

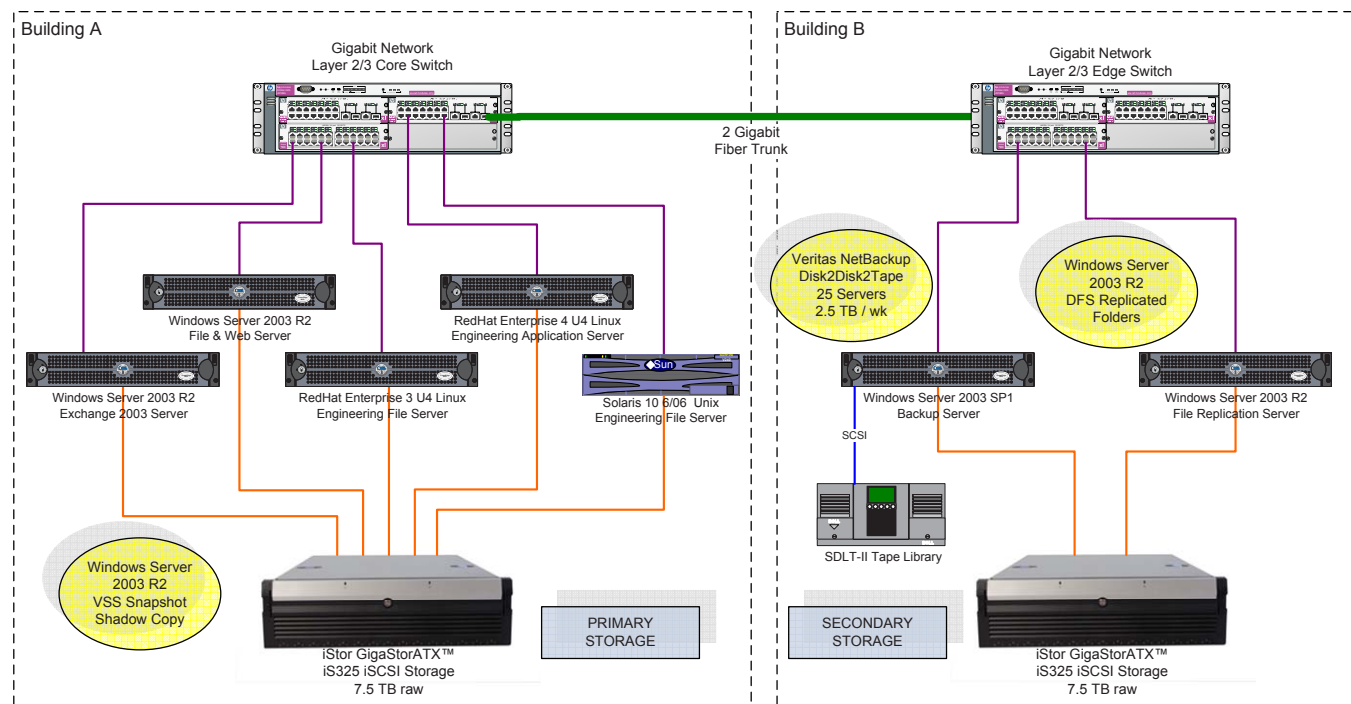
# Engineering New Ideas With The iStor IP SAN Solution

## The Challenge: Optimizing the Network for Business Productivity

In the fast changing world of high technology, businesses are under constant pressure to develop leading-edge products faster than the competition. To succeed, it is crucial that a company's network infrastructure be optimized on numerous levels. These include fast performance which facilitates data sharing and collaboration, sufficient connectivity to data storage in order to facilitate simple and cost-effective capacity expansion, and a robust backup solution for protecting information assets. From a bottom line perspective, it is equally important for an infrastructure to minimize IT administration and support times, especially in smaller companies where IT staff is limited.

iStor Networks, a fast growing iSCSI provider, was presented with the ideal opportunity to test its own data storage technologies in a real-world environment. The company's existing infrastructure was based on legacy direct-attached storage (DAS) systems that were several years old. Additionally, the company's 36 servers (16 Windows®-based and 20 Linux/Unix-based) were located in two different buildings. Building A houses the majority of the company's 60 employees, the engineering department, and 28 servers dedicated to corporate applications such as file sharing, Microsoft® Exchange e-mail, intranet web, and the Linux-based engineering applications. Building B houses the remaining employees and eight additional servers. The performance of the DAS systems was beginning to suffer as they neared capacity, resulting in slower response times and slower backups. Additionally, users were limited in their ability to utilize storage resources since data on the individual servers could not be accessed by other systems or by remote users. From an administration standpoint, the company's sole IT manager had to manage local storage on multiple servers and was unable to allocate time to other important projects.

PRIMARY APPLICATIONS	
E-Mail	Web
File Sharing	Engineering
CRM	E-Marketing
Business Apps (HR, Finance, Etc.)	Backup and Data Protection



Legend	
	Gigabit Host Link
	Gigabit iSCSI Link
	Gigabit Fiber Link

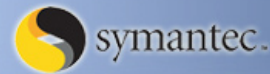
## The Solution: IP SAN Deployment

To meet its challenges, iStor Networks implemented two of its GigaStor ATX iS325 storage arrays in an IP SAN (storage area network) topology. Each GigaStor featured enterprise-class Serial ATA (SATA) disks and eight dedicated 1GbE ports. An IP SAN was the ideal solution for cost-effectively consolidating and upgrading the company's numerous legacy DAS systems. By utilizing iSCSI technology to transport block-level data over IP networks, the company could leverage its existing network infrastructure while still benefiting from increased performance levels, capacity and expandability. Additionally, iStor's 60 employees could now utilize more storage resources by accessing the installed base of DAS via multiple systems. Without the limitations imposed by DAS, data could be shared by seven servers using private direct gigabit network connections to the GigaStor arrays. IT management and administration costs were another decisive factor in deploying iSCSI technology. Since an IP SAN leverages ubiquitous mainstream technologies (Ethernet & SCSI) that are already supported and understood, iStor's IT manager did not have to manage a separate network or receive specialized training, as is the case with a Fibre Channel SAN.

## The Benefits: Maximizing Performance, Productivity and IT Resources

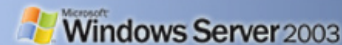
iStor installed the first GigaStor ATX iS325 storage array, loaded with 15 400GB disks, as secondary storage for disk-to-disk backup of its existing servers. Previously a full MS Exchange backup was taking 30 minutes. After installing the GigaStor, disk performance increased so significantly that a full database backup could now be completed in seven minutes – less than one fourth of the time it took previously. Symantec's Veritas NetBackup software was used in conjunction with Windows Volume Shadow Copy Service (VSS) to provide data protection. VSS performed daily point-in-time snapshots of all shared volumes prior to copying data to the secondary disk for backup, ensuring the integrity of files that may have been open during an online backup. The implementation included two simple settings: 1) set a limit of capacity to use for the snapshots based on how many would be retained; for example, iStor retains at least one week of snaps; and 2) set an automated schedule for when the snapshots occur. iStor takes the snapshots three times per day at 8 a.m., noon and 4 p.m. Simple to use, the VSS tool allows end users to retrieve a deleted file or go back to a previous version of a file or folder without any IT assistance. Veritas NetBackup completed this overall data protection plan by providing daily incremental and weekly full disk-to-disk backups with scheduled disk-to-tape backups, also performed from the GigaStor.

The second GigaStor ATX iS325 array, loaded with 15 500GB disks, was added as primary storage for corporate applications including file sharing, MS Exchange e-mail and Intranet web. While migrating those applications from DAS, the company simultaneously upgraded its servers from Windows 2000 to Windows Server 2003 R2 to complement the capabilities of the GigaStor. Features such as VSS were used to recover previous versions of deleted or corrupted files. Additionally, iStor utilized Microsoft's Distributed File System (DFS) Replication feature for real-time replication of shared folders between pairs of servers at the two buildings on its campus. The iStor IT manager defined groups of two servers with replicated folders at each site and then enabled this capability between its two buildings. When a file is changed, this triggers an event (copy on write) that automatically replicates that file to the other server at the second building, adding a layer



Veritas NetBackup 6.0 delivers high-performance data protection that scales to protect the largest UNIX, Windows, Linux, and NetWare environments. With complete protection from the desktop to the data center, NetBackup offers a single console for management of all backup and recovery operations.

<http://www.symantec.com/enterprise/products>



Distributed File System (DFS) Replication provides duplication and fault tolerance to the data environment. It detects file changes made by the user and only transfers those changes that have been made since the last file update.

Volume Shadow Copy Services (VSS) is an easy to use snapshot technology that allows the creation of consistent point in time copies for a volume while ensuring that the contents can't be changed while backups are being made.

<http://www.microsoft.com/windowsserversystem/storage>

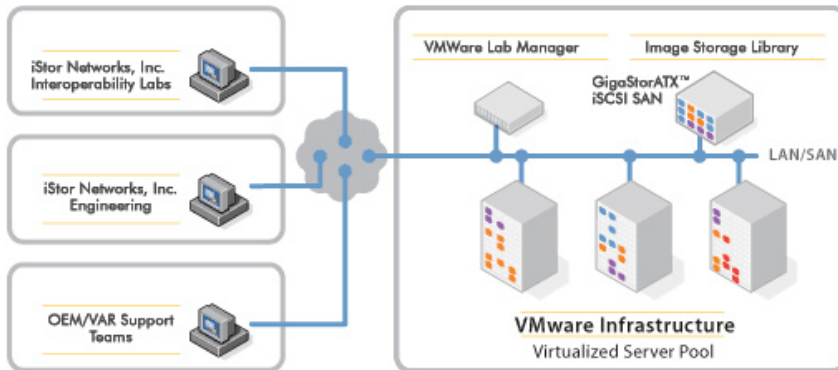


VMware Lab Manager is a new class of software development and test infrastructure that automates the rapid setup and teardown of even the most complex multimachine software configurations. With its shared library and shared pool of virtualized servers, VMware Lab Manager allows us to efficiently move and share and test multi-machine configurations with various iSCSI Software Initiators across Support and Interoperability Test Teams.

<http://www.vmware.com/products/labmanager/>

of protection. DFS runs in the background at iStor with no performance degradation to the IT production systems.

The second GigaStor array also doubled storage capacity for the software and hardware engineering groups that were experiencing space constraints with the DAS systems. Considering future storage needs, it was important that capacity be quickly and easily expandable. IT management could increase capacity on the fly by enabling new volumes on demand. The GigaStor's volume virtualization feature allowed easy allocation of storage to meet the growing and changing needs of the company. The engineering groups rely heavily on high performance storage for data-intensive projects such as software compiles and builds, and have already realized a threefold increase in performance with the GigaStor. Project completion times have been reduced as a result of faster and more efficient data sharing and collaboration.



Deployment of the IP SANs also increased productivity in iStor's product development and testing by leveraging server virtualization techniques. VMware's Lab Manager was implemented in the company's interoperability lab to manage testing for its technology and channel partner program, iStor-inAble. iStor was able to provision complex test environments in seconds, rather than days, without

swapping multiple operating systems on each platform. Lab Manager shaved hours off test cycles and also reduced iStor's investment costs since the company no longer had to purchase a separate hardware platform for each OS. This was a significant savings considering an interoperability certification matrix that includes Windows Server 2003, XP, Vista, VMware ESX, RedHat Linux, SUSE Linux, Sun Solaris, HP UX, IBM AIX, and Apple MAC OS. On-demand access to a shared library of system environments enabled instant results-sharing across the organization, accelerating product development cycles and time to market.

Implementation of an IP SAN has also resulted in a significant reduction in IT management and administration time. After consolidating the storage, iStor's IT manager is no longer managing multiple RAID arrays, freeing up an estimated 50% of his time to devote to other projects. For a smaller company that does not have a large IT staff, this is a very important benefit.

### The Future: Building on the Success of an IP SAN

iStor plans to add another GigaStor ATX iS325 array to migrate the remaining engineering applications from legacy DAS to provide more primary storage. The company also plans to implement Microsoft Data Protection Manager (DPM) Version 2, adding continuous data protection (CDP) for Microsoft applications and file servers.

iStor's IP SAN deployment offers a compelling demonstration of the value proposition inherent to iSCSI technology, offering a solution for primary storage as well as secondary storage for disk-to-disk backups. The measurable benefits include:

- a 3x increase in network performance;
- a 5x increase in storage capacity;
- a 50% reduction in IT management and administration time;
- a 75% decrease in Exchange database backup times and a 20% decrease in other backup times;

Finally, virtualization of the IP SAN implementation optimizes the total value of iStor's infrastructure, which is typical of so many SMB environments in the world today. Overall, the IP SAN squarely addressed iStor's challenge of consolidating legacy DAS into a smaller footprint, resulting in more efficient storage resource utilization, improved manageability and scalability.

*"iSCSI has enabled us to not only consolidate our storage resources but at the end of the day, we have cost effectively built a data protection strategy that simply works."*

— David Murillo  
IT Manager  
iStor Networks, Inc.



**iStor Networks, Inc.®**

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