SANsymphony™-V
Features Summary

An introduction to the technology behind the storage virtualization software.

SANsymphony-V software solves difficult storage-related challenges introduced by server and desktop virtualization, cloud computing and more general expansion, business continuity, and disaster recovery initiatives. It forms an active, transparent virtualization layer across disk storage devices to maximize the availability, performance and utilization of data centers large and small.

The integrated set of centrally-managed data protection, provisioning, caching, replication and migration functions operates uniformly over different models and brands, assimilating current and future equipment non-disruptively. You'll find that SANsymphony-V cost-effectively speeds up applications, delivers uninterrupted data access and extends the life of your tiered storage investments, while giving you peace of mind.

SAN-wide Functions Work Across Unlike and Incompatible Storage Devices

DataCore™ SOFTWARE

First we'll cover how the software fits into your IT environment, and then describe the most salient features in more detail. Most of the features discussed below are built into all the SANsymphony-V packages, but a few come as separately-priced options or they may not be available in lower-end models. Please consult the DataCore web site to understand which features correspond to which packages.

We'll use the following naming convention to describe the features: Hosts refer to servers hosting applications, including database servers, web servers, and file servers. DataCore nodes refer to servers running the DataCore storage virtualization software. And storage refers to the disk devices, be they internal hard drives, direct-attached disk arrays or more intelligent SAN-connected storage systems.

Value-added functions blended across your mix of storage devices

SANsymphony-V software is installed on physical or virtual x86-64 servers, transforming these Windows Server 2008 R2 machines into dedicated storage virtualization nodes. These "DataCore nodes" collaborate in real-time to create a transparent, centrally-managed virtualization layer distributed across your storage assets. The many nuances that distinguish one model or brand from another and render them mutually incompatible no longer stand in the way of using them together. Essentially, SANsymphony-V steps in as a powerful and intelligent intermediary that federates dispersed resources to maximize their combined value and to circumvent device-specific differences.

Your specific I/O needs and brand preferences dictate the size, type and manufacturer of servers selected to become DataCore nodes. Some organizations initially repurpose perfectly good application servers vacated by consolidation projects for this role. Others purchase new ones. The SANsymphony-V software may also run inside existing virtual servers alongside virtual machines. In any case, you always have the option to replace the underlying hardware with more powerful systems when demands grow or when newer, faster machines are deemed appropriate. There is no software throw-away. The DataCore code and its licenses are fully portable between server platforms for the utmost flexibility and investment protection.

Hosts connect to the DataCore nodes over iSCSI and/or Fibre Channel just as they would connect to a SAN disk array. Again nodes may be configured from a wide range of host bus adapters (HBAs) and network interface cards (NICs). A virtual iSCSI SAN forms the internal connection inside virtual servers.

Internal drives and direct-attached arrays already in place may be attached behind the nodes along with external SAN arrays to form the physical storage pool. SANsymphony-V works with all the popular models and brands of disk subsystems supported on Windows Servers. It's common to split the overall disk capacity evenly between a pair of redundant nodes for high-availability and load balancing.

The SANsymphony-V system administrator carves out virtual disks on demand from the physical disk pool according to the capacity, availability and performance needs of each workload. For instance, some groups of virtual disks may be defined to be cached, locally mirrored, remotely replicated and thinly provisioned. In the background, the DataCore software will draw on multiple real devices and the necessary computing and network connections to meet those requirements.

Hosts only sees those "virtual disks" explicitly shaped and assigned to them over designated ports. In clustered systems, the same virtual disks may be assigned to multiple hosts even if the back-end disks are not multi-ported (shareable).

To maximize disk utilization and eliminate wasted space, DataCore implements very granular, thin provisioning techniques and space reclamation features.

DataCore supports hosts running any of the popular operating systems as well as the mainstream hypervisors.

Gain uninterrupted access by stretching mirrored nodes apart

Many customers choose to virtualize their storage infrastructure with DataCore software in order to attain business continuity. SANsymphony-V shields applications from planned or unplanned outages in the underlying components by providing uninterrupted access to the virtual disks.

The software will synchronously mirror virtual disk updates between completely different nodes and storage devices in separate rooms so they won't be exposed to the same facility-related hazards.

Stretching inter-node distances up to 100 kilometers apart via metropolitan area networks (MANs) decreases the chances that an ordinary misfortune such as a roof leak, fire, air conditioning failure or flood will affect both sites.

A virtual disk in these high-availability configurations logically appears to hosts as a single, well-behaved, multi-ported shared drive, although it is really made up of two widely separated mirror images.

Entire sites, nodes, disk subsystems, channels and other components of the environment may be taken out-of-service, upgraded, expanded and replaced without disturbing applications.

Replicate offsite for Disaster Recovery

For additional offsite disaster recovery needs, SANsymphony-V replicates disk updates asynchronously over unlimited distances to another DataCore node using conventional IP lines. You may also reverse the direction of replication to restore the original site after the danger has been averted.

Cache to overcome I/O bottlenecks and help applications go faster

DataCore taps the node's processing, memory and I/O resources to carry out its advanced functions across all of the storage devices under its command. SANsymphony-V reserves up to 1 Terabyte (TB) of rapid access memory (RAM) per node for SAN-wide "mega caches".

Thanks to the sophisticated multi-threaded caching algorithms, data written to or read from disks move swiftly into and out of the caches, harnessing the full potential of each node's high-speed multi-processors.

Caching makes application run faster than they would had they accessed the disks directly, whether connected to top-of-the-line storage systems or lower end gear.

Automatically optimize disk access across tiers for best utilization

Disks with different price/performance attributes can be organized into separate storage tiers. For example, the fastest tier may be composed of Solid State Disks (SSDs), with lower tiers made up of SAS and SATA drives, respectively. The same tier may include similar units from different manufacturers acquired over time. SANsymphony-V automatically promotes frequently accessed disk blocks to faster tiers and demotes less active blocks to slower, more cost-effective drives. You may override auto-tiering policies for special workloads.

Groups of disks may also be segregated for specific requirements, such as test and development and multi-tenancy isolation in public and private clouds.

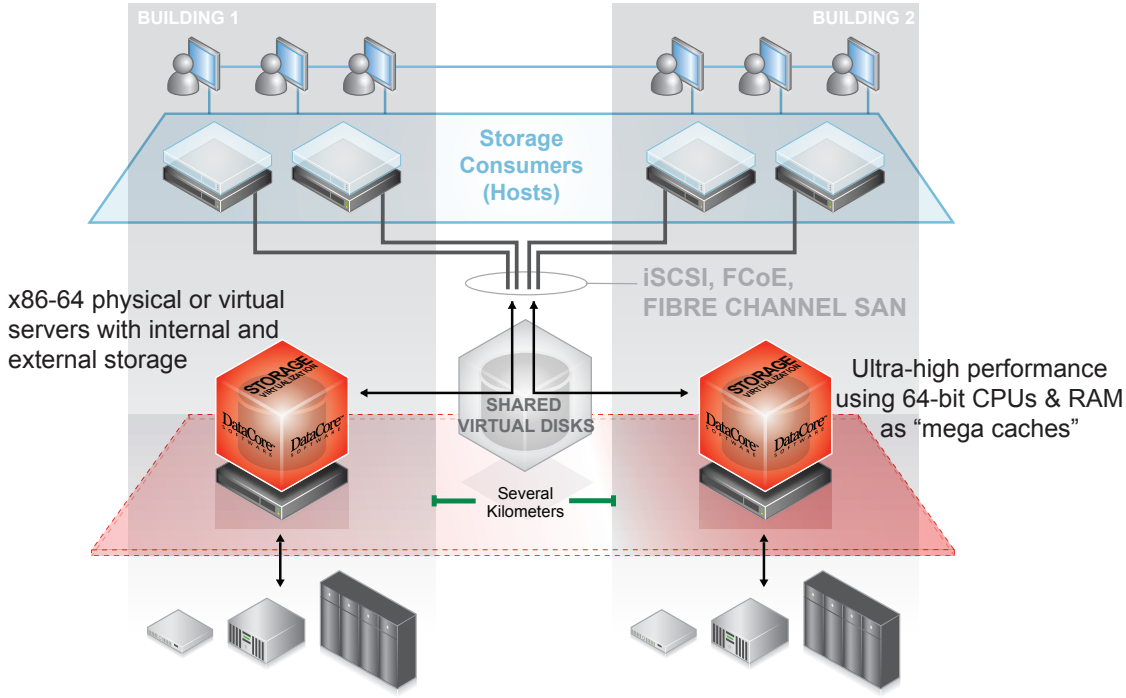
Advanced features such as caching, synchronous mirroring, asynchronous replication, snapshots, thin provisioning and CDP operate across mutually independent devices within the same tier or across tiers.

We find customers prefer to take snapshots of virtual disks in tier 1 and place them in a tier 2 or 3 pool to avoid consuming premium resources for the backup copies. Similarly, tier 1 devices may be remotely replicated to a disaster recovery site that only has tier 2 devices, possibly from a different supplier.

Perfected over the past 12 years, SANsymphony-V Release 8 represents the latest enhancements in DataCore's proven architecture.

It's strict adherence to established interfaces for communicating with disks, networks, operating systems and hypervisors ensures that you can easily adapt to take advantage of the many innovations that the industry will introduce in the next decade, and to do so without disrupting the virtual environment on which your business depends.

Active, Transparent Virtualization Layer Maximizes Availability, Performance & Utilization



COMPATIBILITY

(Please see www.datacore.com for more recent updates to the list of supported environments)

Storage Manufacturers Supported

All of the popular disk manufacturers are supported. These include:

- Dell
- EMC
- Fujitsu-Siemens
- Fusion-IO
- Hitachi Data Systems (HDS)
- HP
- IBM
- LSI
- NetApp
- Oracle (Sun)
- Promise
- Seagate
- Xiotech

Disk Interfaces Supported

Direct-attached and SAN-based connections

- SAS
- SATA
- iSCSI
- Fibre Channel
- Fibre Channel over Ethernet (FCoE) via CNA switches
- SCSI
- IDE

Disk Packaging Supported

- Internal disk drives
- External JBODs
- External storage systems

Media Supported

- Flash
- Standard Magnetic Rotating Disk Drives (HDAs)
- Solid State Disks (SSDs)

Host Operating Systems Supported

- Microsoft Windows Server 2008 R2, 2003 and 2000
- Microsoft Windows 7 and XP
- Apple MacOS X
- Unix
- HP-UX
- IBM AIX
- Sun Solaris
- RedHat Linux
- SUSE Linux

Hypervisors Supported

- VMware ESX, vSphere
- Microsoft Hyper-V on Windows Server 2008 R2
- Citrix XenServer

Network Compatibility

- Synchronous mirroring between nodes over iSCSI and Fibre Channel connections
- Asynchronous remote replication over IP LANs, MANs and WANs
- Inter-node management interface over IP LAN
- Remote console access using Remote Desktop Protocol (RDP) and other standard remote desktop access protocols supported on Windows Server

Summary

As you can see, DataCore offers a comprehensive set of storage virtualization and centralized storage management features that turn ordinary disk space into non-stop, lightning-fast and waste-free storage pools. These integrated software capabilities reconcile disparities between different models of hardware devices from the same or different manufacturers, making them largely interchangeable. They yield unheard of flexibility and cost reductions in operations, procurement and system design.

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For additional information,
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