

How to Choose the Data Storage Solution That Is Right for Your Company

A Briefing for Small and Medium Businesses

White Paper

October 2007



Executive Summary


For many growing businesses, internal (server) or direct attached storage (DAS) may no longer be viable. If a business finds itself purchasing new servers for additional storage capacity while the processor is still adequate, it is throwing away money. Furthermore, with existing approaches it may be difficult to meet data protection, availability and management requirements. In fact, many small and medium businesses (SMBs) spend more time managing storage resources—hunting for capacity, copying data to and from servers, backing up data from multiple servers—than managing all other IT tasks combined. Over time, it simply becomes too cumbersome and expensive to continue using internal storage or DAS.

This reality has caused many companies to consider the creation of storage area networks (SANs) that centralize data storage and management. Many vendors now offer SAN solutions geared toward SMBs. Some of these offerings incorporate enterprise-class functionality for increased system reliability, data protection and management. Other offerings are essentially one-size-fits-all storage devices with limited functionality. Given the wide range of SAN options for SMBs, it can be a challenge to sort through the available offerings and find a solution that's right for your business. This paper is designed to help you understand your needs and identify the best options for your next-generation storage solution.



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Why You Need a Storage Area Network

When it comes to data storage, the needs of small and medium businesses (SMBs) are in many respects the same as the needs of global enterprises. In an information driven world, all businesses, regardless of size, need to store, manage and protect growing amounts of data. All businesses need to make data accessible to the people who need it, when they need it. And no business can function without the data used by the applications and systems that support key processes.


Despite these common needs, SMBs and enterprises have historically approached storage issues in distinctly different ways. To keep pace with growing amounts of data, SMBs have typically added more servers with internal (server) or direct attached storage (DAS) devices. Enterprises, meanwhile, have pushed forward with storage area networks (SANs) built around external disk arrays/storage systems.

While both approaches solve storage problems, SAN-based approaches have many advantages over internal or direct attached storage. When you put a SAN in place, your storage resources can be pooled and shared among different servers and applications. This helps you make greater use of your available storage capacity. Data protection and management are more straightforward because all of your data is in one place. And your data remains available even if a particular server goes down.

This is all quite different from internal storage or DAS. If your storage devices are dedicated exclusively to particular servers, different systems can't share storage capacity. This can leave your company with a costly set of circumstances. When a system runs out of storage space, you may find yourself buying a new server with larger disk drives to meet your need for increased capacity, even though you may have lots of unused storage in other systems. What's more, your company must bear the costs and the headaches of managing and maintaining many disparate systems. And if your data is tied to many different servers, you can't easily deploy common storage services that allow you to search, back up, restore and replicate your data.

So why haven't SMBs jumped onto the SAN train? Two key reasons, mainly: cost and complexity. Until recently, most SMBs have lacked the budgets and the IT management resources to buy, deploy and operate a SAN. But all of this is changing. Today, with the advent of software solutions such as Simple SAN from Microsoft and plug-and-play SAN storage solutions from hardware vendors, SANs are now a viable storage alternative for SMBs. This is good news for the many companies that are wrestling with runaway data growth. Yesterday's approaches simply can't keep pace with data growth of 50 percent or more a year, as is the case at many companies.

With an eye toward the future and the prospect of continuing data growth, many businesses are out shopping for their first SANs. This can be a daunting undertaking, in part because there are so many choices. Many technology vendors are working to provide storage solutions that meet the capacity, availability, performance, protection and manageability requirements of growing businesses. Some of these offerings incorporate enterprise-style performance capabilities, data protection features and management tools in a package that is designed for SMBs. Other offerings are essentially commodity storage devices with limited functionality.



Given the wide and growing range of SAN options for SMBs, it can be a challenge to sort through the available offerings and find a solution that's right for your business. This paper is designed to help you do just that.

Understanding Your Storage Needs

SMBs need their data just as much as enterprise counterparts need their data. Large companies rely upon storage solutions that are built to meet their requirements for performance, availability, security and flexibility. SMBs need the same features but without the cost or complexity of enterprise-class storage solutions. If your company is small or medium-sized business, what you really need is access to enterprise-class functionality in storage solutions that are scaled, priced and packaged to meet SMB requirements.

With that thought in mind, you can then focus on the available products that incorporate enterprise-class features for data protection, system reliability, maintenance and more. These offerings can be viewed in terms of three levels, which progress from entry-level storage systems to more scalable, higher-performance systems designed to keep pace with a dynamic business that is experiencing rapid data growth.

Level 1: Entry SAN Solutions

SAN solutions for SMBs begin with new entry-level storage systems that can be purchased with plug-and-play kits for easy SAN installation. These modular devices are designed to be installed and operated by companies with limited IT and storage expertise, but they have the same high availability and performance characteristics of larger (enterprise-class) storage devices. This class of solution tends to be ideal for the majority of businesses that are launching their first shared storage solutions.

Features to look for in this solution class include the following:

A Point-to-point Architecture

A point-to-point architecture creates direct connections between the cache memory and each hard disk drive in the storage system. A point-to-point architecture built around a Serial Attached SCSI (SAS) interface can greatly improve storage performance and data availability. A SAS backend can move data to and from cache at an extremely fast rate. This speed equates to better application performance and a better return on investment.

If your system and its interfaces offer the right support, you should have a choice of disk drives. You might want to use high-speed SAS drives for data that has mission critical access requirements and high-capacity Serial ATA (SATA) II drives for data that has lower access requirements.

Dual, Active-Active Controllers

To help you keep your data available, you want to look for a storage system that is designed to have no single point of failure. In simple terms, this means that multiple things can go wrong and you are still in business. Active-active controllers are a key component of a system designed to have no single point of failure. This configuration gives you dual controllers. If one controller is unavailable, all data volumes are still available via the other controller. Active-active controllers also support load balancing. If one link becomes overburdened, I/O traffic is automatically rerouted to the other link. The result is much improved performance along with the increased availability.

Capabilities like these aren't just for big businesses. Even small businesses can experience damaging network interruptions. Dual connections between the server and the storage provide an inexpensive remedy to this problem.

RAID-6 Technology

Storage systems in this class are typically based on RAID technology, a term that stands for “redundant array of independent disks.” All RAID designs deploy a technique called “parity,” with which data can be recovered from surviving disks should a single disk fail. But not all RAID designs are created equally, and simply having “RAID” does not mean your data is completely protected.

For higher availability and nondisruptive operation, look for a solution that makes use of dual parity RAID-6 technology. In a RAID-6 configuration, any two drives can fail at the same time—a highly unlikely event—without the loss of any data, and your system remains operational. This is the type of data protection that enterprises demand, because their data is so important. In terms of reliability, RAID-6 is a big step up from the widely used RAID-1 and RAID-5 technologies, which don’t offer the same levels of protection and reliability. While RAID-6 does require additional disk drives, it is actually more economical as disk drives are relatively inexpensive; lost data is very expensive and may be impossible to recover.

Support for All Major Operating Systems

Chances are your business uses many Microsoft® Windows-based applications. But you may also have various other operating systems in your environment, now or in the future. So you want to look for a storage system that connects to all major servers and operating systems. The ideal device should support Windows 2003, Windows XP, Windows Vista and the upcoming Windows Server 2008, as well as Sun Solaris, HP-UX, IBM® AIX®, Red Hat Linux, SuSE Linux, Turbolinux, VMware and other operating systems.

Automated Replacement of Hard Disk Drives

Despite impressive reliability ratings, hard disk drives (HDDs) do fail at times, so you want a storage solution that simplifies HDD replacement. With an automated disk drive replacement feature and the right product architecture, you can slide a new drive into a repair slot and the storage system will automatically rebuild the RAID group. This capability streamlines the repair process and helps you keep your business up and running. This is an advantage over swapping out “dead” drives, which is time consuming and risky. Letting the storage system do the work saves you time and money.

Auto-migration to a New Unit

Auto-migration features simplify the process of copying data from one storage system to another. This need arises when it comes time to upgrade to a new model or to replace a unit that has failed. With auto-migration capabilities, you simply install the new storage system and, with a few clicks of the mouse, copy your data from the old storage system to the new one. Features like these are particularly important if your company has limited IT staff resources and perhaps no storage specialists. You want a storage system that does the work for you. Sooner or later, your business will outgrow its current technology and migrating to a new system must be easy.

Level 2: More Scalable SAN Solutions

If your company is experiencing rapid and unpredictable data growth and running applications that require higher bandwidth, you probably need the increased scalability, capacity and performance that comes with the next level of SAN solutions for SMBs. These solutions should give you access to the enterprise-class features and options available in new entry-level SAN solutions, along with far greater scalability.

The storage systems in this class can accommodate more than 100 SATA II disk drives, support more than 500 LUNs and hosts, and scale to more than 75 terabytes of total storage capacity. This scalability gives you the flexibility to respond quickly to business growth and the demand for increased storage capacity. You can pretty much add HDDs, LUNs and hosts at will, up until you reach the capacity of your system—at which point you can upgrade to a larger model with double or triple the capacity.

Level 3: Faster SAN Solutions

If your company is running applications that require higher bandwidth and faster throughput speeds, you probably need to step up to a faster SAN solution. The storage systems in this class tend to be ideal for companies running high-performance database-driven applications, such as a system that supports real-time online transactions or trades.

While providing the scalability and flexibility of the previous class of solutions, the offerings in this class incorporate features that allow you to move data faster to meet the throughput requirements of high I/O applications. The offerings in this class support high-speed Fibre Channel SANs and disk drives, as well as iSCSI SANs and SATA II disk drives. These devices also support 4Gbit/sec (billion bits per second) Fibre Channel SANs and allow you to add up to 4MB of cache memory, one of the keys to better application performance.

Table 1. SAN Solutions for Small and Medium Businesses

This table shows an example of the types of storage system choices that are available to meet different business requirements. Specific offerings from hardware vendors will differ from the choices shown here.

	<i>Entry SAN Solutions</i>	<i>More Scalable SAN Solutions</i>	<i>Faster SAN Solutions</i>
Cache memory, maximum	2GB	2GB	4GB
Interface	1Gbit/sec iSCSI	2Gbit/sec or 4Gbit/sec Fibre Channel or 1Gbit/sec iSCSI	4Gbit/sec Fibre Channel or 1Gbit/sec iSCSI
Hard disk drives, maximum	12 SAS or SATA II disks	105 SATA II disks	105 Fibre Channel or SATA II disks
Capacity, maximum	9TB	78.5TB	72TB
LUNs, maximum	128	512	512
Hosts, maximum	128	512	512

One Size Does Not Fit All

Every business is different. That's why there is no single SAN solution that is right for all businesses. The storage market has its share of low functionality, generic SAN offerings, but that doesn't mean these products are right for your business. When it comes to meeting the data storage needs of a dynamic business, one size does not fit all.

The key is understanding the needs of your particular business, and then understanding the range of choices available to you. Whatever solution you choose, be sure that you have adequate capacity for current and future needs (up to four years), flexibility to meet changing business application needs, and access to enterprise-class features. These are among the keys to meeting your data storage, protection and availability needs in a manner that gives you the confidence that your data will be there when you need it, at all times and under all circumstances.

When choosing a vendor or vendors for your SAN, there is one key criterion that is critical in making a good decision: Is the vendor financially and technically viable today and tomorrow? Storage systems are relatively easy to manufacture from common components, but that doesn't mean any company can be successful in the market. Sustainable technology comes from companies with both a legacy of success in the market and an innovative R&D culture. When purchasing a storage system, look to companies who have "been around the block" but also innovate. Also, look for companies with the financial wherewithal to remain prosperous. Buying cheap technology won't be a bargain if the vendor is unable to support or upgrade its products.



Next Steps and How Hitachi Data Systems Can Help

To effectively deploy a SAN, you should not have to be an expert in data storage. And you don't have to be with the assistance of Hitachi Data Systems. Working with our worldwide network of resellers and other partners, we can help you evaluate your storage needs, identify the best strategy for moving forward and then solve your challenges with modular solutions that are sized right for your business.

For many years, the largest companies throughout the world have relied on Hitachi storage solutions for 7x24x365 reliability and availability, not to mention industry-leading performance and flexibility. These businesses have helped make Hitachi Data Systems the world's leading provider of enterprise-class storage solutions to companies listed on the FORTUNE 500®.

This leadership position results from our extensive worldwide research and development program dedicated to storage solution innovation, an award-winning product portfolio, a reputation for quality and our network of partners. Today, Hitachi Data Systems brings this same technological leadership and storage expertise to small and medium businesses. It all comes to you in the form of simple storage solutions that are affordable, easy to deploy and easy to use. As an SMB, you deserve the same opportunity to employ world-class storage solutions as larger organizations. Now you have it.

For More Information

To learn more about storage solutions for your business, visit www.hds.com/smb.



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WHP-265-00 October 2007