

MarketScope for High-End Enterprise Disk Arrays, 2008

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Six vendors (EMC, Fujitsu, Hitachi/HDS, HP, IBM and Sun Microsystems) continue to battle for share in the mature market for high-end enterprise disk arrays, where pricing, support and market-proven technology implementations are key purchase criteria.

WHAT YOU NEED TO KNOW

2007 saw a reinvigoration of technology innovation in the high-end enterprise disk array storage market as storage vendors began delivering such technologies as thin provisioning, enhanced replication facilities, redundant array of independent disks (RAID) 6, and internal serial advanced technology attachment (SATA) disk support. While that innovation continued in 2008, albeit more slowly, economics and support capabilities continue to play a greater role in equipment and vendor selection. High-end enterprise disk array storage users are inherently risk-averse. They understand and embrace technology that is mature and stable, tending to wait for technologies to be proven before deploying them. However, the price also has to be right. In today's high-end enterprise disk array market, Gartner research shows that vendors that can compete on price and support are finding success in the market.

End users considering a high-end enterprise disk array purchase are therefore encouraged to include nonproduct criteria in the selection process, as well as array functionality. These nonproduct criteria include:

- Presales support
- Break/fix service and post-sales support
- Total-cost-of-ownership evaluation
- Technologies that have the net effect of reducing power and cooling consumption and space requirements
- Independent software vendor support
- Acquisition, upgrade, service and warranty pricing
- The impact of changing storage vendors on procedures, automation and scripts, storage management tools, and training

Many users are reluctant to change storage vendors, but where the costs and risks of such a change are acceptable, users should regard the end of a product life cycle or useful product service life as a negotiation opportunity to solicit bids from at least three providers and to seriously consider the input of nonincumbents.

We note that the vendor evaluations made in this document were based on high-end storage for both open-system and mainframe environments and that a mainframe-only customer might evaluate the market differently. Support for such technologies as parallel access volume (PAV), multiple allegiance, Geographically Dispersed Parallel Sysplex (GDPS), HyperPAV, extended address volumes and high-performance Fibre Channel Connection (FICON), will be more relevant to users in the mainframe space than in other technologies.

We also take this opportunity to remind readers that Gartner's MarketScopes measure a vendor's current and probable strength in the market by using a combination of product and nonproduct criteria. This makes a vendor's position in the MarketScope an analog of the vendors' ability to continue investing in product development, its service and support capabilities, and its viability. MarketScopes are not a direct or indirect measure of product attractiveness in a particular user environment.

MARKETSCOPE

The high-end enterprise disk array market is a mature market segment. While it is still large, it is no longer a unit or vendor revenue growth market. Rather, the number of units sold declined 4.9% year over year in 2007. This creates a highly competitive climate where every sale is an important one. The average raw configuration for a high-end enterprise disk array in 2007 was 39.3 terabytes (TB), a 43.4% increase over 2006. With an average end-user selling price (hardware only) of \$453,949 in 2007 (a 3% increase over 2006) or \$11.56 per gigabyte (a 28% decrease from 2006), every bid won impacts the vendor's bottom line. The result is a battle for every sale, which creates a high barrier to entry for this market segment.

The six evaluation criteria used for the MarketScope for High-End Enterprise Disk Arrays, 2008 remain unchanged from what was used in 2006 and 2007 (also see Table 1):

- Marketing strategy (completeness of vision)
- Product strategy (completeness of vision)
- Product or service (ability to execute)
- Sales execution and pricing (ability to execute)
- Market responsiveness and track record (ability to execute)
- Customer experience (ability to execute)

Market/Market Segment Description

Gartner defines high-end enterprise disk arrays as external controller-based RAID that:

- Use a multiple controller architecture
- Support mainframe and open-system environments
- Support FICON, Enterprise Systems Connection (ESCON) or Fibre Channel (FC) host connectivity
- Support the z/OS operating system and/or other mainframe operating systems

Inclusion and Exclusion Criteria

Providers are selected for inclusion in the MarketScope based on a variety of vendor-independent criteria, with final determination made by the authors with input from the global Gartner storage analyst community. Factors that contribute to a provider's inclusion on or exclusion from this MarketScope include:

- Products that meet Gartner's baseline definition for high-end enterprise disk arrays
- Global presence
- Market share and revenue data (a measure of vendor penetration into the market)
- Client inquiry activity (reflecting Gartner clients' interest in the vendor and its products)
- Ability to deliver new or interesting technology (demonstrating an understanding of and innovative approach to market needs)

Because the HP XP24000/XP20000 products are offered through an OEM agreement with Hitachi, and the Sun StorageTek 9990V/9985V models are co-branded with Hitachi Data Systems (HDS), the definition of product ownership should be clarified. For the purpose of this MarketScope, a product belongs to a technology provider if it carries the provider's company logo, it is on the provider's price list, and the provider offers first-level maintenance support.

This MarketScope includes the following providers (in alphabetical order):

- EMC — Symmetrix DMX-4
- Fujitsu — ETERNUS8000
- Hitachi/HDS — Universal Storage Platform (USP) V and USP VM
- HP — StorageWorks XP24000, XP20000
- IBM — System Storage DS8000 and DS6800
- Sun — Sun StorageTek 9990V and 9985V

The following vendors offer products that fall under Gartner's definition of a high-end enterprise disk array, but they were not evaluated in this MarketScope because they do not meet Gartner's other criteria for inclusion: NEC (iStorage S4900) and Nippon Unisys (SANARENA 6000 Series).

Rating for Overall Market/Market Segment

Overall Market Rating: Positive

The high-end enterprise disk array storage market is a mature market, which evidenced slight to modest declines in revenue and unit shipments, respectively, between 2006 and 2007. However, despite these declines, the market is still large, and high-end enterprise disk arrays remain a fundamental element of the enterprise data center infrastructure. They offer high-availability features that are unique in their ability to support mission-critical workloads, and IT organizations find that the cost of downtime is simply too real to risk hosting such workloads on smaller systems. High-end enterprise disk arrays are also the only option for organizations deploying a mainframe environment.

The majority of the vendors in our evaluation now support the technologies that Gartner considers "must have" functionality for the high-end enterprise disk array market, including thin provisioning and tiered storage. All the vendors in our evaluation are financially viable and offer products that scale beyond the requirements of most users.

Evaluation Criteria

Table 1. Evaluation Criteria

Evaluation Criteria	Comment	Weighting
Marketing Strategy	A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the Web site, advertising, customer programs and positioning statements.	High

Evaluation Criteria	Comment	Weighting
Offering (Product) Strategy	A technology provider's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature set as they map to current and future requirements.	Standard
Product/Service	Core goods and services offered by the vendor that compete in/serve the high-end enterprise disk array market. This includes current product capabilities, quality, feature sets and skills — whether offered natively or through OEM agreements/partnerships as defined in the Inclusion and Exclusion Criteria section.	High
Sales Execution/Pricing	The vendor's capabilities in all presales activities and the structure that supports them. This includes deal management, pricing and negotiation, presales support, and the overall effectiveness of the sales channel.	High
Market Responsiveness and Track Record	Ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness.	High
Customer Experience	Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups, and service-level agreements.	High

Source: Gartner (September 2008)

Figure 1. MarketScope for High-End Enterprise Disk Arrays, 2008

	RATING				
	Strong Negative	Caution	Promising	Positive	Strong Positive
EMC					x
Fujitsu			x		
Hitachi/HDS					x
HP				x	
IBM				x	
Sun Microsystems			x		

As of 10 September 2008

Source: Gartner (September 2008)

Vendor Product/Service Analysis

EMC

EMC continues to expand its leadership position in the high-end enterprise disk array storage market, posting a 2.7% increase in revenue for 2007 (year over year), which resulted in its first-place, 41.7% revenue market share as of year-end 2007. This follows an 8.5% year-over-year revenue increase in 2006. This large installed base, coupled with two other recent changes, positions EMC well for the present and the near future. First, EMC has improved its overall customer experience with additions such as a new Account Service Rep role that provides every customer, Symmetrix user or not, with a direct contact person at EMC that they can contact with any questions or concerns. Second, EMC is showing a willingness to compete on price in select bid situations.

Today's Symmetrix DMX-4 supports thin provisioning (although it has not yet been market validated and currently is not supported with RAID 5) and RAID 6, bringing it to parity with other competitors on those key features that were missing last year. Those few missing features did not hurt EMC Symmetrix sales in 2007, however, and the investments that EMC is making in future technologies also position the Symmetrix well for the future. The Symmetrix DMX-4 offers features today that competing high-end enterprise storage disk arrays do not yet support, such as storage tiering with solid-state disk drives, data-at-rest encryption via PowerPath, and IPsec encryption for security when doing remote replication over public Internet Protocol networks.

This year, EMC makes the jump from Positive to Strong Positive on the strength of its innovative product vision, improved efforts related to client experience, ever-present marketing savvy and continued revenue share leadership.

Rating: Strong Positive

Fujitsu

Fujitsu participates in the high-end enterprise disk array market with the ETERNUS8000, a 2,047TB array that supports 4 Gbps FC and 1 Gbps Internet SCSI (iSCSI) host connectivity, in-box storage tiering with SATA drives, RAID 6, FC boot from storage area network (SAN), encryption and massive arrays of inactive disks (MAID). These are desirable and promising features, and customer references are positive about both the technology and Fujitsu's service and support. However, we also note that the ETERNUS8000 does not support thin provisioning — a technology that Gartner considers transformational — despite the fact that thin provisioning's

storage-utilization-enhancing characteristics would complement Fujitsu's corporatwide "green" initiative. While the ETERNUS8000 supports both open systems and mainframe environments, support for the latter is limited to Fujitsu's proprietary mainframe operating system (not z/OS), which limits demand for this product in the worldwide mainframe market. As a result, the ETERNUS8000 competes primarily in the open-system arena worldwide and survives based on the parity of its product relative to the competition and the company's reputation.

After a promising positive trend in the rate of revenue loss from 2005 (negative 36%) to 2006 (negative 13%), Fujitsu's 2007 revenue for the worldwide high-end enterprise disk array market declined 20.5% year over year. Likewise, its worldwide unit shipments in 2007 declined 48.2% year over year, and its revenue market share dipped by 0.6% to 2.8% in 2007, keeping it in sixth place. Last year, we advised that Fujitsu would have to improve its marketing and go-to-market sales strategies to succeed in any meaningful way with its late entrance into this mature market. To date, that has not happened, and Fujitsu's MarketScope position for this year declines further within the Promising category.

Rating: Promising

Hitachi/HDS

During the past year, Hitachi/HDS enhanced its high-end enterprise storage offering in several ways, including introducing a smaller configuration of the USP V (called the USP VM), adding support for native SATA disks (including 1TB SATA drives), and extending thin-provisioning support to include externally attached storage. Hitachi/HDS has also integrated Tiered Storage Manager with Tuning Manager to automate the movement of logical volumes between high-performance and high-capacity disks. These enhancements raised the USP V's already strong core feature set to a new level of feature maturity, total-cost-of-ownership management and relevance to new markets. Hitachi/HDS already offers the most mature virtualization solution in the high-end enterprise disk array market. Additionally, Gartner clients have not reported any cases of data loss or unplanned downtime with the USP V or USP VM models; a further indication of the product's stability and the positive customer experience that USP V/USP VM users are having.

Hitachi/HDS saw a 6.6% year-over-year revenue decline in this market, which netted out to a 0.8% decline in revenue market share, but according to Gartner research, Hitachi/HDS achieved a 19.6% increase in first-quarter-2008 revenue compared with the same time period in 2007. It shipped 3.7% fewer units in 2007 than in 2006, but shipped 46.8% more terabytes year over year. The lack of unit and revenue growth in 2007 may be due in part to the continued evolution in Hitachi/HDS's sales organization, although we believe that the recent changes, both in personnel and pricing strategy, show promise. Specifically, we see early indications of the company's increasing willingness to be more aggressive on price, as well as a renewed management focus on the high-end storage market, which 2007 results show has not negatively affected its midrange disk array revenue.

Hitachi/HDS continues the upward momentum we noted last year, moving from Positive to Strong Positive this year on the strength of the maturity and desirability of its high-end storage array feature set (particularly virtualization, thin provisioning and SATA drive support), early indications of increased willingness to compete on price, recent product enhancements, and its strong focus on the heterogeneous high-end enterprise storage market.

Rating: Strong Positive

HP

The StorageWorks XP24000 and XP20000, which HP sources through an OEM relationship with Hitachi, offers a robust high-end system with a collection of desirable features, including RAID 6, boot from SAN, storage tiering (both natively and via externally attached storage), and thin provisioning (again supported with both internal and externally attached storage). However, because it is marketing essentially the same hardware in the high end as Hitachi/HDS and Sun, HP is charged with finding ways to differentiate itself in order to compete.

One way HP does this is through its "Disaster Proof" disaster recovery campaign. HP has gone to extraordinary lengths to demonstrate how the XP hardware — in association with HP server and networking solutions and HP's experience with open systems and NonStop platforms (among others) — can survive catastrophic conditions by failing over to a second data center. Another way is by leveraging all aspects of the company in a broader portfolio play that aims to squeeze storage-only vendors out of consideration — at least in HP-UJ accounts — and maintain or even grow its server attach rates. As long as HP is competitive on pricing and support, server customers will gravitate toward buying storage from the same vendor as they buy their servers from. This is a common approach used by all the portfolio vendors evaluated here, with varying degrees of success.

Gartner believes that HP's overall marketing strategy is sound, but 2007 year-end revenue and market share numbers suggest that HP's execution of its marketing strategy could still improve. HP's revenue in the high-end enterprise disk array storage market was down 2.1% year over year compared with 2006. HP therefore remains behind EMC, IBM and Hitachi/HDS. Changes in sales and marketing leadership appear promising as Gartner has seen indications that HP is beginning to lead with the XP more often as the company implements plans to increase its channel focus on the midrange EVA product and bring all XP sales in-house. We also see indications that HP is showing an increased willingness to compete on price, but these changes have not yet manifested themselves in increased revenue or market share.

This year, HP moves from Promising to Positive on the strength of its customer feedback, marketing vision and strategic pricing policy.

Rating: Positive

IBM

At a time when users are becoming more fiscally aware, if not actually fiscally constrained, and when IT organizations would prefer not to change storage vendors and incur the additional operating expenses associated with retraining, and so on, IBM has done a good job of protecting its installed base. IBM's 2007 revenue remained essentially stable year over year, and the company retained its No. 2 position based on revenue market share and its No. 1 position based on units shipped.

Today's high-end enterprise customers appear content to purchase stable, reliable products with "good enough" technology, provided the price is right, and IBM's DS8000 fits that bill. Despite such deficiencies as not offering support for thin provisioning, SATA drives (now delayed until 2009), and 1TB drives, DS8000 sales continue to be solid. We attribute this to the following factors: the October 2007 product enhancements (which included space-efficient FlashCopy, storage pool striping and z/OS Global Mirror Multiple Reader system data mover), the company's unrivaled ability to provide professional services, and a willingness to compete on price. Also helping DS8000 sales is the SVC, which provides some of the functionality missing from the DS8000. In addition, IBM has a built-in advantage in the mainframe market as owner of the mainframe architecture and has been first to market with features such as PAV, multiple allegiance, GDPS, HyperPAV, extended address volumes and high-performance FICON

associated with System Z. According to Gartner research, IBM has a 47% share of the high-end enterprise disk array market associated with z/OS market. The company also excels in providing flexible financial and warranty programs, which enhance the overall client experience, and bringing a strong portfolio play to bear to maintain storage attach rates.

IBM retains its positive rating with a slight improvement in its relative position within the category.

Rating: Positive

Sun

After a promising revenue increase in 2006, Sun declined 10.5% year over year in 2007 with a corresponding drop in revenue market share of 0.6%, but in the fourth quarter of 2007 and the first quarter 2008, revenue was up 7.8% over the same time period the year before. The Sun StorageTek 9990V and 9985V products (which support thin provisioning of internal and externally attached storage, RAID 6, boot from SAN, and tiered storage both natively and via externally attached storage), are not the issue as Sun continues to reap the benefits of its global distribution, cobranding and go-to-market partnership with HDS. Rather, Sun is weathering the impact of the continuing changes in its sales and marketing organizations; such changes always tend to disrupt a company's sales momentum. Sun has made some effort to compete more aggressively on price, but those efforts have been inconsistent and unpredictable to date.

Sun is conducting a well-publicized campaign for Open Storage, and this focus, including promotion of the Sun Storage J4000 (an open-system, SATA-based storage building block), is diluting the company's marketing efforts on behalf of the 9990V and 9985V and raises questions about Sun's long-term commitment to the 9999V and 9985V products. This is particularly damaging for Sun because end users know that they can just as easily purchase the same hardware from Hitachi/HDS or HP.

Sun retains its Promising rating on the merits of its product choice with only a negligible shift within the category.

Rating: Promising

RECOMMENDED READING

"Magic Quadrants and MarketScopes: How Gartner Evaluates Vendors Within a Market"

"MarketScope for High-End Enterprise Disk Arrays, 2007"

"Market Share: External Controller-Based Disk Storage, Worldwide, 2004-2007"

"Vendor Rating: Sun Microsystems"

"Thin Provisioning Is Revolutionizing Storage Management"

"IBM Improves DS8000 Competitiveness"

"Forecast: External Controller-Based Disk Storage, Worldwide, 2007-2011"

Vendors Added or Dropped

We review and adjust our inclusion criteria for Magic Quadrants and MarketScopes as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant or MarketScope may change over time. A vendor appearing in a Magic Quadrant or MarketScope

one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. This may be a reflection of a change in the market and, therefore, changed evaluation criteria, or a change of focus by a vendor.

Gartner MarketScope Defined

Gartner's MarketScope provides specific guidance for users who are deploying, or have deployed, products or services. A Gartner MarketScope rating does not imply that the vendor meets all, few or none of the evaluation criteria. The Gartner MarketScope evaluation is based on a weighted evaluation of a vendor's products in comparison with the evaluation criteria. Consider Gartner's criteria as they apply to your specific requirements. Contact Gartner to discuss how this evaluation may affect your specific needs.

In the below table, the various ratings are defined:

MarketScope Rating Framework

Strong Positive

Is viewed as a provider of strategic products, services or solutions:

- *Customers:* Continue with planned investments.
- *Potential customers:* Consider this vendor a strong choice for strategic investments.

Positive

Demonstrates strength in specific areas, but execution in one or more areas may still be developing or inconsistent with other areas of performance:

- *Customers:* Continue planned investments.
- *Potential customers:* Consider this vendor a viable choice for strategic or tactical investments, while planning for known limitations.

Promising

Shows potential in specific areas; however, execution is inconsistent:

- *Customers:* Consider the short- and long-term impact of possible changes in status.
- *Potential customers:* Plan for and be aware of issues and opportunities related to the evolution and maturity of this vendor.

Caution

Faces challenges in one or more areas.

- *Customers:* Understand challenges in relevant areas, and develop contingency plans based on risk tolerance and possible business impact.
- *Potential customers:* Account for the vendor's challenges as part of due diligence.

Strong Negative

Has difficulty responding to problems in multiple areas.

- *Customers:* Execute risk mitigation plans and contingency options.
- *Potential customers:* Consider this vendor only for tactical investment with short-term, rapid payback.

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