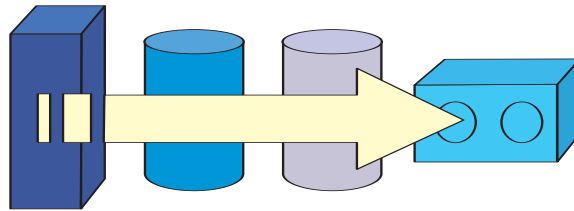


Solutions Brief

SGI® InfiniteStorage Solutions



Data Protection Backup/Restore and Business Continuance

In today's busy computing environments, keeping up with the demands of rapid storage growth is an increasing challenge. As the volume of critical data grows, so too does the need to protect it and to assure its constant availability.

Data protection has three key elements:

- Regular backup and restore to ensure that critical data is protected from equipment failures or user error
- Business continuance to ensure that key servers and applications achieve the highest level of availability
- Disaster recovery to ensure that critical data is protected from localized disasters such as floods, fires, etc.

SGI® InfiniteStorage solutions offer a flexible array of options along the price/availability continuum, from simple offline tape solutions to 100% redundant environments, ensuring that your data protection needs

are met no matter how stringent your requirements or how limited your budget.

The Benefits of SGI Backup and Restore

SGI brings together its high performance servers and storage systems with industry-leading backup and software solutions to create backup and restore capabilities with unprecedented performance, scalability, and flexibility.

World Record Backup and Restore Performance Solves Backup Problems Today and in the Future

In 2003, SGI demonstrated world record backup and restore capabilities. Performance exceeded 10TB per hour for backup and close to 8TB per hour for restore¹. These levels of performance are made possible by the inherent parallelism that exists in SGI® servers and storage infrastructure and the exceptional expertise

that SGI brings to big I/O problems of all types. Whether your environment calls for disk-to-disk, disk-to-tape, snapshot, tiered storage or any combination, SGI can help you architect a high performance backup and restore solution.

Massive Scalability Ensures Sustained Benefits

In a recent survey by Storage Magazine, 50% of IT respondents indicated that they backup more than 5TB of data per day and more than 25TB per week². To achieve the scalability required to backup today's vast data stores, a backup and restore solution must be able to scale in every dimension. SGI solutions scale easily through the addition performance, capacity, and connectivity to accommodate any requirement. You can be certain that a solution that meets your needs today will continue to scale to meet your needs tomorrow without forklift upgrades.

¹ http://www.sgi.com/company_info/newsroom/press_releases/2003/july/scalable.html

² Storage Magazine reader poll results, January 2004



Data Protection

Virtualized Backup for Additional Time and Resource Savings

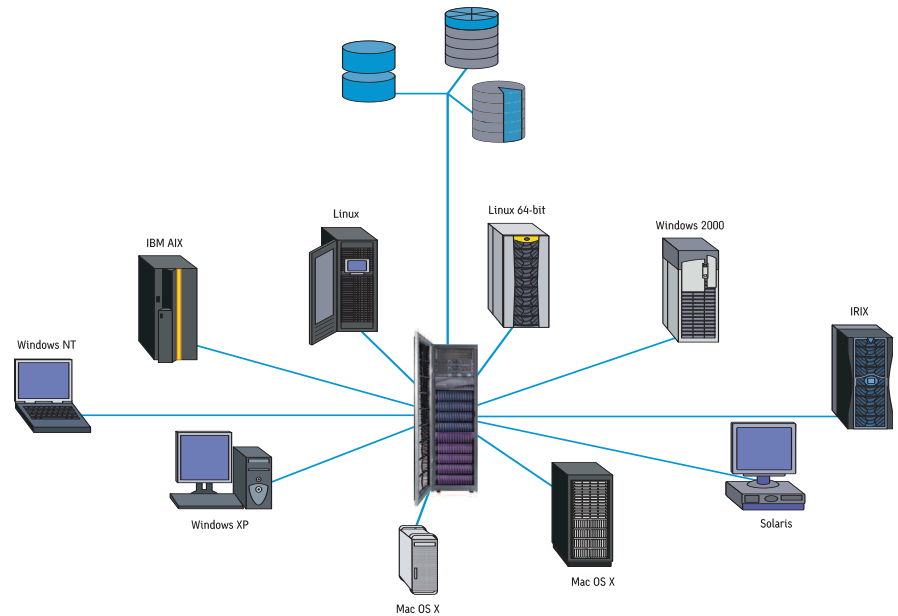
Traditional, Local Area Network (LAN) based backup can be slow, resource-intensive and can interfere with important end-user traffic. Using the SGI® InfiniteStorage Shared Filesystem CXFS™, all systems on a SAN have access to the same data at the same time - without network mounts or data copies. A single system on a CXFS SAN can perform the backup for all the data on the SAN. Data remains available during backup, end-user traffic has full use of the LAN, application system resources are not lost to backup overhead, and a single point of backup and restore reduces time, complexity, management, and risk. With support for IRIX®, Windows®, AIX®, Solaris™, Linux® 32 and 64, Mac OS® X and others, a CXFS based backup solution can cut backup and restore times from hours to minutes.

A Range of Options Adds Increased Functionality Over Time

SGI knows that a single solution cannot satisfy the diverse needs of its customers and is committed to provide you with a broad range of configuration options and compatibility with major backup applications.

With available backup windows shrinking, options that reduce the time that important data is offline are critical. Regular backups can be made faster and more efficient through the addition of Snapshot copies to disk, data lifecycle management, or both.

- SGI® Snapshot options allow you to create a point-in-time image of a data volume to ensure that backups are consistent while operations continue unimpeded.
- Less expensive serial ATA (SATA) disk storage can be used to create disk-to-disk backup solutions that proceed at extremely high speed.



Shrink backup / restore times from hours to minutes
Virtualized backup using CXFS Shared Filesystem

- SGI® InfiniteStorage Data Migration Facility DMF provides a complete data lifecycle management (DLM) solution that allows you to blend primary fibre channel RAID with secondary Serial ATA and Tertiary Tape devices. This not only reduces your investment in primary storage, it reduces the active working dataset that must be backed up.

The Benefits of SGI Business Continuity Solutions

The threat of disruption to critical IT operations has become a serious concern in today's uncertain world. With 24-hour, global operations now a fact of life for many organizations, ensuring business continuity in the face of disaster is paramount. Complete business continuity planning includes:

- High availability—to protect critical applications against hardware and software failures
- Disaster recovery—to recover operations in the event of a disaster that affects an entire site, a metropolitan area, or a geographic region.

While most organizations recognize a need for these capabilities, architecting complete solutions for business continuity can be expensive, time consuming, and difficult. With years of experience in some of the most data-intensive environments in existence, SGI has the technology and expertise to help.

Application High Availability Clustering Minimizes Downtime

To achieve high availability for critical services and applications, two or more computer systems are clustered together with specialized software to create an architecture with no single points of failure. If a failure on one server causes a service disruption, another server automatically restarts that service with minimal disruption and no loss of data. SGI high availability clustering software can significantly reduce the risk that unplanned downtime will impact critical business operations, and offers the flexibility you need to minimize both planned and unplanned downtime for critical data and services.

Data Protection

Built from standard components to minimize costs, SGI solutions offer agents to provide high availability for common services such as NFS and CIFS; popular SGI software including InfiniteStorage Shared File System (CXFS) and InfiniteStorage Data Migration Facility (DMF); and common database. In addition, custom agents can be quickly created to accommodate almost any application.

Disaster Recovery Provides the Highest Level of Data Protection

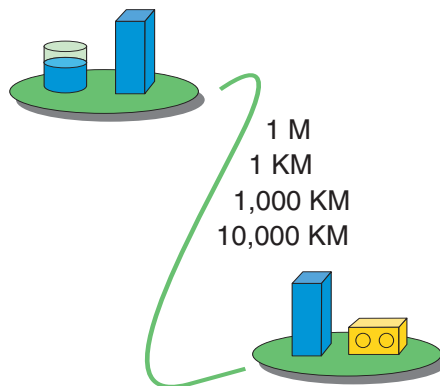
When a disaster occurs, restoring access to critical data and applications is paramount to your business. SGI offers a variety of disaster recovery solutions to reduce the impact of outages that impact an entire site. Traditional offsite storage of backup tapes provides the most inexpensive solution in terms of up front costs, but the time needed to restore full operation may be prohibitive. Nearline or online approaches offer significantly more protection from downtime, but obviously incur additional costs in terms of both upfront and ongoing costs. Asynchronous or synchronous mirroring options ensure that critical data is replicated to one or more satellite sites so that operations can continue unimpeded if one site fails.

Data Protection Product Details

Advanced Hardware Solutions

SGI offers a selection of InfiniteStorage disk arrays that can be populated with high performance fibre channel disk, less-expensive SATA disk, or a combination of the two. SATA solutions form the basis of disk-to-disk backup solutions.

A full selection of industry-leading tape library solutions from SGI's storage partner, StorageTek, is also available. Libraries can be purchased with any of a variety of tape technologies such as DLT, SDLT, or LTO.



Application High Availability Clustering

SGI InfiniteStorage solutions for application high availability (HA) ensure that mission-critical applications and services remain available in the event of an outage such as system maintenance or component failure. When an outage occurs HA software automatically fails over applications from one system in a cluster to another. SGI® InfiniteStorage FailSafe® (for SGI systems running IRIX) and SGI® InfiniteStorage Cluster Manager for Linux® (for Altix® systems running Linux) require no specialized hardware and no application changes.

XVM Mirrors

XVM Mirrors adds mirroring capabilities for both standalone systems and clusters. Using a SAN, data can be mirrored synchronously across metropolitan area distances for disaster protection. Among its many benefits, system disks can be managed by XVM and mirrored for greater reliability. With XVM Mirrors you can specify the read policy for an XVM mirror element, allowing you to read from the mirror in a sequential or round robin fashion, for improved performance. You can also specify whether a particular leg of a mirror is to be preferred for reading.

XVM Snapshot

XVM Snapshot adds a volume level snapshot capability to SGI® InfiniteStorage

Volume Manager XVM. (XVM is included with all SGI servers). A snapshot is a point-in-time, consistent view of a storage volume that can be used for a variety of purposes:

- A snapshot before tape backup provides a stable filesystem image for backup. A consistent backup can be created without halting activity to the filesystem.
- Regular frequent snapshots provide an online backup of recent data that is accessible to end users. If a user deletes, corrupts, or otherwise damages a file, they can recover it from the most recent snapshot without admin intervention.
- An entire filesystem can be restored to a previous state in minutes rather than the hours it would take to do so from tape.
- A snapshot created before a software upgrade or modification provides a simple form of versioning. If testing shows the update has been unsuccessful, the old versions can be rapidly and easily restored.

Industry-Leading Backup Software

SGI offers a choice of industry-leading backup applications including Legato NetWorker® and Atempo® Time Navigator™. These applications take full advantage of the outstanding I/O capabilities of SGI servers and storage systems to achieve record-breaking backup throughput.

Learn More

- To find out more about SGI Data Protection solutions, visit our website at www.sgi.com/storage.
- To find out more about how data-intensive environments are using SGI InfiniteStorage DLM solutions to lower cost, manage risk and improve productivity see: <http://www.sgi.com/products/storage/success.html>
- To locate your local SGI sales office, visit: <http://www.sgi.com/sales>.



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