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Solution Snapshot

Simplifying SAN Environments by Consolidating SAN Islands

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Simplifying SAN Environments by Consolidating SAN Islands

ABSTRACT

For years, organizations around the globe have been enjoying the wide range of business advantages that Storage Area Networks (SANs) provide. As these organizations continue to increase their SAN investments, they are focusing on new ways to optimize their SAN environments for even greater value. One of the most effective ways to achieve this goal is to migrate business processes from multiple SAN islands to a single large SAN infrastructure. Today, storage vendors Brocade and EMC are helping organizations realize the numerous benefits of SAN consolidation, including simplified management, higher resource utilization, and reduced operating costs.

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Optimizing the SAN Advantage

To overcome the inefficiencies of Direct Attached Storage (DAS) environments, organizations around the globe have embraced Storage Area Networks (SANs) to the point that SANs have become ubiquitous in enterprise data centers as well as in many smaller businesses. In turn, these organizations have realized the numerous business advantages — including simplified management, more efficient resource utilization, higher data availability, and lower costs— that SANs provide.

Much of the popularity of SANs has been driven by their ability to strategically enhance operations such as data backup, disaster recovery, and application performance. However, SANs have become so popular so quickly that they are frequently implemented on a purely tactical basis. As with any new IT solution, many organizations have tended to cautiously deploy smaller SANs, at least initially, based on a variety of reasons:

- Some organizations prefer separate SANs for tape storage and disk storage;
- Budgets are often approved for specific SAN systems without considering larger strategic issues;
- Individual groups or departments plan and build their own autonomous SAN infrastructures.

To better understand this trend, it helps to view a typical enterprise SAN environment like the one illustrated in Figure 1:

- A fabric includes one or more interconnected switches.
- A SAN includes one or more related fabrics and associated SAN server and storage devices.
- SAN islands consist of two or more SANs that serve independent functions.

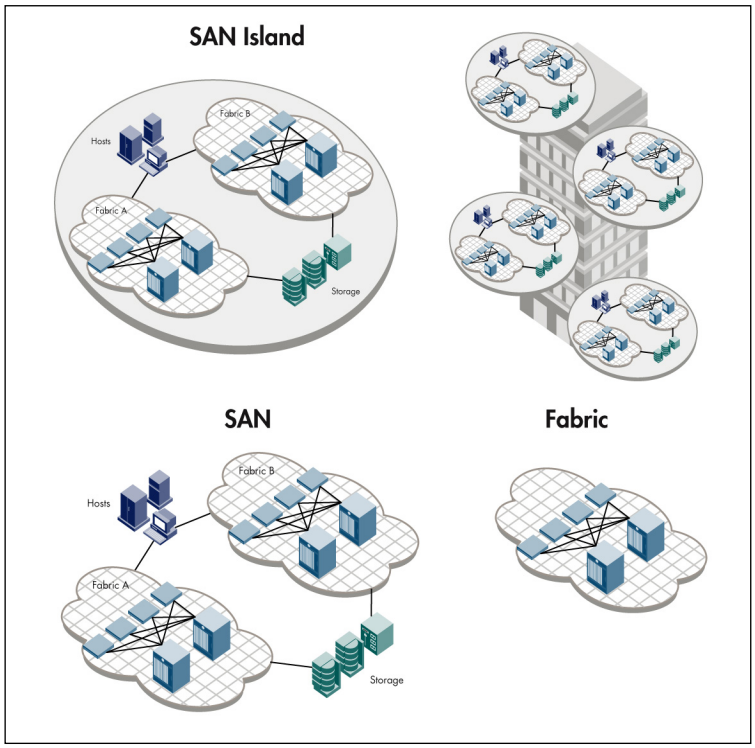

Figure 1.

A SAN, a fabric, and SAN islands.

To clarify further, a dual-fabric SAN is a single SAN with the fabrics related by operational redundancy. However, an ERP SAN and a Microsoft Exchange SAN are examples of SAN islands — SANs separated by application and/or business function.

Although it might make sense initially for businesses to deploy smaller autonomous SANs, doing so can limit their overall IT and business benefits. For instance, each SAN requires its own management and maintenance, requiring IT staff to perform separate iterations of the same tasks — an inefficient use of staff resources that increases overall IT costs. In addition, deploying multiple SANs isolates resources, thereby reducing the number of resources that users can access and share across the enterprise. As a result, many organizations have yet to realize the full range of benefits that their SANs are actually capable of providing.

Key Benefits of Consolidating Multiple SAN Islands

Many organizations with multiple SAN islands discover that they could benefit from more efficient management and better resource utilization. This is especially true for organizations that continue to expand their SAN environments and invest in new technologies. To simplify their IT environments, many of these organizations are beginning to consolidate multiple SAN islands into single, large SAN infrastructures.

As shown in Figure 2, consolidating SAN islands can generate a wide variety of operational efficiencies, including:

- Provisioning server and storage capacity more quickly;
- Utilizing existing resources more efficiently;
- Centralizing fabric management to reduce complexity and lower demand for highly specialized staffing;
- Reducing capital and operating expenses, as well as the total cost of storage;
- Synchronizing business initiatives, such as service level agreements, throughout an enterprise IT environment.

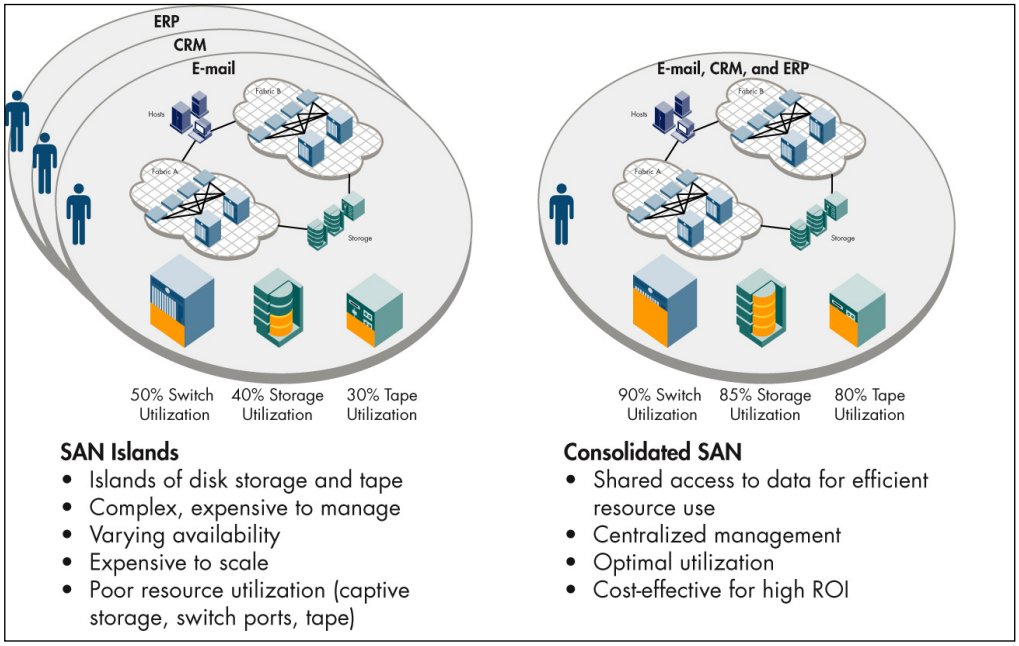

Figure 2. Key benefits of SAN consolidation. *Copyright © Brocade Communication Systems, Inc.*

The Primary Challenges of SAN Consolidation

When considering whether to consolidate smaller SANs into a larger SAN infrastructure, organizations typically identify which environments would most benefit from consolidation, but other issues also require careful consideration. Some of the most critical aspects of SAN consolidation are the potential political and cultural challenges such projects might cause within the enterprise. For instance, asking which IT group owns a given network infrastructure might elicit a surprising number of answers. Groups focused exclusively on storage tend to be most concerned with leveraging the network for business-critical tasks such as data backup and disaster recovery, while network-focused groups are primarily concerned with overall infrastructure performance. In contrast, groups that operate their own independent SANs might not want to bring those systems into a centrally controlled environment.

Beyond corporate cultural and political concerns, organizations must also address practical issues. Because consolidation essentially combines multiple independent SANs into a shared network, the impact on the applications that run on those networks can be significant. As a result, organizations should carefully review their system and SAN infrastructure requirements for potential conflicts.

Effective assessment for a potential SAN consolidation project also requires a thorough understanding of SAN switch requirements to ensure that the necessary features are available to support the build-out process. Switches must support the strategic aims of the greater infrastructure with key capabilities that might include high port count for scalability, zoning to ensure device isolation, self-monitoring functionality, and support for arbitrated loop devices.

In addition, network management tools that effectively scale to larger consolidated SANs — providing real-time analysis and policy-based management — can help organizations gain more control over those environments. Correctly utilizing fabric management solutions for a SAN consolidation project can greatly reduce management workload, better leverage storage assets, and increase data availability. Figure 3 illustrates a typical process flow for a SAN island consolidation project.

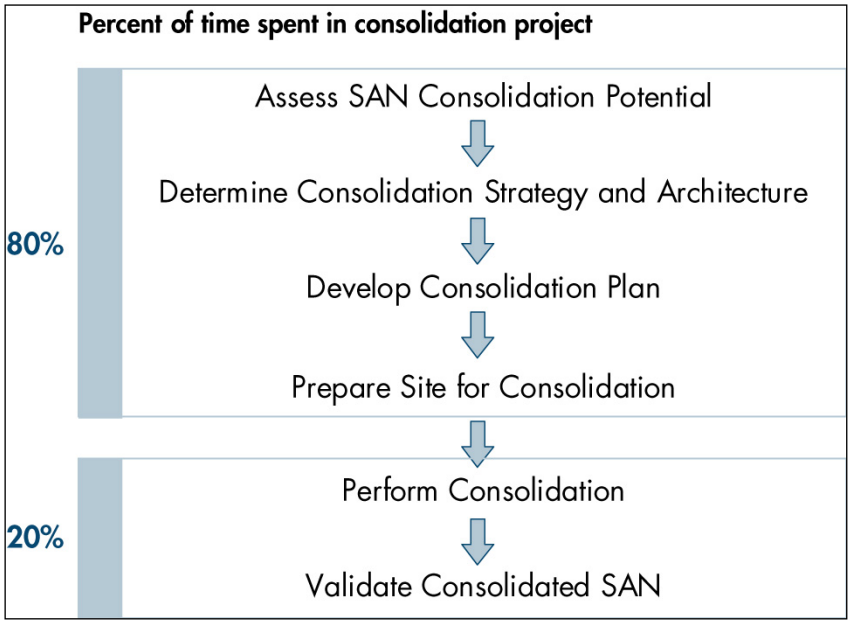

Figure 3. SAN island consolidation process flow.

One particularly effective way to facilitate SAN consolidation is to utilize a core-to-edge design. For example, deploying higher-port-count switches in the core of a SAN can allow fabrics to grow to thousands of ports. Today, SAN consolidation solutions — such as those offered by EMC using products developed by Brocade — enable organizations to leverage their existing SAN environments while improving resource utilization, data availability, performance scaling, and storage provisioning time to support new applications.

SAN Consolidation: The Brocade/EMC Difference

The combination of EMC storage solutions and Brocade SAN infrastructure solutions has enabled some of the world's largest SAN consolidation projects. Through their ongoing partnership, Brocade and EMC continue to develop synergistic products and innovative deployment solutions to solve real-world business problems.

Brocade SAN Infrastructure Solutions

The expertise of Brocade is reflected in its broad family of SAN infrastructure solutions and the strength of its partnerships with the IT industry. At the center of all Brocade solutions is the Brocade Intelligent Fabric Operating Environment, which is designed to provide highly available, scalable, and performing fabrics that support the interconnectivity of existing islands of storage. The real-time Brocade Fabric OS provides a reliable platform for Brocade SilkWorm directors and switches to address ever-growing scalability, availability, and throughput requirements. The Brocade Fabric OS also offers non-disruptive firmware upgrades, a key consideration for organizations that rely on continuous data availability to support mission-critical applications.

Brocade provides a variety of solutions designed to simplify fabric management tasks and streamline the consolidation of isolated SAN islands. In particular, the Brocade SilkWorm 12000 Director, available from EMC as the Connectrix ED-12000B, provides scalability up to thousands of devices. Additionally, Brocade's Advanced Fabric Services can significantly enhance fabric performance, management, monitoring, and security — all of which are crucial for maintaining high performance levels in consolidated SAN environments.

For example, a core-to-edge design, combined with Brocade Inter-Switch Link (ISL) Trunking ,can improve performance by providing automatic load balancing and transparent recovery from individual link failures. By aggregating up to four ISLs into one full 8GB/sec logical link, ISL Trunking increases throughput between core switches or from core switches to edge switches, thereby enabling dynamic bandwidth sharing. Moreover, Brocade supports automated SAN management solutions through its Fabric Access API, which enables third-party storage management applications, such as EMC ControlCenter, to seamlessly manage Brocade fabrics.

EMC SAN Solutions

EMC develops a range of storage systems, storage-related software, storage networks, and storage services designed to maximize the value of IT investments. EMC solutions seek to enhance performance and cost-efficiency by consolidating storage and server resources, centralizing storage management, and facilitating data protection and business continuance operations.

EMC's SAN Architect helps organizations reduce external expenditures by enabling them to implement their own SANs. The product includes automated design and deployment tools supported by best-practices guidelines, configuration/installation advice, and information about specific devices. The result is a solution that can assist in cost effectively automate SAN

deployment, promotes better use of SAN-attached resources, and matches best practices to the particular demands of specific IT environments—thereby streamlining SAN consolidation.

In addition, as organizations consolidate their SAN islands centralized management becomes a critical issue. EMC ControlCenter SAN Manager helps automate the management of consolidated SAN environments by providing a single point of control for multi-vendor servers, storage arrays, and Fibre Channel switches and directors. SAN Manager can display the topology of the entire SAN environment, including high-level or specific details of SAN components. EMC ControlCenter SAN Manager integrates seamlessly with Brocade Fabric Manager (available from EMC as Connectrix B Fabric Manager), which consolidates key management functions to a single operation.

Brocade and EMC: Working Together for SAN Interoperability

Brocade and EMC have a long-standing partnership dedicated to ensuring high levels of product interoperability. Both companies are founders and active members of the SNIA Supported Solutions Forum, an organization dedicated to full support for multi-vendor storage networking solutions.

Brocade products are designed to conform to all applicable industry standards and certifications, such as SANMark testing. To simplify product deployment and integration, Brocade tests its products across a broad spectrum of Fibre Channel solutions, including extenders, storage, servers, and network equipment.

In turn, EMC thoroughly tests its Brocade-developed Connectrix switches and directors with all EMC Symmetrix and CLARiiON networked storage products, as well as with servers, HBAs, operating systems, distance extenders, and other storage networking products. As a result, most organizations will find they can enjoy dependable solutions with ensured interoperability, as well as necessary installation, configuration, and support information.

Strategic Solutions for Continued SAN Growth

By refining current SAN technologies and pioneering new capabilities, Brocade and EMC are developing SAN solutions that are powerful enough to support today's IT requirements and flexible enough to address tomorrow's challenges. As fabric devices become increasingly intelligent, more storage-related functions are already beginning to move directly into the SAN fabric. By incorporating next-generation, multi-protocol switches into their SAN consolidation efforts, organizations should be able to reap the benefits across their enterprise. EMC and Brocade plan to offer a joint solution in this area, with EMC's commitment to develop switch-based applications for the Brocade Fabric Application Platform (SilkWorm Fabric AP).

With solutions such as these, Brocade and EMC are simplifying the migration from multiple SAN islands to a single SAN infrastructure and helping their customers realize the numerous real-world benefits of consolidated SAN environments. Enterprises considering SAN consolidation efforts would do well to consider solutions offered by EMC and Brocade.

Illustrations provided by Brocade Communication Systems, Inc.