

# Storageflex

NETWORK DATA STORAGE SOLUTIONS

## Storageflex HA3969 Storage Solution: Optimized Efficiency for SMB Datacenters

White paper

**Abstract** This document introduces Storageflex's HA3969 systems and analyzes the key features that make them ideal solutions for storage infrastructure consolidation, high-availability clusters, server virtualization and green datacenters

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## **HA3969**

The HA3969 storage solution features advanced hardware design and provides comprehensive data services at affordable price points, making it an ideal storage solution for small and medium businesses (SMBs).

HA3969 provides excellent data protection to ensure the highest data availability for the storage area network (SAN) and direct attached storage (DAS). Combined with modular architecture, thin provisioning, easy and intuitive management and exceptional price-performance, HA3969 brings price-conscious businesses a decisive competitive edge by making IT efficiency keep up with growing storage needs.

For more information about Storageflex's HA3969 storage systems, please visit our website: <http://www.storageflex.com>

## **HA3969 Storage System Features**

### ***High Availability***

The HA3969 storage solution features high-availability hardware design with redundant, hot-swappable hardware components, such as RAID controllers, power supplies and cooling fans, to eliminate single-point-of-failure. Hardware RAID protection ensures data accessibility during drive failure. In the event of a power outage, Cache Safe technology will automatically leverage power of the Battery Backup Unit (BBU) to safeguard cached data by writing it to a flash module for permanent retention.

To protect valuable data sets against more critical threats, HA3969 supports storage-based snapshot, volume copy/mirror and remote replication. Data availability can be achieved with minimal downtime in case of human errors or data volume failure by employing these features.

### ***Outstanding Price/Performance***

Leveraging Storageflex's RAID engine, HA3969 storage solution delivers breakthrough performance for demanding business applications. The models supporting Small Form Factor (SFF) drives can further increase performance density to support highly I/O-intensive applications.

### ***Flexible Scalability***

The HA3969 storage solution supports dynamic scaling to aid in the planning for future storage growth while satisfying current storage needs. Flexible drive type and capacity support (2.5-inch or 3.5-inch, 6Gb/s SAS drives and near line SAS drives, various drive sizes) allows users to meet current needs while accommodating support for tomorrow's applications. The HA3969 storage solution can be expanded to more than one hundred drives to meet the proliferation of storage growth. The "scale as you grow" flexibility of the HA3969 storage solution minimizes the upfront investment and provides the best overall Total Cost of Acquisition (TCA).

### ***Intuitive and Easy Management***

Storage management should be simple. The HA3969 storage solution includes a comprehensive management software suite, SANWatch, to centrally manage multiple HA3969 subsystems over a standard TCP/IP network. HA3969 status and event information summary can be viewed on the portal window. Necessary functions to configure, manage and monitor the HA3969 are only a few clicks away. Besides providing all firmware features through a user-friendly GUI, SANwatch also supports script-based configuration of multiple HA3969 systems simultaneously. Automatic critical event notifications can be customized to suit the most critical storage environment. SANWatch will guide users through initializing, configuring and maintaining the HA3969 every step of the way.

## Efficiency: the Key to Next-Generation Datacenters

In today's uncertain economy, worldwide businesses, whether big or small, are facing a similar IT challenge: how can they manage exponentially growing data with limited IT budgets? Implementing datacenter transformation is a necessity, and efficiency is the key to the transformation.

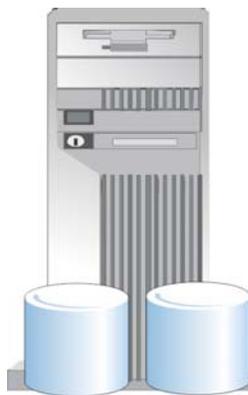
Centering on the concept of efficiency, Storageflex has been developing advanced storage solutions to serve as powerful building blocks of next-generation datacenters. By making data centers more simple, agile and intelligent, Storageflex storage solutions facilitate IT investment to create maximized value with minimized management overhead.

## HA3969 for Storage Infrastructure Consolidation

Storage infrastructure consolidation, also known as data consolidation, is the foundation of IT infrastructure consolidation. Put in the simplest way, it means consolidating data for single point access. Storage infrastructure consolidation often starts from consolidating internal DAS into external DAS, and then external DAS into SAN.

### ***Internal DAS to External DAS***

In a distributed datacenter at the primary stage, every server stores data on its internal drives.



**Internal DAS**

In the first stage of consolidation, the server islands are consolidated to share capacity of external DAS. The number of servers allowed to share the storage depends on the number of ports the storage provides. The number is often less than four.



**External DAS**

### ***External DAS to SAN***

In the second stage of consolidation, several external DAS storage systems are further consolidated into a SAN. With one or multiple switches in-between, the network of storage devices can be shared by a large number of servers as long as users have enough switch ports. Users often determine the best deployment based on their evaluation of applications' performance and capacity demands.



**SAN**

### ***Consolidation Benefits***

The most significant advantages of consolidated storage infrastructure are better resource utilization, higher scalability and easier management.

Compared with SAN, external DAS is based on simpler topology. It therefore is easier to deploy and requires less initial cost. However, in terms of resource utilization and management efficiency, SAN is a better choice.

### ***HA3969 Solution: External DAS***

Users who wish to implement external DAS can choose HA3969 SAS- or Fibre Channel (FC)-host systems. The SAS-host systems provide single-controller and redundant-controller models, with each controller providing two multi-lane 6Gb/s or 3Gb/s SAS host ports. The models support either 2.5-inch or 3.5-inch SAS drives. Through expansion enclosures, they can be scaled up to 240 drives.

The HA3969 Fibre-host systems also provide single-controller and redundant-controller models, and support either 2.5-inch or 3.5-inch SAS drives. Each controller provides up to four 8Gb/s or 16Gb/s FC host ports. Through expansion enclosures, they can be scaled up to 144 drives.

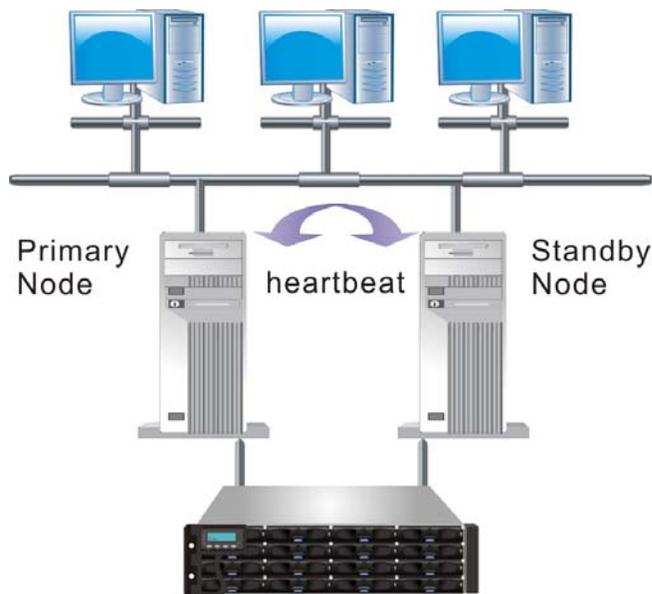
### ***HA3969 Solution: SAN***

Users who wish to implement SAN can choose HA3969 iSCSI-host systems for IP SAN or FC-host systems for FC SAN. Performance of IP SANs is not as strong as FC SANs, but they feature a lower total cost of ownership (TCO) and require less management expertise.

The HA3969 iSCSI-host systems provide single-controller and redundant-controller models, and support 2.5-inch or 3.5-inch SAS drives. HA3969 iSCSI-host models also support link aggregation and jumbo frame features to help users optimize performance. The systems feature up to six 1GbE iSCSI ports on each controller. Through expansion enclosures, the iSCSI-host models can be scaled up to 240 drives.

## HA3969 for High-Availability Clusters

High-availability clusters are often implemented to provide high service availability for mission-critical applications. Two-node configurations are the most common in high-availability clusters. The two servers can be configured as Active/Active or Active/Passive. With constant heartbeats, one node can immediately take over applications hosted on the other node when it fails. The failover operation requires no administrative intervention and is transparent to clients.



**High-Availability Clusters**

### ***HA3969 Solution***

High-availability clusters can satisfactorily support mission-critical applications only when they are complemented by high-availability storage. Although all HA3969 storage systems are based on high-availability architecture, FC-host and iSCSI-host systems are better suited for high-availability clusters since they can be more widely shared among servers when configured into SAN infrastructure. Users can choose among the two types of host connectivity based on their data demands.

Both HA3969 FC-host systems and iSCSI-host systems support clustering. By configuring multi-pathing for redundant-controller models, users can achieve no-single-point-of-failure, fault-tolerant capability throughout data paths.

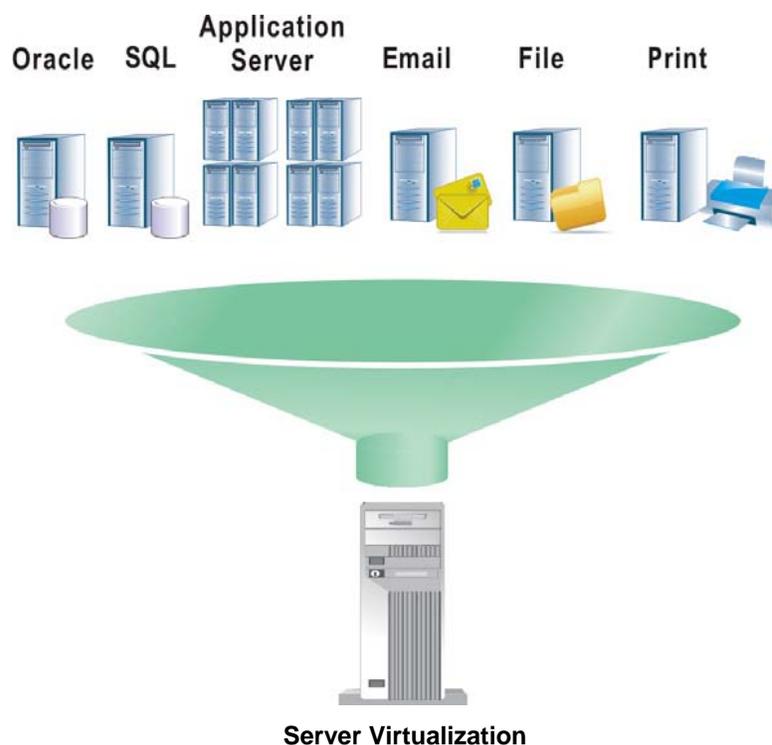
The systems allow users to implement RAID technology and data protection features including snapshot and volume copy/mirror. In the easy-to-use GUI of SANWatch, users can non-disruptively execute and even automate data protection for mission-critical applications such as Microsoft SQL, Microsoft Exchange and Oracle database. With the multiple levels of

protection, valuable data sets can remain intact regardless of physical or logical errors.

Many of the HA3969 FC-host and iSCSI-host systems come with Cache Safe technology. During a power outage, the technology can ensure the integrity of cached data by writing this data into a flash module for permanent retention.

## HA3969 for Server Virtualization

Server virtualization is a technology to abstract server resources from the physical machine so that the resources can be shared among multiple virtual machines hosting different OS and applications on a single server. VMware and Microsoft Hyper-V are key providers of server virtualization technology.



### ***Server Virtualization Benefits***

Through server virtualization users are able to more flexibly allocate server resources for applications and in turn better utilize available computational power and capacity. Along with the decreasing number of required physical servers, users enjoy significant benefits such as a smaller energy footprint and easier management. These benefits have made server virtualization prevalent in companies of all sizes to drive IT consolidation.

### ***HA3969 Solution***

Most HA3969 Fibre-host and iSCSI-host systems are tested compatible with VMware and

Hyper-V. Besides compatibility, HA3969 storage systems are also designed to deal with the challenges server virtualization presents to storage infrastructure, including capacity management, scalability, data protection tasks and troubleshooting.

Supporting non-disruptive LUN expansion, HA3969 allows users to scale data volumes as needed. To further simplify capacity management, HA3969 supports thin provisioning technology. Just-in-time capacity allocation realized by thin provisioning technology ensures optimized space utilization. When an application's capacity demands exceed what a single storage system can afford, users can scale/ the storage systems up to 240 drives through expansion enclosures. With snapshot, volume copy/mirror and remote replication features, the virtual machines stored in HA3969 storage systems can be soundly protected from storage accidents. Moreover, coming with multiple monitoring methods, including component LEDs, buzzers, event notifications, diagnostic reports and event logs, HA3969 can help users effectively perform error-handling, either pro-active or re-active.

## **HA3969 for Green Datacenters**

Green IT has been a hot topic in recent years. Businesses are working to make their datacenters green, not only out of concern for environmental sustainability but also to comply with newly emerging laws and regulations and maintain corporate reputation. In terms of direct business benefits, green initiatives are especially important in helping companies reduce energy bills.

The first step companies can take to make their datacenters green is using devices with lower energy consumption and cooling requirements. If companies aim to implement green IT in a more fundamental and effective way, they should further perform IT consolidation with the help of virtualization technology. According to VMware, for every server virtualized, customers can save about 7,000 kilowatt hours, or four tons of CO2 emissions, each year.

### ***HA3969 Solution***

HA3969 is an ideal storage solution to support green datacenters since the systems come with comprehensive green designs. The HA3969 models supporting 2.5-inch drives consume 30% to 40% less energy than their counterparts supporting 3.5 inch drives. They also generate less heat and therefore demand lower cooling requirements.

To further reduce drive power consumption, the HA3969 storage systems support intelligent multi-level drive spin-down. Based on user-configurable policies, drives will automatically enter idle or spin-down mode if no I/O activity occurs after a pre-set period of time. The technology has been proven able to save up to 65% of storage power consumption.

To make the storage systems even more energy-efficient, HA3969 features 80 PLUS-certified power supplies delivering more than 80% energy efficiency. By integrating these energy-efficient storage systems into virtualized environments, companies will be able to carry out green initiatives without sacrificing necessary capacity and performance.