



Getting Ready to Customize Your Solid State Hybrid Drive

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Hybrid Information Protocol

- Serial ATA Organization (SATA-IO) defined a new standard called Hybrid Information that is on plan to be ratified as v1.0 spec in September 2012.
- With the Hybrid Information protocol a Solid State Hybrid Drive (SSHD) no longer has to rely only on what the drive detects as important data (self pinning). But now has assistance from host to indicate critical user data based on file system knowledge.
- Host software can use Hybrid Information to direct the SSHD to tailor the attributes most important to end user
 - Application performance
 - System responsiveness
 - Power saving
 - System boot time

Why SSHD for Ultrabook and Notebook ?

Vs. SSD

- Better balance of cost per GB & performance
- With Hybrid Information will have more “SSD like” performance when needed

Vs. HDD + FCM

- Uses only 1 interface slot = less space and power consumption
- Lower cost

Vs. HDD

- “SSD Like” boot performance
- Up to 4x performance gain on PCMark Vantage

Range of SSHD Solutions

8GB-16GB Flash (drive self pinning)

- Plug and Play Hybrid – works with all host operating systems with no drivers required
- Lower cost for value oriented notebooks
- SSD like boot and general system performance

24GB – 32GB (Hybrid Information)

- Premium system performance
- Full Intel Ultrabook conformance
- Host software to deliver file system aware performance and customize end user experience

SSHD Boot Time = “SSD Like”

- ✓ Windows 8 two second POST requirement for SSD & Hybrid
- ✓ Ultrabook Rapid Start requirement of 6 seconds

- SSHD will boot from flash without waiting for media to spin up
- Drive time-to-ready under 1 second
- Flash read speeds > 250MB/sec
- Drive will either need to “learn” boot sequence or have host drivers to “pin” boot and hibernate data

Reduced Power Consumption

- Using Hybrid Information host drivers can pin typical user data working set (16-24GB) to reduce power consumption of the SSHD by operating primarily out of flash with HDD in standby mode

Operating Power	Power Consumption (typical)
Writing to disk	1.85W
Reading from disk	1.5W
Flash R/W while disk idle	0.68W*
Flash R/W while disk standby	0.35W*

*Table shows modeled data for 5400 RPM 2.5”
HDD with 16GB flash memory

Hybrid Information = Customized End User Experience

“Non Techie”

- Simply works right out of the box
- New system faster than old system without getting in the way

“PC Enthusiast”

- Wants control over what apps and data are put in drive flash
- Wants statistical logs and graphs showing performance gains

“Corporate IT”

- Quickly configure and manage a series of usage profiles
- Export and lock profiles – reduce support tickets

Summary

- SSHD with the new Hybrid Information standard enables value-add opportunities for PC hardware and software makers to deliver improved system experience while maintaining system cost competitiveness
- SSHD products with support of Hybrid Information expected from multiple drive suppliers in 2013
- Operating system drivers that support Hybrid Information are in development for 2013 systems