



IBM Introduces SAN Storage for the Entry SMB — A Storage Strategy Appears

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Management Summary

At one time or another, we have all seen a marketing campaign headlined “One Size Fits All”. What that slogan really means is *one size fits all, just not very well*. Oh, there are times when the campaign might fit, as in a pair of socks stretching for sizes 6 thru 11, but when you put an XL T-shirt on your four-year-old, it just might be a little large. There is often a need to adapt the product to fit the consumer. Many times, however, the demands of the consumers exceed the research and development (R&D) budgets of most, if not all, manufacturers. In order to put together a product line broad enough to cover the various classes of consumer, companies, such as IBM, often find themselves seeking partners. These partners fill in the pieces of the product set considered a mission distraction by upper management, but which help to complete the product family.

Sears Roebuck is one of the better examples of this philosophy. Their *Kenmore* brand of appliances is famed for bringing together some of the best-of-breed manufacturers in the appliance marketplace. These manufacturers collaborated with Sears, using Sears’ specifications and warranties, to deliver a consistent product under a consolidated family of washers, dryers, refrigerators, stoves, etc. using a single corporate logo. Kenmore is not the only brand for which Sears is famous. They also manufacture a high-end family of tools under their *Craftsman* brand, guaranteed for life.

In fact, most enterprises, in most businesses, could not afford the R&D costs associated with such a broad product base. They must rely on OEM partners to satisfy their customer’s needs. The Information Technology (IT) market is no different, especially if we look at the wide-ranging requirements for disk storage and the myriad demands that Information Lifecycle Management (ILM) puts on enterprises around the world. IBM has recognized this problem and taken action to satisfy all of their customers, whether mainframe users centralized in the “glass house” or those referred to as the SMB market, small and medium sized businesses distributed around the countryside. IBM is in the process of consolidating their storage products under a single *TotalStorage DS* identity, with the first two new elements identified as the *DS300* and *DS400*, primarily for the *eServer xSeries* and *Blade-Center* with *Windows* and *Linux*. They have also renamed the *FAStT* line of storage products to the *DS4000* family. The *DS4000* is designed to interoperate with the *eServer pSeries* and the *eServer xSeries* servers, as well as with Intel processor-based and UNIX-based servers. To learn more about IBM’s *TotalStorage DS* solutions, please read on.

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Consolidating a Storage Position

It would be rather presumptuous for me to claim that IBM does not have a storage strategy. They have had many, mostly at the high end of the storage spectrum, in support of mainframes and larger open systems. Now, however, there are indications that IBM is paying strict attention to the lower levels of the storage marketplace as well. Most notable of these signs was the recent announcement of the reconfiguration of the *NAS Gateway 500*¹ to encompass the entry-level SMB for an IP-connection to networked storage.

With the enforcement of new legislation covering the recording and preservation of all financial transactions, and the institution of privacy safeguards, all public enterprises, both large and small, have had to address the need to manage ever-expanding disk capacity. Management has addressed this activity, referred to as Information LifeCycle Management (ILM), for years in the data center. Most, if not all, mainframes have had tape silos complementing the vast arrays of disk farms populating the glass house floor. These silos have been used for backups and archiving for decades, with individual tape drives preceding them.

ILM refers to the creation of multiple tiers of storage, with primary storage maintained on the highest form of disk storage available, with less important, not as critical data, being kept on slower, but on-line, disk media. ILM refers to information that does not have to be on-line as secondary, or tertiary, data. It can be stored on tape, the same as its predecessors. In a distributed environment, the primary data itself may be kept on second tier primary storage because it is less expensive and access to it less critical than in a data center environment.

The need to control the total cost of operation (TCO) for storage has led to the modification of existing Fibre Channel arrays to support a heterogeneous environment with both Fibre Channel and less expensive ATA disk drives accessible. It has also led to the implementation of arrays attached to networks of servers through a less expensive, and less

performant, iSCSI protocol.

Therefore, vendors such as IBM, and HP and Sun, have implemented concerted efforts to enrich their product offering to span from the high end down to the entry-level configuration. The entry range products must contain at least a subset of the high-end functionality, common across the tiers, so that the entry-level configurations have the software resources required to make them functional. This includes commands for copying and mirroring, as well as a common installation and management focus.

Coordinating such a task across multiple product lines within an organization as broad as IBM would be considered a difficult task. Trying to coordinate these same activities between enterprise partners as diverse as IBM, Adaptec, and Engenio Information Technologies would have to be considered a more monumental undertaking. However, that is exactly what IBM has done in order to provide the entry and mid-range storage solutions. A new high-end enterprise solution is expected soon from within IBM's own engineering resources. That storage solution will be addressed in a separate bulletin.

Implementing Storage Partnerships

In order to control their costs, IBM decided to outsource the development of both the entry-level and departmental storage solutions of the TotalStorage DS Family. The open systems departmental implementation went to LSI Storage Inc., now known as Engenio. In 2004, the decision for the outsourcing of the entry-level implementation went to Adaptec. IBM, however, continues to warrant, service, and support all of the products delivered under the TotalStorage brand.

For more than 20 years, Engenio has

Exhibit 1 – DS4000 Models

DS4000 Models	FASt Models
DS4100	FASt100
DS4300	FASt600
DS4400	FASt700
DS4500	FASt900

Source: IBM

¹ See **The Clipper Group Navigator** dated September 25, 2004, entitled *POWER Everywhere – IBM Extends NAS Gateway to Entry SMB* at <http://www.clipper.com/research/TCG2004079.pdf>.

pioneered much of the technology that defines storage performance. They have had an OEM relationship with IBM for several years. IBM offers the DS4000 (formerly called *FASTT*) family based on Engenio technology. IBM's DS4000 series of storage solutions is designed to meet the demanding needs of workgroups and departments in the open system storage market. See Exhibit 1, on the previous page, for a table relating the two families.^{2,3} Note that the *FASTT200* has not been carried over. Its last order date is Nov. 2004.

The significant changes appear at the entry-level with the arrival of the DS300 and DS400 with advanced features to support business continuity. In order to meet their time to market and the goal of introducing the industry's lowest priced entry-level storage server, IBM awarded the development of this product to Adaptec. They, in turn, developed the platforms based upon product requirements provided by IBM who also provided additional acceptance testing and operating system and cluster development. They met both of their goals, with a development cycle shortened by seven months and a DS300 starting price under \$3,000.

Based upon Adaptec's *Flexible Storage Architecture* and *Storage Manager*, the DS300 and DS400 provide IBM with the high-volume market products in the industry's fast-growing segment (under \$15K), with a projected segment size of \$6.4B by 2008⁴. These products will also integrate well with Adaptec's technology, which is already prevalent in the *xSeries* and *iSeries* servers, as well as the *pSeries* RAID controllers. This opportunity cannot help but lead to increased system volume and revenue for both Adaptec and IBM, as well as leading to increased operating efficiencies that will manifest itself in the bottom line for both. There is also a potential for Adaptec for upgrades to the *Storage Manager*, the virtualization engine that controls the mirroring, snapshot and replication functions.

² Also see **The Clipper Group Navigator** dated May 18, 2004, entitled *IBM Positions FASTT for SMB - Brings SATA to Entry Users* at <http://www.clipper.com/research/TCG2004044.pdf>.

³ Also see **The Clipper Group Navigator** dated August 31, 2003, entitled *IBM Supercharges FASTT Family* at <http://www.clipper.com/research/TCG2003041.pdf>.

⁴ From Adaptec product presentation

Positioning the TotalStorage DS Family

The DS300 and DS400 are primarily positioned in the IT infrastructure market where *Windows* and *Linux* flourish, to support the eServer xSeries and BladeCenter systems, in File/Print, Systems Management, and backup server environments. The DS400 also is positioned in the collaborative workspace, where email and workgroup activities predominate. The DS400 also provides an ideal entry-level vehicle for Web infrastructure requirements such as Web serving and the handling of large quantities of streaming media. Both systems provide simultaneous support of heterogeneous operating systems for xSeries and BladeCenter.

DS300 Configurability

Priced under \$3K, the DS300 provides IBM with the ideal means to transport data through standard Internet protocols for the smaller data center or a remote branch office. **IBM customers can now create a storage area network (SAN) based upon current Gigabit Ethernet networks, eliminating the requirement for the more expensive Fibre Channel infrastructure.** The data center can continue to use advanced storage management techniques, however, in a more TCO-friendly manner. In addition, iSCSI technology allows IT to leverage existing skills that customers are currently using on their servers. **They can also avail themselves of outstanding reliability and performance characteristics that include Ultra320 SCSI drives, battery backup cache, and redundant hot-swappable power supplies, features not normally found in an entry-level storage server.**

With a 3U-form factor, the DS300 is available with either a single or a dual controller and can support up to (14) 146GB drives for a total capacity of two TBs. With a standard configuration of 256MB per controller, the DS300 can expand to 1GB of cache/controller to meet application requirements on demand. With three 1GB Ethernet ports, the DS300 can support RAID levels of 0, 1, 5, 10, and 50 using IBM's *ServeRAID* Technology, also acquired from the Adaptec partnership. The *ServeRAID* Manager removes the complexity from SAN deployment and management and enables a standard FlashCopy replication functionality.

DS400 Configurability

Aimed at the same market as the DS300, the DS400 targets the smaller data center or larger department or remote branch office, with a price around \$5K. However, the DS400 comes with 2GB Fibre Channel host connectivity. In fact, it each controller has a pair of 2GB ports. In addition, the DS400 is upgradable on demand with one or two EXP400 expansion drawers, up to 40 drives, for a total capacity of 5.8TBs. Other than these two characteristics, the DS400 has the same configurability as the DS300.

DS4000 Family

Renamed from the FAST Family to the DS4000, IBM has added new features to the resiliency functionality and extended the configurability of the DS4100.

DS4100

Positioned along with the DS300 and DS400 in the Entry Workgroup Tier, the 4100 (formerly the FAST100) can be configured with up to 14 SATA drives in a 3U drawer, similar to the DS300/400. These SATA drives have a capacity of 250GB each, giving the DS4100 a capacity of 28TB with the addition of up to 98 drives in six EXP100 expansion enclosures, in a nearline storage environment. With dual Fibre Channel controllers, four FC ports, and no single point of failure, the DS4100 is positioned at the top of the general-purpose entry-level class, while providing a unique vehicle for high-volume fixed content support in departmental storage environments.

The DS4100 also comes with data protection through local snapshots and has plans for remote mirroring to support rapid recovery with zero-time backup windows.

DS Storage Manager v9.1

This new release of the storage management software previously available for the FAST family has been extended to support additional functionality beyond the standard configuration and management features previously available. The new version applies to the DS4300, 4400, and 4500. The DS4100 still uses v8.42. These new features include:

- Robust and flexible remote mirroring with global mirror with optional write consistency, Suspend and Resume

features, and Read Access from remote mirrors;

- Performance and RAS Improvements; and
- Improved support for SATA drives.

Conclusion

With the assistance of their partners, Adaptec and Engenio, IBM has commenced the implementation of an innovative, consolidated storage strategy with the announcement of the entry-level and mid-range classes for the TotalStorage DS Storage Family. By using partner technology, IBM has assembled an easy to use entry storage solution that delivers high value for minimal investment. By investing in iSCSI at the entry level, IBM has simplified the infrastructure, and enabled business continuity and ILM for a class of customers who could not previously afford to entertain these activities.

Quite clearly, any storage solution, whether entry level or enterprise, is not *one size fits all*. Different enterprises, different departments, require specific solutions. Through a unique partnership with Adaptec, IBM has enabled an economical solution for a growing set of distinct problems within the “masses”. An entry TotalStorage solution can only lead to reducing the total cost of ownership and improving the bottom line for any customer who implements with IBM.



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