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HDS unveils '3D scaling' with revamped flagship array: the Virtual Storage Platform

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Hitachi Data Systems has unveiled a major new update to its high-end storage system that it believes will cement its position as the leader in this market. Featuring a new hardware architecture and several major new software additions – including a significantly revamped version of the Hitachi Command Suite management platform – HDS claims the Virtual Storage Platform (VSP) provides enterprise customers with a balance of performance, reliability, flexibility and efficiency that has hitherto been lacking in such systems. With **HP's** planned acquisition of **3PAR** shining the spotlight on what appears to be a resurging enterprise storage market, the stakes have arguably never been higher.

The 451 Take

As expected with any major product announcement, there's a lot riding on the successful launch of VSP. We'd suggest that this is good timing for HDS: the 3PAR acquisition saga has thrust high-end storage back into the limelight, while the unfolding cloud opportunity continues to afford suppliers with a scalable but efficient storage story with plenty of opportunity. Feature-wise, VSP appears to constitute a solid improvement over its highly regarded predecessor, with several advancements in system agility, efficiency and management. Meanwhile, its pending proposition for tiering across HDS and third-party arrays could be significant, and could help to add some substance and differentiation to its '3D' messaging. Of course, it now needs to drive this home by developing a compelling case for customer adoption.

HDS is slowly transforming. It claims the recent loss of Sun as a reseller has actually had a positive impact, and while 3PAR's acquisition may have implications for its HP partnership, HDS is developing a more confident stance as it broadens its activities and as its Japanese parent continues to loosen its grip on the reins. (Indeed, HDS's overseas success means that it is viewed in Japan as the model that the rest of the company must emulate.) It's a more diverse company than it was a few years ago (about 55% of revenues are software and services today, vs. just 23% in 2003) as its efforts in midrange, NAS and archive storage continue to grow. Of course, the release of VSP will swing the focus back to the high end, but there is less of a sense that HDS is now just a single-product company.

Context

VSP is the successor to HDS's Universal Storage Platform V (USP V), the flagship array in the company's portfolio. HDS says the criteria it had in mind when designing the next-

generation system was to help enterprise customers manage their information assets – which are growing in volume as well as complexity – more effectively and efficiently. In particular, VSP is designed to provide the agility lacking in previous high-end systems that largely resulted from their 'monolithic' nature. Improved agility, HDS says, helps customers meet rigorous performance and reliability goals with a far lower operational overhead in terms of power, cooling, floor space and management/labor.

Thus, VSP has been designed around four tenets that the company says bridges this disconnect between performance and efficiency: virtualization (one platform for all data, delivering higher utilization), automation (especially of labor-intensive processes to reduce operating expenses), cloud-ready (allowing customers to evolve to cloud/IT-as-a-service at their own pace through consolidation, multi-tenancy, etc.) and sustainability (through energy efficiency).

VSP architecture

At the heart of VSP is a new, fifth-generation network crossbar switch matrix. This utilizes different components than previous Hitachi high-end systems. For example, the fiber channel loop connectivity to back-end disks has been replaced with SAS links; **Motorola** processors have been replaced with **Intel** SPUs, and support has been added for small-form-factor, 2.5-inch HDDs, in addition to 3.5-inch drives. There's also support for a range of Flash disks.

HDS says VSP is designed to be much more 'modular' than previous high-end arrays. This is because the system's four core components – front-end directors, back-end directors (BEDs), virtual storage directors (VSDs – the main processors that control data memory) and cache memory modules (which present a global cache image to all directors) – can all be scaled independently, depending on requirements. VSP will be packaged based on the number of VSDs, which will be offered in pairs from 1-4 or up to eight in total.

The net result of the new architecture and components is a system that HDS says delivers substantially better performance and efficiency than previous generations. Although the maximum capacity of the system – at up to 255PB (as many as six racks with two control chassis and 16 drive chassis) – is the same as the USP-V, the VSP offers up to 70% more front-end fiber channel ports, 50% more BED links (by using 6Gb SAS rather than 4Gb FC), double the cache (1TB), and almost 80% more internal bandwidth. HDS says this translates into significant performance advantages over the USP-V; preliminary results suggest almost double system read IOPS and 2.7x write IOPS, with at least the same level of throughput as the USP-V.

Software

Although HDS claims the new architecture offers substantial benefits over its existing and competitive systems, much of its real-world differentiation will come down to how HDS can leverage this through software. The standout new software capability with VSP is an automated tiering function. As with other tiering features, this is designed to maximize the utilization of SSD storage by ensuring performance-centric data is moved here when necessary.

The tiering within VSP is built on HDS's dynamic provisioning and uses a 'data heat index' to assign data sets to the more appropriate tier – high activity (SSD), normal (SAS) and quiet

(SATA) – over time. As with other approaches, this takes places on a granular basis. Tiers of storage are placed in a pool of pages; data is written to the highest-performance tier first and migrates to lower tiers as it becomes less active. Only the active parts of a volume will reside on a high-performance tier. The initial VSP release will support tiering within VSP, but a pending update – expected in early 2011 – will extend tiering to third-party arrays that are virtualized behind VSP.

Accompanying VSP on the software side is a new version of Hitachi's storage management portfolio, Command Suite v7. The release is actually more of an overhaul than a dot update, since Hitachi has made some substantial changes, especially on the ease-of-use and workflow side. Accordingly, the suite has been unified so that it offers a single management pane for all HDS systems across its file-, block- and content-based storage portfolio. Management of the new automated tiering feature is also driven through Command Suite, and there are also performance and scalability improvements. Note that the word 'storage' has also been dropped from the product name – there are no specific details here just yet, but bear in mind that Hitachi is also developing its own unified computing platform for release in early 2011.

Messaging and competition

The core messaging that HDS has developed to support the functionality contained in both VSP and Command Suite v7 revolves around the notion of '3D,' in that the new system/software enables enterprises to 'scale/manage up, scale/manage out and scale/manage deep.' HDS's positioning will be that no other storage system can deliver all three attributes simultaneously, and without compromise. It attributed much of this to the tightly coupled nature of the VSP matrix architecture; this 'shared everything' approach means that a volume on one node can access all resources on other nodes. HDS contrasts this with the 'loosely coupled' approach of rival systems, which it says comes at the expense of overall system flexibility and utilization.

Hitachi has developed multiple proof points of value delivery through the 3D concept. For example, VSP is designed to scale from a relatively small configuration – starting from a 19" single-controller rack, it can scale performance, density and capacity racks without disruption. The use of 2.5-inch HDDs also increases density scale and can help deliver a 40% reduction in power draw versus a similarly configured USP-V. HDS also notes VSP's ability to combine multiple units – as many as six racks – into a single logical system.

Although most of Hitachi's key rivals are able to make similar claims around performance and capacity scale (there's likely to be the usual robust discussion about the efficacy of such metrics), HDS believes that VSP's ability to 'scale deep,' achieved through automated tiering and third-party array virtualization, is a substantial differentiator. HDS notes that **EMC**, in particular, does not yet offer automated, sub-LUN tiering (a feature EMC markets as FAST) on its own high-end Symmetrix V-Max (but we understand this is pending), and even when it does, it will be limited to Symmetrix only. Likewise, although 3PAR (with Adaptive Optimization) and **IBM** (with Easy Tier on the DS8000) do offer high-end tiering, neither directly supports this over third-party arrays. Of course, the third-party storage tiering feature is not actually available on VSP yet either.

Whether HDS can really turn this to its advantage depends on whether it can develop a compelling business case for customers to implement it. HDS has a track record here in that it has been able to virtualize third-party arrays behind USP-V for years. It claims the time is right for such a feature because the pressure on increasing the value and useful life of existing datacenter assets, as well as a desire to reduce both opex and capex, has never been higher.

SWOT analysis

Strengths	Weaknesses
HDS is already a powerhouse in the enterprise storage market with a significant installed base and reputation for delivering feature-rich, high-performance and reliable products in this segment. With VSP, it's looking to add dimensions around efficiency and flexibility to its story.	Despite its reputation for great technology, HDS is not known for having the easiest-to-manage products (something it's looking to address with the new software management suite), and its agility on the sales and marketing front leaves plenty of room for improvement.
Opportunities	**Threats**
The enterprise market – from both a public and private cloud perspective – has a growing need for products that can handle new levels of IT infrastructure scale and complexity, but in a way that does not result in massive efficiency trade-offs.	The IT supplier market continues to consolidate to the extent that best-of-breed suppliers must evolve so that they deliver either substantially differentiated products or broader portfolios – or both.