STA MRD for 6Gb/s SAS w/enhancements

Upping SAS connectivity and power management capabilities before 12Gb/s SAS
6Gb/s SAS Evolves

- Ultra 320 SCSI
- 3Gb/s SAS
- 6Gb/s SAS
- 12Gb/s SAS

Mid-Cycle Enhancement

Timeline:
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015

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Mid-Life Enhancement (SAS 2.x)

- SAS 2.X specification (STA recommends SAS 2.1)
  - Improves data center scale-out
    - Improved cabling options
      - Distances >20M (~15m to be equivalent to FC copper?)
      - Extensible to SAS-3 (12Gb/s SAS)
    - Potential for optical connects
      - Exploring options (optical option preferred, although distance is TBD, 100m?)
    - Dense Connectivity Solution Options (x8, x16)
  - Green features for large storage farms
    - Power management options
      - Improved PHY management
  - Other SAS-2 clarifications, corrections
  - Time-Bounded Implementation
    - Much faster than SAS1.1 (3 years)
    - Minimal impact on SAS-3

All proposals should be completed by the Jan 09 meetings
STA MRD for 6Gb/s SAS Upgrades

- **Improved Connectivity – Protocol**
  - Active cabling solutions for 20M+
    - SATA round-trip time-outs unlikely to be a factor in projected usage models.
  - Supports a variety of active cabling solutions (including optical)
  - Low Protocol Impact
  - Must be extensible to 12Gb/s SAS

- **Improved Connectivity - External**
  - Requires Power at the SAS connector (like QSFP)
  - Desirable to have QSFP functionality consuming much smaller board space
  - Improved Serviceability
    - Cable swap event logging
    - Auto detect media type and allow for existing OOB operation ala SAS-2
    - NV storage to keep cable SKU info (type and serial number)

- **Improved Connectivity – Internal**
  - Allow for denser x8 or x16 connectors
STA MRD for 6Gb/s SAS Upgrades

- **Improved power management – Low hanging fruit**
  - Device Connect
    - SATA Drive functionality for SAS device
  - Box Connect
    - ????

- **Usage Model**
  - External
    - No impact to existing SAS usage
    - Extends connectivity for rack-to-rack, box-to-box, host-to-rack, host to JBOD, host-to-switch, switch-to-rack, Switch-to-JBOD and cascaded SAS Scale-out environments
    - Improved Serviceability
  - Internal
    - Dense high-port count connectors

- **Market Window**
  - Letter Ballot – Feb 2009
  - Minimal impact to SAS-3 definition/timing