Minutes of SAS Physical Working Group May 6-7, 2008

To: T10 Membership
From: Alvin Cox
Subject: Minutes of SAS Physical Working Group May 6-7, 2008
San Jose, CA

1. Opening
The meeting opened at 9:00 am on May 6 and May 7

2. Attendance
Mr. Mark Lettang 3M
Mr. Charles Staley 3M
Mr. Mickey Felton EMC Corp.
Mr. Ralph O. Weber ENDL Texas
Mr. Douglas Wagner FCI
Mr. David Freeman Finisar Corp.
Mr. Mike Fitzpatrick Fujitsu
Mr. Nathan Hastad General Dynamics
Mr. Rob Elliott Hewlett Packard Co.
Mr. Barry Olawsky Hewlett Packard Co.
Mr. Dan Colegrove Hitachi Global Storage Tech.
Mr. James Rockrohr IBM
Mr. Harvey Newman Infineon Technologies
Dr. Mark Seidel Intel Corp.
Mr. Joel Silverman Kawasaki Microelectronics Am
Mr. Dennis Moore KnowledgeTek, Inc.
Mr. Greg Shogan LSI
Mr. Brian Day LSI Corp.
Mr. Michael Jenkins LSI Corp.
Mr. George Penokie LSI Corp.
Mr. Gregory Tabor Maxim Integrated Products
Mr. Kevin Witt Maxim Integrated Products
Mr. Greg Rice Mindspeed Technologies
Mr. Guillaume Fortin PMC-Sierra
Mr. Tim Symons PMC-Sierra
Mr. Gourgen Oganessyan Quellan
Dr. Edward Chang Samsung
Mr. Joseph Chen Samsung
Mr. Schelto vanDoorn Schelto
Mr. Alvin Cox Seagate Technology
Mr. Gerald Houlder Seagate Technology
Mr. Tom Skaar Seagate Technology
Mr. Greg Alvey Solution Technology
Mr. Benoit Mercier STMicroelectronics, Inc.
Mr. Stephen Finch STMicroelectronics, Inc.
Dr. Sanjay Sethi Toshiba
Mr. Andrew Nowak Tyco Electronics
Mr. Michael Fogg Tyco Electronics
Mr. Dan Gorenc Tyco Electronics
Mr. Scott Shuey Tyco Electronics
Mr. Larry McMillan Western Digital
Mr. Bill Pagano Xiotech
Mr. Alan Westbury Xyratex
43 People Present

3. Review of documents and proposals

4. New Business

4.1 SAS-2 StatEye Update April 10, 2008 (08-191r0) [Newman, Sanders]
The latest release was on 5/5. Enhancements include features to incorporate the link dispersion penalty aspects for receiver testing.

4.2 SAS-2: Interconnect Requirements (08-186r0) [Butt]
The content of this proposal is covered within SFF specifications or by purchase specifications and is not within the scope of SAS 2.0.

4.3 SAS-2 S-Parameters of Cable Assemblies and Backplanes (08-187) [Olawsky]
Table 51 changes:
Remove the Sc22 requirement.
Remove the reference to figure from the Scd21 line.
Add figures similar to 125 and 126 in this section to follow table 51.
Barry will update and post. This addresses several comments on Table 51.

4.4 Electrical questions on SAS 2.0 to SAS 1.1 support? (08-188r0) [Felton]
The result of the discussion is that SAS 2.0-compliant transceivers should be capable of operating with a 10-meter cable reference load if both ends of the TxRx connection have SAS 2.0 transceivers present and SNW3 is exchanged. 1.5 and 3.0 Gbps operating speeds include training in this situation and are expected to be capable of operating at an acceptable BER with a SAS 2.0 compliant TxRx connection. To test these speeds and capabilities, the 6Gbps transmitter and receiver tables need to be updated accordingly.

4.5 Comments on SAS2r14 Physical Layer (08-144r2) [Witt]
Provides information to resolve letter ballot comments.

4.6 Proposed Changes to Receiver Device Physical Testing Section in SAS 2 Draft (08-146r1) [Jenkins]
Provides information to resolve letter ballot comments.

4.12 SAS-2 StatEye v5.080111 results at 1.5 and 3 Gbps (08-227r0) [Elliott]
Results indicated that 1.5 Gbps produces an open eye at 1.5 Gbps with the reference transmitter settings applied to 6 Gbps are scaled to 1.5 Gbps (i.e., use the same UI and adjust the calculate time). This supports the approach being taken in item 4.4. The TxRx connection will be tested with the same settings for transmitter and receiver as for 6 Gbps. It needs to be made clear that this testing does not imply receiver equalization of a 3-tap DFE for 1.5 and 3.0 Gbps operation modes.

4.12 Proposal for 6G SAS Rx Converged Tolerance Test (08-232r0) [Jenkins]
Discussed the impact of SSC and how it affects the receiver tolerance testing. Alvin proposed that SSC be a required feature of SAS 2.0 (rather than optional) but still maintain the control in SNW3 and training to disable the mode. Alvin will post a comment on the T10 reflector soliciting feedback on this item. The STA presentation did not include SSC as an optional item in its list of SAS 2.0 features.

4.7 SAS-2 letter ballot comment updates for transmitter and receiver tables (08-202r0) [Cox]
This is a working document to make a clear summary of letter ballot changes to the affected tables. The proposal will be updated as necessary.

4.8 Limitations of df/dt Specification for SSC Profiles (08-121r1) [Fortin]
Based on letter ballot comments and this proposal to resolve them, the df/dt requirement will be changed to informative.

4.9 SAS-2 Mini SAS 8i connectors and cable assemblies (07-449r0) [Elliott]
Not discussed.

4.10 Proposal for SAS 2.x Specification to Enable Support for Active Cables (08-052r3) [Oganessyan]
Minor updates made from the last revision. A quick review of the changes was made plus mention that active cables are planned to be taken to the June Plugfest.

4.11 Optical considerations for OOB
Not discussed.

5. Review of Recommendations
None.

6. Meeting Schedule
Weekly conference calls to resume on May 22, 2008
Toll Free Dial in Number: (877)810-9442
International Access/Caller Paid Dial In Number: (636)651-3190
PARTICIPANT CODE: 3243413
Webex information:
https://seagate.webex.com/seagate
Topic: SAS-2 PHY WG
Date: Thursday
Time: 10:00 am, Central Daylight Time
Meeting number: 826 515 680
Meeting password: 6gbpsSAS

7. Adjournment
The meeting adjourned at 5:48 pm on May 6 and 11:40 am on May 7.