



## Enabling LAN-Free and Serverless Backup

*Kayo reduces the complexities and administration of backup.*

### Overview

Backup is a key part of every company's IT strategy. Today many companies still have critical data dispersed across the enterprise located either on the servers that manage that data or on direct attached storage. Managing backups in this environment is time consuming and unreliable. As a company's data grows, the LAN may be unable to support the level of backup traffic required for timely backup operations. The introduction of SANs to centralize critical data and simplify the backup process has been recognized to be a cost effective and reliable strategy.

While storage area networks (SANs) provide tremendous benefits and cost savings, there are still management complexities that can be time consuming for the administrator. SANs centralize data, but the data is still isolated on dedicated volumes (LUNs) assigned to each server. As with direct attached storage, the LUN for each server must be backed up individually.

Kayo is a volume sharing software for SANs that enables all servers attached to the SAN to share read access to all volumes on the SAN (write privileges can be exchanged at the volume level). Kayo simplifies the backup process by allowing data to be backed up directly from each volume without affecting any server in the SAN. Administrators now only have to monitor a single system to monitor and identify failed or incomplete backups.

The examples below compare typical backup installations with a backup installation using advantages of Kayo. It highlights how implementing Kayo within a SAN can reduce overall management and increase data integrity within the enterprise.

### Typical Backup Installation

In the example below (Fig. 1) there are five servers attached to the network, each with direct attached storage.

A backup agent is installed on each server that allows that server to be backed up to a central tape system. That agent initiates the backup of either selected files or a complete backup. All data is transferred from the storage across the LAN to the server in front of

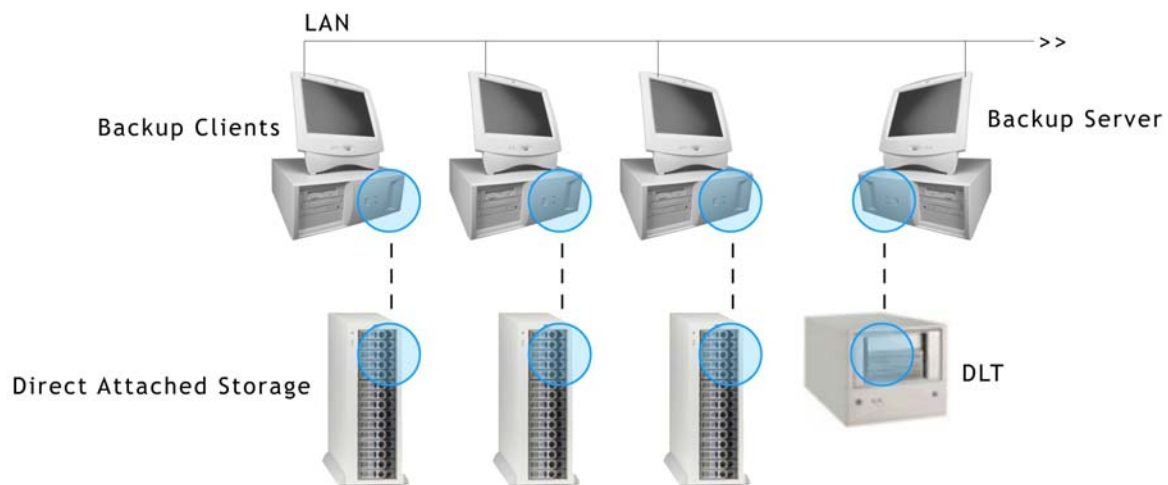
the tape system. Each server generates a backup log that details each backup's success or failure. Backup administrators must review these logs to ensure a complete and successful backup. This is a very time consuming task. As the number of systems that are backed up grows the likelihood of a failed backup increases.

Weaknesses with the traditional approach:

- LAN capacity is insufficient for large volumes of data and frequent backup
- Managing storage backup is complex and expensive
- Expense of purchasing and managing separate backup software for each server
- Difficult to track failed backups
- Data restores are slow and affect network performance

The backup system would be very similar if the servers were using SAN storage. Because the storage is partitioned and a volume (Logical Unit Number - LUN) is uniquely assigned to each sever, backup traffic would still be routed through the server and over the Ethernet to the tape backup system.

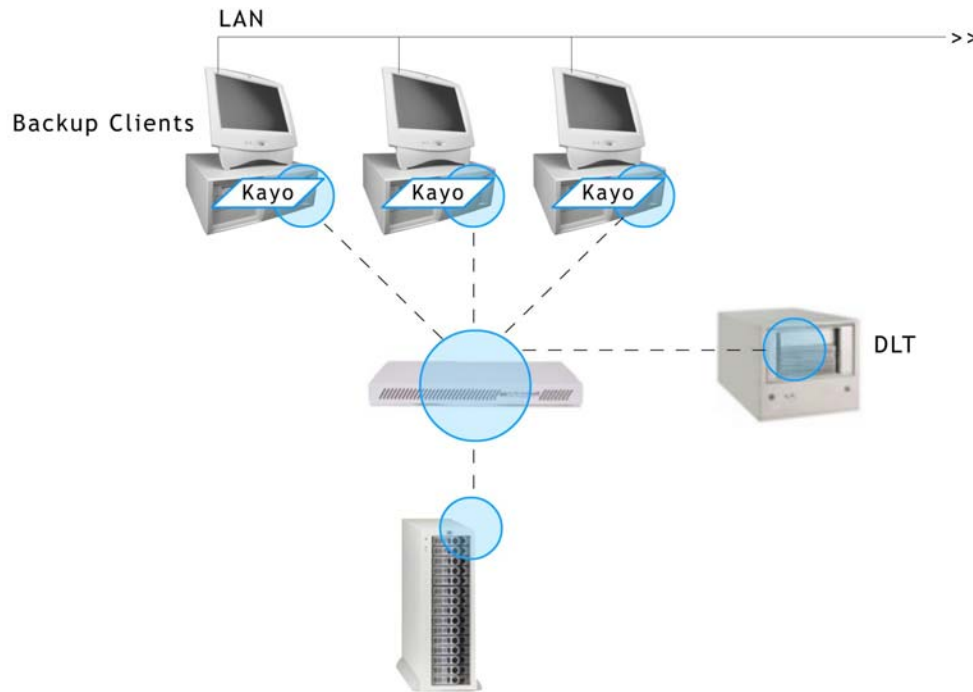
*Fig. 1 Typical Backup System*



### Kayo Enabled Backup Solution

By allowing all servers (including the tape backup system) to read from all volumes in a SAN, Kayo enables a single backup operation without using server processing and Ethernet capacity for backup traffic.

Fig. 2. Backup Environment Using Kayo



#### How Kayo Works

After installing Kayo on servers connected to the SAN, install the backup software of your choice, select the volumes that will be backed up, schedule the backup and you are up and running. All backup traffic is sent over a fibre channel connection the server to which the tape subsystem is attached.

#### Kayo Benefits

- Single system backup reduces total cost of ownership
- Improves failed backup identification
- Monitor a single backup log
- Works with any major backup software package
- Works with all tape systems
- Data can be backed up when servers are off or disconnected from the network
- No additional training in needed to configure Kayo
- Simplifies SAN management
- Storage hardware independent, works with any fibre channel storage and HBA

### *Volume Sharing Software for Storage Area Networks*

Kayo is a native NTFS solution that brings the power of the Storage Area Network (SAN) to the Windows NT desktop. Kayo allows the high-speed transfers, typical for the SAN, to take place without risk of data corruption. It ensures complete and up-to-date information about the status of the SAN volumes on every machine on the network. The software is completely transparent to the user. The users see the volumes on the SAN as their local disks and work with them in exactly the same way as with local storage. Kayo supports JBOD, RAID 0,1,3 and 5 as well as single NTFS partitions. Kayo is available for Windows NT 4.0 and for Windows 2000. Support for other Operating Systems is to follow.

### *Automatic Refresh Functionality (ARF)*

The refresh is done automatically right after any modification is made and saved on the disk. The refresh operation is transparent for the user. Any and all computers on the network have the most up-to-date information from the shared storage. When the writer creates, deletes, or changes a file the reader can see all of these modifications immediately. The refresh does not effect work in progress on any computer on the network.

### *Communication*

The communication between the writer and readers is based on Client/Server Architecture through TCP/IP network. When the writer makes a change on a volume, all readers are updated automatically. The notification that a change has been made is the only information exchanged through the LAN.

This gives high availability and faster response. If the writer goes offline for any reason, all the readers still have access to the shared storage. All the volumes remain accessible. As the only information on the LAN is the commands and control of updates there is no additional traffic generated and processed. The speed of the read operations is equal to the speed allowed by the fiber channel network.

Sanbolic's mission is to provide advanced software products and solutions to address the infrastructure needs of the storage area network (SAN) market. It was founded by early adopters of SAN technology to develop platform-independent solutions that provide true interoperability and compatibility.

*For additional information contact:*

Sanbolic, Inc.  
304 Pleasant Street  
Watertown, MA 02472  
[sales@sanbolic.com](mailto:sales@sanbolic.com)  
P: 617.926.2802  
F: 617.926.2808

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