVES FOR 25 X 2.5" DRIVE DISK PROCESSOR ENCLOSURE/DISK ARRAY ENCLOSURE**

Nominal Capacity	300 GB 10K Drive	600 GB 10K Drive
Formatted Capacity*	272.59 GB	545.19 GB
Form Factor	2.5"	2.5"
Height	1.0"	1.0"
Rotational Speed	10,000 rpm	10,000 rpm
Interface	6 Gb SAS	6 Gb SAS
Data Buffer	16 MB min	16 MB min

**ACCESS TIME**

Average Read	3.6 msec	3.7 msec
Average Write	4.2 msec	4.2 msec
Rotation Latency	3.0 msec	3.0 msec

**NOMINAL POWER CONSUMPTION (WATTS)**

Operating Mode	6.15	5.6
Idle Mode	3.5	3.1

\* 520 bytes/sector, 1 MB = 1,048,576 bytes

## VNX OE PROTOCOLS AND SOFTWARE FACILITIES

The VNX series offers support for a wide variety of protocol and advanced features available via various software suites and packs.

### PROTOCOLS AND FACILITIES SUPPORTED

- Access-based Enumeration (ABE) for Microsoft Windows® Server 2003
- Address Resolution Protocol (ARP)
- Automated Volume Management (AVM): File system provisioning
- Block Protocols: iSCSI, Fibre Channel (FCP SCSI-3), and FCoE
- Common criteria certification: VNX has been submitted for common criteria certification and successfully tested by an independent and accredited evaluation laboratory, and conforming to IT security standards sanctioned by the International Standards Organization
- DFS Distributed File System (Microsoft) as Leaf node or Root Server
- Ethernet Trunking
- File Protocols: NFSv2, v3, and v4; CIFS (SMB 1 and SMB 2); FTP (including SFTP and FTPs)
- FileMover API: Open API for automated, transparent data movement between tiers of storage Network Lock Manager (NLM) v1, v3, and v4
- Failsafe Networking
- Internet Control Message Protocol (ICMP)
- Kerberos Authentication
- Lightweight Directory Access Protocol (LDAP)
- LDAP signing for Windows
- Link Aggregation (IEEE 802.3ad)
- UNIX archive utilities (tar/cpio)
- Network Data Management Protocol (NDMP) v1-v4
- Network Information Service (NIS) Client
- Network Status Monitor (NSM) v1
- Object support via EMC Atmos™ Virtual Edition
- Portmapper v2
- Network Time Protocol (NTP) client
- NT LAN Manager (NTLM)
- Routing Information Protocol (RIP) v1-v2
- Simple Network Management Protocol V1-V3 (SNMP)
- Simple Network Time Protocol (SNTP)
- Virtual Data Movers for Microsoft Windows clients
- Virtual LAN (IEEE 802.1q)

### VNX SOFTWARE

	VNX5100	VNX5300, VNX5500, VNX5700, and VNX7500
<b>Management</b>	Unisphere™ for Block	Unisphere for Block, Unisphere for File, or Unisphere for Unified
<b>Protocols</b>	FC included	CIFS, NFS, pNFS, MPFS, FC, FCoE, iSCSI included
<b>Base Software (included with VNX OE)</b>	EMC Virtual Provisioning™	File Single Instancing Compression Virtual Provisioning

### SOFTWARE SUITES

<b>FAST Suite:</b> Automatically optimize for the highest system performance and the lowest storage cost simultaneously	Extendable cache for performance boost Trend analysis and reporting Monitor and achieve performance objectives	Dynamically tier data across drives Extendable cache for performance boost Trend analysis and reporting Monitor and achieve performance objectives
<b>Security and Compliance Suite:</b> Keep data safe from changes, deletions, and malicious activity	Encrypt data where it is created	Encrypt data where it is created Disk-based WORM functionality Anti-virus integration and alerting

<b>Local Protection Suite:</b> Practice Safe Data Protection and Repurposing	Block storage snaps and clones Continuous Data Protection for DVR-like recovery for block storage	Block storage snaps and clones Continuous Data Protection for DVR-like recovery for block storage File system snaps
<b>Remote Protection Suite:</b> Protect data against localized failures, outages, and disasters	Unified storage replication with DVR-like recovery Integrated WAN deduplication and bandwidth reduction	Unified storage replication with DVR-like recovery Integrated WAN deduplication and bandwidth reduction Granular file system level replication and recovery
<b>Application Protection Suite:</b> Automate applica- tion copies and prove compliance	Application copy management Prove protection compliance	Application copy management Prove protection compliance
<b>SOFTWARE PACKS</b>		
<b>Protection Pack</b>	Local Protection Suite + Remote Protection Suite + Application Protection Suite	Local Protection Suite + Remote Protection Suite + Application Protection Suite
<b>Total Value Pack</b>	Security & Compliance Suite + Local Protection Suite + Remote Protection Suite + Application Protection Suite	NA
<b>Total Efficiency Pack</b>	NA	FAST Suite + Security & Compliance Suite + Local Protection Suite + Remote Protection Suite + Application Protection Suite

NOTE: For more detail on software licensing, please contact your sales representative.

## OPTIONAL VMware FACILITIES AND TITLES

- VNX Plug-in for VMware®: For provisioning, management, cloning, and deduplication
- Site Recovery Manager (SRM) Integration: Managing failover and failback making disaster recovery rapid and reliable
- Replication Manager: Host-based management of array-based copies of data

## ADDITIONAL OPTIONAL EMC TITLES

- EMC Ionix™: VNX integration with EMC Storage management infrastructure
- EMC PowerPath®: Path management
- EMC File Management Appliance (FMA and FMA/VE): Policy based file archiving

## VNX ELECTRICAL SPECIFICATIONS

(For specific power specifications please refer to the EMC Power Calculator at [power.emc.com](http://power.emc.com) with your Powerlink account.)

## DPE AND SPE ENCLOSURES

	VNX5100 DPE (15x3.5" drives)	VNX5100 DPE (25x2.5" drives)	VNX5300 DPE (15x3.5" drives)	VNX5300 DPE (25x2.5" drives)	VNX5500 DPE (15x3.5" drives)	VNX5500 DPE (25x2.5" drives)	VNX5700 SPE	VNX7500 SPE
<b>POWER</b>								
<b>AC Line Voltage</b>	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 Vac ± 10%, single-phase, 47 to 63 Hz	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 Vac ± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac ± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac ± 10%, single-phase, 47 to 63 Hz
<b>AC Line Current (operating maximum)</b>	4.2 A max at 100 Vac, 2.1 A max at 200 Vac	4.0 A max at 100 Vac, 2.0 A max at 200 Vac	4.8 A max at 100 Vac, 2.4 A max at 200 Vac	4.6 A max at 100 Vac, 2.3 A max at 200 Vac	4.8 A max at 100 Vac, 2.4 A max at 200 Vac	4.6 A max at 100 Vac, 2.3 A max at 200 Vac	5.3 A max at 100 Vac, 2.7 A max at 200 Vac	5.3 A max at 100 Vac, 2.7 A max at 200 Vac
<b>Power Consumption (operating maximum)</b>	415 VA (390 W) max	395 VA (385 W) max	480 VA (455 W) max	460 VA (450 W) max	480 VA (455 W) max	460 VA (450 W) max	530 VA (500 W) max	530 VA (500 W) max
<b>Power Factor</b>	0.98 min at full load, low voltage							
<b>Heat Dissipation (operating maximum)</b>	1.40 x 10 <sup>6</sup> J/hr, (1,330 Btu/hr) max	1.39 x 10 <sup>6</sup> J/hr, (1,320 Btu/hr) max	1.64 x 10 <sup>6</sup> J/hr, (1,560 Btu/hr) max	1.62 x 10 <sup>6</sup> J/hr, (1,540 Btu/hr) max	1.64 x 10 <sup>6</sup> J/hr, (1,560 Btu/hr) max	1.62 x 10 <sup>6</sup> J/hr, (1,540 Btu/hr) max	1.80 x 10 <sup>6</sup> J/hr, (1,710 Btu/hr) max	1.80 x 10 <sup>6</sup> J/hr, (1,710 Btu/hr) max
<b>In-rush Current</b>	15 A max for ½ line cycle, per line cord at 240 Vac  8 A max for ½ line cycle, per line cord at 120 Vac	15 A max for ½ line cycle, per line cord at 240 Vac  8 A max for ½ line cycle, per line cord at 120 Vac	15 A max for ½ line cycle, per line cord at 240 Vac  8 A max for ½ line cycle, per line cord at 120 Vac	15 A max for ½ line cycle, per line cord at 240 Vac  8 A max for ½ line cycle, per line cord at 120 Vac	15 A max for ½ line cycle, per line cord at 240 Vac  8 A max for ½ line cycle, per line cord at 120 Vac	15 A max for ½ line cycle, per line cord at 240 Vac  8 A max for ½ line cycle, per line cord at 120 Vac	15 A max for ½ line cycle, per line cord at 240 Vac  8 A max for ½ line cycle, per line cord at 120 Vac	15 A max for ½ line cycle, per line cord at 240 Vac  8 A max for ½ line cycle, per line cord at 120 Vac
<b>Startup Surge Current</b>	29 A rms max for 50 ms, at any line voltage	29 A rms max for 50 ms, at any line voltage	29 A rms max for 50 ms, at any line voltage	29 A rms max for 50 ms, at any line voltage	29 A rms max for 50 ms, at any line voltage	29 A rms max for 50 ms, at any line voltage	27 A rms max for 50 ms, at any line voltage	27 A rms max for 50 ms, at any line voltage
<b>AC Protection</b>	12.5 A fuse on each power supply, both phases	7.8 A fuse on each power supply, both phases	7.8 A fuse on each power supply, both phases					
<b>AC Inlet Type</b>	IEC320-C14 appliance coupler, per power zone							
<b>Ride-through Time</b>	30 ms min							
<b>Current Sharing</b>	± 15 percent of full load, between power supplies							
<b>DIMENSIONS</b>								
<b>Height (in./cm)</b>	5.25 in./ 13.34 cm	3.5 in./ 8.9 cm	3.5 in./ 8.9 cm					
<b>Width (in./cm)</b>	17.5 in./ 44.45 cm	17.5 in./ 44.5 cm	17.5 in./ 44.5 cm					
<b>Depth (in./cm)</b>	24.25 in./ 61.6 cm							
<b>Weight (lb/kg) (with and without drives)</b>	Full: 96.8/44.0 Empty: 61.8/28.1	Full: 75.25/34.2 Empty: 59.0/26.8	Full: 96.8/44.0 Empty: 61.8/28.1	Full: 75.25/34.2 Empty: 59.0/26.8	Full: 96.8/44.0 Empty: 61.8/28.1	Full: 75.25/34.2 Empty: 59.0/26.8	52.5 lb/23.81 kg	52.5 lb/23.81 kg

NOTE: Each DPE or SPE requires a Standby Power Supply (see the following information)

## STANDBY POWER SUPPLY

<b>POWER</b>	<b>1.2kW Standby Power Supply</b>
<b>AC Line Voltage</b>	100 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz
<b>AC Line Current, Internal and Pass-through</b>	0.10 A max at 100 Vac, internal power consumption (Up to 10 A max at 100 Vac, pass-through to AC outlets) 0.05 A max at 200 Vac, internal power consumption (Up to 6 A max at 200 Vac, pass-through to AC outlets)
<b>Internal Power Consumption</b>	70 VA (40 W) pk in hi-charge mode, 10 VA (6 W) in float charge mode
<b>Power Factor</b>	N/A for pass-through load, internal 10 VA load is 0.60 power factor
<b>Heat Dissipation</b>	21.6 x 103 J/hr, (20 Btu/hr) steady state
<b>In-rush Current</b>	9 A max for 1/2 line cycle, per power supply at 240 Vac
<b>AC Protection</b>	15 A fuse, both phases
<b>AC Inlet Type</b>	IEC320-C14 appliance coupler with switch
<b>AC Outlet Type</b>	IEC320-C13 appliance coupler, quantity two
<b>Charge Times</b>	190 minutes max
<b>AC Failure Detect Time</b>	10 ms max
<b>Transfer Time</b>	25 ms max
<b>Dimensions (H/W/L)</b>	1.6 in/17.5 in/23.75 in or 4.0 cm/44.45 cm/60.3 cm
<b>Weight</b>	47 lb/21.6 Kg

## DATA MOVER ENCLOSURES, DISK ARRAY ENCLOSURES AND CONTROL STATION

	<b>VNX5300 DME with (2) Data Movers</b>	<b>VNX5500 DME with (2) Data Movers</b>	<b>VNX5700 DME with (2) Data Movers</b>	<b>VNX7500 DME with (2) Data Movers</b>	<b>15x3.5" Disk Array Enclosure</b>	<b>25x2.5" Disk Array Enclosure</b>	<b>Control Station</b>
<b>POWER</b>							
<b>AC Line Voltage</b>	100 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz	100 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz	100 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz	100 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz	100 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz	100 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz	100 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz
<b>AC Line Current (operating maximum)</b>	4.7 A max at 100 Vac, 2.3 A max at 200 Vac	5.0 A max at 100 Vac, 2.5 A max at 200 Vac	5.3 A max at 100 Vac, 2.7 A max at 200 Vac	5.3 A max at 100 Vac, 2.7 A max at 200 Vac	2.8 A max at 100 Vac, 1.4 A max at 200 Vac	2.5 A max at 100 Vac, 1.3 A max at 200 Vac	1.0 A max at 100 Vac, 0.5 A max at 200 Vac
<b>Power Consumption (operating maximum)</b>	465 VA (440 W) max	500 VA (470 W) max	530 VA (500 W) max	530 VA (500 W) max	280 VA (235 W) max	250 VA (230 W) max	132 VA (104 W) max
<b>Power Factor</b>	0.98 minimum at full load, low voltage	0.98 min at full load, low voltage	0.98 min at full load, low voltage	0.80 min at full load, low voltage			
<b>Heat Dissipation (operating maximum)</b>	1.58 x 106 J/hr, (1,500 Btu/hr) max	1.69 x 106 J/hr, (1,610 Btu/hr) max	1.80 x 106 J/hr, (1,710 Btu/hr) max	1.80 x 106 J/hr, (1,710 Btu/hr) max	8.46 x 105 J/hr, (800 Btu/hr) max	8.28 x 105 J/hr, (785 Btu/hr) max	3.60 x 105 J/hr, (300 Btu/hr) max
<b>In-rush Current</b>	15 A max for 1/2 line cycle, per line cord at 240 Vac 8 A max for 1/2 line cycle, per line cord at 120 Vac	15 A max for 1/2 line cycle, per line cord at 240 Vac 8 A max for 1/2 line cycle, per line cord at 120 Vac	15 A max for 1/2 line cycle, per line cord at 240 Vac 8 A max for 1/2 line cycle, per line cord at 120 Vac	15 A max for 1/2 line cycle, per line cord at 240 Vac 8 A max for 1/2 line cycle, per line cord at 120 Vac	50 A max for 1/2 line cycle, per line cord at 240 Vac 25 A max for 1/2 line cycle, per line cord at 120 Vac	50 A max for 1/2 line cycle, per line cord at 240 Vac 25 A max for 1/2 line cycle, per line cord at 120 Vac	15 A max for 1/2 line cycle at 240 Vac 8 A max for 1/2 line cycle at 120 Vac
<b>Startup Surge Current</b>	27 A rms max for 50 ms, at any line voltage	27 A rms max for 50 ms, at any line voltage	27 A rms max for 50 ms, at any line voltage	27 A rms max for 50 ms, at any line voltage	10.6 A rms max for 100 ms, at any line voltage	10.6 A rms max for 100 ms, at any line voltage	NA
<b>AC Protection</b>	7.8 A fuse on each power supply, both phases	7.8 A fuse on each power supply, both phases	7.8 A fuse on each power supply, both phases	7.8 A fuse on each power supply, both phases	10 A fuse on each power supply, both phases	10 A fuse on each power supply, both phases	NA
<b>AC Inlet Type</b>	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone				
<b>Ride-through Time</b>	30 ms min	30 ms min	NA				
<b>Current Sharing</b>	$\pm$ 15 percent of full load, between power supplies	$\pm$ 15 percent of full load, between power supplies	$\pm$ 15 percent of full load, between power supplies	$\pm$ 15 percent of full load, between power supplies	$\pm$ 10 percent of full load, between power supplies	$\pm$ 10 percent of full load, between power supplies	NA



# EMC VNX SERIES TOTAL EFFICIENCY PACK

Boost application performance, protect critical information, and reduce storage costs with comprehensive software from EMC

## ESSENTIALS

- Optimize SAs for both the lowest cost and the highest application performance automatically
- Secure data where it is created and enforce retention at the file-level for compliance
- Recover and repurpose applications locally and remotely
- Protect any host or any application from any disaster
- Manage Microsoft Exchange, SQL Server, SharePoint, and Oracle application copies and prove compliance with protection policies
- Manage all software via Unisphere™

IT administrators everywhere are under constant pressure to do more with less: shrinking budgets, fewer resources, and less infrastructure. EMC meets these challenges with a set of unique and powerful storage and data management software solutions. Designed to work with the EMC® VNX™ series of storage platforms, these advanced features dramatically improve efficiency by simplifying and automating many storage tasks.

The EMC Total Efficiency Pack for VNX includes five complete data management suites:

- **FAST Suite**—Automatically optimize for the highest system performance and the lowest storage cost simultaneously.
- **Security and Compliance Suite**—Keep data safe from changes, deletions, and malicious activity.
- **Local Protection Suite**—Practice safe data protection and repurposing.
- **Remote Protection Suite**—Protect data against localized failures, outages, and disasters.
- **Application Protection Suite**—Automate application copies and prove compliance.

## FAST SUITE

The FAST Suite improves performance and maximizes storage efficiency by enabling customers to deploy a FLASH 1<sup>st</sup> strategy. Using the FAST suite and just a small number of Flash drives, a FLASH 1<sup>st</sup> strategy lowers storage costs and delivers higher performance levels for your most important applications by automatically tiering and serving data from the most cost-effective drive type, based on the data's need. Customers define how and when data is tiered using policies that dynamically move active data to high-performance drives, and less active data to high-capacity drives, in one-gigabyte increments for both block and file systems. For inconsistent, high-demand workloads, an extendable cache of up to two terabytes ensures that data is served from the highest performing Flash drives for as long as needed. With a FLASH 1<sup>st</sup> strategy, customers never have to make concessions for cost or performance.

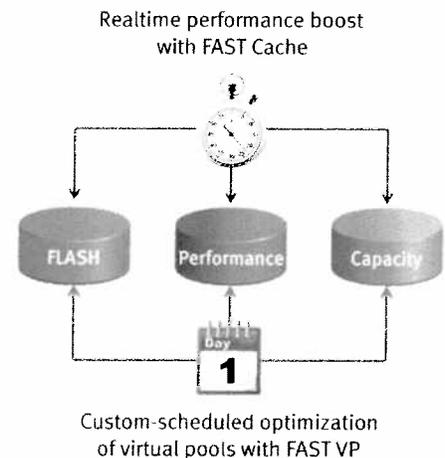


Figure 1. Set-it-and-forget-it performance optimization for application workloads

## SECURITY AND COMPLIANCE SUITE

The Security and Compliance Suite helps customers ensure that data is protected from unwanted changes, deletions, and malicious activity. Encrypt data where it is created for protection anywhere outside the server. Maintain data confidentiality for selected data at rest and enforce retention at the file-level to meet compliance requirements. Integrate with third-party anti-virus checking, quota management, and auditing applications for added data protection, security, and peace of mind.

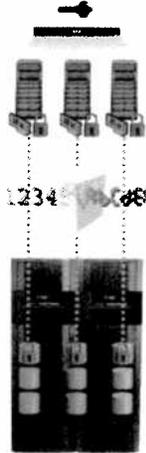


Figure 2. Meet compliance requirements to secure and retain sensitive data

## LOCAL PROTECTION SUITE

Practice safe data protection and repurposing with the Local Protection Suite. This suite gives customers any point-in-time recovery with DVR-like roll-back capabilities for business continuity on block-based storage, allowing recovery of production applications with minimal data exposure. Application owners can tune recovery point objectives based on the criticality of data, and perform faster recovery through self-service capabilities. Create point-in-time copies to instantly restore production data residing on file-based storage as well as use production copies for development, testing, decision support tools, reporting, and point-in-time backups.

### Local Protection



Figure 3. Local copies for instant recovery and repurposing

## REMOTE PROTECTION SUITE

The Remote Protection Suite offers protection against localized failures, outages, and disasters. It lets customers deliver disaster recovery protection for any host and any application on block-based or file-based storage—without compromise—and with immediate DVR-like roll-back to a point-in-time. Capabilities include compression and deduplication for WAN bandwidth reduction and application-specific recovery point objectives. Replication options are available for “many to one” fan-in replication for centralized backup operations, as well as “one-to-many” disaster recovery configurations.

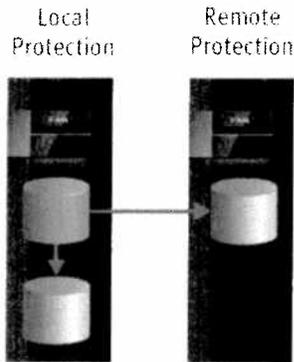


Figure 4. Immediate disaster recovery at a remote site or restore back to production

## APPLICATION PROTECTION SUITE

With the Application Protection Suite, automate application-consistent copies of Microsoft® Exchange, SQL Server®, SharePoint® and Oracle, and prove recovery for defined service levels. User roles enable self-service copy management, while improving visibility for all application recovery points. Alerts are generated automatically, enabling fast resolution to recovery gaps. Integrated reporting enables customers to prove compliance with protection policies.



### Application Integration

- Automate copies
- Identify recovery gaps
- Prove compliance

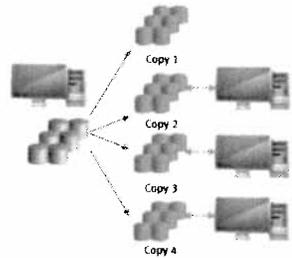


Figure 5. Automate application copies and prove protection compliance

## VNX SERIES SOFTWARE SUITES

The VNX series has simple and attractively priced software packs and suites offering customers maximum application performance as well as local and remote protection for assured application recovery. Increase productivity with copies of production data for repurposing activities. Prove compliance with application protection policies and enhance data security. Suites can be purchased individually for any VNX family systems or bundled into comprehensive packs. All software is managed through VNX's easy-to-use interface, EMC Unisphere.

VNX Packs	VNX Suites	Function	
VNX Total Efficiency Pack*	<b>FAST Suite</b> Automatically optimize for the highest system performance and the lowest storage cost simultaneously.	Dynamically tier data across drives Extendable cache for performance boost Trend analysis and reporting Monitor and achieve performance objectives	
	<b>Security and Compliance Suite</b> Keep data safe from changes, deletions, and malicious activity.	Encrypt data where it is created Disk-based WORM functionality Anti-virus integration and alerting	
	Total Protection Pack	<b>Local Protection Suite</b> Practice safe data protection and repurposing.	DVR-like recovery for block storage Block storage snaps and clones File system snaps
		<b>Remote Protection Suite</b> Protect data against localized failures, outages, and disasters.	Unified storage replication with DVR-like recovery Integrated WAN deduplication and bandwidth reduction Granular file system level replication and recovery
<b>Application Protection Suite</b> Automate application copies and prove compliance.		Application copy management Prove protection compliance	

\*The VNX5100 offers the Total Value Pack, which includes the Protection Pack as well as the Security and Compliance Suite. The FAST Suite is available for purchase separately on the VNX5100.

Figure 6. Simple and easy software packs for maximum IT efficiencies

## 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](http://www.EMC.com).

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