

## Ultra-Scalable Storage Provides Low Cost Virtualization Solutions

### *Flexible IP NAS/iSCSI System Addresses Current Storage Needs While Offering Future Expansion*

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According to Whatis.com, storage virtualization is “the pooling of physical storage from multiple network storage devices into what appears to be a single storage device that is managed from a central console.”

### Introduction

Companies are finding it increasingly expensive, time-consuming and difficult to manage the amount of data they generate (analysts estimate that the amount of data companies generate is growing at 60% per year). Faced with these pressures, IT managers need to find more dynamic ways to consolidate, allocate, maintain and secure data storage systems today, while ensuring room to grow in the future.

This white paper examines the benefits of ultra-scalable, low-cost storage virtualization solutions and shows how Globalstor’s ExtremeStor iNAS can fill a key need in these solutions.

### Executive Summary

According to David Hill, founder and principal analyst for Mesabi Group, a leading analyst firm following the storage industry, IT organizations are facing a number of challenges including:

- **Demanding service levels** - More applications run 24x7 with zero tolerance for either unplanned or planned downtime.
- **Management complexity** - Not only are there too many servers, operating systems, storage systems and switching systems, but too many management consoles are required to manage them. This is coupled with budget pressures and staff management issues (such as cross-training, retention, and hiring).

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“Storage virtualization opens a new world of application possibilities.”

-John Webster  
Data Mobility

- **Under-utilized storage assets** - SNIA reports that non-virtualized disk has only a 30% to 50% utilization rate and tape only a 20% to 40% utilization rate. CIOs must dread the question from CFOs, “Now tell me again why you want more storage when ...?” whenever they go to the CAPEX budget well for more storage dollars.

Storage virtualization has evolved specifically to meet these challenges. According to Mesabi Group, the promised benefits of storage virtualization are:

- Improved service levels - significant reduction in both planned and unplanned downtime
- Reduction in management complexity
- Simplification of storage policies and procedures
- Establishment of an architecture for the future that is more scalable, flexible and secure
- Enablement of on-demand dynamic provisioning without disruption
- Improvement of the delivery and quality of services, such as replication and migration
- Improvement of the utilization of storage assets allowing scarce IT funds to be deployed to other pressing demands

In the following sections we will take a look at improved service levels, reduction in management complexity and improvement of the utilization of storage assets; and examine exactly how storage virtualization can deliver these benefits.

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“Storage virtualization has tremendous potential for simplifying storage administration and reducing costs for managing diverse storage assets.”

-Informat.com

## Improved Service Levels

Today, an increasing number of applications run 24x7 and cannot tolerate even limited downtime. A well-planned storage virtualization solution from a vendor such as Globalstor provides:

- Automatic failover
- Automatic allocation of storage resources as needed (no more “disk full” problems)
- Management access from any place, at any time via the Web

## Reduction in management complexity

In today’s multi-vendor storage environments, IT professionals often have to switch between multiple, complex management consoles to keep everything configured and running properly. A good storage virtualization solution, such as Globalstor’s, provides users with a single management console from which they can control all of their storage assets. Storage virtualization solutions also reduce management complexity by allowing IT staff to access, configure and troubleshoot all of their storage assets from anyplace that they have Web access.

## Improved utilization of storage assets

As the statistics we presented earlier showed, most storage assets are greatly under-utilized. Even a small increase in utilization can mean significant savings for an IT organization. But exactly how does storage virtualization increase utilization?

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“Improvement in the utilization of storage assets allows scarce IT funds to be deployed to other pressing demands.”

-David Hill  
Mesabi

Today, many applications have their own dedicated physical storage device, and very few of these applications are using all the physical storage allocated to them. This is most often caused by the tendency to “over buy” capacity so that the physical devices will not have to be replaced with larger devices later. Rather than having individual physical devices dedicated to each application, with Storage Virtualization all of the individual physical storage devices can be made to appear as one or more large virtual drives. Each application is then allocated the storage it needs, and with automatic allocation capabilities no application has to be concerned with exceeding the capacity of a dedicated physical device. Since multiple applications are sharing a pool of devices, utilization of available resources increases dramatically. And if resources start getting tight, Storage Virtualization allows additional physical storage devices to be added without any down-time for the applications.

In the following section we will take a look at ExtremeStor iNAS from Globalstor, a leading provider of storage solutions, and examine how it can help create an ultra-scalable, low-cost storage virtualization solution.

## **About ExtremeStor iNAS**

ExtremeStor-iNAS is an extension of Globalstor’s popular line of ExtremeStor series products that offer small to medium enterprises the flexibility of 12, 16, 24 or 36 bay systems that can be configured with either 250GB or 500GB hot-swappable SATA (Serial Advanced Technology Attachment) hard drives for scalable capacity ranging from 3TB to 18TB of raw storage. The ExtremeStor-iNAS features dual Opteron CPUs for maximized 64-bit computing power, hardware RAID controllers, Web-based GUI for remote management, clustering capabilities with heart-beat failover, snap shots, dynamic volume expansion and limited scalability via on-board dual U320/SCSI I/O connections that ship standard with every unit for additional scalability out the back.

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An INS survey conducted in 2006 reported that 86% of IT professionals are interested in a storage virtualization system.

By integrating dual Opteron CPUs, the ExtremeStor-iNAS ensures maximum computing power over a dual gigabit network interface for more efficient file retrieval. Globalstor also supports 10Gb Ethernet. For ultimate reliability and security, the ExtremeStor product line incorporates a Linux minimized OS on a solid state flash disk and supports encrypted 128-bit Secure Socket Layer (SSL) transportation. For extreme scalability, organizations also have the option of adding Fibre Channel connectivity on specific models.

Well-equipped to safeguard businesses of virtually any size against downtime and critical data loss, ExtremeStor-iNAS includes two to three hot-swappable power supplies, and two to three hot-swappable fans depending on model. RAID support includes levels 0, 1, 5 and 0+1.

## **ExtremeStor iNAS for Storage Virtualization**

The ExtremeStor-iNAS line of NAS/iSCSI server solutions facilitates storage virtualization by easily integrating with existing networks and enabling IT managers to effortlessly consolidate multiple file servers. The low cost-of-entry, backplane compatibility, speed, reliability, scalability and various upgrade options meet today's virtualization requirements while providing an affordable growth path to meet tomorrow's needs as well.

ExtremeStor iNAS reduces storage administrative costs by centralizing storage management. If there is a disk failure of any sort, ExtremeStor's monitoring and management software will immediately notify the administrator of the failure.

In NAS environments, ExtremeStor iNAS can improve overall network performance by reducing the number of server nodes that deliver storage volumes to users on the network. Using ExtremeStor iNAS for virtualization can also reduce backup windows by reducing the number of backup jobs.

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The INS survey indicated that IT managers' primary concerns for a virtualization system are scalability and ease of deployment.

ExtremeStor iNAS improves overall service levels by simplifying the process of adding additional storage. The ExtremeStor-iNAS storage management software eliminates the need to purchase additional licenses and/or hosts to support future storage growth - when more storage is needed, simply attach it.

ExtremeStor iNAS also allows automatic monitoring of storage quotas and can be configured to automatically allocate storage as needed for specific users or applications. This can greatly improve the utilization of storage assets.

## **A Step-by-Step Example of Using ExtremeStor iNAS To Realize The Benefits of Storage Virtualization**

- **The Initial Challenge:** A customer has a production workgroup that uses both Windows and Mac clients. They have a number of disk and tape storage systems installed on a network. The need to create a flexible environment that meets the day-to-day storage needs of the various clients in the production team as well as their backup requirements and positions them for future growth.
- **The Solution:** The customer installs ExtremeStor iNAS on their network and creates two volumes; one for the production workgroup and the other for their backup needs. The production volume is configured as a NAS shared volume. The other volume is being used for iSCSI so that the backup server can use the iSCSI target as a backup device for a disk-to-disk-to-tape solution. The backup server sees the iSCSI target as though it was a local hard drive on that backup system and will ultimately compliment the customer's existing backup solution which consisted of a tape library.
- **The Next Challenge:** After several months in production, the workgroup's backup requirements grew to a point that they needed more space for the disk-to-disk portion of their backup process. The workgroup was also running low on disk space.

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➤ **The Solution:** With the ExtremeStor iNAS already installed, the customer had a number of options that could be easily implemented. The customer decided to add a 4TB SATA-to-SCSI raid array to their existing ExtremeStor iNAS server. On the back of the iNAS server, they have access to two Ultra 320 SCSI ports that they can use to add on additional storage. They added the SATA-to-U320 RAID array on to one of these ports. The customer then rebooted the ExtremeStor iNAS and logged in through Globalstor's web-based storage management system. Using the management system, the customer divided the 4Tb volume into two virtual volumes. One of the volumes was added as a dynamic volume to the NAS volume already being used by the workgroup – doubling their available capacity. The second volume was exported via iSCSI. On the backup server the user converted the first iSCSI target to a dynamic volume. Then they imported the iSCSI target. The original volume was then turned into a spanned volume and the new iSCSI target was added onto the original volume. And most importantly, *the data was never in jeopardy and the customer was able to double their available storage to both the backup server as well as the workgroup.* Using ExtremeStor iNAS and the Globalstor storage management system, this entire process took the customer *less than 10 minutes!*

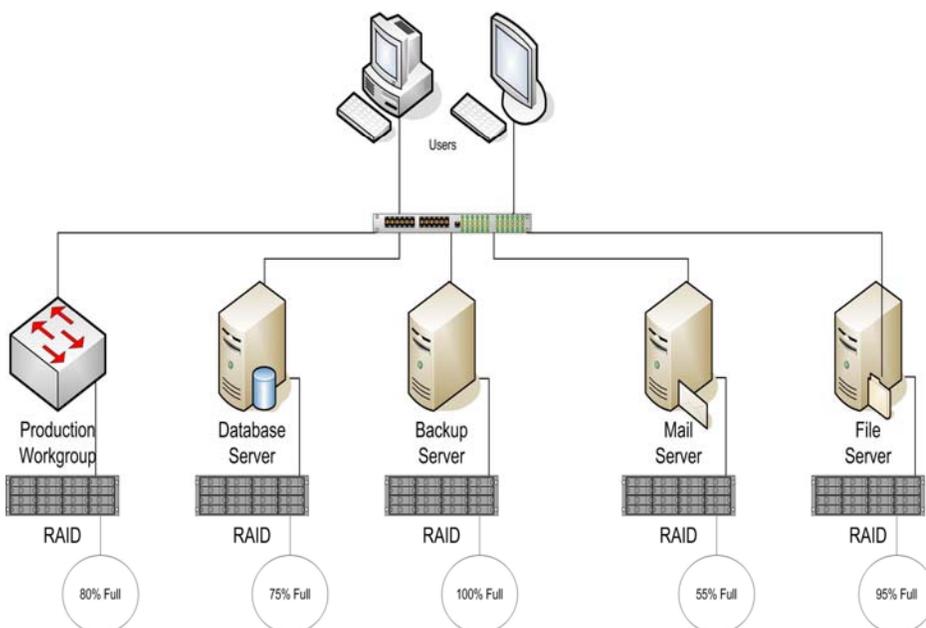
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## Existing Traditional DAS Environments

Storage assets are under-utilized and management of the system is complex.



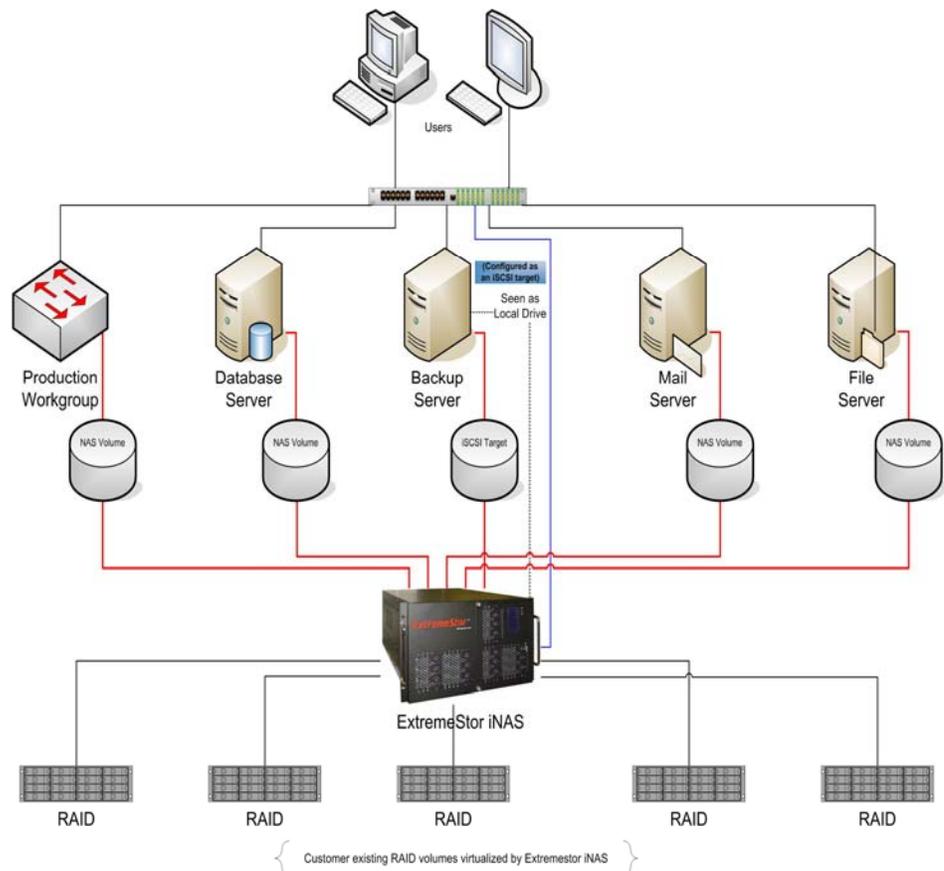
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## Implementation of iNAS Utilizing Existing Customers Storage

Everything is virtualized and centrally managed from one GUI. Once storage is full, expansion is simply done on the fly by connecting additional arrays through the back of the iNAS with no additional license fees to the client.

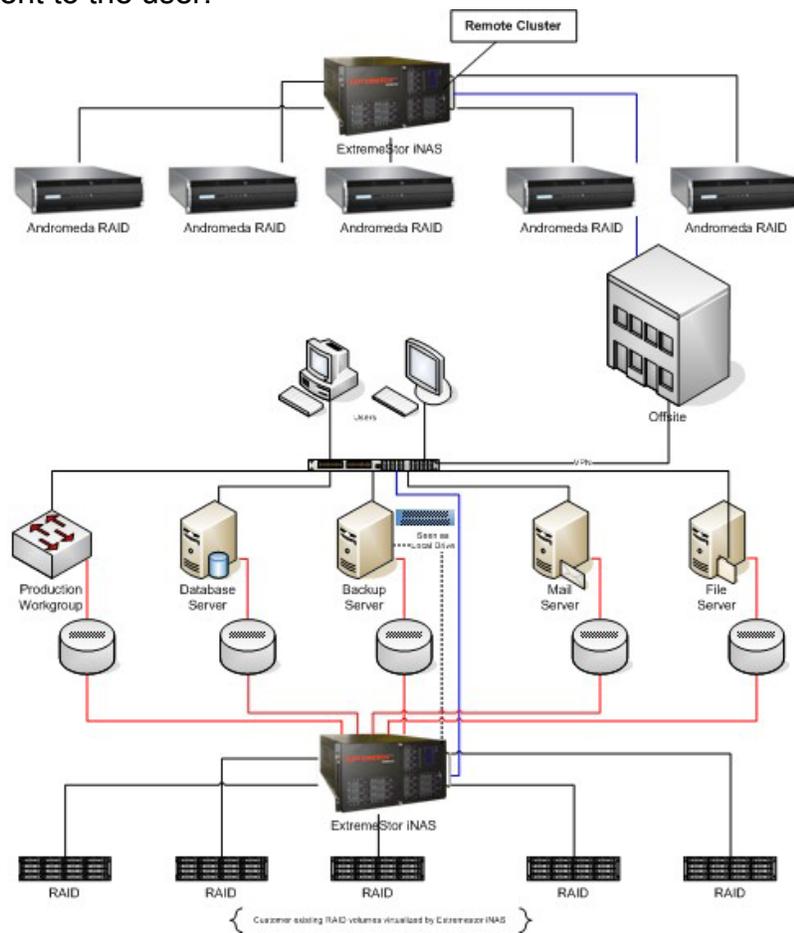


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## Implementation of 2nd iNAS at Off-site Location for an Additional Layer of Redundancy

Now there is a complete second copy of data located on or off-site for Disaster Recovery purposes in a clustered configuration, two iNAS units work in Active – Standby mode while the secondary system continuously makes block level backup copies of primary disks, all in real time. If the primary site fails, then the secondary site takes over the role of the other system providing consistent and stable service, all transparent to the user.



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## Six Questions to ask an iNAS storage vendor

1. What is the vendor's cost per TB?

*Globalstor's answer:* ExtremeStor cost per TB is as low as \$1K.

2. Does the vendor's solution support 10Gb Ethernet?

*Globalstor's answer:* ExtremeStor supports 10Gb Ethernet.

3. Is cluster failover support included?

*Globalstor's answer:* Cluster failover is standard with ExtremeStor.

4. Can the solution import 3rd party iSCSI devices?

*Globalstor's answer:* ExtremeStore can import and virtualize any standard iSCSI device.

5. Does the solution support both iSCSI and NAS simultaneously?

*Globalstor's answer:* ExtremeStor supports both simultaneously.

6. Is the vendor's operating system 64-bit?

*Globalstor's answer:* ExtremeStor's incorporates a 64-bit operating system for improved performance. The 64-bit OS takes advantage of the 64-bit Server architecture used in the ExtremeStor-iNAS. The 64-bit OS boots quicker and the virtualization, replication, cluster and overall storage performance is vastly improved.

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## Next Steps

Experts recommend that companies evaluate their current storage environment to determine if Storage Virtualization can improve efficiency. The following is a summary of some of the steps needed to do an assessment:

1. Take an inventory of all storage assets.
2. List each device, the type of device, its capacity, its current utilization, and space available.
3. Total the capacity and current utilization across all devices to determine the percent utilization.
4. Identify and quantify storage issues that have arisen in the past year and rate each by the severity of their impact on the business.
5. If the percentage utilization is low and the business impact of storage issues high, then an investigation of Storage Virtualization makes sense for your company.

If you are ready to take the next steps, we invite you to contact the knowledgeable staff at Globalstor to discuss how ExtremeStor iNAS can help your company. The staff at Globalstor is recognized throughout the industry for the depth and breadth of their knowledge of complex storage issues and how to implement solutions that provide both short and long-term benefits for their customers.

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## Contact us

For more information on ExtremeStor iNAS or any of the other Globalstor products and services, please contact:

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