Storage Consolidation

Cut the Cost, Risk, and Complexity of Your IT Environment.

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Executive Summary

The combination of a sluggish economy, tight spending controls, and corporate mandates to minimize risk have left many IT departments understandably cautious about new initiatives. However, storage consolidation may offer the low-cost, low-risk, high-upside scenario that IT managers are looking for in today's "do more with less" climate.

The explosion in data-driven, data-fed, data-dependent network services not only increases the need for data storage and management, but also compute power and network resources to provide access to services. The result for many companies is server and storage sprawl, with proliferating devices, inaccessible islands of information, and incompatible data silos. Storage consolidation is the right starting point for alleviating a wide range of problems and streamlining data center operations. It is a project that can be completed quickly and inexpensively because many of the needed tools and resources are already in the data center; it is also a project that can create an increasing array of benefits as you explore new next-generation technologies such as virtualization.

Storage consolidation can be an extremely effective way to regain control and improve the efficiency and utilization rates of your storage resources. You can:

- Cut the total cost of ownership (TCO) and improve ROI through economies of scale--without cutting the quality of your mission-critical services.
- Deliver the appropriate level of performance to each end-user group.
- Build a data continuance environment (DCE) that delivers business continuity.
- Maximize the productivity of your current IT staff with no additional training.
- Centralize and simplify management tasks, reducing complexity and cost.
- Use your data center floor space more efficiently and possibly eliminate the need to build or lease additional capacity elsewhere.

But there is more than one type of storage consolidation, more than one process for consolidating storage resources, and more than one set of benefits to expect. This paper will help you determine:

- Whether storage consolidation makes sense for your particular situation.
- Which type of consolidation is most appropriate for your requirements.
- How to identify opportunities and how best to proceed with your storage consolidation project.

The paper also provides brief descriptions of the key Sun products and services that help you consolidate your resources and implement a Complete Storage Solution with minimal disruption, risk, and cost; and it offers examples of Sun customers that have achieved substantial benefits from their storage consolidation projects.

Consolidation Defined

Consolidation has emerged as an extremely effective way to streamline many types of data-driven applications while reducing total cost of operation (TCO) for storage resources. There are two key categories: server consolidation and storage consolidation.

- *Server consolidation* is moving decentralized, but congruent, applications on multiple heterogeneous servers throughout the company onto a cluster of homogeneous servers.
- *Storage consolidation* is the integration of multiple dispersed and/or heterogeneous storage platforms and the data they contain.

Types of Storage Consolidation

There are three types of storage consolidation:

1. *Physical (Platform) Consolidation*: Direct attachment of multiple heterogeneous servers to a single powerful device. This approach, made possible by heterogeneous, data-center-class storage systems, dramatically reduces storage costs by creating a single source of high-performance storage for multiple types of servers, eliminating the need to purchase separate storage devices for each server type. It also simplifies administration and conserves valuable data center floor space.
2. *Infrastructure Consolidation (Centralization)*: Pooling storage resources— including switches, arrays, tape libraries, and other storage assets —on a storage area network (SAN) to be shared among heterogeneous hosts and managed centrally. This model improves efficiency and reduces management complexity while also improving scalability, availability, and data accessibility.
3. *Data Management Consolidation (Integration)* is the moving of decentralized data located on distributed file systems into a common file system for efficient sharing and ease of management.

The list of applications and uses for which consolidation is an attractive option includes everything from data warehousing and decision support to customer relationship management (CRM), enterprise resource planning (ERP), product lifecycle management (PLM), supply chain management (SCM), and sales force automation (SFA).

While this paper focuses on storage consolidation, it is important to understand that storage consolidation and server consolidation go hand-in-hand. To truly consolidate your IT environment, a Complete Storage Solution that addresses both server and storage requirements will deliver the greatest gains.

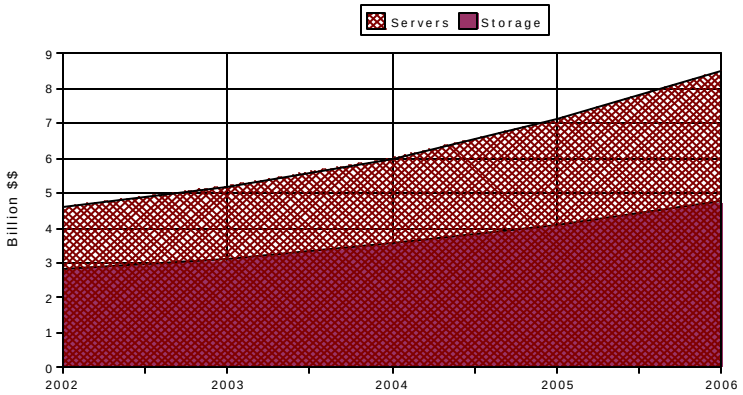
The Value of Storage Consolidation

Storage consolidation is not simply transferring disks from a large number of small boxes to a small number of large boxes, and its benefits can extend far beyond the obvious cost savings. To fully appreciate the benefits of storage consolidation, it is helpful first to understand the trends that are fueling the rapid growth in consolidation projects. This section describes the market drivers and summarizes--in the words of independent analysts--the key benefits that can be derived from storage consolidation.

What's Driving the Move to Storage Consolidation

Recent studies by IDC project strong growth for server and storage consolidation, as illustrated in the graphic below. In fact, IDC's survey of 400 senior IT managers at major corporations revealed that fully 90% of respondents have some type of server and storage consolidation strategy. And according to the Meta Group, 84% of Fortune 2000 companies are recentralizing enterprise systems, and 94% have adopted a hybrid/centralized model. This section examines why--and why now.

Server and Storage Consolidation Market (IDC, 2002)



Out-of-Control Growth Increases Costs

According to IDC, disk storage shipments (measured in gigabytes) will grow more than 40% between 2002 and 2003. At the same time, customers are facing inefficient resource utilization and high management costs.

Many businesses experiencing unprecedented storage growth today are still using a distributed storage infrastructure. As they struggle to keep up with growing capacity and increasingly stringent service agreement levels (SLAs), their costs are skyrocketing out of control. This is especially true in heterogeneous environments with multiple hosts

attached to discreet islands of storage or in environments where old equipment is still deployed. In a legacy environment, as the equipment ages, components become more difficult and expensive to find, and they take longer to replace. Disparate systems often do not communicate with one another so data has to be duplicated, further adding to the cost of storage.

New IT Initiatives Add Complexity

New projects such as Web services, messaging, and on-line initiatives further exacerbate the cost and complexity of the storage environment. For example, each new application added by IT typically requires the introduction of multiple additional servers. And for every server that you add into the environment, you also have storage issues. You've got to decide how you're going to set up your data management schemes, how you're going to do the backup on all these servers, what the network implications are, how you're going to manage the environment, and how you're going to keep the applications secure. In addition, these new projects often require around-the-clock, instant access to a growing volume of data. IT managers are struggling to keep the data flowing whenever and wherever it is needed.

Growing Need to Protect Data

At the same time, data needs to be collected, analyzed, and protected from disasters, which requires an effective data continuance environment and business continuity strategy--including the deployment of backup and restore, copy and remote replication, and rapid recovery techniques.

Trying to maintain a smooth flow of information among disparate host platforms attached to distributed islands of storage is expensive at best, impossible at worst. A storage administrator in such an environment will not be able to manage much more than one or two terabytes (TB) of data. Backup windows will be exceeded and valuable data will be left exposed. Many systems will not be adequately protected from unplanned disaster, human error, or system failure.

The decision of how to balance the IT budget between the many hosts systems and their relative storage will need to be constantly monitored, reviewed, and changed on a monthly — or even weekly — basis.

Business Advantages of Storage Consolidation

Storage consolidation can cut costs and improve efficiency for everything from data analysis to next-generation Web services. But what are the specific benefits and how are they derived? This section presents the key advantages from a business perspective.

Higher Utilization Rates for Server and Storage Systems

Storage consolidation can unlock surplus server and storage capacity and thereby delay or obviate the need to make additional hardware purchases. With consolidated storage, resources do not need to be tied to specific applications and user groups; they can be more readily distributed and allocated to those who need them.

Higher IT Productivity

By consolidating storage, businesses can achieve economies of scale and thereby cut data and storage management costs. Data and storage systems are more centralized, so administrators are more productive, so fewer IT staff are required. Through techniques such as automation of data migration from disk to tape or archive, additional cost savings and efficiencies can be gained.

IDC research concluded that consolidated, networked storage is at least 3.75 times cheaper to administer than server-attached storage (IDC Perspective: Leveraging Networks for Storage Consolidation, Octoboer 2001).

Reduced Backup Windows

Since business data now needs to be available continuously, the backup window has essentially vanished as a data protection option for administrators. However, through storage consolidation, backup/restore operations for everything from desktop clients to data center servers can be centralized and expedited, helping to minimize the backup window and thereby minimize business disruption for backup/restore operations.

Better Foundation for Disaster Recovery/Business Continuity

Business continuity requires the perpetual availability of data--not just systems--because if data is lost, corrupted, or unavailable the needed service is not functional, regardless of whether the systems that run it are available. By centralizing and better integrating data and systems, storage consolidation provides an excellent foundation for more effective business continuity planning and rapid disaster recovery. Networking storage resources also facilitates the process of making copies over high-speed networks, migrating information from disk to tape, and implementing LANless and/or serverless backup.

Performance Allocation Based on Business Priorities

Through storage consolidation, the IT department can more easily allocate specific service levels to various groups depending on their needs and their strategic importance to the business. For example, a customer care application that directly impacts the customer experience can be allocated higher disk speeds and capacity levels than a more mundane search-and-retrieval service for internal employees.

More Accurate Charge-Back for IT Services

With centralized storage, administrators can more easily identify applications, data, and storage assets by Service Level Group. That means usage levels for various services can be more easily and objectively gauged, so costs can be passed on to specific user groups with accuracy. This enables the IT department to charge lines of business or divisions for services actually used, to provide more detailed management reporting about usage levels, make better projections about future usage patterns, and adjust usage based on business priorities.

Bottom Line: Lower TCO

The net result of the aggregate benefits of storage consolidation is lower TCO for storage resources and higher ROI from those resources--without sacrificing quality of service to end users. Storage consolidation can enable organizations to optimize the mix of technologies for the best TCO, including direct-attach storage (DAS), network-attach storage (NAS), storage area networks (SANs), shared DAS, and others.

According to Sun's internal research and customer experience, storage consolidation can start to produce significant cost savings and accelerated ROI at about 10 terabytes of raw capacity.

Is Storage Consolidation Right for You?

Many of the benefits of storage consolidation are intuitively obvious. Determining whether storage consolidation makes sense for your particular situation may not be so clear-cut. This section helps you consider the symptoms of complexity and identify opportunities for storage consolidation without your data center.

Symptoms of Complexity

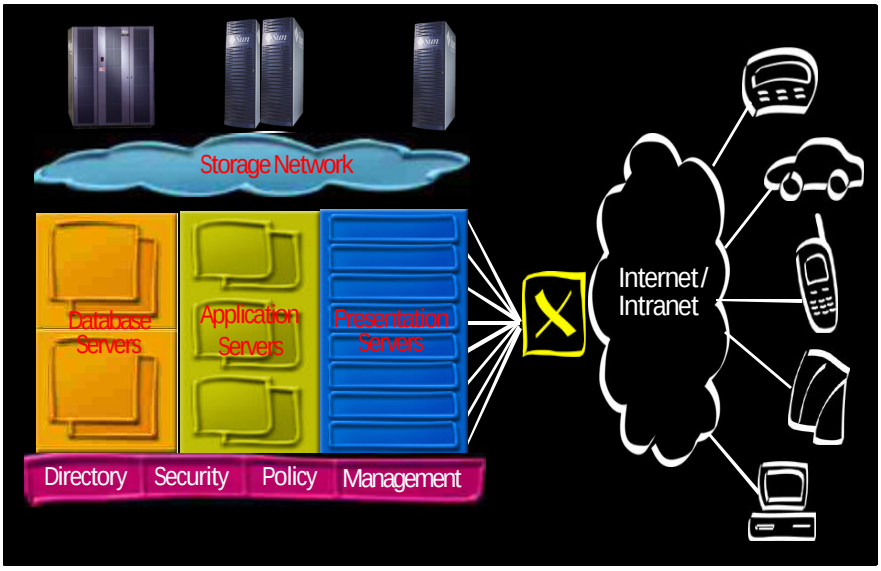
If any of the following conditions exist within your data center, it is likely that there are opportunities for reducing complexity and increasing efficiency through storage consolidation.

- Difficulty deploying, tracking, and managing resources
- Difficulty managing events
- Inability to scale current system administrator ratios
- Inability to deliver predictable, end-to-end service levels efficiently
- Over-provisioning has led to inefficient utilization of compute resources

How to Identify the Opportunities in Your Data Center

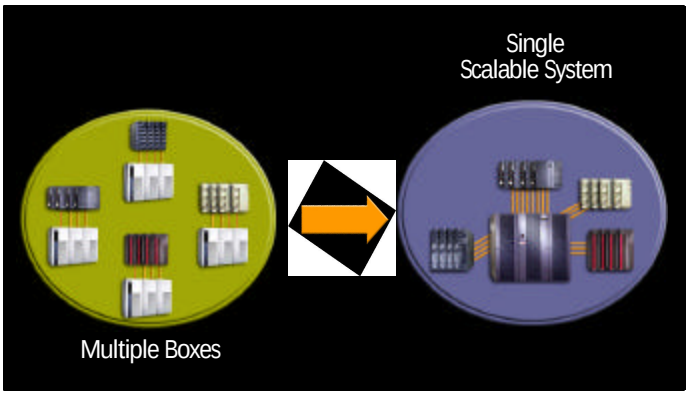
In considering where consolidation opportunities exist within your environment, the first question is where to look. The answer is everywhere. It may be useful at this stage to evaluate opportunities individually within each element of your end-to-end services architecture, as pictured below. There may be opportunities not only within your storage network, but also in your back-end database server environment, within your application servers, and in your presentation servers.

The End-to-End Services Architecture



As you analyze your infrastructure, you may identify opportunities for the three types of storage consolidation described earlier. Following are three specific examples of opportunities you may uncover, along with criteria for measuring success.

Platform Consolidation: Multiple Storage Boxes to a Single Storage and Management Point



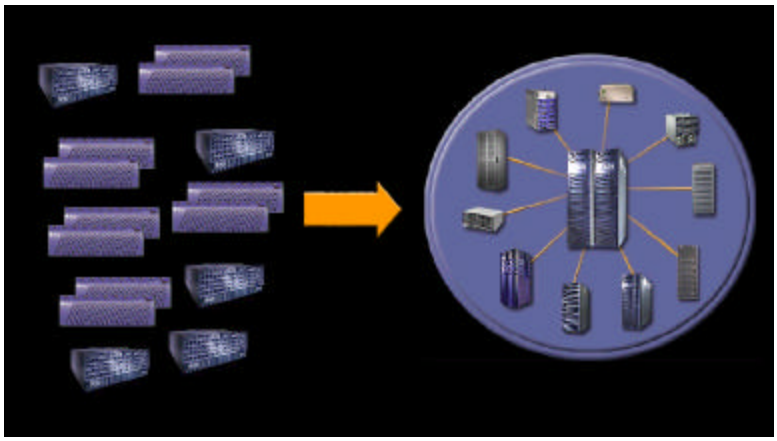
Problems:

- Excessive software licenses and hardware componentry
- Increasing complexity and growth
- High maintenance costs and service charges
- Excessive floor space utilization

Success Factors:

- Data storage costs matched to data value
- Optimized space utilization
- Reduced software licensing costs
- Improved availability, reliability, performance, and scalability
- Lower maintenance and service costs

Data Management Consolidation: Storage Sprawl to Sprawl Containment



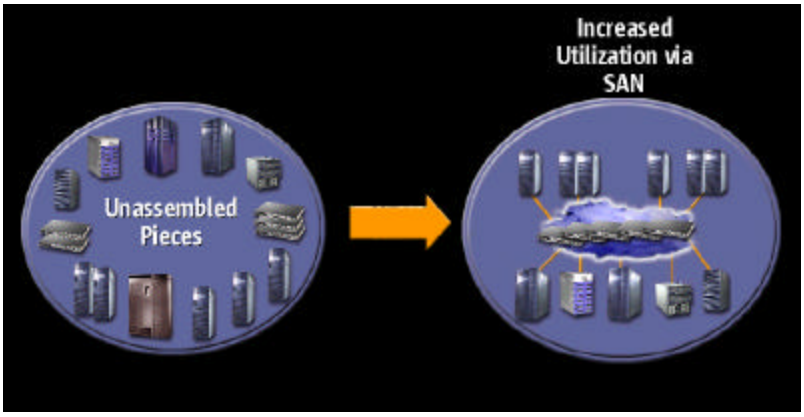
Problems:

- Extraneous storage is costly and cumbersome
- Multiple, superfluous software licenses and hardware components
- Time-consuming maintenance and service
- Excessive space utilization

Success Factors:

- Reduced data storage costs
- Scalable capacity
- Increased management efficiencies
- Improved availability, reliability, performance, and scalability
- Lower maintenance and service costs

Infrastructure Consolidation: SAN Islands to Integrated SANs



Problems:

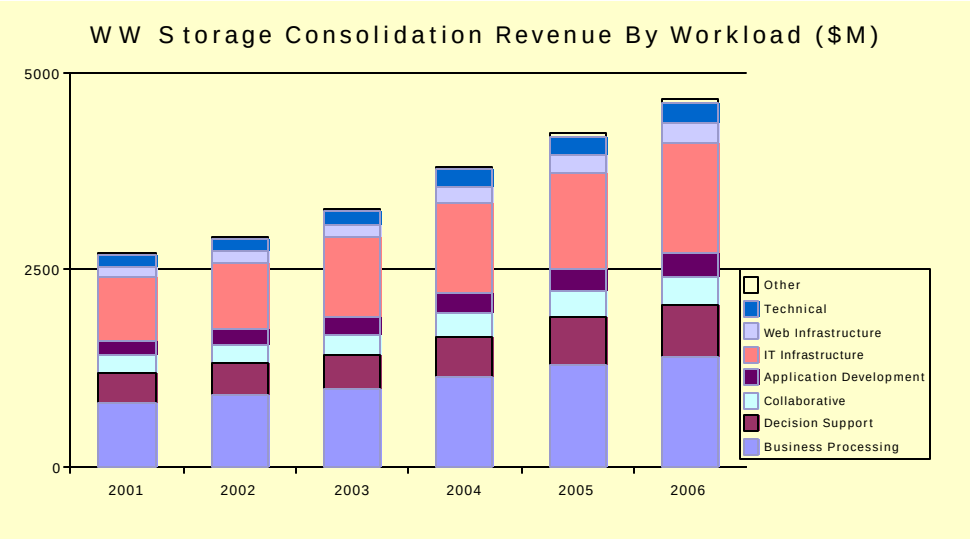
- Limited scalability and performance
- Unpredictable availability and reliability
- Suboptimal TCO
- Poor manageability

Success Factors:

- Quick and easy growth path
- Continuous uptime
- Reduced overall storage costs
- Improved reliability, scalability, and performance
- Simple, convenient control and monitoring

Storage Consolidation Workloads

In considering storage consolidation opportunities, you may want to prioritize your efforts according to the value of the workload being performed. The chart below shows the projected growth rates for consolidation projects by workload.



Checklist: Are You Ready for Storage Consolidation?

Take this mini-survey to determine if storage consolidation is right for you:

- Is your storage growth difficult to predict and/or manage?
- Are your storage costs out of control?
- Does your data need to be updated more often than it is currently?
- Are your storage administrators overworked?
- Is the complexity of your storage environment spiraling upward?
- Is your IT department finding it difficult to deliver required availability and performance levels?
- Is your company taking on new e-commerce and/or e-business initiatives?
- Is your business a global company with global e-mail, v-mail, and/or intranet requirements?
- Is your upper management using reports based on outdated information?
- Are required applications being delivered late?

- Are IT dependencies not fully understood, leading to incorrect management disciplines being applied?
- Is your business experiencing problems handling incoming Web traffic efficiently?
- Is your business experiencing difficulty scaling quickly and non-disruptively to meet growing demands?
- Are planned/unplanned services or maintenance disrupting production?
- Would a catastrophe put you out of business for an unacceptable amount of time (perhaps even forever)?

If you answered “yes” to one or more of the above questions, your business is ready for storage consolidation.

Sun’s Storage Consolidation Solutions

This section provides a brief overview of Sun’s key products and services for storage consolidation. For complete details about any product mentioned here, please visit our Web site at *www.sun.com/storage* or contact your local Sun iForce Channel Partner. You can also contact Sun Services, Sun's source of expert consulting, training, and support, or visit their Web site at *www.sun.com/service/solutions/consolidation.html*. Sun Services can help you with any aspect of designing, implementing, and managing a complete storage consolidation solution.

Platform Consolidation: Sun’s Data Center Consolidation Solution

Sun’s complete, end-to-end Data Center Consolidation Solution provides an example of how Sun can provide an integrated platform consolidation offering for the largest, more complex data centers. The solution addresses server and storage consolidation with a single, rock-solid platform that provides extreme levels of performance and availability, while improving efficiency and reducing complexity. The solution encompasses:

- An end-to-end IT infrastructure (server, storage, tape, software, services)
- Storage optimized for the Solaris™ Operating Environment and tailored to the Sun Fire™ server platform — with extreme connectivity
- Best-of-class storage hardware designed for extreme consolidation
- A next generation file system that takes you beyond storage consolidation to data continuance and enables storage systems to achieve maximum performance, seamless file sharing, and intelligent backup and recovery
- Comprehensive consulting, training, and support. Sun’s expertise extends to the entire IT environment and is an essential part of delivering a complete data center consolidation solution.

Infrastructure Consolidation: Open SAN Architecture

Software--not just storage hardware--is the key to effective storage consolidation. And Sun's software for storage consolidation is a key differentiator and a critical competitive advantage for Sun.

Sun's software advantage is clearly on display in the Sun StorEdge Open SAN architecture, a comprehensive set of products and services that help ease SAN management and allow you to consolidate storage resources on the network.

This architecture provides a common full-fabric SAN infrastructure combined with high-availability storage products that span from workgroups to the largest data centers. It is the first fully integrated open SAN solution optimized for Sun environments. With any-to-any connectivity, wide area coverage, SAN-wide load balancing, and increased support for open, heterogeneous SANs (including Linux, Windows NT 4.0, Windows 2000, HP-UX, and IBM AIX), you can consolidate multiple storage devices into one efficient, scalable infrastructure. Sun helps bring it all together by offering a range of services for SAN architecture, implementation, and management.

Data Management Consolidation: Heterogeneous Backup and Archive

The need to manage data on multiple hosts from multiple vendors adds considerable cost and complexity to the IT environment. Through Sun's data management consolidation solutions, companies can save money and administrative time through:

- Consolidation of heterogeneous hosts (including hosts with non-Sun operating environments) onto a single management platform.
- LANless/serverless heterogeneous backup: Locally created bitmaps can be exported to a shared backup host, and the shared backup host can direct-attach or SAN-attach any supported Sun StorEdge tape library or backup product. Only a single license is required, so there is only a single, consolidated backup host to manage.

With Sun StorEdge data management software, you can manage rapid growth and reduce TCO by providing automated, policy-based services to optimally match service levels with application requirements. Key elements of Sun's heterogeneous backup and archive solutions include:

- Sun StorEdge Utilization Suite software featuring Sun SAM-FS, which provides a fully integrated and automated method for protecting, archiving, and recovering huge amounts of data, enhanced throughput of multi-user applications, and fast recovery
- Sun StorEdge Performance Suite software, which offers a shared file system service for high-performance, data-intensive environments with very large volumes, making it suitable for high-end data consolidation solutions.

Sun StorEdge Products for Storage Consolidation

The tables below summarize the key individual hardware and software components of Sun's end-to-end storage consolidation solutions.

Table 1: Key Hardware Components of Sun's Storage Consolidation Solutions

Hardware Component	Description
Sun StorEdge 9900 series	The ultimate solution for large-scale data center consolidation. The series includes the Sun StorEdge 9970 and 9980 systems, offering extreme levels of availability, performance, scalability, and connectivity for the data center.
Sun StorEdge 6000 series	With integrated virtualization, these systems are optimized for server and storage consolidation in mid-range companies and the enterprise data center. A multi-platform SAN solution, it is optimized for network performance and delivers scalable capacity, performance, availability, and manageability.
Sun StorEdge 3510 FC Array	With support for full virtual LUNs, this Fibre Channel workgroup array can serve as a consolidation platform for previous-generation Sun arrays such as the Sun StorEdge A1000 array.
Fiber Channel Switching Infrastructure	Sun's SAN infrastructure includes the Sun StorEdge 2-Gb 16-port switch, which is performance optimized and tested for the Sun environment; as well as support for the most popular switches from McData and Brocade.
Sun StorEdge Tape Libraries	Sun provides a selection of tape library products with a wide range of scalable capacities to accommodate explosive data growth.

Table 2: Key Software Components of Sun's Storage Consolidation Solutions

Software Component	Description
Storage software portfolio	An open, integratable storage management portfolio based on industry standards that allows customers to choose best-of-class management components to provide automation and service-level management capabilities.
Sun StorEdge Enterprise Storage Manager (ESM)software	This open, standards-based SAN management platform helps lower TCO and improve application service levels by streamlining operational activities and reducing the complexities of SAN management.
Sun StorEdge Resource Management Suite software	A valuable data-analysis and decision support solution for storage consolidation projects, allowing IT managers to centralize and simplify the administration of their storage infrastructure.
Sun StorEdge Performance Suite software	Provides a shared file system service for high-performance, data-intensive environments with very large volumes, making it suitable for high-end data consolidation solutions.
Sun StorEdge Availability Suite software	Provides a solid foundation for consolidated backup infrastructure; continuous access to files and data; and effective business continuity planning.
Sun StorEdge Utilization Suite software (featuring Sun SAM-FS)	Provides a fully integrated and automated method for protecting, archiving, and recovering huge amounts of data.
Sun StorEdge Traffic Manager software	Enables administrators to allocate bandwidth on demand, deliver SAN-wide dynamic load balancing, and provide integrated path failover.
Sun StorEdge Diagnostic Expert software	Health management software that not only diagnoses problems but also is unique in its ability to provide advice about remedial actions to take.

Table 2: Key Software Components of Sun's Storage Consolidation Solutions

Software Component	Description
Sun StorEdge Diagnostic Reporter software	A companion utility that sends administrators an e-mail message when the Configuration Service console is not running, improving availability and simplifying management.
Sun StorEdge 9900 Series software	A complete portfolio of software to extend the value of the Sun StorEdge 9900 Series with storage management capabilities, recovery management, real-time copy, intelligent performance tuning, heterogeneous data sharing, host access control, load balancing, failover, and more.

Customer Care Solutions

Sun customer care and service initiatives provide comprehensive product support that helps you optimize your storage consolidation solution to meet your requirements and implement it quickly and correctly. Our service offerings include:

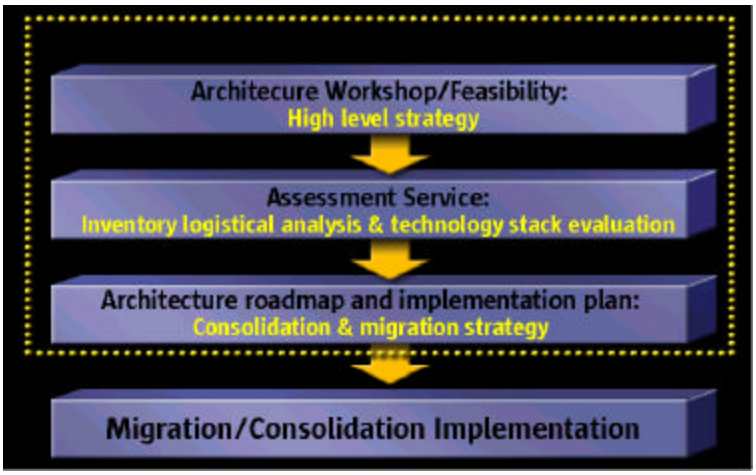
- *Consulting Services*: Sun consultants provide expert assistance in consolidation assessment, architecture, implementation, and management, as well as data migration. Whether your needs involve a small or large scale SAN, our consultants offer the expertise and experience to devise a solution tailored to the requirements of your business, and work with leading third-party specialists and solution providers to develop an end-to-end solution. Specific offerings include:
  - TCO Review Services: Help you assess and reduce the TCO of your consolidated storage assets. Three levels are available: Storage TCO Review, a free-of-charge consultation; Storage TCO Discovery, a more detailed and thorough assessment conducted through in-depth interviews; and Storage TCO Full Study offerings, a comprehensive TCO evaluation using real data and the Gartner master tool.
  - SAN Assessment, Architecture, and Implementation: Sun consultants provide customized assistance with any facet of assessing, planning, architecting, and implementing a SAN that meets your business requirements.
  - Hardware and Software Installation/Implementation Services: Utilizing field-proven best practices, Sun consultants help ensure proper systems configuration and timely completion of your storage consolidation solution installation and integration.
  - Storage Migration Services: Helps you manage the risk and resources required to accomplish complex data migration activities.

- *Education and Training Services*: Sun professionals offer a full storage curriculum to build your staff's confidence in working with Sun StorEdge systems and software products, helping to minimize system downtime and maximize the operational value of your storage products. Specific offerings include:
  - Storage Management Learning Path: Provides training for effectively administering and managing storage, as well as administering a highly available computing environment.
  - Server Administration Learning Path: Provides in-depth training for administering and managing enterprise servers and can help administrators gain the skills necessary to administer Sun servers to maximize uptime.
- *Support Services*: Sun offers comprehensive support services for your entire Sun storage environment. Specific offerings include:
  - SunSpectrum services: Provides four levels of support for Sun hardware and software--from proactive, mission-critical service to basic self-maintenance support.
  - Sun Software Support Services: Two levels of service for all Sun software products to help applications remain stable, reliable, and available.
  - Sun StorEdge Remote Response: A remote support solution for Sun StorEdge 3900 and 6900 series storage systems that proactively identifies operational anomalies to help prevent them from becoming business problems.
  - Sun Remote Services (SRS) Net Connect: Consists of a self-managed, Web-based tool enabling management of Sun server and storage systems at no cost.
  - Sun Vendor Integration Program (SunVIP): Simplifies and consolidates the management of multiple vendors, leading to rapid problem management and resolution.
- *Storage Centers*: Sun's network of Storage Centers worldwide bring together the hardware, software, staff, and expertise you need to create a proof-of-concept (POC) for a specific storage and/or SAN solution.
- *Storage Elite Partner Services:* Sun's Storage Elite Program is aimed at empowering a team of partners to drive down TCO for Storage in the enterprise with best-of-breed storage management software architecture and services, helping to ensure that customers have access to the best storage-qualified and knowledgeable partners in the industry. Sun partners who have been certified by the Storage Elite Program are not only competent in Sun products, but also with heterogeneous storage hardware and software. The program now includes 34 Storage Elite Certified Partners and 12 more that are on the verge of receiving Certification.

How to Get Started: Sun's Storage Consolidation Methodology

Undertaking a storage consolidation project need not be a daunting challenge. Sun has simplified the process of identifying opportunities, developing solutions, and implementing quickly and correctly with its Storage Consolidation Methodology. The steps are illustrated below.

Sun's Storage Consolidation Methodology



Architecture Workshop/Feasibility: Sun storage consultants will visit your site, meet with technical and executive management to understand your goals and strategy, identify specific opportunities for consolidation, and provide TCO Assessment and TCO Architecture/roadmap services.

Assessment Service: Working with your technical staff, Sun consultants assess your current environment to determine how your architecture is laid out, where the data resides, how the data is managed, how the data is distributed, what type of applications are being used, etc. Sun's consultants will define and write down quantifiable benefits and success metrics, such as improved utilization rates from existing storage assets.

Architecture Roadmap and Implementation Plan: Once Sun consultants have the facts, they will work with you to implement a consolidation solution and train your staff on the new environment.

It is important to note that the first three phases of the methodology are an iterative process, not a step-by-step progression. Based on your input and the results of testing, Sun consultants constantly refine and enhance the plans for maximum benefit.

Migration/Consolidation Implementation: During the final phase, the actual migration occurs and the consolidation plan is implemented, including the installation and configuration of new hardware and software products.

TCO Review Services: Throughout the Workshop, Assessment, and Architecture phases, Sun can help you assess and reduce the TCO of your consolidated storage assets. For specifics about the Storage TCO Review, Storage TCO Discovery, and Storage TCO Full Study offerings, contact your local Sun sales representative, Sun Services representative, or Sun iForce Channel Partner representative.

The Sun Advantage for Storage Consolidation

Many companies offer storage consolidation services today. Sun's solutions stand apart because:

- Sun's consolidation solutions do not begin and end with storage. Sun's approach takes into account the critical interrelationships between servers, software, storage, networks, IT skills, security procedures, partners, and business practices in delivering consolidation solutions. And Sun has the expertise in end-to-end platform infrastructure to help ensure a successful deployment-rapidly and with minimal risk and disruption.
- Sun has focused on storage software, not just hardware, and has remained one of the last true innovators in developing sophisticated software products for storage management and data protection.
- Sun offers an end-to-end data center consolidation solution that addresses storage, server, and data consolidation with a single integrated platform featuring best-of-class servers, storage systems, tape backup, software, and services.
- Sun's approach recognizes the critical importance availability plays in successful storage consolidation solutions, and takes a holistic approach to delivering maximum uptime — from optimizing the built-in RAS features of its hardware and software products to providing comprehensive consulting, education, and support services specifically designed to increase service-level availability.
- Sun's storage consolidation solutions are available and supported for every business type, every industry, and every level — from the high-end data center to the midrange level to the workgroup — anywhere in the world.
- Sun can assist you through every phase of your storage consolidation--from architecting and implementing, to managing the solution. Sun offers expert consulting, education, and support services that can help you achieve your business goals: lower TCO, simplified administration and manageability, optimized staff utilization, and improved availability, efficiency, and profitability.

- Because our storage consolidation solutions are highly integrated, they provide you with a high degree of cohesiveness, which allows your business to cost-effectively grow its storage at its own pace while keeping up with growing demand for performance and availability requirements.

Real-World Consolidation Examples

The following customer vignettes demonstrate the benefits actual Sun customers are deriving from their consolidation projects.

Nova Scotia Power, Inc.

As the primary operating subsidiary of Halifax-based energy and services company Emera, Inc., Nova Scotia Power, Inc. (NSPI) serves Emera ’s 440,000 residential and business customers, currently generating 97 percent of the power Nova Scotians use.

Recently, NSPI’s IT division conducted a careful examination into areas where it could reduce its TCO and more cost-effectively accommodate change. Simplifying its IT infrastructure and processes was one way NSPI hoped to achieve these goals. With the help of Sun, NSPI has consolidated a collection of smaller systems that have accumulated over the years to more powerful and higher-capacity platforms.

A long-time user of Sun servers and workstations, NSPI began working with Sun to consolidate its Solaris™ servers —five Sun Enterprise™ 3000 servers, seven Sun Ultra™ 2 servers, and three Sun Ultra 10 servers —onto the new Sun Fire™ platform running the Solaris 8 Operating Environment. “We wanted a large capacity, scalable, high-availability system,” explains Scott Briand, IT Technical Architect at NSPI. “Our users were demanding shorter maintenance windows and 24/7 support.”

At the same time, the company was also considering what it would do with its Windows NT servers. “Our multiple Windows NT servers were requiring more and more storage, and between those and the Sun servers, we had 15 different direct-attach storage units out there,” explains Briand. “We wanted a storage solution that would scale more easily, while also providing high availability. That ’s when we realized a SAN would be the right strategy for us.”

NSPI brought in Sun for a two-week engagement to set up and run a proof-of-concept, which entailed a battery of rigorous acceptance trials. Sun helped install and test a cluster of Sun servers and implement the SAN. Knowledge transfer during the consulting engagement as well as formal onsite training, gave NSPI systems administrators the expertise they needed to operate and maintain the new environment. “Sun realized that we were treading down a new technological path with our SAN,” Briand says. “It put its best resources at our disposal to help ensure our proof-of-concept would be successful.”

Although NSPI has yet to complete its cost-of-ownership calculations, the return on investment is likely to be very large, according to Briand. “With the consolidation, we will be eliminating five servers,along with the support and maintenance and floor space they require. And with the SAN, we won’t have to invest in direct-attach storage for every new server we buy. It ’s also easier and less costly to manage all our storage from one machine, using Sun ’s data center-class storage management software.”

Specifically, Briand notes, “The Sun StorEdge 9900 series system demonstrated exceptional performance, scalability, and availability. We were able to prove to management that we could benefit from best-of-breed SAN components and get the complete package from Sun, which has been our platform vendor of choice for more than seven years.”

Hostworks

Founded in 1999, Hostworks is a leading provider of mission-critical Internet hosting in Australia. The company hosts enterprise applications and Internet sites to the highest levels of availability, while offering its customers a complete range of hosting solutions and unrivaled management expertise. Today, Hostworks hosts over 300 e-commerce transactions per second and is responsible for over 15 percent of all Australian Internet site content.

Hostworks needed a cost-effective, consolidated storage system that could meet the very high transaction throughput requirements of one of its largest customers, while also delivering the performance, high availability, scalability, and flexibility that Hostworks customers would need in the future. “What we were looking for was a leading technical solution that could meet all our key criteria,” states Marty Gauvin, Managing Director for Hostworks. “We wanted to buy from a vendor we knew we could work with, one who had a good understanding of our business. And, we wanted to pay the right price.”

Hostworks investigated several storage vendors,but selected the Sun StorEdge 9960 system for several reasons. “We had worked with Sun in the past and we knew they understood our business and we saw they could deliver the services we required,” states Gauvin. “Sun had also shown great flexibility, and so it was logical for us to go back to a vendor that we trusted and one we knew could meet our needs at the right price.” Gauvin continues, “Hostworks is a mission-critical, managed-hosting service provider focused on excellence, and Sun is a systems/software/solutions provider also focused on excellence. We’ve gotten great response from current and prospective customers with that combination.”

Questerra

Founded in 2000, Questerra is a wholly owned subsidiary of MeadWestvaco Corporation of Connecticut, a leading producer of packaging, coated and specialty papers, and specialized chemicals.

Questerra offers a Web-based service that consolidates and intelligently processes data from any source, presenting it to decision makers using a unique location metaphor. Maps, analytic applications, reports and tabular information with drill-down capabilities for further analysis, are combined in an easy-to-use Web-based interface. This allows new opportunities for better decisions, faster response times, and enhanced collaboration.

With a Sun SAN solution now providing the foundation of Questerra's service offering, Questerra is changing the way that insurance companies analyze and assess risks with respect to their exposure to claims. Using Questerra's service, which runs on a consolidated SAN infrastructure consisting of Sun servers, Sun StorEdge systems, and a wide range of Sun software products, insurance companies can better analyze and manage the risk associated with policy writing, and aid in the creation of a book of business that can increase revenues, while simultaneously managing downside liability.

Questerra considered solutions from other leading vendors, but selected Sun after a thorough technical evaluation. As von Kaenel explains: "Our goal was to be one of the first providers of Internet-based spatial-enabled technologies for use throughout the enterprise. Sun technology provided the rapid time-to-market that allowed us to create a single, integrated platform to help us achieve that goal. I'm not aware of any vendor that provides a more comprehensive solution than Sun. Sun offered us everything from servers and software to consulting services to help us put it all together."

Conclusion

Providing around-the-clock access to data without bottlenecks is difficult, but not impossible with the right consolidation technology and knowledge.

High-performance, highly available Sun StorEdge systems utilize state-of-the-art architectures with industry-leading data and storage management packages to provide your business with the ability to quickly distribute and analyze information on the fly. Our professional services will help your business plan for the future. And our worldwide support will help your business stay up and running smoothly.

Information only has value if it is based on current data. Sun high-performance storage systems deliver truly bottleneck-free non-disruptive performance to provide data for on-the-fly access, distribution, and analysis whenever and wherever it is needed.

And, no matter what the future holds, our storage platforms and software provide your company with the agility to quickly adapt to changing business conditions which result from new competition, new markets, new customers, and new opportunities. So you have full investment protection no matter where the future takes you.

For More Information

For details about any of the products, services, and programs mentioned in this paper, please visit *www.sun.com/storage* or *www.sun.com/consolidation*, or contact Sun Professional Services, *www.sun.com/service/sunps/platforms/dsmovw.html*, for assistance with any aspect of designing, implementing, and managing your storage consolidation solution.

About Sun Microsystems, Inc.

Since its inception in 1982, a singular vision — "The Network Is The Computer™" — has propelled Sun Microsystems, Inc. (Nasdaq: SUNW) to its position as a leading provider of industrial-strength hardware, software and services that make the Net work. Sun can be found in more than 170 countries and on the World Wide Web at *http://sun.com*.

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