Delivering Enterprise Features for the Mid-Range
— IBM Introduces DS3500 with TPC MRE

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Management Summary

I don't know about you, but when I go shopping, I look for a product that is reliable, easy to use, and inexpensive. Not cheap, mind you: inexpensive. It must be a real value, with the important features available in the top-of-the-line model, but with a price tag that doesn't exceed my credit limit. Brand names are not as critical as is the dealer, although there is a certain comfort level that be attained when you recognize the name of the manufacturer. The dealer, however, is another story. When you are spending you're hard earned money, you need a store that you can trust. One that hires experienced people who know their product and can be trusted to maintain it as well. Take digital televisions for example. *What is the best technology? Is it LCD, LED, 3-D, Plasma? Which is right for you? What is the contrast ratio? What is the refresh rate? Does it connect to the Internet? What is the right size screen for my room?* I am not an expert. What I need is a dealer who has been in business for a long time and can be trusted to sell me the TV that fits my needs.

The same can be said for the individual charged with the responsibility to run the data center in a small or medium sized enterprise (SME). In most cases, the SME IT staff is small and probably trying to make do with limited resources and an even more limited budget. It has the responsibility for servers, storage and networking, and can't possibly handle one more chore. Yet, it has to. Server sprawl has made the IT architecture too complex and too expensive for the limited resources. Server efficiency often is under 20%, with the infrastructure is wasting scarce resource. The staff may have just finished consolidating and virtualizing the servers in the data center and now have to simplify the storage architecture, which has grown too complex for the limited staffing. Thus, the data center needs to upgrade to a new storage array with the scalability and flexibility to handle all of today's data, with room for future growth that is already knocking at the door. A partner, one you can sit down with, is needed; one who can help with the requirements and choices and who has a product set that can meet those needs without over-provisioning the storage or breaking the budget. In this case, at this time, you need IBM.

With a catalog that covers the range from the smallest home office to the largest enterprise data center, IBM has a storage offering that meets your needs. For the SME, IBM has a recently expanded product set that meets both the hardware and software requirements for any small- or medium-sized enterprise. Specifically, with the availability of the IBM *System Storage DS3500 Express*, IBM can enable you to deploy a low-cost array with exactly the right amount of storage to meet today's needs, knowing that you have the scalability to handle whatever tomorrow throws at you. Furthermore, with the *System Storage DS Storage Manager* and the *Tivoli Storage Productivity Center*, you have the management tools necessary to simplify your environment. To learn more about IBM's DS-3500 product set, please read on.

SME Data Center Environment

Server sprawl is contributing greatly to the rising total cost of ownership (TCO) issues in the data center of every enterprise, small, mid-range, or large. In order to curtail a significant portion of this cost, data centers around the globe have initiated programs to consolidate and virtualize multiple servers, and multiple applications, on a single platform. Creation of a virtual infrastructure using hypervisors such as *VMware* and *Hyper-V*, however, place significant consolidation demands on the storage attached to the servers, either directly or through a storage network. Consolidation requires improved performance in order to maintain the highest levels of productivity and enterprise competitiveness.

With storage doubling about every 12 to 18 months, the demands on the IT staff can accelerate faster than capacity and availability issues can be solved. Some of the most pressing TCO issues outside of acquisition costs include: storage administration and management, energy consumption, reliability and availability, and, when you get down to basics, finding enough floor space simply to deploy this growing capacity. These demands are increasing every day; unfortunately, the budgets are not. A low-cost entry point for the SME is mandatory, along with scalability and flexibility in order to enable the data center to protect these valuable enterprise investments.

The enterprise, including employees, partners, and customers, demands 24x7x365 access to storage in order to be able to provide business continuity in the data center. Storage reliability is critical. Any lack of IT experience in the SME data center cannot be used as an excuse for outages or slow response. The current administrative staff requires simplicity in the deployment, administration, and management of all storages resources. It must arrive on-site pre-configured and pre-tested. There is simply not enough experienced staff on hand to manage a dynamic configuration and testing exercise. Ease-of-use is critical in the SME environment.

Data is a valuable resource; one of the most valuable resources that any enterprise possesses, and the value of that data is increasing daily. Protecting that information has become one of the most urgent responsibilities of the storage administrator. The data center staff must meet industry and government standards for security and availability in order to protect that information. Encrypting data has moved from "nice-to-have" to "critical", in order to protect the enterprise from an embarrassing theft by hackers or competitors seek-

ing an edge. Furthermore, that encryption needs to be transparent; it cannot interfere with mission-critical application response time or storage availability. Data integrity is essential for business continuity.

By the way, we are not limiting our view to simply the datacenter. Every SME, and even departments in large enterprises, have distributed processing requirements, with remote offices and branch offices dotting the landscape. In many instances, there is no IT experience at the remote location. Backups and recoveries require simplicity, not to mention disaster recoveries that are critical in any business continuity plan. Any storage hardware solution must have a complete storage management solution behind it, with a full set of applications to handle any replication or other management issue that arises.

Which raises the question: *where can a budget-strapped SME with large enterprise issues find a storage solution that carries a low price tag but a full feature-rich functionality menu?* If you are one of the many smaller SMEs that have had a difficult time gaining the attention of any of the Tier 1 vendors, there is good news for you. IBM has upsized their *System Storage DS3000* family with the recent announcement of the IBM *System Storage DS3500 Express*, doubling the capacity while downsizing their enterprise level storage management software, IBM *System Storage DS Storage Manager*, providing the SME with much of the same functionality as the larger enterprises. In addition, IBM has introduced a new tier of support for their *Tivoli Storage Productivity Center for Disk* (*TPC-D*) with the availability of the *Tivoli Storage Productivity Center for Disk – Midrange Edition* (*TPC-MRE*).

Introducing the DS3500

The IBM System Storage DS3500 is a next generation entry-level storage system based on a 6 Gbps SAS host interface architecture and drive technology. It provides a fully integrated, low-cost entry point for the entry-level data center, with the performance, scalability, and features of higher priced storage arrays. It enables the data center with the flexibility to start small and grow into a larger configuration as business demands warrant, taking advantage of lower cost drives in the future. The DS3500 is qualified with IBM's *System x* servers, *BladeCenter*, and *Power* systems, as well as other Intel and AMD processor-based servers and HP *Itanium* and *PA-RISC* servers.

It provides investment protection for the enterprise along with a cost-effective backup and recov-

ery system, introducing remote mirroring across FC ports into the *DS3000* family. The DS3500 also introduces the System Storage DS Storage Manager into the entire *DS4000* and *DS5000* line, along with full disk encryption.

The DS3500 is the ideal vehicle for data center consolidation for the SME looking to ensure data availability and storage efficiencies throughout the enterprise. It comes with multiple protocols, for both DAS and SAN connectivity, in order to support reduced acquisition costs and enabling the SME to implement a single storage system for all of their requirements, maximizing productivity, reliability, and operational cost. With the latest 6 Gbps SAS technology, the DS3500 delivers mid-range performance and scalability at an entry-level price. It has a balanced performance in terms of IOPS and MB/s to make it well suited for both mixed workloads and virtualized environments. In fact, the DS3500 has, effectively, twice the performance of the current *DS3000* series in both throughput and IOPS, with up to 4,000 MB/s and 40,000 IOPS in sustained drive reads.

System Storage DS3500 Configurability

The DS3500 comes with either a single or dual intelligent RAID[1] controller in a 2U rack-mount configuration with up to four 6 Gbps SAS host ports. Each controller comes with 1GB of battery-backed cache standard, with a 2GB option available. The DS3500 comes standard with four storage partitions, with optional upgrades for 8, 16, 32, or 64 partitions. It has improved performance with concurrent iSCSI/SAS or FC/SAS host connectivity and increased scalability with enhanced features. These options include a *Turbo Performance* option, as well as additional host connectivity.

Turbo Performance can enhance the dual controller version of the DS3500 with a 30% improvement in IOPS and up to a 100% improvement in throughput. This protects the investment that the data center makes in the DS3500 today with a growth path for tomorrow. The additional connectivity protects your investment, as well offering improved scalability and flexibility. Additional connectivity options consist of four additional SAS ports, eight 8Gbps FC ports, or eight 1Gbps iSCSI ports. In addition, each controller module is configured with two Ethernet ports, one for remote management and the other for authorized service personnel trouble shooting and diagnostics.

The DS3500 also comes with dual redundant and hot-swappable fans and power supplies. It is energy efficient to lower the TCO for the data

center with new power saving features that do not impact performance, scalability, or functionality. These include new energy-efficient power supplies to ensure low heat dissipation and SFF disks (2.5") with up to three times the IOPS per Watt than with 3.5" drives. In terms of device connectivity, the DS3500 has two 6 Gbps SAS drive ports supporting up to 96 SAS drives, twice the scalability of the DS3000: high-performance drives with a capacity of 600, 450, 300 and 146GB, 7.2K RPM nearline drives with a capacity of up to 2TB, and a 300GB 10K RPM self-encrypting drive, which has local key management within the IBM DS Storage Manager for comprehensive data security.

The balanced performance of the DS3500 makes it an ideal low-cost storage platform for the SME, or department of a larger enterprise, engaged in a consolidation and virtualization effort with diverse workloads and application requirements. The DS3500 is simple enough for a part-time administrator to manage remote sites with just the right amount of performance and functionality built-in to enable these sites to be self-sufficient. Furthermore, with a dual-controller configuration, the DS3500 starts at only $8,799. See Exhibit 1 (on the next page) for a few examples of workloads where the DS3500 can deliver a simplified, low-cost solution. The DS3500 is pre-tested to deliver outstanding performance for important applications, such as *Microsoft Exchange* and solutions involving *VMware* solutions, and is compatible with the IBM *System Storage DS4000* and *System Storage DS5000.*

System Storage DS Storage Manager

The *IBM System Storage DS Storage Manager* is an intuitive and powerful storage management application. It has been designed with the ease-of-use qualities of the DS3000 and the robustness and functionality available on the DS5000 and the DS-4000. The Storage Manager comes with a new GUI designed for both an experienced storage administrator, looking for complete control over the storage configuration, and the part-time admin who needs an intuitive interface to enable optimum utilization with the least amount of effort. Ideal in a consolidation environment, the DS Storage Manager also can view and manage the DS5000 and the DS4000, as well as the DS3500.

The DS Storage Manager has enhanced security features to provide continuous data protection, with local key management of full disk encryption for data at rest. It also manages disk partitioning and data replication options *FlashCopy*, *Volume Copy* and remote mirroring. When configured with FC ports, the Storage Manager can be used

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[1] The DS3500 supports RAID levels 0, 1, 3, 5, 6, and 10.

> ### Exhibit 1 –
> ### Workloads for the DS3500
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> - **Transactional Workloads** – High-perform-ance IOPS processing make the DS3500 well suited for OLTP, database, e-mail environ-ments that are the core of every SME's critical applications;
> - **Data Warehousing** – Impressive throughput with 6Gbps SAS and 8Gbps FC interfaces make the DS3500 the right engine for data warehousing environments where an indivi-dual storage system must be scalable and flexible enough to process large amounts of data;
> - **Business-Critical Applications** – With self-encrypting drives and 24x7x365 availability, the DS3500 supports business-critical appli-cations where data must be *protected* and *available*;
> - **Secondary Storage** – With support for up to 2 TB 7.2K RPM nearline SAS drives and RAID 6, the DS3500 can store very large amounts of data cost effectively and securely; and
> - **Backup and Restore** – With the ability to mirror data between systems over FC, the DS3500 can support shorter backup windows and offer a quick recovery for high pro-ductivity.

with a DS3500, at a secondary site, in support of the DS4000 and DS5000 at production sites for low-cost backup and recovery via the remote mirroring facility. In addition to the functionality of the Storage Manager, the DS3500 also has access to the full range of functionality provided by IBM via the *Tivoli Storage Productivity Center for Disk – Midrange Edition* (*TPC-MRE*) v4.1.

Tivoli Productivity Center for Disk Mid-range Edition (TPC-MRE)

TPC-MRE enables the mid-range data center with continuous real-time monitoring and fault identification to help improve SAN availability. It provides an equivalent set of features to *Tivoli Productivity Center for Disk*, an enterprise offering from IBM, addressing the largest enterprise data centers. TPC-MRE provides the data center with a robust set of storage resource management (SRM) capabilities to help manage a multi-site mid-range storage infrastructure from a single pane of glass. It provides the data center with a simplified pricing structure for IBM disk arrays: $8,099 per enclosure

for any DS3000, DS4000, DS5000, *Virtual Disk System* (*VDS*). This is a significant price reduction as compared to TPC for Disk, up to 80% less.

TPC-MRE delivers an impressive feature set, with functionality designed to simplify a complex administrative task, offering.

- Performance, configuration, and SAN topo-logy reporting across multiple mid-range arrays, helping to prevent bottlenecks before they occur;
- Continuous real-time monitoring and fault identification to help improve SAN avail-ability;
- Help to monitor metrics such as throughput, I/O data rates, and cache utilization;
- Timely alerts that can enable event-based actions using customized threshold policies;
- Outstanding ROI and ease-of-mind for ad-ministrators required to maintain storage per-formance levels for mission-critical applica-tions; and
- A reduction in storage administration costs by helping to simplify the management of com-plex SANs.

Conclusion

The DS3500 provides the SME data center with a wide range of benefits, not simply limited to hardware or to software. The DS3500 has an af-fordable entry point with mid-range performance, scalability, and functionality. It has outstanding options with Turbo Performance, multi-protocol support and dynamic growth for scalability and flexibility, energy efficiency to help keep the planet green, and a simplified ease-of-use from IBM's DS Storage Manager to help an over-worked staff, while enhanced security features keep your data safe from hackers and thieves.

But that's not all! With Tivoli Storage Pro-ductivity Center-MRE, IBM provides the data center with a robust set of SRM capabilities to help manage multi-site midrange storage infrastructures from a single console. This simplifies the man-agement of the DS3500 with a lower price, based upon physi-cal disk enclosures, than was available before.

If your SME does not have the staff to dedicate individual resources to storage manage-ment, you should look into IBM's DS3500. It may be the storage solution you need.

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