

Accredited Standards Committee*
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Reply to: John Lohmeyer

To: T10 Membership
From: Ralph Weber and John Lohmeyer
Subject: SAS Protocol WG -- January 14, 2008
Santa Ana, CA

Agenda

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Results of Meeting

1. Opening Remarks

John Lohmeyer called the meeting to order at 9:05 a.m. Monday, January 14, 2008. He thanked Curtis Stevens of Western Digital for hosting the meeting. As usual, the people present introduced themselves.

2. Approval of Agenda

The draft agenda was approved with no additions and changes.

No additions and changes were made during the course of the meeting.

3. Attendance and Membership

Attendance at working group meetings does not count toward minimum attendance requirements for T10 membership. Working group meetings are open to any person or organization directly and materially affected by T10's scope of work. The following people attended the meeting:

Name	S	Organization
Mr. Paul von Stamwitz	P	AMCC
Mr. Kevin Marks	P	Dell, Inc.
Mr. Mickey Felton	A	EMC Corp.
Mr. William Martin	P	Emulex
Mr. Ralph O. Weber	P	ENDL Texas
Mr. Masakazu Kawamoto	V	Fujitsu Kawasaki
Mr. Nathan Hastad	P	General Dynamics
Mr. Rob Elliott	P	Hewlett Packard Co.
Mr. Dan Colegrove	P	Hitachi Global Storage Tech.
Mr. George O. Penokie	V	Independent
Dr. Mark Seidel	P	Intel Corp.
Mr. Pak Seto	V	Intel Corp.
Mr. Brad Besmer	A	LSI Corp.
Mr. Brian Day	A	LSI Corp.
Mr. Steve Johnson	A	LSI Corp.
Mr. Dennis Kleppen	A	LSI Corp.
Mr. John Lohmeyer	P	LSI Corp.
Mr. David Uddenberg	V	LSI Corp.
Mr. David Geddes	P	Marvell Semiconductor, Inc.
Ms. Zenta Darnell	V	Maxim Integrated Products
Mr. Chris Fore	A	Network Appliance
Mr. Tim Symons	P	PMC-Sierra
Mr. Michael Rogers	A	Samsung
Mr. Gerald Houlder	P	Seagate Technology
Mr. Stephen Finch	P	STMicroelectronics, Inc.
Mr. Truong Nguyen	V	Sun Microsystems
Mr. Mark Evans	P	Western Digital
Mr. Duncan Penman	V	Western Digital
Mr. Curtis Stevens	A	Western Digital
Mr. Praveen Viraraghavan	AV	Western Digital

30 People Present

Status Key: P - Principal
 A - Alternate
 AV - Advisory Member
 E - Emeritus
 L - Liaison
 V - Visitor

4. Miscellaneous topics

No miscellaneous topics were presented to the group.

5. General Protocol topics

5.1 SAS-2 Redundant primitive sequence error handling (07-089) [Elliott]

Rob Elliott asked that discussion of a proposal to correct a number of error cases for which the recipient's Redundant Primitive detection rules are unclear, especially in light of the 6 Gbs usage of Decision Feedback Equalization (07-089r1), be deferred to the next meeting.

5.2 SAS-2: Limiting SAS Target response to OPEN_REJECT (RETRY) (07-391) [Penokie]

George Penokie presented a proposal to add the OPEN_REJECT (RETRY) time limit field to the Protocol-Specific Port mode page in SAS-2 (07-391r2). The group requested several minor changes, and George agreed to prepare a new revision.

George Penokie moved that 07-391r3 (r2 as revised) be recommended for inclusion in SAS-2. Gerry Houlder seconded the motion. In the absence of any objections, the motion passed unanimously.

5.3 SAS-2 Add SMP Report General Open Response While Configuring (07-403) [Besmer]

Brad Besmer presented a proposal to a Report General bit to indicate full compliance with final SAS-2 configuration requirements (07-403r1). The group discussed backwards compatibility with SAS-1.1 devices at length, and eventually requested minor wording changes in the definition of the new bit. Brad agreed to prepare a new revision.

Brad Besmer moved that 07-403r2 (r1 as revised) be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. The motion passed 7:0:11.

5.4 SAS-2: Indeterminate response length to a SMP REPORT GENERAL function (07-397) [Penokie]

George Penokie presented a proposal to clearly differentiate SAS-2 REPORT GENERAL requests from their SAS-1.1 equivalents using a technique that included adding an Allocated Response Length field (07-397r2). The group requested numerous changes, and George agreed to prepare a new revision.

George Penokie moved that 07-397r3 (r2 as revised) be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. The motion passed 8:0:10.

5.5 SAS-2 Mode page tweaks (08-005) [Elliott]

Rob Elliott presented a small proposal to align some SAS-2 mode page statements to SPC-4 (08-005r0).

Rob Elliott moved that 08-005r0 be recommended for inclusion in SAS-2. Brian Day seconded the motion. The motion passed 13:0:4.

5.6 SAS-2: Transport layer read and write flowcharts (08-007) [Penokie]

George Penokie presented a document that contained all the flowcharts from the last year of transport layer cleanup work (08-007r0). He noted that future requests to modify the transport layer will be greeted with demands that these flowcharts be revised to include the new feature.

George asked that discussion of this topic be removed from future agendas.

5.7 SAS-2 XL Forward Dword correction (08-011) [Elliott]

Rob Elliott presented a proposal to make a statements about expanding and collapsing STP primitives match other requirements about forwarding dwords (08-011r0).

Rob Elliott moved that 08-011r0 be recommended for inclusion in SAS-2. Bill Martin seconded the motion. In the absence of objections, the motion passed unanimously.

5.8 SAS-2 Elasticity buffer clarifications (08-009) [Elliott]

Rob Elliott presented a proposal to clarify three issues about deleteable primitives (08-009r0). The group requested a handful of corrections, and Rob agreed to prepare a new revision.

Rob Elliott moved that 08-009r1 (r0 as revised) be recommended for inclusion in SAS-2. Gerry Houlder seconded the motion. In the absence of objections, the motion passed unanimously.

5.9 SAS-2: SP State Machine - SL State Machine interaction issue (08-010) [Martin]

Bill Martin presented a proposal to correct several problems with the description of multiplexing in the SP State Machines (08-010r0). The group requested a minor change to permit non-implementation of multiplexing, and Bill agreed to prepare a new revision.

Bill Martin moved that 08-010r1 (r0 as revised) be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. In the absence of objections, the motion passed unanimously.

5.10 SAS-2 SMP DISCOVER Self-Configuration Levels Completed (08-040) [Besmer]

Brad Besmer presented a proposal to add one more reason for self-configuration levels completed code zero to be returned (08-040r0).

Brad Besmer moved that 08-040r0 be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. The motion 10:0:1.

5.11 SAS-2 SPC-4 Differentiate between ACK NAK timeout reasons (08-064) [Elliott]

Rob Elliott presented a proposal to define new additional sense codes to indicate when different timeouts have been detected (08-064r0). The group asked for corrections in the proposed ASCQ values, and Rob agreed to prepare a new revision.

Questions were also raised about there being too much differentiation, but the group decided not to change this aspect of the proposal when Rob noted that the SAS-1.1 behavior would be permissible in SAS-2.

The group requested more time to review the proposal, and Rob stated that incorporation of a revised version of the proposal will be requested by a Hewlett Packard letter ballot comment.

6. Zoning topics

No zoning topics were presented to the group.

7. Non-zoning Expander topics

No non-zoning expander topics were presented to the group.

8. Physical WG overlap topics

8.1 SAS-2 Far-end retimed loopback phy test function (07-119) [Elliott]

Rob Elliott asked that discussion of the proposal to define a far-end loopback testing mechanism for SAS (07-119r4) be deferred to the next meeting.

8.2 SAS-2 Phy test pattern transmitter controls (07-479) [Elliott]

Rob Elliott presented a proposal to add more transmitter setting controls to the Phy test pattern setup (07-479r1). The group raised several issues with statements that appeared to setup conflicting support requirements for various Phys, and Rob agreed to prepare a new revision.

The group discussed the effects on other Phys in the same device of performing this function on some specific Phy, and additional edits were made in the proposal to clarify this behavior. Other changes were made to provide devices a way to refuse to perform the function.

Rob Elliott moved that 07-479r2 (r1 as revised) be recommended for inclusion in SAS-2. Brad Besmer seconded the motion. The motion passed 6:0:9.

8.3 SAS-2: Remove restrictions for SSC (08-014) [Houlder]

The group asked that discussion of this topic be remanded to the SAS Phy group.

Gerry asked that discussion of this topic be removed from future agendas.

9. New Business

9.1 SAS: Add low power transceiver options (08-015) [Houlder]

Gerry Houlder presented a document whose purpose was to begin building consensus regarding the SAS protocol efforts to lower power consumption on inactive SAS links or SAS links with reduced activity. He noted that the starting point for the discussion is a set of changes adopted by SATA. The group discussed numerous options for adding new low-power features to SAS-x, use of existing SCSI low-power features, and related topics.

Gerry sought agreement regarding some choices with long lead times – such as the choices of primitives or whatever for link layer signaling. He received pushback against adding the use of K28.6 characters to SAS links (as compared with using them on SAS/SATA links).

9.2 SAS-2 Use American numbering convention (08-041) [Elliott]

Rob Elliott proposed that SAS, and by implication all T10 standards, switch from using commas as decimal separators to using periods. Bill Martin proposed that the topic should be discussed in the T10 plenary not in this group. Rob agreed to revise the proposal and present it to CAP.

10. Review of Recommendations

The following documents were recommended for consideration by the Plenary:

For inclusion in SAS-2:

- 07-391r3 (Limiting SAS Target response to OPEN_REJECT (RETRY)) [Penokie]
- 07-403r2 (Add SMP Report General Open Response While Configuring) [Besmer]
- 07-397r3 (Indeterminate response length to a SMP REPORT GENERAL function) [Penokie]
- 08-005r0 (Mode page tweaks) [Elliott]
- 08-011r0 (XL Forward Dword correction) [Elliott]
- 08-009r1 (Elasticity buffer clarifications) [Elliott]
- 08-010r1 (SP State Machine - SL State Machine interaction issue) [Martin]
- 08-040r0 (SMP DISCOVER Self-Configuration Levels Completed) [Besmer]
- 07-479r2 (Phy test pattern transmitter controls) [Elliott]

11. Meeting Schedule

A SAS Protocol Working Group meeting is scheduled for:

Monday, March 10, 2008 commencing at 9:00 a.m. in Raleigh, NC at the Hilton Raleigh-Durham Airport at Research Triangle Park Hotel (Reservations: 919-941-6000) hosted by Network Appliance.

Teleconference calls will be announced on the T10 reflector as needed.

12. Adjournment

The meeting was adjourned at 5:20 p.m. on Monday January 14, 2008.