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WHITE PAPER

Meeting the Needs of Mid-Sized Organizations with Next-Generation Midrange Storage

Sponsored by: Hitachi Data Systems

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EXECUTIVE SUMMARY

Storage is an increasingly important part of IT decision making for mid-sized organizations. The storage capacities and practices that IT managers thought would support company growth for years are providing breathing room for just a few months, causing increasingly frequent disruptions in systems and applications.

Like IT managers at large enterprises, IT managers at mid-sized organizations want storage systems suppliers to deliver solutions that meet current and future requirements. Many have considered the development of comprehensive data consolidation and data protection practices; however, finding appropriate storage solutions to address these needs is often a challenge.

- They need simple and scalable solutions that enable painless, long-term management and expansion across all systems in an affordable way.
- They need storage solutions that enhance the reliability, availability, and speed of data backup and recovery operations.
- They need to add a layer of business protection to reduce business risk and provide for recovery in case of a major outage or other disaster.

Turning these desires into a usable reality for IT managers has been an important goal for the storage industry over the past two years. Many of these solutions, however, focused on the needs of the largest enterprises, carrying price tags and calling for staff resource commitments beyond the reach of mid-sized organizations. IT managers at mid-sized organizations need solutions that deliver the same advanced data services, but that are packaged in hardware and software solutions optimized to accommodate their specific business requirements: lower upfront costs, greater ease of deployment, and no limitations on future expansion.

Hitachi Data Systems, with its new midrange storage solutions (the TagmaStore WMS100, AMS200, AMS500 and NCS55), is developing a broad portfolio of solutions that addresses the unique business needs of mid-sized organizations. It is delivering a set of solutions that supports consolidated, networked storage, enables cost-effective replication, supports long-term data archiving, and addresses the specific storage management challenges of IT managers at mid-sized organizations.

EVOLVING INFORMATION REQUIREMENTS OF MID-SIZED ORGANIZATIONS

The changing nature of business needs and the growing availability of advanced technology continue to change the ways in which firms of all sizes operate. This is especially true among mid-sized organizations that face explosive information growth, new regulatory and governance requirements, and ever-increasing industry competition. These mid-sized organizations include:

- Mid-sized businesses with several hundred to a few thousand employees that support a growing array of applications ranging from file servers, to e-mail, to databases
- Independent departments that for regulatory, budget, or business practice reasons maintain the underlying IT systems that support medical records/images, video monitoring, or other content-rich applications

In the past several years, these organizations experienced an explosion in the diversity of data types and the pace of new data creation driven by:

- The explosion in Internet traffic, with the exponential increases in email and the size of attached files that are driving explosive expansions of email systems
- The growing use of images to support Web sites and other business applications

Mid-Sized Organizations' Looming Storage Challenge

Today, IT managers at mid-sized organizations face many of the same issues that managers at larger enterprises struggled with less than a decade ago (see Table 1).

These changing circumstances make storage and storage management a growing concern for IT managers in mid-sized organizations. The storage capacities and practices IT managers thought would be adequate to support company growth for years are providing breathing room for just a few months and are causing increasingly frequent disruptions in systems and applications. Like IT managers at large enterprises, IT managers at mid-sized organizations want storage systems suppliers to deliver solutions that meet current and future requirements.

- They need simple and scalable solutions that enable painless, long-term retention across all systems in an affordable way.
- They need storage solutions that enhance the reliability, availability, and speed of data backup and recovery operations.
- They need to add a layer of business protection to reduce business risk and provide for recovery in case of a major outage or disasters.

TABLE 1

Current Storage Challenges Faced by Mid-Sized Organizations

	Content-Intensive Departments (Today)	Mid-Sized Enterprises (Today)	Large Enterprises (1997)
Total storage capacity (excluding desktops)	3–10TB	5–30TB	5–30TB
Major storage challenges	• Effective utilization of storage capacity • Reducing backup windows • Protecting data at offsite locations • Application availability • Governance/regulations • Meeting legal obligations (e.g., discovery)	• Effective utilization of storage capacity • Reducing backup/upgrade windows • Moving data to remote sites • Software upgrades • Email growth • Meeting legal obligations (e.g., discovery)	• Utilization of storage capacity • Reducing backup/upgrade windows • Moving data to remote sites • Application availability • Email growth
Emerging technologies	Capacity-oriented storage (e.g., SATA-based systems) Storage networks Storage virtualization (file and block) Heterogeneous data replication	Capacity-oriented storage (e.g., SATA-based systems) Storage networks Storage virtualization (file and block) Heterogeneous data replication	Modular External Storage (RAID storage systems) Storage networks Storage virtualization (tape and file virtualization) Homogeneous data replication

Source: IDC, 2005

Mid-Sized Organizations Have Unique Business Challenges When It Comes to IT

Storage is an increasingly important part of IT decision making for mid-sized organizations. Many have considered the development of comprehensive data consolidation and data protection practices; however, finding appropriate storage solutions to address these needs is often a challenge. Despite having many requirements in common with large enterprises, mid-sized organizations also need solutions that meet their unique business and organizational requirements.

- IT managers at mid-sized organizations don't have the time or staff to evaluate, select, and self-integrate best-of-breed hardware and software from multiple suppliers. They want solutions that are easy to acquire and to set up. In addition, they need solutions that enable simple data migration from existing systems, without requiring any long-term expansion in IT staffing levels.

- IT managers don't have access to large amounts of investment capital, nor are their planning horizons such that they can afford to make bets on new technology based on long-term return on investment (ROI) or total cost of ownership (TCO). They want solutions that have a low initial investment without sacrificing the ability to expand as needs grow.

- IT managers don't want to rearchitect the entire IT environment to address new or changing business conditions. They want integrated offerings (e.g., storage, connectivity, and supporting software and services) that address specific needs (e.g., server consolidation, improved data protection, and email archiving) without disrupting current operations.

Table 1 also highlights the critical storage technologies that storage system providers are introducing to address these requirements. The next section of this white paper looks at each of these technologies and discusses the issues associated with leveraging them to meet the needs of mid-sized organizations.

KEY STORAGE TECHNOLOGIES

Suppliers of storage products, both hardware and software, recognize that mid-sized organizations' storage requirements are evolving in response to changing business conditions. These suppliers are developing and delivering a number of new technologies and product lines designed specifically to enable more cost-effective and easier adoption of advanced storage capabilities in areas such as storage consolidation, ongoing storage administration, and data replication/protection.

These efforts fall into three main categories:

- Reducing the total cost and incremental acquisition cost of storage through delivery of more modular, midrange storage systems

- Lowering the cost of storing secondary data through greater use of capacity-oriented (lower cost per gigabyte) disk drive technologies, such as Serial ATA (SATA), to delivered tiered storage

- Enhancing the ability of storage systems to support faster, less intrusive storage configuration and data migration though the inclusion of advanced virtualization and data replication functions on midrange storage systems

Capacity-Oriented Storage: Optimizing Storage for Future Needs

The past several years have seen the emergence of a new class of storage systems that leverages lower-cost and larger-capacity disk technologies (e.g., SATA) to significantly boost storage system capacities while reducing capacity costs. Although not appropriate for all application workloads, these capacity-oriented technologies provide IT managers with greater control over costs when allocating storage for specific applications.

IDC research shows that more than 40% of all storage capacity installed in organizations in 2008, regardless of size, will leverage capacity-oriented technologies. Therefore, it is not hard to predict that incorporating capacity-oriented storage systems into existing environments is an important goal for many mid-sized organizations.

Doing so, however, needs to be approached with caution. The use of capacity-oriented disks can place considerable strains on existing data protection technologies, such as RAID, that leverage the use of multiple disk drives to ensure data integrity in case of a disk failure. The most popular RAID option (e.g., RAID 5) stripes data across multiple disks and then inserts parity bits on an additional disk to shield the system from a single-disk failure. Thus, any single physical disk may be a parity drive for one volume and a data drive for another.

Should a single drive fail, the parity group is rebuilt, using a spare disk drive. Note that during a "rebuild," the data is still available to the server; the storage device, however, cannot offer the same performance (access to the data in the parity group being rebuilt) until the rebuild is completed.

When disk sizes were small (under 80GB), rebuilding data was relatively quick. Today, with capacity drives of 300–500GB, rebuild times can take hours if not days, leaving the data exposed to a second disk failure, which would force a complete restore of the data from tape.

This risk is exacerbated when SATA drives are deployed. Unlike Fibre Channel drives, SATA drives are not manufactured for the constant use associated with a rebuild and thus pose greater risk of a second disk failure during the rebuild. Storage systems suppliers are just starting to deploy new RAID systems (often referred to generically as RAID 6 or dual-parity RAID) that significantly reduce this risk. RAID 6 effectively doubles the parity (data copied to two disks), meaning that the parity group can recover from a second hard disk drive failure, even during rebuild.

Beyond concerns about data reliability, IDC finds a natural tendency in mid-sized organizations to simply buy more disk capacity as the solution to all problems, rather than put in place the policies and practices needed to ensure that existing storage is used more effectively.

IT managers at mid-sized organizations need to look for midrange storage systems that accommodate the need for expandability and low-cost capacity while simultaneously delivering a robust and easy-to-use set of advanced storage services for configuration, replication, and ongoing operations.

Tiered Storage: Managing Storage for Different Needs

Concurrent with the use of next-generation storage arrays that deliver different classes of storage to meet different requirements, IT managers are connecting application servers and storage systems via storage-attached networks (SANs) in an effort to consolidate the use and management of server, storage, and tape assets.

Such tiered storage solutions allow IT managers to use different classes of storage based on specific needs for performance, capacity, availability, and cost-effectiveness. They also provide a set of capabilities that extends across all of these tiers of storage systems. These capabilities include:

- Automating storage provisioning, capacity expansion, and data protection tasks across heterogeneous systems
- Enabling cross-system data movement so that IT managers can easily and intelligently migrate or replicate data between heterogeneous storage classes (this is particularly important as data characteristics often change over time)
- Supporting the robust and coordinated management of information throughout its life cycle, from creation through frequent access to long-term archiving, retention, and disposal as set forth by regulatory compliance guidelines

Turning the idea of tiered storage into a usable reality for IT managers has been an important goal for the storage industry over the past two years. Many of these solutions, however, focused on the needs of the largest enterprises, carrying price tags and calling for staff resource commitments beyond the reach of mid-sized organizations.

IT managers at these mid-sized organizations need solutions that deliver the same advanced data services, but that are packaged in hardware and software solutions optimized to accommodate their specific business requirements — lower upfront costs, greater ease of deployment, and no limitations on future expansion.

The remainder of this white paper examines a number of storage solutions from Hitachi that are designed to address many of the current and future needs of IT managers at mid-sized organizations.

HITACHI'S NEXT-GENERATION MIDRANGE STORAGE SOLUTIONS

Hitachi Data Systems (HDS), a wholly owned subsidiary of Hitachi Ltd. (NYSE: HIT), is a leading supplier of storage systems, software, and services to enterprises around the globe. Under the framework of "application optimized storage," HDS developed and continues to enhance a broad suite of storage hardware and software products, complemented by professional services to ensure optimum deployment. This approach allows the company and its partners to address the specific needs of different customers based on company size and business need. HDS also delivers its portfolio of products, professional services, and industry solutions in conjunction with a worldwide network of strategic partners.

TagmaStore WMS and AMS: Next-Generation Modular Storage

In 2005, Hitachi updated its modular storage product family to better address the changing needs of mid-sized organizations. These products include a new generation of modular storage systems:

- **TagmaStore Workgroup Modular Storage (Model WMS100).** A SATA-only storage system designed to meet the needs of small businesses, independent workgroups, and enterprises that need to cost-effectively archive large amounts of content. The WMS100 can scale from just over 1TB to 42TB, includes support for RAID 0+1, 5, and 6 to enhanced reliability, and includes support for embedded network-attached storage for the easy consolidation of file servers

- **TagmaStore Adaptable Modular Storage (Models AMS200 and AMS500).** A line of storage systems that supports tiered storage (SATA and FC drives) and support for RAID 0, 0+1, 5, and 6 within a single system. The AMS solutions address the needs of mid-sized companies and departments that need high performance and/or capacity in a single, commonly managed platform for storage consolidation. They also provide a secondary tier of storage for larger enterprises. The capacity range for the AMS200 is 365GB–88TB. The AMS500 has a range from 365GB–67.5TB. Both the AMS200 and AMS500 also will support the addition of an embedded NAS solution, available in late 2005.

Both of these platforms are supported by setup wizards and a complete portfolio of software to optimize cache utilization and enable advanced storage functions, such as data replication and migration between these new systems and existing Hitachi storage platforms (the Thunder 9500 V Series modular storage systems, the Lightning 9800, 9900 V Series enterprise storage systems, and the TagmaStore Universal Storage Platform). Additionally, all three products (WMS100, AMS200, and AMS500) can be utilized, in conjunction with the TagmaStore Universal Storage Platform and TagmaStore Network Storage Controller storage lines, as reliable but inexpensive tiered storage.

Hitachi also includes a base set of software to facilitate setup and management of an array. Complementing this is a comprehensive set of storage management tools (the HiCommand Storage Management Suite) that manages setup and ongoing administration of all Hitachi storage systems plus any other storage systems that support the Storage Management Initiative Specification (SMI-S) management standard.

TagmaStore Network Storage Controller Model NSC55: Enabling Tiered Storage in the Mid-Sized Enterprise

In 2004, HDS announced the availability of TagmaStore Universal Storage Platform (models USP100, USP600, and USP1100), the company's foundation for delivering next-generation tiered storage solutions, based on a networked storage controller foundation. Networked storage controllers make it possible to extend many of the capabilities of individual high-end storage systems to a pool of diverse storage systems without sacrificing performance or availability. In addition, networked storage controllers:

- Deliver robust and well-integrated port aggregation, volume management, and common data replication functions
- Ensure flexibility in deployment options without sacrificing consistency and commonality of functions
- Scale quickly and cost-effectively with minimal disruption to ongoing operations, including the ability to partition resources to meet variable requirements
- Enable rapid and painless data migration services across existing and future storage systems
- Integrate effectively with overall storage resource management systems

The TagmaStore Universal Storage Platform with supporting virtualization and data replication software delivers a high level of modularity and performance as well as exceptional scalability. It can virtualize and manage as much as 32PB of internal and externally attached heterogeneous storage. In its first release, it was best aligned with the needs and skills of large enterprises.

Concurrent with the introduction of the WMS100, AMS200, and AMS500, Hitachi also introduced a midrange version of its Universal Storage Platform called the TagmaStore Network Storage Controller model NSC55. The NSC55 incorporates all the above-mentioned functions and capabilities of the Universal Storage Platform and is packaged to meet the needs of mid-sized enterprises.

The NSC55 is rack-mountable and uses single-phase 200V power—no need for raised flooring. Finally, it provides a modified software pricing and bundling model that better matches the way mid-sized organizations want to acquire and deploy storage software solutions.

Challenges for Hitachi

Storage system suppliers, such as Hitachi, recognize that mid-sized organizations' storage requirements are evolving in response to changing business conditions. The development of new technologies and product lines, such as the WMS100, AMS200, AMS500, and NSC55, make it easier for IT managers to adopt advanced storage for consolidation, archiving, compliance, and business continuity.

Having a broad catalog of products that meets mid-sized enterprises and SMB requirements for low cost and simplicity isn't enough, however. IT managers need their storage suppliers and value-added resellers to provide simple solutions that quickly address specific business requirements. These solutions must:

- Be integrated packages (e.g., storage, connectivity, tape systems, and supporting software) that address specific needs (i.e., data protection, email consolidation)
- Be easy to set up and enable simple data migration from existing systems
- Not require an expansion in IT staffing levels

While Hitachi can address some of these concerns with specific technologies or packaging options, realistically addressing the midrange segment ultimately takes a business partner who can select, integrate, and deploy the right combination of hardware and software products to deliver complete solutions that meet the unique requirements of mid-sized organizations.

Over the past three years, Hitachi has made significant investments in developing strong business partners around the globe. Some of these partners focus on large enterprises and the advanced storage functions that they require. Others focus on the more straightforward needs of mid-sized enterprises. With this next generation of storage solutions that brings the advanced capabilities of high-end storage to mid-sized organizations, Hitachi needs to extend the capabilities of both groups of business partners to target new applications and deliver more support services.

As an IT manager, the skills that you should look for from Hitachi and its partners include:

- The ability to support a suite of scalable products that meet different application quality-of-service requirements
- The ability to design and deploy a SAN infrastructure that supports current targeted needs without jeopardizing the future expansion of services
- An understanding of the benefits and pitfalls of tiered storage
- The capability to support heterogeneous server and storage environments

Finally, the partner must show the forethought to incorporate management into the deployment process. Ongoing administration/management is the most overlooked and misunderstood issue in most IT deployment plans. Your storage solutions partner and its implementation partner must provide the tools and services to help you develop a sound management and provisioning process that meets both today's and tomorrow's needs.

FINAL THOUGHTS

Today, IT managers need simple and scalable storage solutions that enhance the reliability, availability, and speed of access to data while enabling painless backup/recovery and long-term archiving across all systems in an affordable way.

When evaluating a storage supplier's offerings for either mid-sized enterprises or SMBs, IT managers need to focus on three questions:

- Does the supplier offer a broad portfolio of products that addresses requirements for low upfront costs, ease of deployment, and simple administration?
- Does the supplier and/or its partners make its products available in predefined bundles that enable improved data consolidation, data protection, and compliance?
- Does the supplier have capable channel partners, appropriately certified, that have the support infrastructure and ability to provide the right solution based on the current and future needs of your business and your key applications?

HDS with its new midrange storage solutions is developing specific solutions that target the unique business needs of mid-sized organizations. It delivers a set of targeted solutions that supports consolidated, networked storage; enables cost-effective, long-term data archiving; and addresses the specific storage management requirements of IT managers at mid-sized organizations.