IBM Positions *FAStT* for SMB
Brings SATA to Entry Users

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Management Summary

Americans are always tinkering. We take a good product that was designed for a given customer base and play with it. First, we try to *supersize* it. We add more pieces to it. We try to use bigger pieces than before. We try to make it better. Then we discover, much to our chagrin, that we did not make it better, we simply made it bigger, i.e., fatter. So, what do you do when something is too fat? That's right; you put it on a diet and shrink it right down, down, down. Past its previous limits you go, until we have created a mini product. Just like the last one, only smaller. Rather than modifying a successful product, what is wrong with designing a product to fit the market space for which it is intended?

In the data center, we have an ever-changing market target for storage. No matter what size the business, enterprise, or agency, we are witnessing an explosion of data requirements, a doubling, tripling, and even a quadrupling of information storage. Caused by disasters such as 9/11 inspiring new concerns over disaster recovery and business continuance, enterprises are implementing new mirroring and snapshot utilities in order to be able to recover on-line and maintain their client base. Caused by corrupt management in companies such as Enron and Tyco, publicly held institutions of all sizes are implementing new archiving procedures to protect and preserve all financial data and all email. The legislature inspired them with fines and prison sentences to threaten executives and to protect us all. Vendors of all sizes are addressing these issues for major enterprises across the board. Unfortunately, few are attempting to solve these problems for the vast number of small-to-medium sized businesses (SMBs) that face the same issues.

One of the companies paying attention to the $10M - $50M (revenue) SMB space, along with similar sized departments or operations in larger enterprises, is IBM. IBM has implemented an Information Lifecycle Management (ILM) program to enable these small businesses to implement their own secondary storage architecture. By doing this, the enterprise can meet the demands of an expanding data requirement, reduce the acquisition costs of storage and reduce the total cost of ownership (TCO) as well. Part of that program has lead IBM to introduce a brand new member of the *FAStT* storage array family, the *FAStT100*. To learn how the FAStT100 can assist your Information Technology (IT) staff in reducing storage acquisition costs and in lowering the TCO, please read on.

The Appeal of ATA Disks

There is no typical SMB data center[1], whether at the entry level or in the mid-range. We see two different environments, however, existing in these centers:

- One in which consolidation and the centralization of storage has resulted in the creation of a monolithic, homogeneous data storage architecture or a large storage area network (SAN);

- The other in which direct-attached storage (DAS) or small SANs, islands of storage, are still prevalent.

In either case, ATA storage has an opportunity to reduce the costs of ownership.

In an attempt to reduce administrative costs, some mid-range businesses have already implemented a SAN that can share all enterprise data assets between all of the servers on the storage network. In order to achieve optimal performance with a maximum of storage functionality, some businesses have installed high-end storage arrays to provide the fastest response possible for their mission-critical applications. In addition, some have installed a software capability to provide failover, remote mirroring, and other features deemed necessary to the enterprise data center. The data center staff has implemented this while keeping their eyes on the main prize, **a reduction in total storage-acquisition costs.**

Smaller SMBs face a similar problem. They still need to consolidate in order to achieve the economies that their larger brethren have already achieved. However, with the availability of less expensive devices, they may now be able to implement an architecture that relies on ATA devices as a primary array.

Fortunately, along with the implementation of a multitude of ILM programs, the IT staff (this could mean YOU) has learned that not all data requires the same level of care
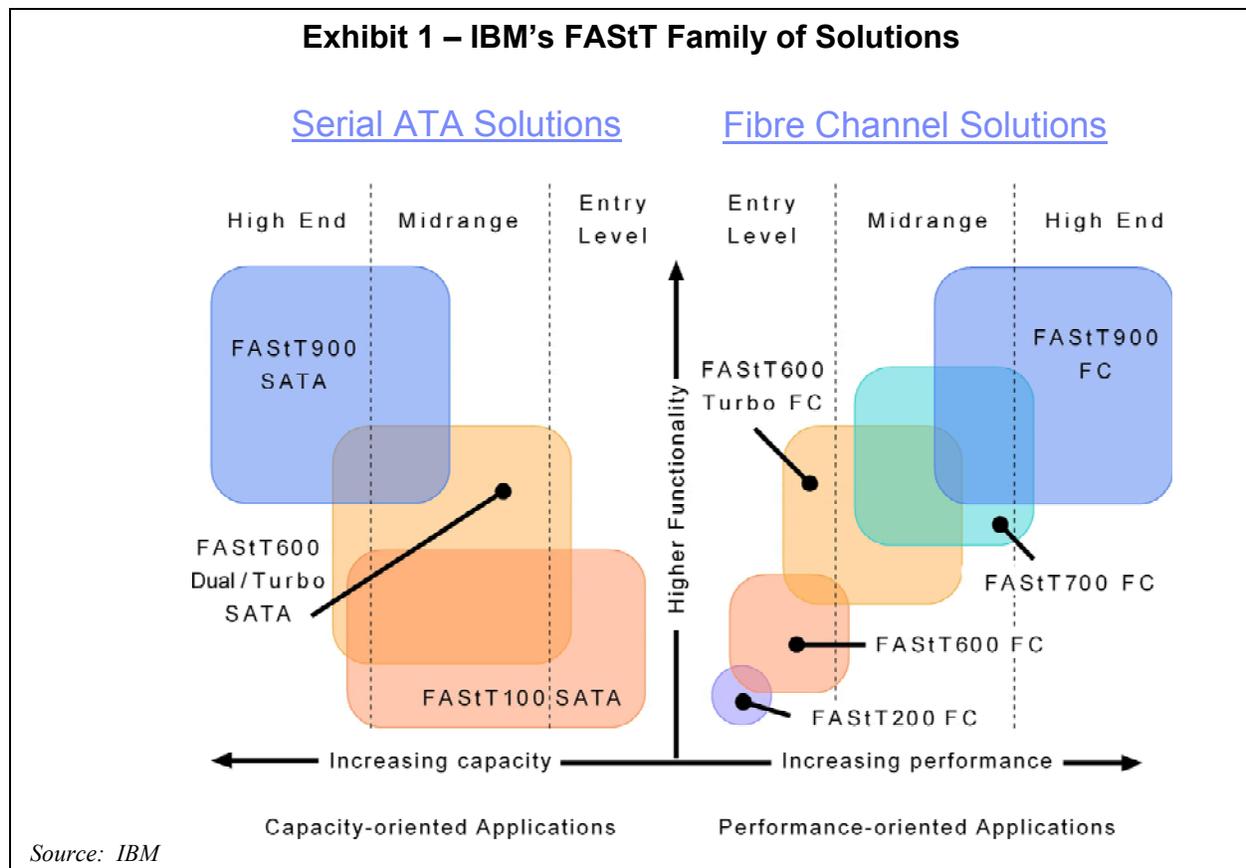
and handling. Some applications are not as critical as others; some data is not as essential to the everyday operation of the enterprise. This is not to say that we can treat this information more callously than any other. It must be available on-line, it must be protected with a RAID architecture to assure accessibility, and it must be backed up. The difference is that the data center can implement all of these activities with less sophistication, less speed, and less cost.

One of the ways to accomplish this is to acquire a secondary storage tier to complement the primary tier that handles the mission-critical portion of the business.[2] If the central data store is on a *FAStT 600 (Dual or Turbo)* or *FAStT 900*, or other enterprise storage system, then the IT staff may want to look into the acquisition of ATA devices to support the secondary tier. Instead of running with high-speed, high function, high cost Fibre Channel (FC) disks, the data center could implement an array consisting of lower cost, lower performing ATA devices. The disk drives can represent the majority of acquisition costs. After factoring in controllers, enclosures, and management software, this can represent 30-80% of the new investment. By replacing the Fibre Channel requirement with a request for lower cost disks, the staff can reduce the hardware cost from 30% to over 50%, depending upon the environment.

With the arrival of Serial ATA (SATA) disks, the data center is now armed with the tools necessary to implement a variety of business continuation strategies for the enterprise. In order to improve recovery time from the loss of files and higher application availability, backups can now be performed using a disk-to-disk environment without incurring the increased burden normally associated with the use of FC drives for backup. With SATA, health organizations can implement economical compliance with the requirements established by a variety of legislative actions

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[1] A data center may be the "Glass House" of an enterprise with a false floor and a staff of dozens, or it could be a closet near the telephone switch with a staff of one or two part-timers..

[2] See *Tiered Storage Classes Save Money - Getting The Most Out Of Your Storage Infrastructure* in **The Clipper Group Explorer** dated August 29, 2002, and available at http://www.clipper.com/research/TCG2002030.pdf.

Exhibit 1 – IBM's FAStT Family of Solutions

Serial ATA Solutions   Fibre Channel Solutions

Source: IBM

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implemented to protect the health records of patients. They can preserve medical images and health histories on-line, inexpensively, in order to comply with the requirements of retention-managed data. Moreover, the IT staff can now implement new policies regarding the retention of archived information on-line and establish a low-cost disaster recovery program to ensure business continuance.

SATA also provides an ideal medium for entry-level storage. With characteristics similar to secondary storage, entry-level storage with low duty cycles provides the data center with devices that can support lower levels of throughput concerning MB/s and IOPS, while retaining an immediate access to data. Any loss of uptime is more than compensated by the lower cost of the devices.

IBM has already established a family of disk array products that support both SATA and FC, consisting of the FAStT900 at the high end and the FAStT600 Dual and Turbo products in the midrange. Now they have

complemented that offering with a new, entry-level array for SATA, the *FAStT100*. See Exhibit 1 for FAStT models supporting SATA.

FAStT100 Introduction

Designed for rack-mount installation in a 3U enclosure, the FAStT100 is an entry-level storage system with mid-level potential and high-end functionality. The T100 comes with dual storage controllers with 512 MB of cache and up to 14 SATA drives, each running at 7200 RPM with 250 GB capacity. Coupled with multiple power supplies and fans, the T100 provides the SMB with a low-priced array with no single-point-of-failure within the drawer. IBM provides management support from its SAN Volume Controller for this customer installable array.

In addition to the 14 devices within the drawer, IBM provides access to three additional EXP100 expansion drawers, each with another 14 drives, for a total initial capability of 56 drives, or 14TB. IBM has

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also identified that four additional drawers will become available by the end of 2004 for 112 drives and 28 TB of capacity. These drives are connected to the SAN through a pair of storage controllers with a total of four 2-Gbps Fibre Channel SAN connections.

Clearly, SATA does not provide the same performance characteristics as Fibre Channel. In fact, in rich media or video server environments where the data center deals with large-block sequential transfer, estimates are that SATA will operate at about 67% of FC running with 10K drives. If the application set is more concerned with the random transfer of small blocks as in database and OLTP applications, then SATA will achieve a performance of only 25% of FC. Therefore, automated or manual ILM policies established to assign data to specific drive architectures should keep in mind that SATA is good for applications that require throughput performance but not for applications requiring a high level of IOPS performance.

Storage Manager 8.42

IBM supports the FAStT100 with *Storage Manager 8.42,* the latest version of their FAStT management software that now provides a robust functionality and an intuitive GUI. It can be installed on any system that is supported by Linux (*Red Hat AS 3.0* and *SuSE ES 8*), *Windows 2000, Windows Server 2003*, or *AIX 5.1* or *5.2.* This storage management software also provides a common interface for all of the other models in the FAStT family managed by v8.x, although only v8.42 will support the T100. (See Exhibit 1.) Storage Manager 8.42 is included in the purchase price of the FAStT100 platform and provides a distinct advantage when compared to the acquisition costs of management software for competitive products. Storage Manager also comes with optional products that can be acquired, as needed, for partitioning and FlashCopy.

Conclusion

The FAStT100 is the latest introduction

into a growing family of storage arrays introduced by IBM over the last few years. With over 20,000 FAStT arrays in service, most of them over the past two years, IBM appears to have found a winning formula for hardware performance and software functionality tailored to a specific tier of storage requirements. The FAStT100 continues this tradition with primary support for SATA drives and all of the standard FAStT features and functionality. By reducing the acquisition costs of this secondary storage tier, IBM has provided the data center with the cost advantages needed for ILM storage.

Using the common interface and centralized administration capability of Storage Manger 8.42, IBM enables the IT staff to reduce storage management costs and lower the TCO of the disk array set. The on-line administration and scalability enable the staff to maintain continuous data availability and to control the acquisition and expansion costs by adding drawers of SATA disk to the solution only when the application demands warrant that action. The data center staff remains in control.

The FAStT100 enables management to retain control over the storage network. The T100 enables the staff with the power to establish a multi-tier data storage policy, with a secondary level comprised of lower-cost solutions in place of the monolithic environment found in many of the largest data centers. Now is the time to think about multiple tiers of storage!

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