

EMC VNX FAMILY

VNX2 unified storage, optimized for virtualized applications

ESSENTIALS

- Unified storage for **file, block, and object** storage
- MCx™ multi-core optimization **unlocks the power of flash** in a hybrid flash array
- Powerful new **multi-core** Intel CPUs with 6-Gb/s SAS backend
- FAST Suite ensures **superior performance at the lowest cost**
- Controller based encryption for Data at Rest Encryption with embedded key manager
- Easy storage provisioning from the **#1 provider** of VMware® integration* and the **1st storage platform** to support Microsoft Server 2012 Hyper-V 3.0 environments
- Dense configurations with 120 drives in 3U of space
- **Administration simplicity** with EMC Unisphere™ Management Suite
- Drive level encryption for the entire array with **Data-at-Rest Encryption**
- VNXe3200 is the most affordable flash-optimized hybrid flash array **starting at less than \$12K**

* Source: Wikibon survey, 2011, 2012, 2013

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 VNX2 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.



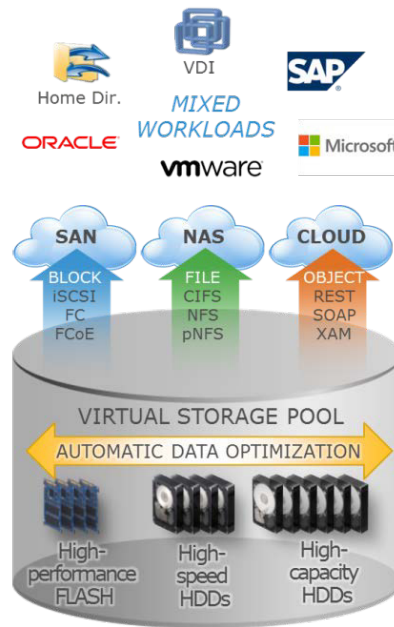
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DATA SHEET

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POWERFUL, EFFICIENT, PROTECTED, AND SIMPLE

A robust platform for consolidation of legacy block storage, file servers, and direct-attached application storage, the VNX family enables organizations to dynamically grow, share, and cost-effectively manage multi-protocol file systems and multi-protocol block storage access. The VNX/VNXe 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 (FCoE is VNX only) access for high-bandwidth and latency-sensitive block applications. EMC ViPR™ provides federated management and object interfaces to VNX storage for a variety of cloud frameworks.



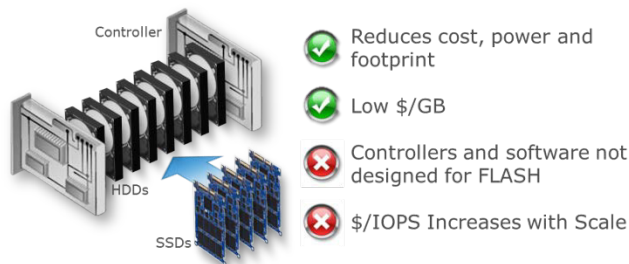
Ideal for mixed workloads, both physical and virtual, The VNX family VNX2 storage platform is powered by the latest Intel Multi-Core Xeon E5-2600 series with a 6-Gb/s SAS drive back-end and delivers more firepower, greater efficiency, and better protection – all with ease.

FLASH-OPTIMIZED TO BOOST SYSTEM PERFORMANCE

The VNX family enabled with MCx (multi-core optimization) unleashes the power of Flash to address the high performance, low latency requirements of virtualized applications.

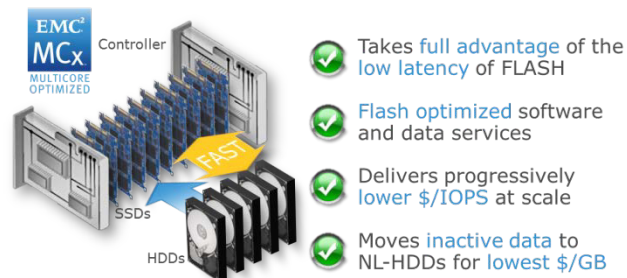
The traditional approach to building a hybrid array entails adding flash drives to a traditional hard disk based array. This approach allows for consolidation of multiple workloads and deliver low \$/GB. However, since the system was not designed for flash, it limits the scalability and increases the cost.

The Traditional Hybrid Array



A better option is the VNX family Flash Optimized hybrid array design. By designing the system for Flash, bottlenecks are eliminated to deliver the highest performance and the lowest latency. Then, by adding FAST VP™ tiering and high capacity NL-SAS drives, you can drive down costs for inactive data.

The VNX FLASH Optimized Hybrid Array



In addition, VNX-F all-flash configurations deliver consistent performance and low latency for application environments that require the lowest \$/IOPS. MCx (Multi-Core RAID, Multi-Core Cache and Multi-Core FAST Cache) distributes all VNX data services across all cores – up to 32 (in the VNX8000). This approach delivers unprecedented application performance while maintaining affordable pricing: Compared to the previous generation, the VNX family with MCx delivers:

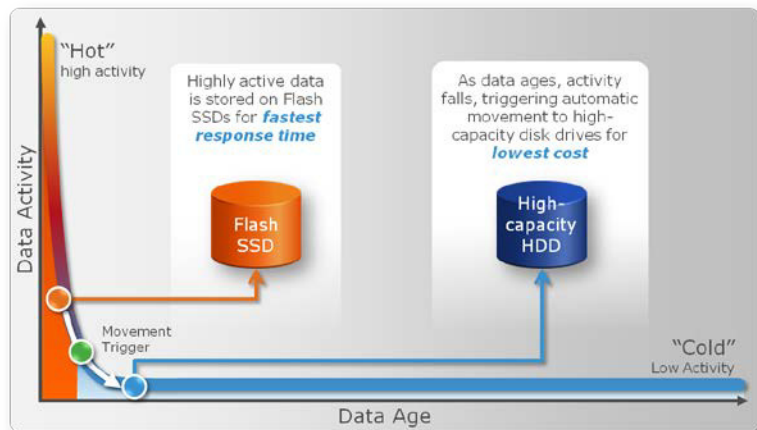
- Up to 4X more file transactions (580,796 SPECsfs2008 nfs Ops/Sec)*
- Up to 4X OLTP transactions (735K concurrent Oracle and SQL OLTP IOPS)**
- Up to 6X more virtual machines (6,600 VMs)
- Up to 3X more bandwidth for Oracle and SQL data warehousing (30GB/sec)
- Up to 3X performance for transactional NAS applications (such as VMware over NFS) with 60% faster response time

* Source: www.spec.org

** Source: Demartek

USE STORAGE CAPACITY MORE EFFICIENTLY—AUTOMATICALLY

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 1st strategy.



FLASH 1st, available only through EMC, ensures customers never have to make concessions for cost or performance. Highly active data is served from up to 4.2 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) automatically tiers the data from high-performance to high-capacity drives in 256 megabyte increments, resulting in overall lower costs—regardless of application type or data age.

While only a few flash drives (typically less than 5%) are needed for improving performance and lowering cost. We encourage customers to use increased amounts of flash in order to deliver more IOPS. Other efficiencies customers can leverage in combination with flash include block deduplication, thin provisioning, and compression.

With further development of the VNX EMC now offers a VNX-VSS which covers video surveillance needs. This solution has been tested and validated with industry-leading video management software and is simple with automated configurations and load balancing. With highly resilient architecture and built-in features that prevent accidental, premature, or malicious alteration of video data you can trust your data is secure and available.

CONTINUOUS AVAILABILITY TO KEEP THE BUSINESS RUNNING

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

- 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
- RAID protection levels 0, 1, 1/0, 3, 5, and 6—all of which can co-exist in the same array simultaneously to match different protection requirements
- Proactive hot sparing enhances system robustness and delivers maximum reliability and availability
- Redundant data paths, power supplies, drive connections, and storage processors—all with non-disruptive field-replacement capabilities
- Continuous system monitoring, call-home notification, and advanced remote diagnostics
- VNX Series Data-at-Rest encryption (Q3 2014) provides protection from drive removal or loss, and can eliminate the need for Data Erasure services.
- EMC VPLEX® extends this continuous availability within and across data centers. In addition the VPLEX/VE Standard Edition offers improved availability and mobility for VNXe.

Complete Portfolio of Protection for VNX

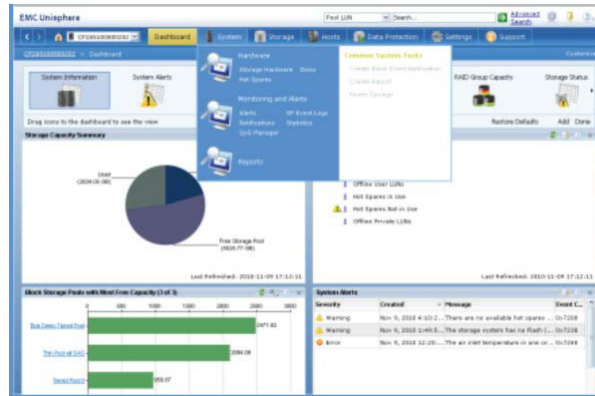


EMC VNX family data protection software provides the right protection for every application need:

- VNX/VNXe local protection is delivered with snapshots for point-in-time recovery. VNX series delivers continuous data protection with RecoverPoint local replication
- VNX series remote protection is available with the same DVR-like recovery with RecoverPoint Continuous Remote Replication
- To make application consistent replicas controlled by the application, Replication Manager and AppSync™ provide application protection for VNX series – delivered as a service

EMC Backup and Recovery solutions, including Data Domain, Avamar®, and Networker®, shorten the backup window and speed recovery in concert with deduplication to reduce the backup size.

MANAGE, MONITOR, AND TUNE YOUR STORAGE ASSETS WITH EASE



Whether your environment is virtual or physical EMC offers intuitive management tools to manage, monitor, and tune your storage assets with ease.

Unisphere make is easy to manage VNX and VNXe 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 their environment.

Unisphere Central allows VNX and VNXe users to monitor health, alerts, and performance across multiple VNX's, VNXe's and XtremCache deployments through a central console.

Monitoring and Reporting automatically collects block and file storage statistics along with configuration data, and stores them into a database that can be viewed from dashboards and report.

Unisphere, Unisphere Central, and Monitoring and Reporting are included in the Unisphere Management Suite for VNX and the base software for VNXe.

The VNX family is the ideal system for virtualized application environments offering integration and support. EMC VNX is the #1 provider of VMware integration and the 1st storage platform to support Microsoft Server 2012 Hyper-V 3.0 environments.

EMC Virtual Storage Integrator (VSI) for VMware vSphere™ plug-ins, VASA (vSphere API for Storage Awareness) and VAAI (vStorage APIs for Array Integration) provides visibility into both the storage and virtual environment.

EMC Storage Integrator (ESI) is a free plug-in enabling application aware storage provisioning for Microsoft Windows server applications, Hyper-V, VMware and XEN Server environments. This wizard driven tools allows for easy provisioning in a Windows environment for physical and virtual environments.

The **EMC Storage Analytics (ESA)** tool is powered by the VMware vRealize Operations™ analytics engine that delivers actionable performance analysis and proactively facilitates increased insight into storage resource pools to proactively detect capacity and performance issues.

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 series software is also available in modular suites:

- **FAST Suite**—Automatically optimize for the highest system performance and the lowest storage cost, simultaneously
- **Events and Retention 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
- **Unisphere Management Suite** – Monitor and manage multiple VNX systems with full visibility across the virtual stack.
- VNX Series **Data-at-Rest encryption** provides protection from drive removal or loss, and can eliminate the need for Data Erasure services

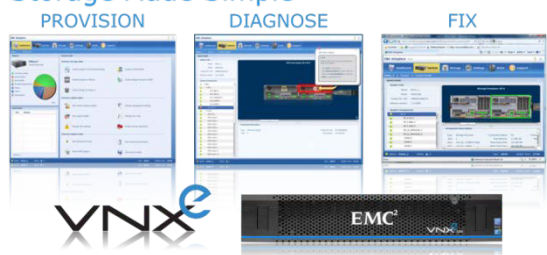
VNX Series Packs		VNX Series Suites
VNX Total Efficiency Pack	VNX Total Protection Pack	FAST
		Events & Retention
		Local Protection
		Remote Protection
		Application Protection

Features of Suites and Packs may vary depending on the system. See the [EMC VNX Series Software Suites data sheet](#) for details.

THE MOST AFFORDABLE HYBRID STORAGE

The newest member of the EMC VNXe Series is the most affordable flash optimized hybrid array – and it’s also the most capable. The new VNXe3200™ has the power of EMC’s next generation VNX series unified storage systems - compressed into an efficient, easy-to-use package designed for resource-constrained IT departments in any size company. Starting at less than \$13K, the VNXe3200 is the most affordable flash-optimized hybrid array.

Storage Made Simple



The VNXe3200 can be setup for NAS or SAN in minutes and is designed to integrate directly into your application and virtualization environments. It stores and protects your data while lowering your total costs in terms of \$/IOPS and \$/GB. The VNXe3200 was also designed for 99.999% availability utilizing dual controllers, flexible RAID options, and non-disruptive upgrades.

VNXe SOFTWARE OPTIONS

Every VNXe unified storage platform comes with base software, 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, NFS, iSCSI, and FC. The VNXe3200 now includes snapshots for local data protection without additional licensing charges.

VNXe3200	Description
VNXe Base Software	<ul style="list-style-type: none">• VNXe Operating Environment• Unisphere Web-based Management Interface• Integrated Online Support Ecosystem• Protocols: file (NFS, CIFS, SMB3) or block (iSCSI or FC)• Unisphere Central (multi-system, multi-site)• Monitoring & Reporting (performance tools)• Unified Snapshots (file and block)• File Deduplication & Compression• Thin Provisioning• Event Enabler (common Anti-Virus)• File Level Retention
EMC Storage Analytics	<ul style="list-style-type: none">• Powerful reporting and analytics tools for VMware• vRealize Operations Manager, EMC Adapter for VNXe
FAST Suite	<ul style="list-style-type: none">• FAST VP – autotiering for reduced cost, higher perf• FAST Cache – SSD as extended cache for 3X boost
Remote Protection Suite	<ul style="list-style-type: none">• Native block asynchronous replication- based on VNX snapshot technology
RecoverPoint Advanced Protection	<ul style="list-style-type: none">• Virtual RPA or hardware appliance options

[See the EMC VNXe Series Software Suites data sheet for details.](#)

FLEXIBLE DEPLOYMENT OPTIONS – VSPEX AND VBLOCK

All EMC VNX platforms are available individually or as part of VSPEX™ proven infrastructure or VCE Vblock® converged infrastructure. Both VSPEX and Vblock speed cloud deployments with integrated servers, storage, network, hypervisor, and management in a proven configuration.

MAXIMIZE THE BENEFITS OF THE VNX FAMILY WITH EMC GLOBAL SERVICES

EMC VNX platforms come standard with a three- year Enhanced support warranty, which provides customers with next business- day onsite coverage and 24x7 remote support. Customers have the option to upgrade to Premium support to receive 24x7 same-day onsite support.

Outside of support EMC delivers a full complement of services for the VNX family which include expert planning, design, implementation, consulting, migration and education. Please contact your account team for further information.



store.emc.com/vnx

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Published in the USA. 1/15 Data Sheet H8520.13

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