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NST5000™
HYBRID
STORAGE
SYSTEMS

Hybrid Storage for NAS and iSCSI.

OVERVIEW

The NST5000 Hybrid Storage systems deliver solid-state enhanced NAS and iSCSI storage for unprecedented levels of performance at the price of spinning disk. The NST5000 is highlighted by FASTier™ software technology that automatically and intelligently leverages the speed of solid-state to accelerate the underlying spinning disks for up to 10X performance over traditional disk-only storage. The result is a radical new cost-per-I/O that allows organizations to go further in their virtual and cloud environments.

For organizations struggling to meet both high performance and high capacity NAS or iSCSI application requirements, the NST5000 makes that easy with a hybrid of solid-state accelerated SATA. For applications with the most stringent workload requirements like server virtualization, desktop virtualization (VDI), databases and cloud computing. The NST5000 hybrid of solid-state accelerated SAS delivers unparalleled performance to ensure application demands never outpace available I/O again. Your applications will have never performed faster on a system operating at the economics of spinning disk storage.

The NST5000 is fully featured with snapshots, replication, thin provisioning and much more. A revolutionary GUI streamlines setup and management for the time-constrained IT administrator. As with all Nexsan storage, the NST5000 with E-Series disk arrays offers industry-leading density and power management for the smallest footprint with up to 60 disks in 4U, while consuming 85% less power when idle via AutoMAID® power saving technology. A no single point-of-failure architecture ensures the ultimate in reliability. The net of all this performance and functionality is a true enterprise-class solution without the enterprise-class price.

INTRODUCING FASTier™

Nexsan's proprietary FASTier™ acceleration technology uses multiple types of solid-state memory, including both DRAM and SSD to optimize block & file operations in a fault tolerant architecture. FASTier can scale from 100GB to 2.8TB - large enough to hold entire working sets for unprecedented application acceleration. Automatic caching algorithms remove the need for manual intervention or application-specific tuning. Whereas traditional disk storage is hard pressed to meet high I/O requirements and SSD-only arrays have a very high cost with limited capacity, Nexsan's Hybrid Storage realigns the trade-off between performance, capacity and cost so IT administrators can do more than ever before.

DATA SHEET

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- iSCSI block and NFS/CIFS shared folders
- FASTier™ acceleration technology
- Snapshots
- Asynchronous replication
- Synchronous replication
- Quotas and thin provisioning
- Online capacity expansion
- Enterprise-class reliability and fault tolerance
- Hot-swappable active components
- Utilize SSD, NL-SAS, SAS and SATA drives
- Active Directory, LDAP, iSNS and CHAP integration
- Industry-leading efficiencies with 60 disks in 4U storage arrays and up to 85% energy savings

TECHNICAL SPECIFICATIONS

- Dual redundant storage controllers
- 93TB maximum capacity for NST5100
- 720TB maximum capacity for NST5300
- 1080TB maximum capacity for NST5500
- RAID 5, 6 and 10
- 1 / 2 / 3 TB 7200 RPM NL-SAS or SATA drives
- 450 / 600 GB 15K RPM SAS drives
- Ethernet ports: up to (4) 1Gb plus (8) more 1Gb or (4) 10Gb per system

For a full listing of technical specifications, www.nexsan.com

NST5000 PRODUCT FAMILY

All NST5000 storage systems utilize SSD, NL-SAS, SATA or SAS drives; two redundant, high performance, multi-core Xeon-based storage controllers; high speed I/O subsystems and a fully redundant architecture. All active components are hot-swappable, including power supplies, disks and controllers. FASTier read and write cache complements up to 96GB of RAM per controller to significantly accelerate IOPS and throughput. The NST5000 features up to 24 Xeon CPU cores and 192GB of DRAM, up to 12 dedicated RAID engines, up to 1PB of capacity and up to 2.8TB of SSD in FASTier cache. The NST5100 delivers up to 15 drives and two optional FASTier SSDs in a 3U chassis, and up to 16 more drives in a 3U drive expansion chassis, for a total raw capacity of up to 93TB. For larger capacity needs, the NST5300 houses up to 16 FASTier SSDs in a 3U chassis while leveraging Nexsan E-Series™ disk arrays on the backend, which deliver up to 240 drives in just 19U, while the NST5500 delivers up to 360 drives in just 27U.

The NST5000 provides CIFS and NFS shared folders as well as iSCSI volumes. Snapshots do not require the pre-reservation of storage capacity, and they may be scheduled and managed easily from the management GUI or initiated from Windows VSS requestors.

Individual shares, LUNs, or entire storage pools may be replicated asynchronously to a second NST5000 storage system, with snapshots intact for use on the target side for backups, testing or data mining. Synchronous replication utilizes two separate E-Series storage systems connected via Fibre Channel to the NST5000 head and written to simultaneously for business continuity. Active Directory and LDAP integration make it easy to manage user identities and access rights on the NST5000 shares, while CHAP, iSNS and LUN masking protect iSCSI traffic. Quotas limit storage consumption by share, and oversubscription is permitted for thin provisioning storage, along with alarms which notify when additional storage is needed. Capacity can be expanded by adding additional storage to a running system, so future needs can be met without incurring downtime. Moreover, link aggregation combines Ethernet ports for faster throughput.

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ENTERPRISE-CLASS FEATURE SET

NAS (CIFS and NFS) Services	Shared Folders can be accessed through CIFS, NFS or both. FTP services are also provided.
iSCSI Block Services	iSCSI volumes can be provided to physical or virtual servers for direct-attached or SAN connections.
FASTier™	DRAM & Flash SSD technology is used to accelerate read and write IOPS and throughput. FASTier works transparently so there is no administration burden to turbo-charge I/O performance. FASTier is especially useful for random I/O workloads such as databases or for VMware, Xen or Hyper-V environments.
Online Capacity Expansion	Add additional hard drives to any storage pool to increase its capacity on the fly without impacting active clients. I/O will automatically be balanced across all drives by the NST5000.
Snapshots	There is no performance penalty for taking snapshots. Up to 2048 snapshots are supported. Storage does not need to be reserved to hold snapshot data. The management GUI makes it easy to setup and manage snapshot creation and deletion schedules. Snapshots are mountable for testing or other purposes. Granularity is per pool, per share, or LUN.
Asynchronous Replication	Asynchronous replication is WAN efficient because it only transmits delta blocks to the destination side. All snapshots taken on the source side are available on the destination side for backups, data mining or testing purposes. Granularity of replication is a storage pool, a share, or a LUN.
Synchronous Replication	Synchronous replication places two E-Series storage systems under the NST5000 head, each connected via Fibre Channel. Writes are acknowledged after they are simultaneously placed onto both E-Series, so they are always identical. Together with failover/failback support, synchronous replication provides the utmost in business continuity.
Quotas / Thin Provisioning	More storage can be allocated than actually exists in the system – referred to as oversubscription. Alarms warn of limits reached, so storage can be added.
Link Aggregation	IEEE 802.3ad link aggregation allows multiple Ethernet ports to be combined for faster throughput.
Data Protection Suite	Provides NST5000 with snapshot and replication capabilities.
Performance Enhancement Packages	Increase the memory to 48GB per controllerand add a second Xeon multi-core processor in a NST5300 or increase the memory in the NST5500 to 96GB per controller.

ENTERPRISE-CLASS PERFORMANCE AND RELIABILITY

Drive Types	The NST5100 utilizes SSD, SAS 15K RPM or NL-SAS 7200 RPM drives to meet varying storage needs. The NST5300 and NST5500 models store their data on E-Series disk arrays, which support mixing and matching SSD, SAS 15K RPM and SATA drives.
Drive Stress Tests	Stringent drive stress tests ensure that only the best quality drives go into Nexsan storage systems.
System Drive Tests	Drives are tested in the storage system prior to being shipped to a customer, to ensure top quality and ongoing reliability, then removed and packaged for shipment.
Anti-Vibration Design	State-of-the-art anti-vibration dampening maximizes reliability and performance in the high density E-Series disk arrays that are utilized by the NST5300 and NST5500.
Cool Drive Technology™	Push/pull fans modules and specially designed air channels optimize drive cooling and reliability of the high density E-Series disk arrays that are utilized by the NST5300 and NST5500.
Dual Storage Controllers	Dual controllers provide a no single point-of-failure solution. Should one controller fail, the second will perform all of the I/O operations as well as utilize its I/O ports for connection to external storage.
RAID	RAID 5/6/10 are provided to protect against a single drive failure or two drives failing at the same time.

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ENTERPRISE-CLASS PERFORMANCE AND RELIABILITY Cont.

High Availability	All active components are redundant and hot-swappable including power supplies, disks and controllers.
NST5500 and NST5300 Controller I/O Ports	Each NST5300 or NST5500 storage controller provides (2) to (6) 1Gb Ethernet ports, (2) optional 10Gb Ethernet ports; as well as (2) to (6) 8Gb Fibre Channel ports for connection to the E-Series disk arrays.
NST5100 Controller I/O Ports	Each NST5100 storage controller provides (2) to (6) 1Gb Ethernet ports, (2) optional 10Gb Ethernet ports, as well as a 24Gb SASx4 port to the NST5100X expansion chassis

POWER AND SPACE EFFICIENCY

Industry-leading Storage Density	The NST5100 delivers up to 32 drives in 6U of rack space, providing an industry-standard 5 drives per U of storage density. The NST5300 delivers up to 240 drives in 19U of rack space, while the NST5500 delivers up to 360 drives in 27U, providing an industry-leading 13 drives per U of storage density.
AutoMAID® Power Management	In the NST5300 and NST5500, each RAID set can have its drives progressed into deeper power saving levels when they have not been accessed for a specified period of time, saving up to 85% in power in the disk array. No changes need to be made to applications to get the advantages of AutoMAID.

EASY TO MANAGE

Quick Start wizard	Get the storage system up and running in 15 minutes or less.
Easy to Manage	A revolutionary GUI design makes it easy to set-up, manage and monitor the storage system. Wizards guide the IT generalist through setup, share and LUN creation and management, snapshots, volume management, replication, clustering, user management and security and setting up alerts.
Web-based Management	A Web server residing in the storage system presents the management GUI in a Web browser. Administer storage systems remotely. There is no need to install management software on a client computer and keep it updated. Use Windows Computer Manager to manage Share/Folder/File permissions for users and groups as well as LUNs.
Single Pane-of-Glass Management	Remotely manage one or many systems. Nexsan storage systems find each other, and appear in the management console, which displays their health using red/yellow/green indicators. Easily move between systems to administer them.
Automatic RAID Set Maintenance	In the event of a drive failure, spare drives are automatically added to a RAID set and a RAID set rebuild is run – all without any manual intervention being required.
Alerts	Alerts are sent via SNMP or email and are stored in system log files. They are transmitted to the Web browser-based management console.
NTP client	Network Time Protocol client relieves the administrator from having to set, adjust and synchronize clocks across systems.
NDMP V4	Backup with popular backup and restore solutions through the industry-standard NDMP V4 interface or backup LUNs using any popular backup and restore applications. NDMP V4 preserves all access rights for CIFS and NFS shares, and uses background snapshots for fast backups.
Role-based Administration	Storage system administrator can grant limited rights administrators per storage pools. These administrators can create, manage and delete shares and LUNs, perform snapshots and replication, and manage share-level access permissions.
Data Migration Tools	Helps to move data between storage systems.
Active Drawer Technology™	Active drawers hold the drives to enable easy, hot-swappable management of extreme density without heavy lifting or having to power down the NST5300 or NST5500 storage system. On the NST5100, the drives are front-accessible.

NOTE: NSTXX10 is NAS only
NSTXX20 is iSCSI only
NSTXX30 is iSCSI and NAS