



SATA Express

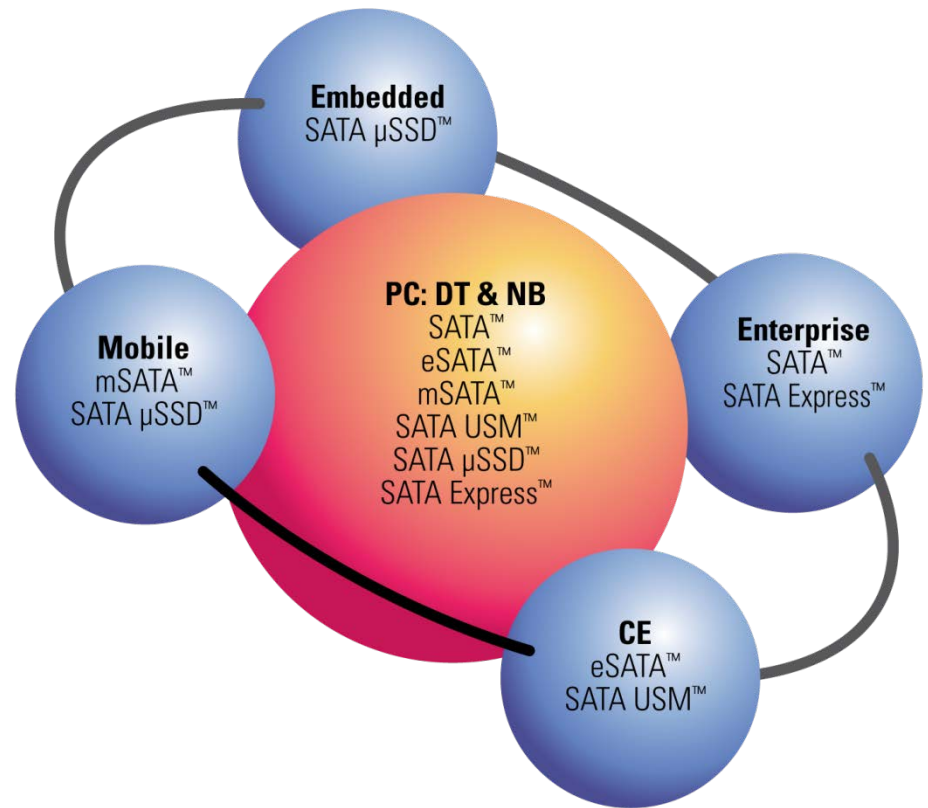
Evolving SATA for High-Speed Storage

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SATA is Everywhere

SATA is the de facto standard for PC storage

Since its introduction, SATA has evolved into new application spaces and now provides storage interface solutions for HDDs, ODDs, SSDs, and Hybrid HDDs in client, mobile, enterprise, CE, and embedded storage markets



A Need for Speed

Today, most applications are well-served by SATA 6Gb/s and will be for the foreseeable future

However, some client SSDs and Hybrid HDDs (HHDD) will soon require greater speeds than those enabled by the current generation of SATA

SATA-IO is developing SATA Express which utilizes PCI Express® (PCIe®) as the physical interface



Why SATA Express?

- Some client SSDs & HHDDs will soon require more than 6Gb/s
 - 12Gb/s SATA would take too long; PCIe is here now
- With the next speed increase, the client storage infrastructure has to change in any case
 - Whether 12Gb/s or PCIe
- SATA Express must be low cost
 - 6Gb/s SATA will be more than adequate for HDDs for the foreseeable future
 - Portion of client SSDs that will require greater than 6Gb/s is fairly small
 - Difficult for 12Gb/s to achieve low cost within a reasonable timeframe – PCIe is already widely used

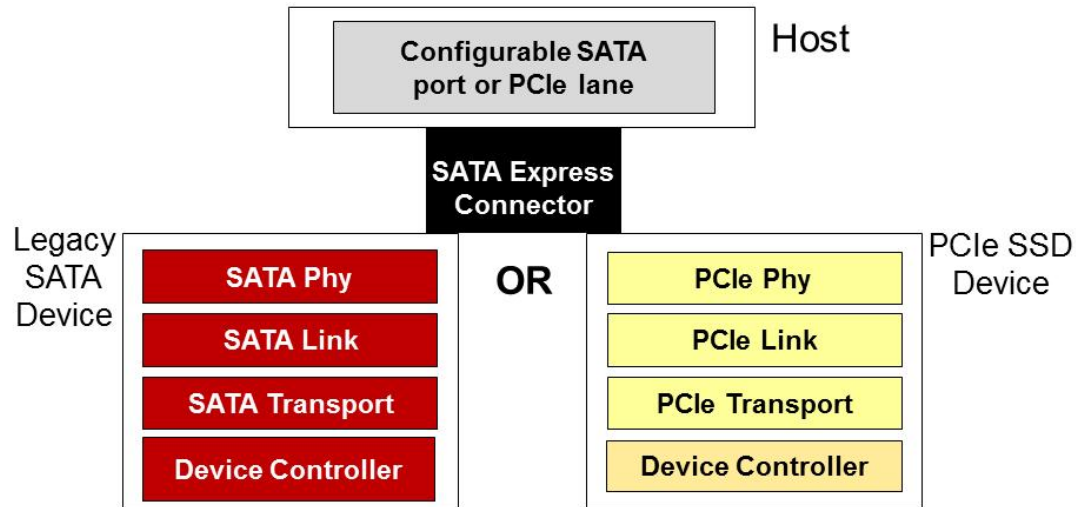
What is SATA Express?

- Client storage with a PCIe interface, utilizing SATA Express connectors
- Provides up to 8Gb/s and 16Gb/s
 - One lane or two lanes of PCIe Gen 3, 2 or 1
- Defines new device and host connectors to support both new SATA Express and current SATA devices



SATA Express Connectivity

- The SATA Express host connector can mate with a SATA Express device or a SATA device
 - A signal driven by the device tells the host whether it is connected to a SATA Express or a SATA device



- A SATA Express device can also mate with the SFF-8639 connector for enterprise applications

SATA Express Software Architecture

- Although not defined by the specification, there are two choices for register interface / command set:
 1. AHCI, which is used for SATA, would enable a SATA Express device to be compatible with SATA software environments
 - AHCI is supported in most major O/Ses
 - But AHCI is not optimized for SSD performance
 2. NVMe Express is architected for high performance SSDs
 - But NVMe does not provide SATA software compatibility
 - Drivers for Windows, Linux, and VMWare are available at www.nvmexpress.org

Next Steps and Timeline

- SATA Express is currently under development within SATA-IO
- Completed specification expected by late 2012
- In the meantime, SATA-IO will continue to optimize the existing SATA infrastructure for a wide variety of applications
- SATA will continue to be the mainstream storage interface for the foreseeable future



For More Information...

- Go to the SATA Express page on the SATA-IO site www.sata-io.org/technology/sataexpress.asp
- Check out the NVM Express site at www.nvmexpress.org
- Download the SFF-8639 connector specification at <ftp://ftp.seagate.com/sff/SFF-8639.PDF>