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White Paper

Benefits of FC SANs

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SUMMARY

As the volume and criticality of data continue to grow, companies need efficient, scalable solutions for making data available to servers, applications, and users across the enterprise. By providing a network of storage resources to servers, SANs uncouple storage from individual platforms, allowing data transfer among all nodes on the storage network. SANs offer a range of benefits, such as improved backup and restore, enhanced business continuance, and simplified consolidation that address the needs of today's data-intensive businesses. NetApp® SAN solutions provide maximum storage efficiency.

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1 INTRODUCTION

The growth of business data continues to explode along with the need to store it. Workers generate more and more e-mail messages and file attachments, users demand instant access to data like never before, IT managers install more storage-hungry applications, and aging paper-based data continues to be converted into digital form.

However, with IT managers facing flat or shrinking budgets, the pressing challenge for them is to do more with less—to squeeze the most data storage out of every IT dollar. To achieve this objective, they must start by assessing all data storage costs: those tied to initial equipment acquisition as well as those for resource management, capacity use, heterogeneous support, and, most importantly, system downtime.

Traditionally, companies have accommodated storage needs with direct-attached storage (DAS), which links storage resources directly to associated servers or platforms. Direct-attached storage represents the status quo in many organizations that aren't aware of the hidden costs or technology limitations related to this form of implementation: management difficulty, limited asset utilization, low server scalability, and limited distance.

For over a decade, storage area networks (SANs) have been mainstays for companies looking to increase storage utilization and manageability while reducing costs. SANs represent a topology for connecting storage assets directly to the network and establishing a peer-to-peer server/storage implementation. SANs have historically been based on Fibre Channel (FC), but also incorporate iSCSI and Fibre Channel over Ethernet (FCoE). SANs solve multiple issues for enterprises with data centers to remote offices.

Fibre Channel SANs have proven to:

- Accelerate backup and restore
- Improve business continuance
- Boost high availability (HA)
- Foster storage consolidation

2 ACCELERATE BACKUP AND RESTORE

As enterprise data becomes more and more valuable, ensuring its stability and protection is more critical than ever. SANs can accelerate and simplify the data backup and restore process. SANs are ideal for backup-intensive environments, especially when there are clearly defined areas for isolating backup workloads. The switched 4Gb or 8Gb full duplex capabilities of Fibre Channel fabrics can significantly improve backup and restore performance. Moreover, Fibre Channel is designed to transport large blocks of data with great efficiency and reliability. Two popular SAN-based backup and restore approaches are typically referred to as the “LAN-free” and “server-free” backup and restore models.

Removing the LAN from the backup and restore process provides a variety of advantages. SAN-attached tape drives and libraries can be implemented so that each server sends its own backup data directly to the shared tape resources instead of through the network to the backup server (see Figure 1). Sophisticated backup and restore software applications still control the process, tracking the backup and restore data. The SAN enables bulk data transfer from each server to shared SAN storage, but the LAN is used only for metadata communication traffic between the servers. The result is a faster, scalable, and more reliable backup and restore solution with more effective utilization of storage, server, and LAN resources.

In the SAN-based server-free backup and restore model, data is transferred directly between storage devices (for example, from disk to tape) without using host servers. The server-free backup and restore model significantly reduces application host CPU cycles, thereby freeing up valuable CPU cycles to improve operating efficiency and enable higher workloads across the enterprise.

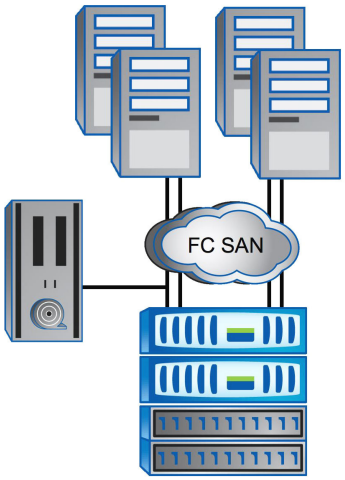

Figure 1) Backup and restore.

3 IMPROVE BUSINESS CONTINUANCE

Because SANs can integrate multiple storage devices and applications, they provide many high-availability options for organizations that need to support a wide range of business continuance activities in a cost-efficient manner. The distributed networked approach of SANs addresses the ability to recover data and quickly bring systems back online following a disaster. Without this level of protection, even minutes of downtime can pose significant consequences to many types of organizations. To guard against downtime and to reduce business risk, a SAN solution eliminates single points of failure, incorporates failover software, streamlines data backup and recovery, and enables high-performance mirroring over great distances (see Figure 2).

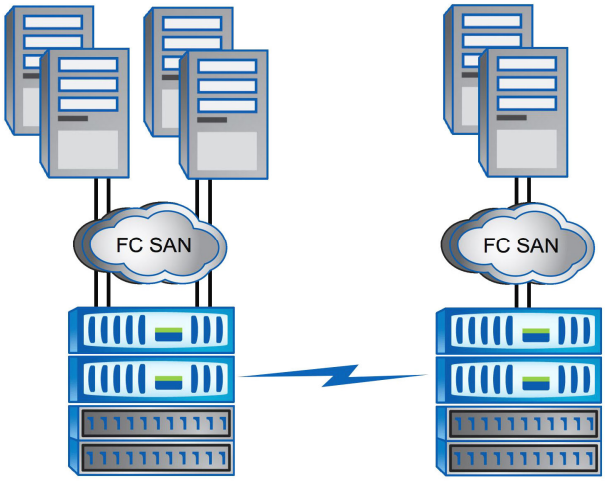

Figure 2) Mirroring.

4 BOOST HIGH AVAILABILITY

With the increase in the volume and criticality of corporate data and the importance of industry regulations, companies demand the highest possible system availability. Some of the key availability benefits of SANs include built-in redundancy, dynamic failover protection, and automatic I/O rerouting capabilities. Flexible connectivity options enable the development of SANs that have no single points of failure. SANs provide hot-plugging capabilities that enable organizations to install, configure, and bring storage online without experiencing server downtime. SANs can also support high-availability operations by enhancing clustering implementations.

5 FOSTER STORAGE CONSOLIDATION

There are many technical and business advantages to consolidating servers and storage with SANs (see Figure 3). A SAN infrastructure enables any-to-any connectivity between heterogeneous server and storage systems. This allows much more efficient use of storage and server resources by consolidating widely distributed or underutilized resources into centrally managed environments, and provides the following benefits:

- Increased utilization of existing storage
- Decreased storage capital expenditures by enabling the purchase of storage on an “as-needed” basis
- Increased administrative staff productivity: Manage more storage with fewer personnel
- Reduced application downtime and minimized business impact for storage upgrades
- Simplified storage management with centralized storage and server platforms

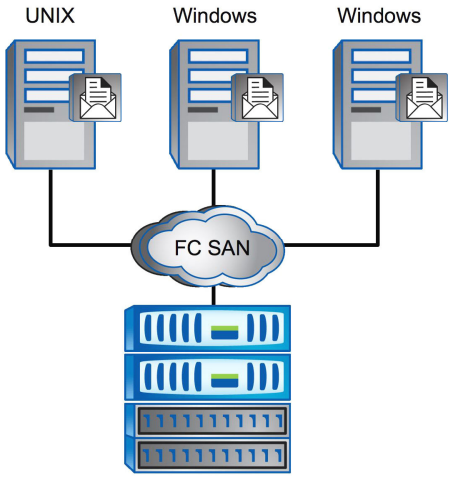

Figure 3) Consolidation.

6 NETAPP FC SAN

NetApp provides a full range of storage-efficient Fibre Channel SAN solutions for environments with the most demanding performance and availability requirements. By coupling high-performance, efficient storage with unique data management software, NetApp delivers increased utilization and availability of critical data, productivity improvements, and lower storage costs.

NetApp FC SAN solutions deliver compelling customer value across thousands of deployments with:

Efficient and easy provisioning

- Instant provisioning, dynamic reconfigurations, and easy data restores via automation or “one-click” operation with zero downtime
- Industry’s most efficient use of disk space with the advanced thin-provisioning provided by NetApp FlexVol®
- Grow or shrink volumes nondisruptively to match application changing requirements

Maximized application uptime

- Microsoft® Exchange, SQL Server®, SharePoint®, SAP®, Oracle®, and VMware® ESX integrated management automate and simplify backup, restore, and failover with NetApp SnapManager® and SnapDrive®.
- Saving time and administrative resources, NetApp Single Mailbox Recovery for Microsoft Exchange (SMBR) quickly and accurately retrieves individual mailboxes and e-mail messages.
- Application-aware backups eliminate performance degradation and routine downtime.

Affordable and flexible business continuity and disaster recovery

- Reduce backup administration by up to 50% with NetApp SnapVault®; restore data in seconds with NetApp SnapRestore®, saving time and money.
- Get integrated high availability and disaster recovery with NetApp MetroCluster; achieve synchronous and asynchronous mirroring to and from any NetApp system with SnapMirror®.
- NetApp deduplication can be used broadly across many applications, including primary data, backup data, and archival data.

Reduced TCO

- 35%–55% lower TCO for environments like SAP, Oracle, and VMware enables you do more with fewer resources.
- Higher utilization allows you to use half the rack space, half the power, and half the cooling load without compromising performance.
- You can reduce system costs by using SATA disks for production applications with NetApp RAID-DP® (double parity).

Unique flexibility and investment protection with unified multiprotocol storage

- NetApp offers a truly unified storage architecture capable of meeting all storage needs—SAN and NAS: primary, secondary, and archive—from a single platform.
- Minimize complexity and cost with the ability to use multiple block and file protocols (FC, FCoE, iSCSI, NFS, CIFS) to simultaneously access the same storage system.
- Implement a single set of processes for all data management functions.

Interoperability with leading applications and host environments

- Comprehensive support for VMware, Windows, Solaris™, AIX, Linux®, HP-UX, OpenVMS, and NetWare.
- Broad support for native and third-party multipathing and clustering.
- Comprehensive SAN professional services.

In summary, NetApp FC SAN delivers significant cost-of-ownership savings with efficient provisioning, maximized business application uptime, and affordable business continuity. NetApp allows you to store the maximum amount of data for the lowest cost:

- 50% lower capacity requirements without sacrificing performance or resiliency.
- Achieve up to 90% utilization.
- 50% or greater reduction in power, cooling, and space requirements.
- Manage twice as much data without increasing personnel numbers.