

Slow adoption of flash memory in laptops for Vista enhancements

Key Points:

- Microsoft Vista enables the use of flash for write cache on hard disk drives as well as flash cache as a flash read cache
- Although both ReadyDrive (hybrid disk drives with flash write cache) and ReadyBoost (flash read cache USB drives) have been demonstrated at trade shows for the last year actual shipping product seems minimal
- There are issues getting system vendors to adopt ReadyDrive and users are finding that the requirements for ReadyBoost prohibit them from using existing USB flash storage devices
- Adoption of flash in laptops, including SSD laptops, may be hindered by this slow adoption
- Once Vista memory requirements are appreciated it will spell big growth for all sorts of storage, DRAM, flash and hard disk drives—not to mention blue laser optical disks

Article: Microsoft Vista is now in general release. Vista was supposed to enable hybrid hard disk drives with flash memory for a write cache. The flash write cache reduces the power-on requirements for the hard disk drive and thus can extend the laptop battery life by about 12%. Vista would also use some of the flash cache on the disk drive for some of the boot information for the operating system making the boot times faster than without the flash cache. Microsoft's hybrid drive concept competes against Intel's Robson technology that would put a flash cache on the motherboard of the computer. Both technologies have their advocates. As I have stated in the past a successful introduction of hybrid hard drives into the market could herald a new generation of hard disk drives with greater electronic and software functionality.

Vista seems to want all the memory that it can get. Ideally a Vista computer will have two gigabytes or more of DRAM plus flash, plus lots of hard drive space. The new operating system could be a big driver for all storage technologies over the next couple of years. A limitation of the current version of Vista is that the flash memory that it supports for ReadyDrive and ReadyBoost must be single-level (SL) cell flash memory rather than the more common multi-level (ML) cell flash memory. Single level cell flash has less storage capacity but it will last longer before wearing out compared to multi-level cell flash. OS and system manufacturers are still concerned with the reliability of multi-level cell flash in their operating environments although flash manufacturers such as Sandisk have shown data indicating that ML flash could have the necessary life times for these applications.

Microsoft plans to drive the adoption of hybrid drives in mobile computers with an aggressive qualification process allowing the laptop vendor to sport a Vista logo sticker. To date no notebook vendors have announced a laptop using a hybrid disk drive.

Although Microsoft was hoping to do its first Vista laptop qualifications by this June it has been forced to reschedule the logo program to June 2008 instead.

I think that there are advantages to the hybrid drive concept and that laptop models using this technology should be out later in 2007. The adoption of a storage hierarchy within the circuit board of hard disk drives will enable even more sophisticated electronic and control integration in hard disk drives. Disk drives ultimately could have many applications built into their electronics and firmware lowering overall costs to system designers.