



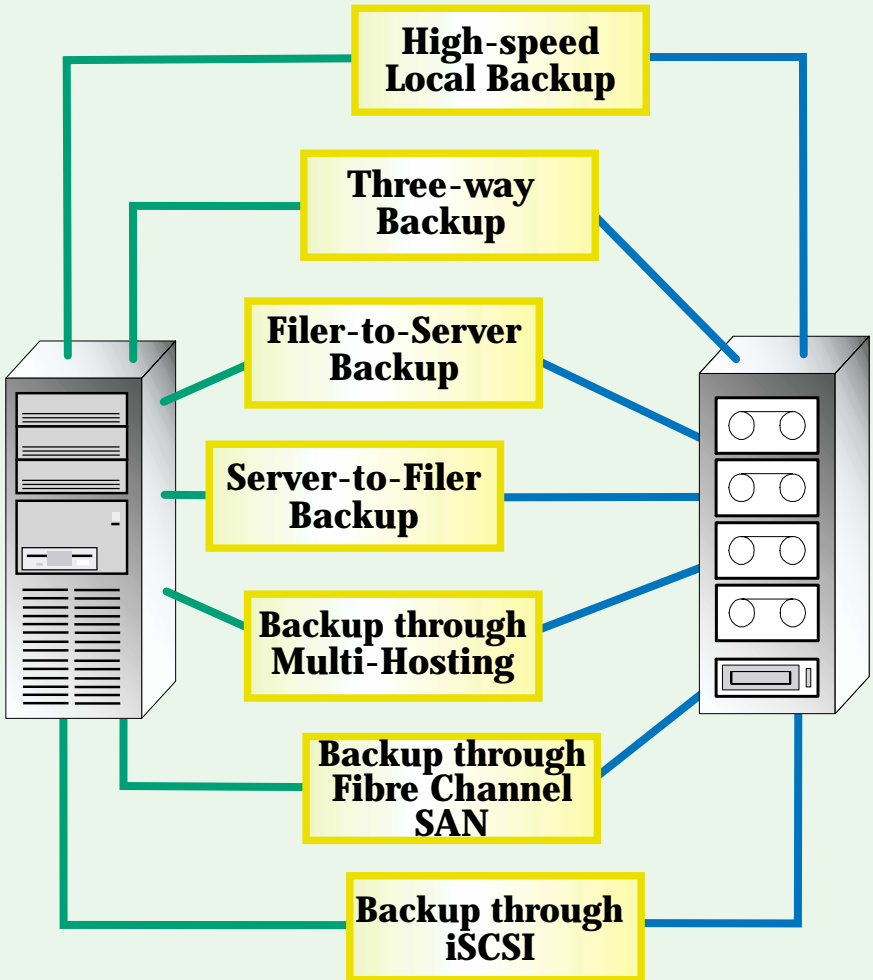
# Seven Effective Strategies for Data Protection

A Practical Guide to  
NAS and SAN Deployment

**syncsort**

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# 7 Strategies for Data Protection



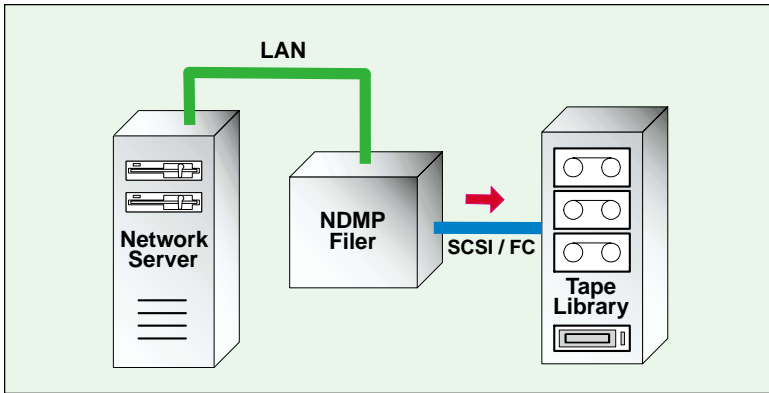
Every enterprise must protect its data. **Network Attached Storage (NAS)** implementations and **Storage Area Networks (SANs)** have become popular schemes for data management. They must be considered carefully in your data protection plan.

**Backup Express**, Syncsort's high-performance backup and restore solution, advances virtually all NAS and SAN strategies. Backup Express supports **Network Data Management Protocol (NDMP)**, which is required for communicating with NAS appliances; **Direct Access Recovery (DAR)**, which substantially accelerates NDMP restores; and Backup Express **SAN Resource Sharing (SRS)**, which dynamically allocates tape resources in a SAN.

Understanding the benefits and drawbacks of the **seven NAS/SAN topologies** reviewed in this guide will help you optimize your network design in accordance with *your* precise data protection needs.

# 1. High-speed local backup (filer-to-tape)

**Description:** Back up a NAS appliance (also called a *filer*) directly to a SCSI-attached or Fibre Channel-attached tape drive or robotic tape library.



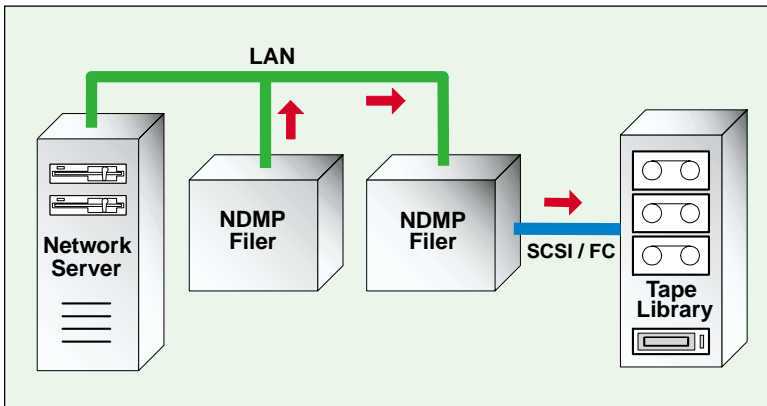
## Local Backup

Use this topology if you require an easy-to-deploy method for rapidly backing up finite amounts of data while keeping your LAN resources free. Because data does not traverse the LAN, data security is maximized and network bandwidth is inconsequential.

Because only a single data stream is initiated for each backup job, filer-to-tape backup does not optimize your hardware investment when large backups are performed. Expanding this scheme could be expensive because, as NAS appliances are added or data volumes expand, you may need to purchase additional tape devices.

## 2. Three-way backup (filer-to-filer)

**Description:** Back up a secondary NAS appliance through the LAN to a tape device or library that is attached to a separate, primary NAS appliance.



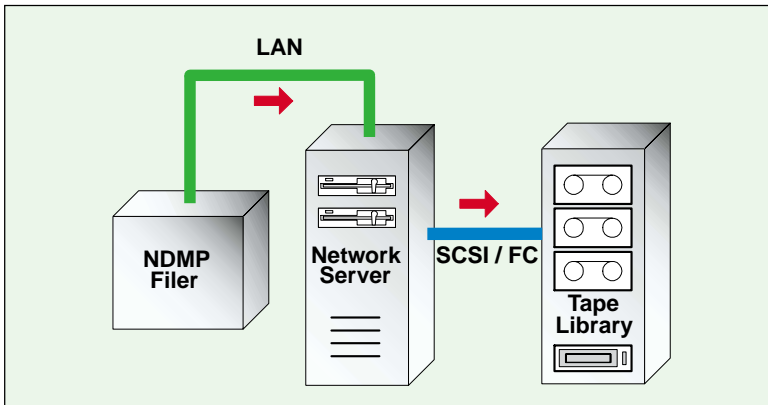
**Three-way Backup**

Used for fast backups of data stored on more than one NAS appliance, this topology offers scalability at the file server level and leverages your tape library investment. When used with Backup Express, this, like all NAS solutions, is excellent for multi-platform networks.

With this design, data *does* travel across the LAN, so bandwidth and security concerns may enter the picture.

### 3. Filer-to-server backup

**Description:** Back up a NAS appliance through the LAN to a tape device or library connected to a server.



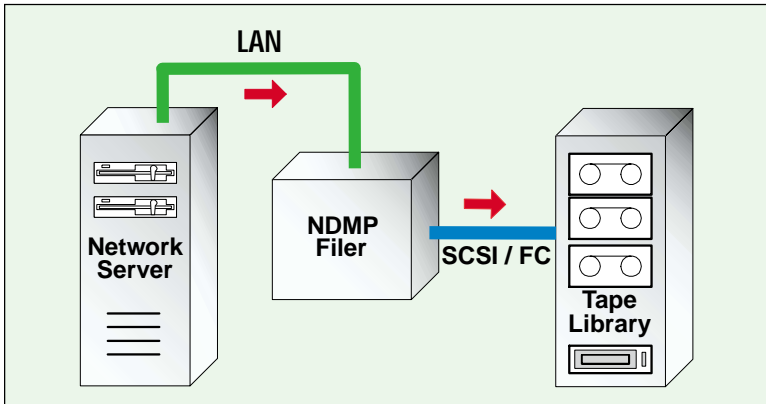
#### **Filer-to-Server Backup**

If your NAS appliances are not connected directly to a storage device, there is no need to reconfigure your network to facilitate backup and restore.

Filer-to-server backup is useful for enterprises with complex networks and expectations of growth. The design is flexible and scalable, allowing you to employ the latest technologies and to leverage your library and storage investments. And with this topology, your filers do not need to support newer tape devices because the server drives the tape devices directly. But because all data traverses the LAN and device server, there may be bandwidth and server contention.

## 4. Server-to-filer backup

**Description:** Back up data on a server through the LAN to a tape device or library that's SCSI-attached or Fibre Channel-attached to a NAS appliance.

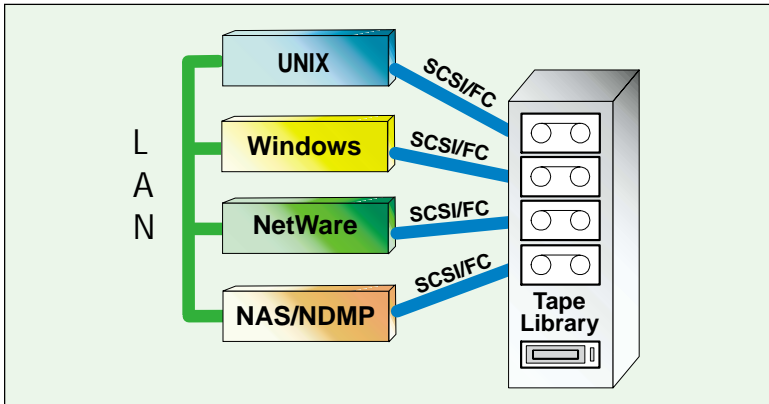


**Server-to-Filer Backup**

Use this topology if you keep most of your data on NAS appliances, but still wish to back up smaller amounts of data that reside on your servers. Though the data on your servers may not be backed up or restored as quickly as possible, the critical data on your NAS appliances are. The data coming across the LAN from your servers are subject to security and bandwidth issues.

## 5. Backup through multi-hosting

**Description:** Servers and NAS appliances in any combination are directly connected by SCSI or Fibre Channel to one or more drives in a single, multi-drive tape library.



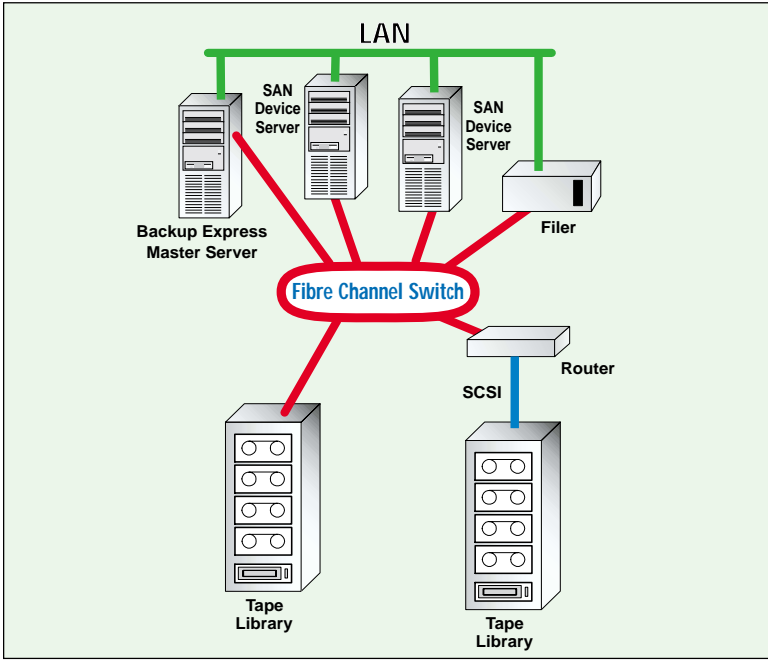
**Multi-Hosting**

Use this topology if the duration of your backup window is short and your file servers are physically near your tape library. This design offers a significant reduction in network traffic and optimizes tape drive performance. All servers stream data simultaneously to their locally attached drives, increasing backup speed and data security and reducing bandwidth usage. When used with Backup Express, multi-hosting is excellent for networks with multiple operating systems.

When deployed with SCSI connections, this configuration may be somewhat cumbersome to expand. However, multi-hosting with Fibre Channel is rapidly gaining acceptance in the industry, which has the added benefit of enabling easy migration to a SAN.

# 6. Backup through Fibre Channel SAN

**Description:** Servers and NAS appliances in any combination are connected to one or more tape libraries through a Fibre Channel switch.



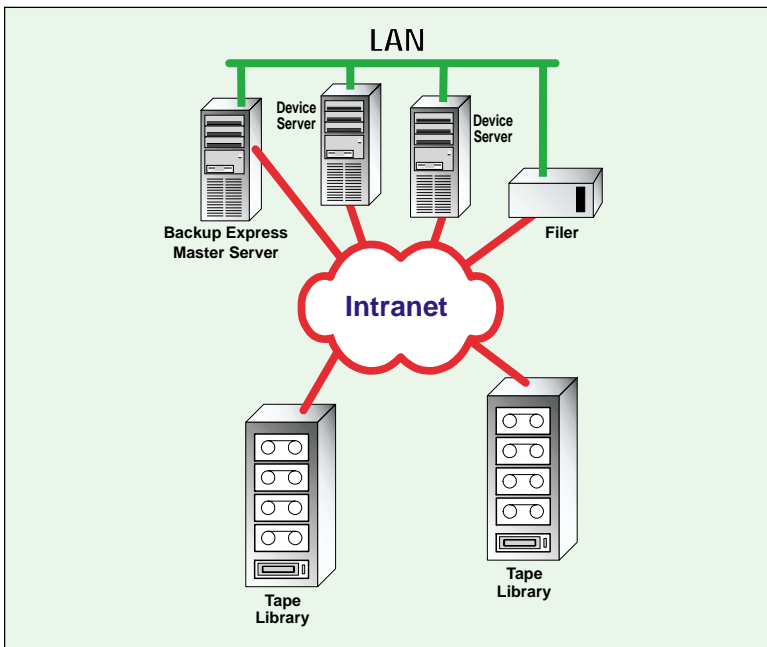
**Fibre Channel SAN**

The addition of the switch enables your backup job to complete as quickly as possible because a sophisticated backup technology like Backup Express SAN Resource Sharing (SRS) dynamically allocates tape drives to maximize your hardware investments. If a drive is unavailable, Backup Express easily works around the use of that drive. Fibre Channel also allows for greater physical separation among the components and facilitates expansion and flexibility. Plus, the SAN design keeps the LAN bandwidth free for other applications.

Deployment of a SAN can be expensive and complex, and knowledge of Fibre Channel technology is required to maintain this topology.

## 7. Backup through iSCSI (SCSI over IP)

**Description:** Using iSCSI technology, remote IP-attached storage devices are seen by a host computer as if they are local devices.



### **iSCSI Storage Network**

Like a SAN, iSCSI provides for a many-to-many connection among servers and storage devices. iSCSI facilitates long-distance data transfers over Intranets (or the

Internet), thus storage and servers can be added at convenient, remote locations. Because iSCSI networks use your existing TCP/IP infrastructure, they require a low level of investment, are inexpensive to maintain, and are easy to expand without disruption of network processes. And the data transfer can be very fast.

However, because data being backed up and restored is flowing over an Intranet, security considerations must be addressed. Further, TCP/IP protocols are not currently optimized for storage, which requires high bandwidth and relatively error-free transmission. But comprehensive standards *are* under development to tackle issues of infrastructure and interoperability.

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For more detailed information about any of the NAS or SAN strategies described in this guide, or to arrange a free trial of Backup Express, call **(201) 930-8200** or visit our web site at:

**<http://www.syncsort.com/bex/infobex.htm>**

**S**olving today's backup and restore challenges requires an understanding of advanced data management technologies as well as high-performance backup software that supports them.

**Backup Express** exploits those technologies — including NAS and SAN — and provides you with data protection that's reliable, flexible, intuitive, and fast. Its distributed architecture and comprehensive tape drive support allow Backup Express to back up to any device on the network while maintaining a central catalog for the entire enterprise. Backup Express operates across multiple operating systems — including UNIX, Windows, and NetWare — and across geographically-dispersed networks.

By taking advantage of Syncsort's acclaimed sort product, Backup Express performs efficient **Direct Access Recoveries (DAR)**, which can speed NDMP restores by up to 98%. DAR processing directly accesses the specific tape containing the file(s) to be restored without having to load and stream through every tape in the backup set.

**Backup Express** gives you the capability to manage data protection in today's complex network environments and the flexibility to adapt to tomorrow's emerging technologies.



## NOTES

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