

Greater ROI

Lower TCO

Flexibility

Performance

High Availability

Thin Provisioning

Consolidation

Data Migration

Data Sheet

Storage Management, Virtualization and Control

SANsymphony™ software from DataCore provides invaluable cost savings to IT organizations that are forced to expand storage, servers and staff because technical barriers keep them from fully utilizing and protecting existing assets.

Economic Benefits

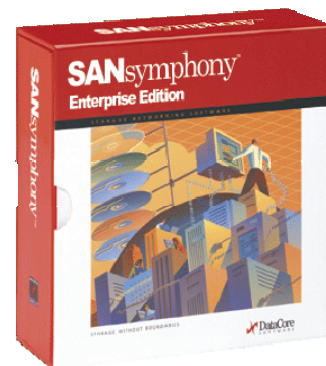
SANsymphony™ software incorporates advanced, yet proven, open storage management technology to maximize asset utilization in both homogeneous and heterogeneous IT environments. Customers cite the following compelling reasons for introducing the product into their operations:

- Dramatically better disk utilization through storage resource pooling and tiered storage classes.
- Reduced operational burden by centralizing and automating storage administration across like or dissimilar equipment.
- Elimination of planned and unplanned downtime using non-disruptive storage provisioning and replication techniques.
- Enhanced performance, connectivity and productivity allowing them to support more users with existing resources and personnel.

All these benefits translate into lower total cost of ownership (TCO) and greater return on investment (ROI), as well as a more versatile and responsive IT infrastructure.

"We needed a smarter approach that would allow us to control and automate storage across our entire environment, and decided to 'go virtual' with DataCore. Once you do so and look back, the old storage box approach seems so primitive. We run DataCore in tandem with VMware and together they allocate resources as needed, where needed. DataCore has made storage a network utility - a service for our users and applications. "

-Michael Gayle, Director of IT at Calvary Chapel



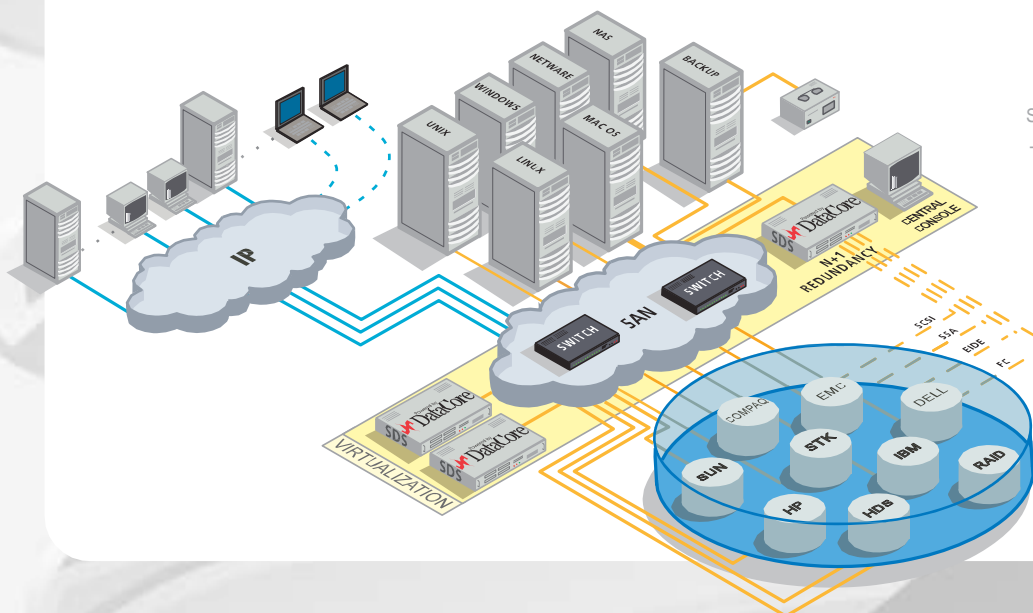
Open storage Virtualization and Management

Operational Benefits

SANsymphony software consolidates and automates key aspects of storage management, enabling large enterprises as well as smaller companies to:

- Effectively use all disk capacity at their disposal.
- Automatically allocate disk space just-in-time.
- Collapse physical space requirements to their minimum.
- Pool disk capacity from multiple storage devices and multiple suppliers.
- Eliminate storage-related outages, planned and unplanned.
- Add, move and upgrade disks without rebooting storage consumers (hosts).
- Ensure non-stop data access despite hardware, software and procedural failures.
- Overcome physical limitations and vendor-specific nuances of storage devices.
- Accelerate I/O performance from existing disk arrays.
- Match quality of service (QoS) levels to a workload's importance and departmental objectives.
- Centrally manage storage on behalf of mission-critical servers and desktop users.
- Distribute administrative responsibility and privileges for individual storage domains, while retaining global centralized control.
- Incorporate affordable business continuance and disaster recovery practices on campus, regional and global levels.
- Rapidly restore applications by reassigning known working image to alternative server.
- Leverage existing storage investments while facilitating technology insertion dictated by new business requirements.

Comprehensive Open Storage Management



SANSYMPHONY
SOFTWARE
ENCOMPASSES THE
WIDE VARIETY OF
WORKLOADS AND
STORAGE EQUIPMENT
TYPICAL OF TODAY'S
ENTERPRISES.

Automated Thin Provisioning and Protection

Implementation

Network Storage Pooling

The core SANsymphony product and many of its optional functions are layered as a network storage facility between heterogeneous front-end storage consumers and heterogeneous back-end storage devices. Logically and administratively, all SANsymphony- managed capacity appears to come from a centrally controlled resource pool equipped with various enhanced attributes. In reality, the actual disk space may be distributed among several dissimilar storage devices potentially located across separate sites.

Physical disks and the LUNs presented by intelligent arrays may be carved into smaller virtual volumes or concatenated into larger ones.

Advanced Storage Virtualization

SANsymphony software runs on one or more dedicated storage networking servers called storage domain servers (SDS). These servers collaborate to create enhanced disk volumes whose virtual proper ties exceed those of the underlying storage devices – thus the term “virtualization.” Storage domain nodes may be configured from a wide range of commercial Intel or AMD based server platforms.

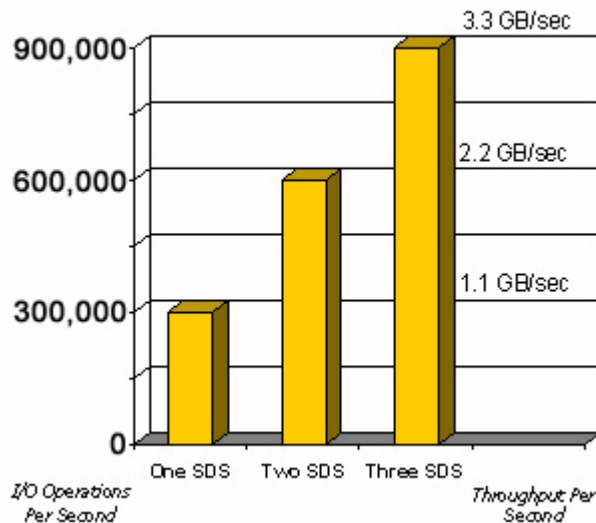
Thin Provisioning Disk Space Allocation

SANsymphony’s innovative features offload and automate much of the complexity and supervision required with conventional disk resources and volume management. DataCore’s thin provisioning Virtual Capacity Network Managed Volumes (NMV’s) , for example, are presented to storage consumers as if they were the largest disks addressable by their operating systems.

In reality, only a fraction of that virtual capacity is physically allocated from the storage pool. As the application consumes additional space, more blocks (thin slices) are dynamically allocated to meet demand. This completely does away with disruptive and time consuming disk repartitioning and resizing and eliminates wasted space from over provisioning.

Enterprise Class Performance and Scalability

Each SDS node employs sophisticated caching to turbo-charge storage consumer application I/O performance and off-load back-end disk subsystems (Arrays, JBOD’s, etc.). Typical scaling results from network-wide caching are shown below:



SANsymphony’s unrivaled performance makes it uniquely capable of front-ending the most powerful storage subsystems, allowing them to serve a larger community of storage consumers more cost effectively than they can alone. Data caching also greatly benefits mid-range and low-end disk arrays under the management umbrella of SANsymphony.

Add Value Across the Enterprise

High-availability N+1 Grid Architecture

Non-stop data accessibility is configurable with “N+1” redundant SDS nodes that circumvent any single point of failure. Such innovative and cost-sensitive architecture ensures that service level obligations continue to be met in spite of component failures. Essentially, the I/O responsibilities associated with an outage, scheduled or unexpected, are distributed in real-time among the remaining storage resources being managed by SANsymphony. Clients automatically exploit alternate paths to other running SDS's to maintain end-to-end high-availability.

Hardware and Operating System Independent

One of the key advantages of SANsymphony software is its ability to add value across a variety of operating environments (i.e., UNIX variants, Linux Variants, VM variants, NetWare, Mac OS) and storage subsystems, including everything from intelligent controllers to simple arrays.

Many of the functions traditionally confined to a specific array or to an individual host are now implemented as network storage services and made consistently available throughout the SAN. For example, snapshots can

originate on one storage array and be deposited on storage anywhere else in the system. The same is true for remote mirroring and disaster recovery, be it synchronous or asynchronous.

SAN Domains and Quality of Service (QOS)

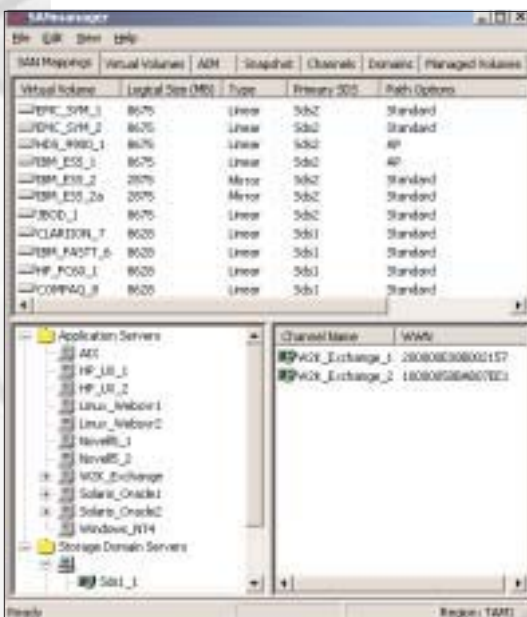
Administrators of SANsymphony-controlled storage pools employ a graphical representation of disk resources to appropriately categorize, prioritize, and allocate capacity with the proper QoS characteristics required to suit their consumers.

In large diverse scenarios SANsymphony Storage Domains (i.e., Virtual SAN's) are used to divide storage assets along natural groups that map to specific business requirements and their distinct QoS characteristics. Domain I/O priorities are controlled by setting IOPS and throughput (MBPS) rates on a per domain basis. Storage domains provide “traffic flow control” to maximize bandwidth and optimize channel usage. Management responsibility can be similarly subdivided with commensurate administrative security and privileges. Capacity planning metrics may be rolled up for the entire pool or apportioned to individual storage domains.

Business Continuance and Disaster Recovery

SANsymphony software provides several alternatives for creating and updating known good working images of critical applications at one or more remote contingency sites. To leverage the convenience and low cost of existing Internet infrastructure, DataCore offers an Asynchronous IP Mirroring (AIM) option. AIM operates over conventional LANs and WANs using standard TCP/IP protocols. Secure, encrypted connections such as VPNs

ALLOCATION
OF STORAGE
RESOURCES IS
AS SIMPLE AS
DRAG AND DROP.



performance

and trunked or aggregated multi-link circuits can be used to enhance the privacy and speed of inter-site transmissions. Point-in-time snapshots of remote volume copies may be triggered periodically or event-driven.

When it is essential to keep the remote copy in lock step with the primary image, SANSymphony synchronous

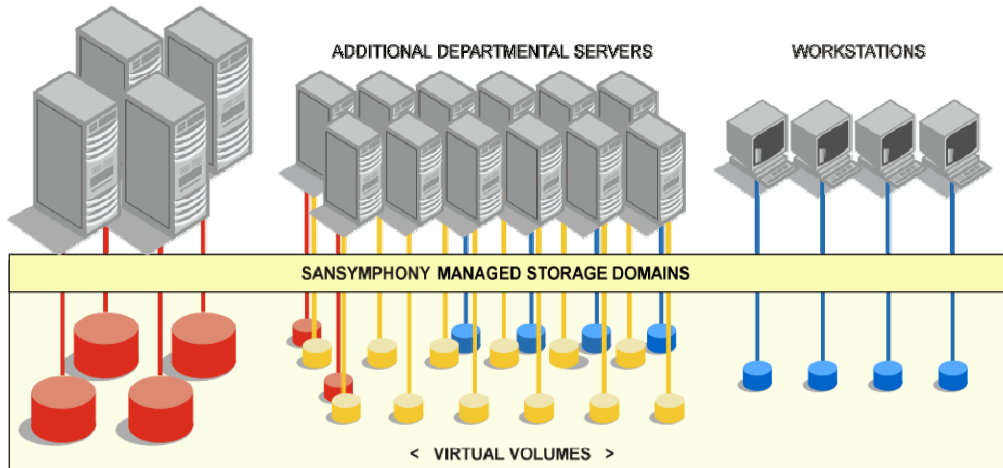
Network Mirroring option (i.e., business continuance volumes) is an attractive alternative. Separations up to 100 kilometers are typically achieved using dedicated high-bandwidth optical routes across Metropolitan Area Networks (MANs).

The originating and remote sites may use dissimilar storage equipment.

Customer-Defined Storage Domains Cater to Departmental Requirements

“DataCore’s SAN Domains begin to change the focus of the conversation from how companies manage their storage to how they manage their enterprise.”
- Jerome M. Wendt, Datacenter Infrastructure Group Inc.

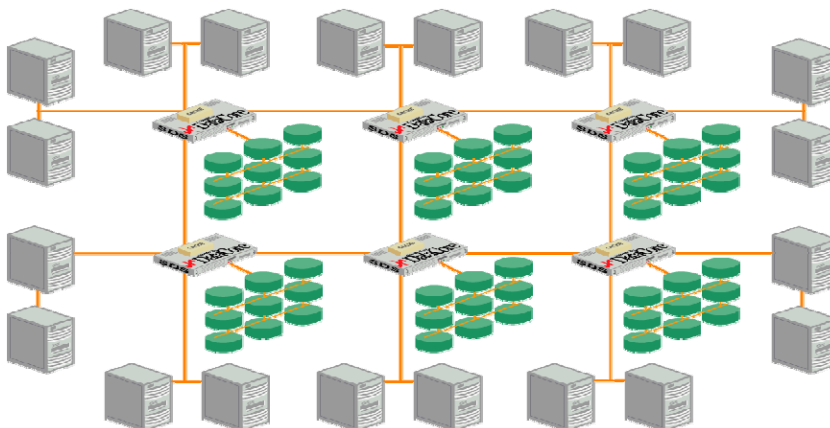
MISSION-CRITICAL FINANCIAL APPLICATIONS



COLOR INDICATES PRIORITY OF DOMAIN

HIGH PRIORITY | MEDIUM PRIORITY | LOW PRIORITY

N + 1 Grid Protection



features

SANsymphony is divided into a core set of functions included with the base package and optional features. Some of the optional features augment the capabilities of the storage domain nodes while others enable additional client-side (i.e., storage consumer) services.

Core Functions

- Non-disruptive capacity allocation.
 - Simple, secure and flexible disk space provisioning (repudiates unauthorized access & discovery).
 - Infrastructure, device, protocol and switch-agnostic storage network management.
- Dual infrastructure Support (iSCSI and FC) – Front-end, High availability paths, Back-end
- Smart auto recovery services - prioritize data volume recoveries to speed up critical business applications.
- Block-level disk virtualization and services
 - High performance read/write caching (Accelerates I/O typically by a factor of 2-4X).
 - Protocol bridging (e.g., Fibre Channel to SCSI, SATA).

Centralized Management Features

- Intuitive central management console uniform consolidated management from a central console (drag-and-drop GUI).
- Flexible SAN Domains (VSAN's):
 - Map storage assets to departmental requirements and workloads.
 - Flow control IOPS and throughput.
- Extensive I/O monitoring tools (graphical and textual).
- Comprehensive network discovery and diagnostic utilities to simplify configuration and quickly isolate potential problems.

Optional Features (per storage domain node)

- Thin provisioned Virtual Capacity Network Managed Volumes (NMV's).
 - Appear to clients as largest addressable disk (e.g., 2 terabytes), but only consume physical space as needed.
 - Are automatically thin slices of space just-in-time.
 - Never need resizing or repartitioning.
- Local and remote data replication (bi-directional).
 - Volume-level point-in-time snapshot (full copy or space-saving difference-only view).
 - Synchronous (real-time) remote mirroring.
 - Asynchronous (store and forward) IP-based remote mirroring.
 - Proxy Mode – Powerful non-disruptive data migration & re-purposing services
 - New virtualization services- Traveller time addressable CDP volumes

Client-side Features (optional concurrent licenses)

- Host-based alternate pathing drivers to ensure diverse routes to mirrored data.
- Laptop and desktop IP-based remote mirroring and restoration services to ensure a recovery image is always available at a central site.
- Microsoft Volume Shadow Copy Services (VSS) option – VSS provider integrated with SANsymphony's Snapshot API's.

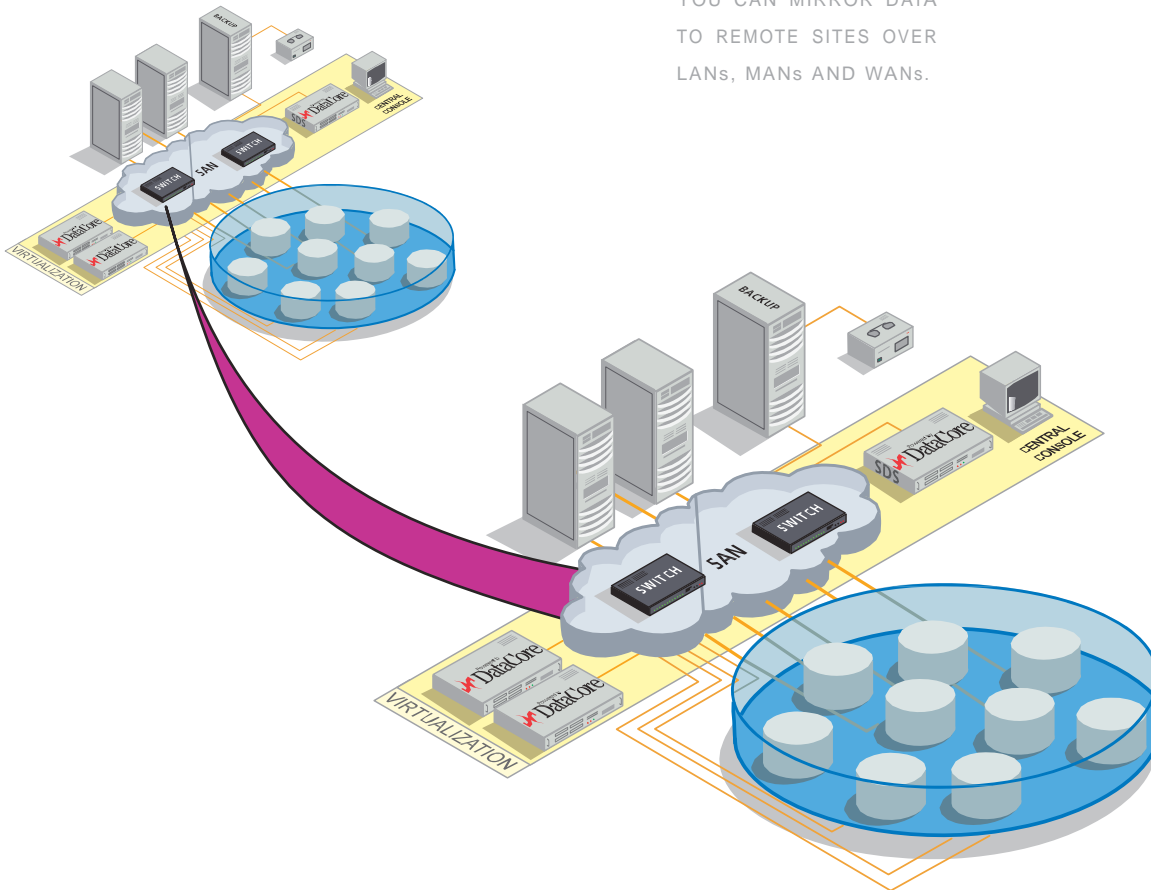
Interoperability

Servers, desktops, laptops and Network Attached Storage (NAS) systems connect into Powered by DataCore storage pools using any or all of the following:

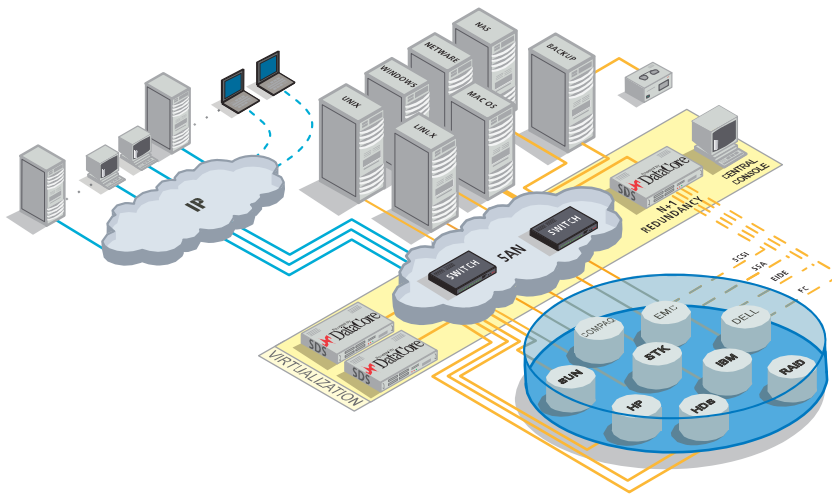
- Fibre Channel connections
- IP/Ethernet LAN connections
- IP WAN connections (for remote mirroring)
- Hybrid IP/Fibre Channel connections

Please consult DataCore's website at www.datacore.com for a list of supported disk interfaces and qualified platforms.

FOR COMPLETE
DATA PROTECTION,
YOU CAN MIRROR DATA
TO REMOTE SITES OVER
LANs, MANs AND WANs.



DataCore SANsymphony 6.0: The Perfect Complement to Virtualized Server Infrastructure.”
 - Analista Taneja Group



Leader in Storage Virtualization and Management

DataCore Software Corporation is the leading provider of advanced storage management software. The company’s SANsymphony software dramatically improves storage asset utilization and staff productivity, so organizations can achieve higher return on investment, lower total cost of ownership and enhanced responsiveness to changing business requirements.

Double your disk utilization

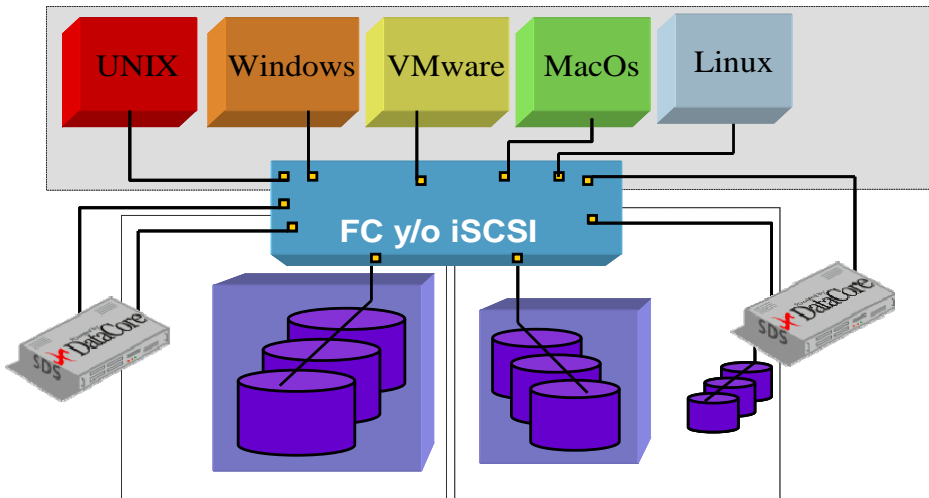
Manage storage assets effectively

Eliminate storage related downtime

Support more users with existing resources

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