Tivoli® SANergy™
Helping You Reach Your Full SAN Potential

Highlights

With Tivoli SANergy, customers can efficiently centralize their storage resources for reduced administration overhead, improved performance, and greater ROI. Tivoli SANergy enables users implementing storage area networks (SANs) to transparently share access to common storage, volumes, and files. Storage resources can be shared across UNIX®, Microsoft® Windows NT® and Apple Macintosh systems at the volume, file, and byte level with increased throughput and lower overhead than server-based sharing. The resulting high-performance shared storage environment can significantly reduce IT costs by consolidating storage space and eliminating the replicated data common to multihost environments.

Tivoli SANergy helps you reach your full SAN potential because it can:

- *Simplify SAN storage centralization and administration through the power of heterogeneous sharing at the volume, file, and byte level*

- *Extend industry-standard networking to utilize the high bandwidth of any SAN media, including Fibre Channel, SCSI, SSA, iSCSI, and InfiniBand*
- *Enable storage centralization without the performance-limiting overhead of server-based file sharing*
- *Increase data availability by eliminating the single-point-of-failure potential of server-based sharing*
- *Reduce the total amount of storage required in a SAN by eliminating redundant or replicated data*
- *Reduce the number of disk volumes required in a SAN and improve the efficient deployment of unused space*
- *Increase the server-to-storage scalability ratio, eliminating the expense and bottleneck of dedicated file servers*
- *Use industry-standard file systems and SAN and local area network (LAN) protocols*

- *Work with almost any SAN and LAN product, regardless of hardware and software*

Storage Sharing with a SAN

SANs have arrived just in time to ease the task of managing the twenty-first century's nearly insatiable demand for online information. Fueled by high-performance, dedicated storage networks, the one-to-one relationship between storage and computer systems is rapidly being replaced with a network of storage devices that can be shared by multiple systems. By enabling the centralization of storage, IT organizations can reap ROI benefits, such as reduced administration and simplified expansion, as storage demands increase.

Besides these benefits, SAN offers the potential not only to share the storage devices efficiently, but also to share access to the information that these devices contain. In an evolution of centralized information that began with the introduction of dedicated network-attached storage (NAS) servers, today's computing

environments often look to the storage network as a means of providing true file sharing, without the performance limitations of the NAS approach.

SAN-speed Sharing to Free a LAN
Tivoli SANergy frees up the LAN by moving data to the SAN, which easily handles data quantities that would otherwise slow the LAN to a crawl. And the efficiency of SAN protocols eliminates the majority of processor overhead that LAN protocols require, freeing up more processing power for applications.

Using Tivoli SANergy, administrators can perform bulk data copies from one computer or RAID subsystem to another at speeds of dozens of megabytes per second. With the proper software, capabilities for LAN-free backup, archive, and restore are available. Hierarchical storage management (HSM) data migration can occur at SAN speeds without impacting any LAN traffic.

Tivoli SANergy provides transparent support for most system services or applications, including

Oracle, IBM®, IBM DB2®, Microsoft SQL Server, and Microsoft Exchange Server.

SAN-speed Sharing for Application Files
For many high-bandwidth applications in collaborative work environments, sneaker-net has been faster than any wire network. LANs suffer from the bandwidth-crippling overhead of network protocols.

With Tivoli SANergy, multiple high-bandwidth workstations run file-sharing-capable applications—all sharing the same application files simultaneously, at full SAN speeds. These applications include CAD, 3D modeling, and design; graphics, RIP engines, and digital printing; animation and multimedia creation packages; and video and film editing and compositing programs. Sneaker-net is eliminated because the network is fast enough to handle bandwidths of dozens of megabytes per second to each workstation. As a result, Tivoli SANergy can improve collaboration, enhance operational flexibility and efficiency, simplify workflow, and increase productivity.

SAN-speed Sharing for Web Servers
With Tivoli SANergy, high-bandwidth, media-rich Web sites can scale more easily to handle increased hit volumes. When Web traffic increases beyond the capabilities of the Web servers, users can simply connect more servers to the SAN storage. With Tivoli SANergy running on the servers connected to the SAN, all servers can use the same media files on the same SAN storage at the same time. This eliminates the need to buy new storage and duplicate the same Web page materials every time a new server is brought online.

Inside Tivoli SANergy
Using patented techniques, Tivoli SANergy is implemented as a file system extension. It leverages the distributed data sharing capabilities embedded within the Windows NT, Windows® 2000, UNIX, and Macintosh operating systems. Tivoli SANergy redirects the data portion of standard network file input/output off the LAN and to the SAN. Normal networking protocols (CIFS or NFS) establish access to shared files across a

standard LAN. The data itself flows at a much higher bandwidth over the more efficient SAN. SAN-connected storage media is formatted in either NTFS, UFS, or EXT2 FS or any other file system that supports the SANergy open API.

Tivoli SANergy extends the standard Windows NT, Windows 2000, Sun Solaris™, or Red Hat Linux® file server to act as the metadata controller (MDC) for shared storage. This MDC manages the access to storage across the SAN by the computers running Tivoli SANergy client software.

The MDC manages access to common storage by providing the necessary file system metadata when requested by the client computers. Hosts can then access the storage directly through their SAN connection. In a heterogeneous sharing environment, this metadata sharing is critical to ensure the coherency of files being used across the SAN. Metadata sharing also enables the continued use of all the network-access security mechanisms already built-in to today's operating systems.

With the addition of two new application programming interface (APIs), developers can leverage Tivoli SANergy by adding new MDC platforms and additional file systems. One API allows file system vendors to enable a SANergy MDC to share access to their volumes and files, extending the current SANergy support for NTFS, UFS, EXT2 FS, and any Tivoli Ready™ for SANergy-certified third-party file system. The other API enables operating system vendors, like those that make NAS servers, to add Tivoli SANergy MDC support hosts to their products. This could enable NAS servers to provide faster and more efficient file sharing to their hosts. These two APIs are available through the Tivoli Ready program, in addition to the already existing SANergy Simple Network Management Protocol (SNMP) APIs for administration and configuration.

Enterprise-ready Availability
Tivoli SANergy High Availability is an add-on feature to the Windows NT and Windows 2000 versions of Tivoli SANergy. It ensures that critical data remains available in the event of an MDC failure.

If a Tivoli SANergy MDC for Windows NT or Windows 2000 fails, the spare MDC running SANergy High Availability seamlessly assumes the duties of the failed MDC. MDC-dependent Tivoli SANergy hosts running Windows NT, Windows 2000, and UNIX automatically remap their drives. Most network-aware applications, including database servers, carry on without interruption. Tivoli SANergy High Availability is an essential component for SANs supporting corporate databases, Web servers, and other business-critical applications.

Enterprise-ready Management
In addition to using native and HTML-based interfaces, administrators can use any SNMP management console to manage Tivoli SANergy. A custom SANergy management information base (MIB) is included to support the use of consoles, such as Tivoli Netview®, HP OpenView, or SunNet Manager.

Supported Operating Systems

MDCs

Microsoft Windows NT and Windows 2000, Sun Solaris, and Red Hat Linux (on 32-bit Intel® platforms only)

Hosts

Microsoft Windows NT and Windows 2000, Sun Solaris, Red Hat Linux (on 32-bit Intel platforms only), MacOS, SGI Irix, IBM AIX®, Compaq Tru64, and Data General DG/UX

Features	What It Does	What It Means To You
Single file system	Uses native file system on MDC or any other Tivoli SANergy-enabled third-party file system.	Eliminates the need to manage multiple file systems, regardless of the number of computers connected to the SAN.
LAN-flexible	Utilizes any LAN hardware and software.	Continues using your existing LAN to handle metadata traffic and low-bandwidth data.
SAN-flexible	Utilizes any SAN hardware and software.	Works equally well with Fibre Channel, SCSI, SSA, iSCSI or InfiniBand SANs with components from any manufacturer.
Heterogeneous operation	Supports true file sharing across heterogeneous networks.	Works with the mix of computers and operating systems used today.
Enterprise-management ready	Enables management control through the Web and SNMP.	Enables immediate control through most SAN management consoles.

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