

Commentary

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You Can't Tell the Major Enterprise Disk Storage Players without a Scorecard

Making sense of the computer storage market starts with understanding the role of the major disk storage system vendors. Disk storage systems — not storage networking — are still the center of the storage solar system, around which all other storage requirements turn. Whether the major players foster innovation, and whether they succeed in market positioning vis-à-vis one another, will determine not only each vendor's success but also the success of the overall storage market.

Storage Still Revolves Around Disk Storage Systems

Making sense of the computer storage market is not easy. There are literally hundreds of storage companies.

However, at the top are no more than a dozen companies that are a classic example of the 80-20 rule, where no more than 20% of the companies have 80% of the revenues. And the majority of these companies have a strong interest in external disk storage systems.

Why disk storage systems? Logically, a storage infrastructure decision should start with a decision to choose storage network components, such as a switch. That would imply that those companies would be closest to the IT buyers. That is not the case.

What happens today is that IT buyers decide on the disk storage first, and then buy the SAN switch, probably from the disk system vendor, and

usually according to the vendor's recommendation. Likewise, replacement or upgrade decisions for such products may go through the storage component supplier.

The reason that storage decisions start with disk is that disk is the storage that matters most to the IT buyer — because disk is where nearly all production information — from online transaction processing systems to e-mails to medical images — resides.

All the rest of the enterprise (i.e., not personal) computer storage market revolves around external disk storage as follows:

- *Embedded products* (such as disk drives and host bus adapters)
- *Complementary products* (such as storage networking components and tape libraries for data protection)
- *Value enhancement products* (for example, storage management soft-

ware for storage resource management and backup/restore processing)

- *Service-related products* (such as break-fix maintenance and professional services)

Small and emerging companies are trying to take advantage of this market as well, typically by doing one of the following:

- OEM a product to one of the major disk storage players
- Find a niche that the larger players have not yet taken advantage of
- Offer a new product that can supplement or complement existing products

Thus, the center of gravity of the storage market is still enterprise disk storage.

The Disk Price Erosion Challenge

Enterprise disk storage system vendors face a continuing challenge with falling disk prices. Raw disk prices continue their inexorable trend, falling at a rate of well over 30% per year. This is nothing new, and it is not likely to cease any time in the near future.

Moreover, falling disk prices continue to put downward pressure on disk storage system prices as well.

Vendors can take some solace from the fact that the price/elasticity curve still holds to some extent, so that disk storage demand will grow. However, they are also proactively attempting to take market share from their competitors as well as diversifying into other storage-related products and services.

IT buyers overall have not seen an erosion in their budgets, so they can take advantage of the price erosion to acquire more storage and/or buy other storage products, such as advanced software that is now becoming available.

All in the Family

However, disk storage still commands a good piece of the IT storage budget, so enterprise disk storage vendors will continue to emphasize their disk system offerings. They offer a minimum of two disk storage lines (hereafter referred to as families) to try and cover the full range of the customer food chain (from large enterprises all the way down to small and medium businesses).

The two families are "enterprise" and "midrange." These names are misnomers. The terms were marketing terms to try and segment the market into "enterprise" storage for high-end customers and "midrange" for all other organizations. However, all independent organizations, even the smallest, are enterprises. Also, in many cases even the largest enterprises find midrange storage satisfactory for certain applications. The names will be retained because no other names (monolithic vs. modular?) really do any better, and they are familiar.

Enterprise-class storage leads midrange storage on a number of "bigger, better, and faster" parameters (Table 1), but, when all is said and done, midrange storage is *good enough* for many business applications. For those applications, the price premium for enterprise-class disk storage systems is not acceptable.

Within midrange storage another form of "disintermediation" is taking place. That is the substitution of Serial ATA (SATA) disks for more expensive higher-

performance (but also higher cost) fibre channel drives. SATA drives are *good enough* for many applications.

Table 1: Comparing Enterprise to Midrange Storage Systems

	Enterprise	Midrange
Form Factor	Monolithic	Modular
Scalability	Very high	All but very high end
Reliability	Very high	High
Performance	Higher than midrange	Very good
Software Functionality	Latest and greatest	Very good
Platform Support	Mainframe plus open systems	Open systems only (typically)
Price	Higher than midrange	Lower than enterprise

Source: Mesabi Group November 2004

Understanding the Storage Heritage is Important

Comparing and contrasting competing enterprise and midrange storage system products is not easy. Disk storage systems can be classified as follows:

- *Model* — a particular product that presumably could be bought via a purchase order

- *Series* — a collection of model numbers that all have a common base number, such as 300 or 6000
- *Family* — any collection of one or more model number series that a vendor has arbitrarily grouped together as a family
- *Brand* — the sum of all families; the highest level at which a vendor classifies its storage, for example, Total-Storage for IBM and StorEdge for Sun

In trying to make sense out of classification schemes, IT buyers may find that no two model numbers — even within the same series — have the same architectural heritage. IT buyers will have to determine whether or not this is important to them. Brand names are expected to be generic, but within a family (or at least a series) a common architectural heritage (although usually desirable) is not always the case.

A common physical heritage may be important if an IT organization outgrows one model number and wants to upgrade to another model without having to learn anything new and with assurance that the server platforms that were supported before are already covered.

A common hardware heritage may not matter if there is software transparency between two models within a series or within a family. Software transparency is software compatibility — that is, a model can automatically run the software that applies to other members of the series or family.

Understanding the Business Heritage is Important

Another way of looking an enterprise disk storage vendor is in terms of its business

heritage. The two major lines of inheritance are as follows:

- *Storage-focused companies* — storage in one form or another is the primary business of the vendor
- *Server and storage customer-facing companies* — these companies have a server lineage. Storage is important, but is unlikely to be their only (or even their main) focus.

Each lineage has a major advantage (and corresponding disadvantage). Even though servers and storage are technically independent buy decisions, vendors with a server lineage have a home-field advantage, but only to their installed base of server customers. The fact that the potential customer already has their servers means that they at least get a chance to present their storage case. Also, these vendors may be able to bundle together a combination server-storage sale.

On the other hand, vendors with a storage-focused lineage have an advantage in selling across all installed server platforms, as compared to a server-based lineage vendor trying to sell to customers who do not already have its servers.

The Disk System Competitive Landscape

The picture of the major enterprise disk storage system vendors broken down by business heritage and the split between enterprise and midrange storage lines is a complex one (Figure 1).

However, there are three sets of inter-company relationships that need to be understood. The first is that between EMC and Dell. Customers benefit from getting world-class storage from EMC

through Dell as well as the benefits of the world-class efficiency that is realized through the Dell business model.

The second is the OEM relationship that Engenio has with a number of companies. Engenio is very strong in the midrange space, such as disk controllers, and several disk storage vendors have chosen to take advantage of this.

The third is the relationships among Hitachi Ltd. Japan (not shown in the figure), Hitachi Data Systems, Hewlett-Packard, and Sun Microsystems.

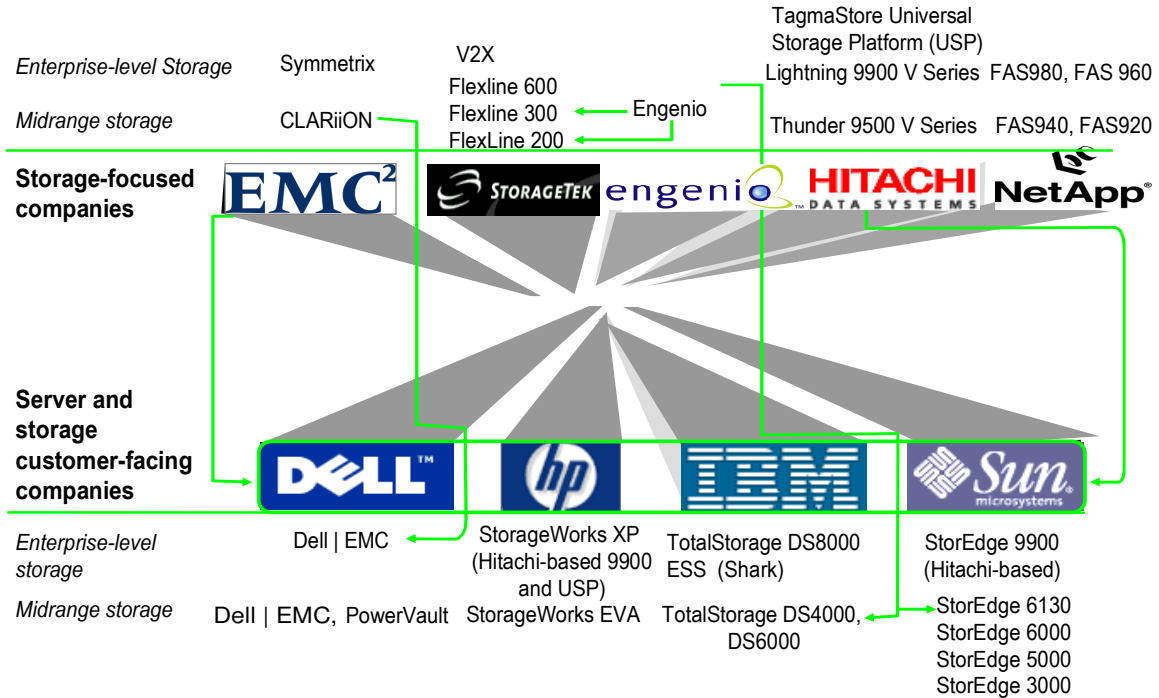
Hewlett-Packard (HP) is an OEM to Hitachi Ltd. Japan. HP has both an OEM and an engineering agreement with Hitachi Ltd. The agreement between Hitachi Ltd. and HP reached its fifth year anniversary on May 5, 2004 and has been extended until 2008. HP's XP products hardware-wise are the same as the HDS Lightning-class products. HP offers different software at times than HDS. HP does not OEM the Thunder-class products.

Hitachi Data Systems (HDS) is a wholly-owned subsidiary of Hitachi Ltd. Japan. HDS resells to Sun Microsystems. Sun sells Lightning-class products under its StorEdge label. Sun does not resell Thunder-class products

Thumbnail Sketch of Each Storage-Focused Company

- **EMC** — Even though the Symmetrix and CLARiiON lines are architecturally distinct, each family is consistent within itself and EMC has done a lot of work to ensure that the two can work together. A strong focus on ILM (Information Lifecycle Management) as an integrating principle, continued software and hardware innovation

Figure 1: Disk System Competitive Landscape



Source: Mesabi Group November 2004

through internal development as well as acquisition, and world-class professional services will continue to give EMC a strong market position with a strong core in enterprise disk storage systems.

- **StorageTek** — although StorageTek is primarily a tape automation player, it has disk storage offerings with an emphasis on the midrange. StorageTek has had a long history in disk systems, but its focus has to be on accounts that already have a StorageTek tape silo.
- **Engenio** — The company is a spin-off of LSI Logic. Although it does

sell directly, Engenio's main revenues come from its acting as an "arms supplier" to other disk storage system companies through its OEM arrangements. Among its OEM arrangements are successful deals with IBM, StorageTek, Teradata, and now Sun. Engenio's concern is that IBM's DS6000 will displace the DS4000 (nee FAStT). However, the DS4000 has had strong acceptance and customers do not like to change what has worked for them except in specialized situations.

- **Hitachi Data Systems** — HDS has a strong enterprise (Lightning 9900 V Series) and midrange (Thunder 9500 V Series) product suite, augmented by

its recently announced TagmaStore Universal Storage Platform that will eventually replace the Lightning products. A key strength is a lot of software commonality across the 9500 and 9900 series of products. HDS focuses on the high-end of the storage market. Its reseller arrangement with Sun for enterprise storage enables it to get the home-field advantage with the Sun server installed base

- **NetApp** — Although NetApp is a storage company, it is not a natural player in enterprise storage (which focuses on blocks), as its main focus has been network-attached storage (NAS) (which focuses on files). That said, NetApp has been very effective in leveraging its existing technology and developing new software. Its enterprise and mid-range product offerings mean that existing customers can use NetApp for block storage without having to move to another vendor and new customers can consider NetApp because it does not just do NAS. Moreover, NetApp has been very creative in some of its software offerings especially with reference to replication and data protection.

Thumbnail Sketch of Each Server and Storage Customer-Facing Company

- **Dell** — Dell does not compete in the high-end “enterprise” storage space, except that Dell sells EMC Symmetrix through its software & peripherals (S&P) channel. Dell is more comfortable in selling at the midrange level into the enterprise through its arrangement with EMC, although the high end of these products can penetrate at least

part of the “enterprise” space. Whenever the customer wants storage to support servers that run Microsoft server operating systems, Dell’s business model gives it a major advantage. The Dell/EMC relationship is mutually beneficial — Dell gets world-class storage and EMC gets a partner with a world-class efficiency model.

- **Hewlett-Packard** — HP’s enterprise storage family comes to HP via the OEM relationship with Hitachi Ltd., and HP’s midrange storage family derives primarily from its Compaq acquisition — there is no architectural compatibility between the two lines. However, HP has a large installed base and sells a very broad portfolio of storage products, so it is always at least in the game.
- **IBM** — Its fall storage announcements have put IBM in a strong position.; The DS6000 is the first “midrange” storage system that plays in the mainframe space; the DS8000 is the “jacks or better” hand that gives IBM relative parity in the enterprise storage space; and technical advances in the SAN Volume Controller and Tivoli Storage Manager are additional positives.
- **Sun** — Sun seems to believe in a disk storage series of products for every market segment. Storage seems to be a ray of sunshine for Sun overall for the Sun-server installed base. Sun has some good software (notably QFS and SAM-FS) that it could leverage with its installed base.

What to Look Out for in 2005

The first trend to monitor among the enterprise disk storage vendors is the battle to manage heterogeneous brands

of disk storage from a single control point. That means that even if there is a mix of different types of storage for midrange and enterprise in an IT infrastructure that one vendor would control the storage management window to all the storage.

- EMC with Control Center, HDS with its TagmaStore Universal Storage Platform, and IBM with SAN Volume Controller are among the enterprise disk storage leaders in providing this functionality.
- Winning this battle is important because IT buyers will tend to choose the winner in their storage buying decisions more frequently, despite the ostensible purpose of making choices more open.

The second trend to monitor is the degree to which midrange storage erodes enterprise storage. Midrange storage is “good enough” in a lot of cases, and with the inexorable migration of key software functionality to midrange that trend will continue.

The third trend to monitor is software progress in such key areas such as virtualization, intelligence in the fabric, and ILM. The enterprise disk system vendors are not the only ones to offer products in these areas and some of the other vendors offering the new technologies may indeed have an impact on the disk

storage market via their new software functionality.

A truism in the software market in particular and (IT technology in general) is that hype leads and delivery of software functionality trails. Even when functionality is available there is still a lag time (which can often be measured in years) for any customers other than early adopters to be able to understand, buy, and implement the technology.

In 2005 storage virtualization is likely to continue to gain acceptance, fabric intelligence is likely to take some steps forward (but not be a world beater), and ILM will continue to take steps forward in the tiering and pooling of storage as well as in the area of compliance, but broader general understanding and acceptance is still some time away.

Conclusion

When viewing the storage market in 2005, the impact of innovation and market penetration in the enterprise disk storage space is still where the highest storage “seismic” market shocks will take place — and the key disk storage vendors are the players to watch to see if and how fast earthquakes will take place.

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