

Sun, Rivals Seek New Uses for Flash-Based Storage

By DON CLARK

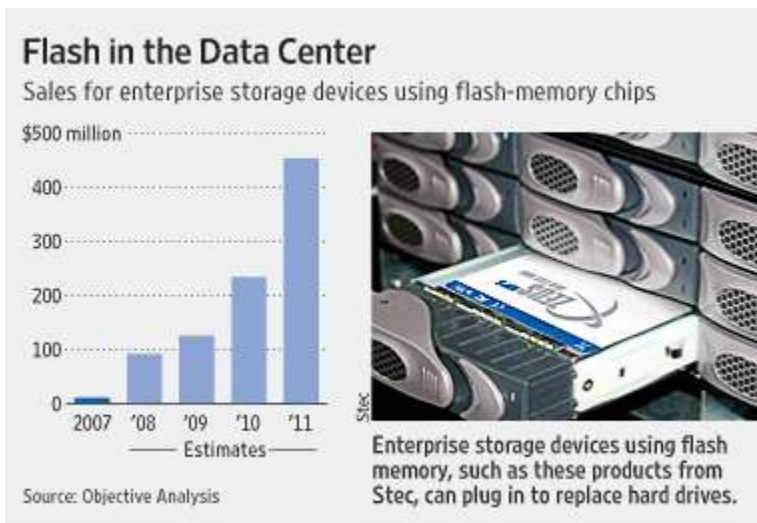
(See Corrections and Amplifications item below.)

Chips called flash memory that have transformed many consumer products are beginning to shake up corporate computer rooms, with Sun Microsystems Inc. emerging as a surprise innovator.

The computer maker, though it lags rivals in data-storage hardware, has been pushing a redesign of servers and storage systems to take advantage of flash-memory chips. In its latest gambit, Sun is trying to popularize a tiny circuit board that can squeeze more flash chips, saving money, space and electricity.

But other companies are pushing rival flash-based products, which are emerging as one of few bright spots as corporations scale back their technology buying because of the recession.

"It's been growing extraordinarily fast, so it's a major focus area for us in 2009," said Bob Wambach, senior director of high-end storage marketing at EMC Corp., which added flash-based storage systems in January 2008.



Stec Inc.

Flash-memory chips became a mainstay of portable devices like iPod music players because they retain data when electrical current is switched off. They are also faster than disk drives; flash-based alternatives called SSDs, for solid-state drives, allow computers to boot up and retrieve files quickly.

Speed improvements in disk drives have been slower. So companies that need high performance have faced costly options.

They include expensive drives that spin at very high speeds, and arrays of drives that store data near the outside edge of disks so it can be fetched quickly.

Companies such as Stec Inc. and Texas Memory Systems Inc. began offering storage modules based on flash memory for military and commercial customers with specialized needs. Such products have gotten more affordable, as

competition among chip makers to serve the much larger consumer market has caused prices to plunge. EMC uses such "enterprise" SSDs, as they are called, as does Sun in storage systems it introduced in November.

The price of flash-based technology remains high. Jim Handy, an analyst at the research firm Objective Analysis, estimates that a 500-gigabyte hard drive costs makers of storage systems around \$50, where an enterprise SSD that stores 32 gigabytes would cost them \$3,000. Factoring in the speed difference, however, the flash-based technology is less expensive in terms of the cost of handling transactions per second, he estimates.

Another concept is to use flash memory as a kind of accelerator. Backers of the approach include Fusion-io and Violin Memory Inc.; Texas Memories is offering a similar product Tuesday.

But some customers worry that flash chips can fail if data is written and erased too many times. Addressing that issue was a major focus of Michael Cornwell, who helped Apple Inc. develop flash-based devices such as the iPod and joined Sun in 2007.

Mr. Cornwell, Sun's lead technologist for flash memory, approached chip makers that include Samsung Electronics Co. to modify their products. The companies estimate the collaboration brought a five-fold increase in the endurance of Samsung's flash chips.

Rather than simply replacing hard disks, Mr. Cornwell favors new combinations that exploit DRAM and two kinds of flash chips -- one best at reading data, and another at storing it -- along with high-capacity disk drives. He estimates such a "hybrid" storage pool fetches data 3.2 times faster than conventional alternatives and saves electrical power.

Sun also plans to produce compact servers with no disk drives. "We have some really compelling designs coming out," Mr. Cornwell said.

Sun is proposing that other companies follow its lead in installing flash chips on circuit boards measuring about 69 millimeters by 30 millimeters, less than a third the size of a typical drive-sized SSD. This "open storage module," also allows air to flow more efficiently to cool servers, Mr. Cornwell said.

Gene Ruth, an analyst at the Burton Group, notes that other companies have their own ideas about the best way to exploit flash technology. But the right combination could produce "a killer product that will change the industry. And I think that Sun has a leg up there," he said.

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Corrections & Amplifications

Some 32-gigabyte solid-state storage devices used by enterprises cost less than \$500. This Technology article Tuesday about Sun Microsystems Inc. and the use of flash memory cited an analyst estimate that a device with that capacity would cost makers of storage systems \$3,000, but should have specified that such devices have varying prices based on their performance.