



# Achieving the Benefits of Block-Based Storage without Breaking the Bank

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## White Paper

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## Introduction

There's a well-known proverb that says... "*You can't have your cake and eat it too!*" And while this may apply to a lot of things, there's no rule that says it has to apply to data storage. In fact, it can actually be quite easy for organizations to create robust, flexible, easy-to-manage storage solutions that allow them to realize far greater returns on the investments in their application, server and storage infrastructures, without digging deep into their coffers to do so.

This paper explains how organizations can take advantage of block-based access to data on shared storage provided by **Sanbolic® Melio™** to enhance the flexibility, availability and manageability of their applications and solutions without incurring many of the costs associated with hardware-based SAN storage (i.e., arrays, switches, HBAs, fiber cables, power and cooling, staff training, etc.).

## Melio Soft-SAN™: Achieving more with less

Using **Sanbolic Melio** and industry-standard server hardware, organizations can create software-based shared storage platforms that offer many of the inherent benefits of SAN storage, at a fraction of the cost. At the same time, these cost-effective storage platforms or "**Soft-SANs**" offer administrators a springboard to SAN storage when higher-end storage arrays become necessary to support the ever-growing demands of today's I/O intensive applications.

The key to constructing a **Melio Soft-SAN** lies in the ability to reuse server hardware already in one's possession. By reusing or repurposing equipment which is not currently in service, organizations can leverage previous investments in their hardware and network infrastructures to garner the benefits of block-based storage. In addition to saving on upfront storage hardware cost, organizations can also realize significant savings in time, which is often heavily consumed while conducting the research necessary to determine which storage hardware best meets their needs as well as their budgets.

## Anatomy of a Melio Soft-SAN

A Melio Soft-SAN is a flexible, highly-available, easy-to-manage shared storage platform comprised of three physical Windows® Server 2008™ or Server 2008 R2™ systems that work together to host one or more logical storage volumes whose data is made highly available via software-based RAID 1 (mirroring).

The servers making up a Melio Soft-SAN must have the following components installed:

- iSCSI Software Initiator
- iSCSI Software Target
- Sanbolic *Melio*

Note that any industry-standard iSCSI Target and Initiator may be used to allow each server participating in the Melio Soft-SAN to expose locally mounted target drives and connect to and mount remote target drives hosted by the opposing servers.




An ideal storage platform for SMBs, Melio Soft-SANs can also be extremely useful in larger enterprise environments as well. Some examples include:

- **Server virtualization** – Provides centralized shared storage for Microsoft® Hyper-V™ virtual machines, enabling live migration of VMs between Hyper-V hosts, simplified VM management, data protection for VM files via VSS-based snapshots and the ability to live migrate VM files to higher-end SAN storage in order to scale the virtual server infrastructure quickly and easily without disrupting user productivity.
- **Desktop virtualization** – Provides a shared storage repository for all OS images streamed on demand to virtual machines hosting virtual desktops in a streamed desktop environment, greatly simplifying image management and maintenance while enabling high availability of desktop images.
- **Data consolidation** – Provides centrally-managed shared storage for application data, enhancing application data availability and manageability.
- **Development/Testing** – Provides centralized shared storage that allows development/QA teams to share access to data/files to simplify product development/testing.
- **POCs** – Provides a flexible shared storage platform that allows organizations to set up POCs quickly and easily and transition from POC to production seamlessly.

Simple to implement and easy to manage, Melio Soft-SANs possess the unique ability to address a wide range of use cases quickly and easily at a much lower cost than hardware-based SANs.

## About Sanbolic Melio



The driving engine behind a Soft-SAN is **Sanbolic Melio**, a feature-rich product suite comprised of various advanced software components that work together to simplify, share and enhance block-based storage.


At the core of Melio is an advanced, 64-bit symmetrical cluster file system called “**Melio FS™**” that allows multiple servers to share simultaneous read-and-write access to block-based storage. As an all-purpose cluster file system, Melio FS supports all workload types and extremely large storage capacities.

Melio includes a host-based cluster volume manager that greatly simplifies the management of Melio shared storage by creating virtual pools of storage (logical volumes) out of physical storage resources (hard disks), while providing advanced functionality such as the ability to create volume sets and stripe sets to improve I/O performance, as well as expand logical volumes dynamically to support future growth needs.

Administrators are able to protect data on Melio shared volumes by creating point-in-time snapshots (VSS-based) that are stored directly on the file system without reserving additional disk space. Snapshots can then be accessed quickly and easily (with a single click of the mouse button) by mounting them locally on any server participating in the Melio cluster or as network shares accessible via UNC.

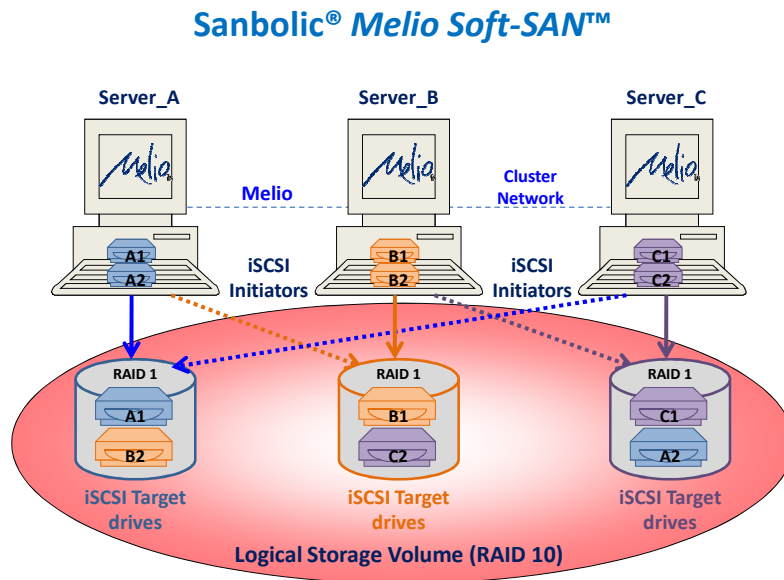
A data mover utility is also included that allows administrators to predefine user-based policies to automate the process of copying or moving data from one volume to another for reliable data backup and recovery.

Using Soft-SANs powered by Melio, organizations can achieve the following benefits:

- **Flexibility** – Provide multiple servers with access to shared storage containing all data, thus allowing compute resources to be quickly reassigned amongst various projects.
  - **High availability** – Maintain access to data on shared volumes during server or storage failures.
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- Simplified management – Manage all shared volumes from a centralized management console.
- Data protection – Enable reliable data backup and recovery using VSS-based snapshots.
- Live data migration – Migrate data from one partition to another without disrupting volume access.

The following diagram illustrates a flexible, highly available, easy-to-manage Melio Soft-SAN comprised of industry-standard servers.



## How to build a Melio Soft-SAN

Perform the following steps on three (physical) Windows® servers to create a Melio Soft-SAN similar to the one depicted in the diagram above:

1. Using the iSCSI Target software, create a target and two disks (VHDs), mount the disks (for read and write access) and expose them as iSCSI drives accessible by the Initiators on the opposing servers.
2. Using the iSCSI Initiator, connect to and mount the iSCSI drives hosted by the opposing servers.
3. Install **Sanbolic Melio**, launch the Melio cluster volume manager (*Start > All Programs > Sanbolic > Melio Volume Manager*) and follow the instructions in the “**Creating Mirrored Sets with Melio**” tech brief: <http://blog.sanbolic.com/?p=1589>

Congratulations... you’ve just created a **Melio Soft-SAN!**



## Conclusion

Deploying a **Melio Soft-SAN** allows organizations to utilize their existing server hardware to create flexible, highly available shared storage platforms that are ideal for smaller/entry-level projects and POCs. Easy to manage and cost-effective, Melio Soft-SANs allow organizations to achieve many of the inherent benefits of block-based storage without incurring the expenses associated with purchasing, operating and maintaining hardware-based SANs.

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