



OBJECTIVE ANALYSIS

Semiconductor Market Research

OBJECTIVE ANALYSIS ALERT!

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INTEL & HITACHI TO CO-DEVELOP ENTERPRISE SSDs

On 2 December 2008 Hitachi Global Storage Technologies and Intel announced a pact under which Hitachi will supply enterprise-class flash SSDs using a combination of Intel and Hitachi technologies by 2010. Under the four-year agreement Hitachi will produce complementary products to Intel's, with Hitachi supplying SSDs that use the Fibre Channel and Serial Attached SCSI (SAS) interfaces, while Intel continues to supply SSDs using the interfaces they have already introduced: SATA, PATA, USB, and PCI Express.

Hitachi plans to introduce engineering samples in December of 2009, followed by OEM qualification devices and limited production in 2010.

Surprise! Hitachi Beats Other HDD Makers to the Punch

We find it most interesting that number 3 enterprise HDD company Hitachi has beat out number 1 Seagate and number 2 Fujitsu to commercialize enterprise-class flash SSDs. Seagate, with a share of 64% of the high performance enterprise HDD market last quarter, has announced that it will introduce enterprise SSD products by 2009 but it has not clarified what sort of products these will be.

Seagate has the most to lose by not participating in this market, since they are the leading enterprise HDD manufacturer and the standard pitch for the enterprise SSD is that a single SSD can replace more than ten enterprise HDDs at a comparable cost for very high performance applications, shrinking the storage system's footprint, power consumption, and cooling requirements. (Although many SSD makers loudly proclaim that SSDs improve reliability as well, our opinion on this is guarded until some unbiased source publishes a comparison pitting the reliability of enterprise HDDs against that of enterprise flash SSDs.) With compelling economic arguments like this the enterprise HDD market could face significant competition for some very lucrative markets.

But Other Companies Already Have Enterprise SSDs!

Hitachi will have a big advantage over many other SSD firms in the highly specialized enterprise storage business because their sales force knows exactly who purchases FC and SAS drives, are familiar with the extended qualification times (4-6 months or longer) for enterprise products, and the company already has long-term business and engineering relationships with those people—Hitachi knows where all the bones are buried. SSD makers who are not already entrenched in the enterprise HDD business have to spend far more time finding those accounts, discovering what specifications and performance subtleties are really important to enterprise storage vendors, and generally gaining their trust. This is not to say that dedicated enterprise SSD companies are altogether on the

outside - STEC has done a brilliant job of penetrating some storage system vendors, most notably EMC, and other SSD-only companies have tales to tell of successes here and there.

What About Companies that Make Both SSDs and HDDs?

You might expect several other SSD companies with an HDD business to already have the integrated relationships that Hitachi has. Toshiba is a both an SSD vendor and an HDD supplier, but Toshiba has no enterprise-class HDDs or SSDs, and the company's SSDs are sold out of their semiconductor division, with a different marketing and sales team than are used to sell HDDs. This presents almost the same difficulties as if they were a different company altogether.

Samsung uses the same sales and marketing group to sell HDDs and SSDs as of their reorganization this year, but Samsung only offers SSDs with SATA and PATA interfaces, which only reaches the low end of the enterprise storage market. Both Toshiba and Samsung have fixed their SSD focus on the notebook PC market, which has the potential of becoming a larger SSD market, but has so far failed to materialize. Meanwhile, enterprise flash SSDs are poised to grow at a phenomenal rate, with a forecast average annual unit growth of 151% for the next five years. (For a thorough understanding of these two markets, consult the following Objective Analysis Reports: [*The Solid State Disk Market: A Rigorous Look*](#) and [*Solid State Drives in the Enterprise*](#).)

Why did Hitachi Team with Intel?

The Hitachi SSDs are likely to offer technical advantages over competing drives. Intel has put a lot more work into optimizing their SSD controller than other companies are able to, simply because Intel has a very strong team of researchers devoted to understanding and optimizing the entire computer architecture. This team, which is normally dedicated to designing new processor and chipset architectures, has spend significant time and effort analyzing traces of disk I/O patterns in typical computing environments, and has devised an SSD controller that is optimized to marry those I/O patterns with the peculiarities of the NAND flash chip. In addition Intel offers a wear leveling algorithm that appears much more efficient than that of their competitors. Most other companies have started with a NAND controller designed for camera image storage use, and then added changes to make it better suited to a computing environment.

Why Would Intel Choose Hitachi?

Hitachi Global Storage Technologies is the combination of IBM's and Hitachi's HDD businesses. IBM invented the HDD over 50 years ago. Hitachi is very strong in the technical development of the Fibre Channel interface as well as with the new SAS interface, both of which have proven to be tricky to bring to production. By teaming with Hitachi, Intel gains experience in FC and SAS that would otherwise prove difficult to

master, while bringing to its enterprise SSDs the reputation and quality standards of a respected and established HDD supplier.

Our Outlook

We expect to see Hitachi give Seagate and Fujitsu a very difficult time in the high performance enterprise HDD market as Hitachi goes after this important part of these companies' business. Meanwhile, Hitachi's relationships with HDD enterprise system integrators will doubtlessly give them a strong advantage over outsiders trying to gain entry to this market. Intel will profit from this relationship by using Hitachi as a sales arm for Intel NAND and controller technology in addition to any royalty payments that Hitachi may pay to them.

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