

Accredited Standards Committee*

InterNational Committee for Information Technology Standards (INCITS)

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Date: May 10, 2006

Reply to: John Lohmeyer

To: T10 Membership
From: Ralph Weber and John Lohmeyer
Subject: SAS Protocol WG -- May 8, 2006
San Jose, CA

Agenda

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2. Approval of Agenda
3. Attendance and Membership
4. Miscellaneous topics
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 - 4.2 Report about T11.5 SM-HBA draft standard [Krithivas/Nixon]
5. General Protocol topics
 - 5.1 SAS-2 protocol for changing driver amplitude (03-285) [Evans]
 - 5.2 SAS-2 BREAK_REPLY (06-119) [Hoglund]
 - 5.3 SAS-2 Require expanders transmit three AIPs (06-164) [Elliott]
 - 5.4 SAS-2 Wide SSP target port simultaneous connection rules (05-322) [Elliott]
 - 5.5 SAS-2 Support multiple STP affiliations (06-188) [Elliott]
 - 5.6 SAS-2 Multiplexing (05-381) [Elliott]
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 - 6.2 SAS-2 BROADCAST (SCSI ASYNCHRONOUS EVENT) (06-044) [Fairchild]
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7. Self-configuring expander devices
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 - 7.2 SAS-2 Configuring bit (06-097) [Symons]
 - 7.3 SAS-2 Self-configuring expander status (06-187) [Elliott]
 - 7.4 SAS-2 Expander Configuration Supervisor and SMP CHANGE Request (06-029) [Weber and Johnson]
8. Zoning/expander topology topics
 - 8.1 SAS-2 Allow table-to-table expander attachment (06-189) [Elliott]
 - 8.2 SAS-2 Zone Group of an Expander's SMP (06-212) [D'Avignon]
 - 8.3 SAS-2 Zone management proxy device (06-215) [Symons]
 - 8.4 SAS-2: Reporting ZONE PARTICIPATING CAPABLE in the IDENTIFY address frame (06-210) [Marks]
9. SMP function topics
 - 9.1 SAS-2 Add expander change count to all SMP functions (06-197) [Elliott]
 - 9.2 SAS-2 Restrict access to SMP write functions (06-208) [Elliott]
 - 9.3 SAS-2 SMP Lists (DISCOVER LIST) (06-037) [Johnson]
 - 9.4 SAS-2 REPORT GENERAL additions for zoning and self configuration (06-213) [Johnson]
 - 9.5 SAS-2 SMP CONFIGURE PHY ZONE function (06-201) [Symons]
 - 9.6 SAS-2 SMP REPORT ZONE PERMISSION function (06-203) [Symons]
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 - 9.8 SAS-2 SMP REPORT ZONE ROUTE TABLE function (06-204) [Symons]
 - 9.9 SAS-2 Expander Routing Table (REPORT EXPANDER ROUTE TABLE) (06-078) [Johnson]
 - 9.10 SAS-2 Expander Route Table (CONFIGURE EXPANDER ROUTE TABLE) (06-214) [Johnson]

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- 10. New Business
- 11. Review of Recommendations
- 12. Meeting Schedule
- 13. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer called the meeting to order at 9:00 a.m. Monday, May 8, 2006. He thanked Mark Overby of Nvidia Corp. for hosting the meeting. As usual, the people present introduced themselves.

2. Approval of Agenda

The draft agenda was approved with no changes.

No agenda 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. Lawrence J. Lamers	A	Adaptec, Inc.
Mr. Paul von Stamwitz	P	AMCC
Mr. Michael Wingard	P	Amphenol Interconnect
Mr. Robert Snively	P	Brocade Comm. Systems, Inc.
Mr. James A. Lott, Jr.	P	Dallas Semiconductor
Mr. Kevin Marks	P	Dell, Inc.
Mr. David Black	A	EMC Corp.
Mr. Kenneth Hirata	A	Emulex
Mr. Ramez Rizk	V	Emulex
Mr. Ralph O. Weber	P	ENDL Texas
Mr. Walt Hubis	V	Engenio Information Tech.
Mr. Nathan Hastad	P	General Dynamics
Mr. Rob Elliott	P	Hewlett Packard Co.
Mr. Steven Fairchild	V	Hewlett Packard Co.
Mr. Dan Colegrove	P	Hitachi Global Storage Tech.
Mr. George O. Penokie	P	IBM Corp.
Mrs. Vicky Duerk	V	Intel
Mr. Schelto van Doorn	V	Intel Corp
Mr. Pak Seto	V	Intel Corp.
Mr. Robert Sheffield	P	Intel Corp.
Mr. Dennis Moore	AV	KnowledgeTek, Inc.
Mr. David Uddenberg	V	LSI Logic
Mr. Brad Besmer	V	LSI Logic Corp.
Mr. Brian Day	V	LSI Logic Corp.
Mr. Tim Hoglund	V	LSI Logic Corp.
Mr. Steve Johnson	V	LSI Logic Corp.
Mr. John Lohmeyer	P	LSI Logic Corp.
Mr. David Geddes	P	Marvell Semiconductor, Inc.
Mr. Mark Evans	P	Maxtor Corp.
Mr. Duncan Penman	V	Mindshare, Inc
Mr. Mark Overby	P	Nvidia Corp.
Mr. Tim Symons	P	PMC-Sierra
Mr. Gerald Houlder	P	Seagate Technology
Mr. William Martin	P	Sierra Logic, Inc.
Mr. Stephen Finch	V	STMicroelectronics
Mr. Vit Novak	P	Sun Microsystems, Inc.
Mr. Kjartan Nesbakken Haugen	AV	Tandberg Storage
Mr. Wayne Gentry	V	Unisys Corporation
Mr. Ed D'Avignon	V	Vitesse Semiconductor
Mrs. Zenta Darnell	V	Vitesse Semiconductor
Mr. Gregory Tabor	P	Vitesse Semiconductor
Mr. Luben Tuikov	V	Vitesse Semiconductor
Mr. Jeff Williams	P	Xiotech Corp.
Mr. Bob Hansen	V	Xyratex

44 People Present

Status Key: P - Principal
 A,A# - Alternate
 AV - Advisory Member
 L - Liaison
 V - Visitor

4. Miscellaneous topics

4.1 SAS-2 Alternate icon (06-161) [Elliott]

Rob Elliott explained the need for two simpler SAS icons (06-161r0). Gerry Houlder moved that 06-161r0 be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. In the absence of any objections, the motion passed unanimously.

4.2 Report about T11.5 SM-HBA draft standard [Krithivas/Nixon]

Bob Sheffield asked that this be deferred to the next meeting.

5. General Protocol topics

5.1 SAS-2 protocol for changing driver amplitude (03-285) [Evans]

Mark Evans requested that discussion of this topic be deferred to the next meeting.

5.2 SAS-2 BREAK_REPLY (06-119) [Hoglund]

Tim Hoglund presented a proposal to close the link layer race condition related to Break primitive processing by changing Break from a signal-oriented function to a request-response transaction (06-119r1). The group requested several editorial changes and Tim agreed to prepare a new revision.

Tim Hoglund moved that 06-119r2 (r1 as modified) be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. In the absence of any objections, the motion passed unanimously.

5.3 SAS-2 Require expanders transmit three AIPs (06-164) [Elliott]

Rob Elliott presented a proposal to require three AIPs be transmitted (06-164r1), instead of allowing three AIPs to be transmitted as specified in SAS-1.1. He noted two ways to effect the change. The group accepted the second option which meant defining a new type of primitive sequence. However, the group insisted that each received primitive of the new type be processed 'normally'. Rob agreed to prepare a new revision.

Rob Elliott moved that 06-164r2 (r1 as modified) be recommended for inclusion in SAS-2. Bill Martin seconded the motion. In the absence of any objections, the motion passed unanimously.

5.4 SAS-2 Wide SSP target port simultaneous connection rules (05-322) [Elliott]

Rob Elliott presented a proposal to add recommendations regarding target usage of simultaneous connections on wide links (05-322r3). The group requested several significant changes and Rob agreed to prepare a new revision for consideration at the next meeting.

5.5 SAS-2 Support multiple STP affiliations (06-188) [Elliott]

Rob Elliott presented a proposal (06-188r0) to define a way for STP ports to support a countable number of affiliations (other than 1 or infinitely many). The group requested numerous changes and raised unresolved issues regarding legacy initiators. Rob agreed to develop resolutions for the raised issues offline and prepare a new revision for consideration at the next meeting.

5.6 SAS-2 Multiplexing (05-381) [Elliott]

Due to the late hour, Rob asked that discussion of this topic be deferred to the next meeting.

6. BROADCAST topics

6.1 SAS-2 No BROADCASTs before link reset sequence completes (06-199) [Tuikov, Elliott]

Rob Elliott presented a proposal to make the Broadcasts section match statements made in the State Machine definitions (06-199r0). The group discussed how appropriate the proposed wording was with respect to other ports and the existing SAS-1.1 statements.

The group requested wording changes to limit ignoring Broadcasts to just the phy which is in the process of performing a Link Reset Sequence (as opposed to Broadcasts received when any phy is performing a Link Reset Sequence). Rob agreed to prepare a new revision of the proposal.

Luben Tuikov moved that 06-199r1 (r0 as modified) be recommended for inclusion in SAS-2. Kevin Marks seconded the motion. In the absence of any objections, the motion passed unanimously.

6.2 SAS-2 BROADCAST (SCSI ASYNCHRONOUS EVENT) (06-044) [Fairchild]

Steve Fairchild presented a proposal to define a broadcast primitive indicating a unit attention condition has been established (06-044r2). The group requested several changes relating to when the Broadcasts are sent, removing SCSI from the Broadcast name, and other editorial corrections. Steve agreed to prepare a new revision.

Steve Fairchild moved that 06-044r3 (r2 as modified) be recommended for inclusion in SAS-2. Mark Evans seconded the motion. The motion passed 8:1:9.

6.3 SAS-2 BROADCAST processing clarifications (06-177) [D'Avignon/Elliott]

Rob Elliott presented a proposal to clarify Zoned Broadcasts (06-177r2). He noted that the proposal had been discussed previously in Zoning teleconferences and the Denver face-to-face meeting. The group requested one editorial correction and Rob agreed to prepare a new revision.

Rob Elliott moved that 06-177r3 (r2 as modified) be recommended for inclusion in SAS-2. Ed D'Avignon seconded the motion. In the absence of any objections, the motion passed unanimously.

7. Self-configuring expander devices

7.1 SAS-2 Self-configuring expander device model (06-098) [Symons]

Tim Symons presented example configurations for self-configuration (06-098r4). The group requested minor corrections and Tim agreed to prepare a new revision.

The group agreed to place the revised document on file for reference during future protocol development discussions. It was agreed that this topic should be removed from future agendas.

7.2 SAS-2 Configuring bit (06-097) [Symons]

Tim Symons presented a proposal to update the usage of the Configuring bit to make it more consistent with expected SAS-2 self-configuration operations (06-097r3). The group requested several changes and Tim agreed to prepare a new revision of the proposal.

Tim Symons moved that 06-097r4 (r3 as revised) be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. In the absence of any objections, the motion passed unanimously.

7.3 SAS-2 Self-configuring expander status (06-187) [Elliott]

Rob Elliott presented a proposal to define an SMP function to return self-configuring status information from expanders (06-187r0). The group requested numerous changes and Rob agreed to prepare a new revision for consideration at the next meeting.

7.4 SAS-2 Expander Configuration Supervisor and SMP CHANGE Request (06-029) [Weber and Johnson]

Ralph Weber asked that discussion of this topic be deferred to the next meeting.

8. Zoning/expander topology topics

8.1 SAS-2 Allow table-to-table expander attachment (06-189) [Elliott]

Rob Elliott presented a proposal to allow table routed expander ports to be connected to other table routed expander ports (06-189r1). He noted several other ways in which the proposal aligns expander definitions with current implementations (as opposed to SAS-1 models that were long ago overtaken by events).

The group requested numerous changes and Rob agreed to prepare a new revision for consideration at the next meeting.

8.2 SAS-2 Zone Group of an Expander's SMP (06-212) [D'Avignon]

Ed D'Avignon presented a proposal to force expanders to be in Zone Group 1 (06-212r0). The group requested several changes and Ed agreed to prepare a new revision.

Ed D'Avignon moved that 06-212r1 (r0 as revised) be recommended for inclusion in SAS-2. Kevin Marks seconded the motion. In the absence of any objections, the motion passed unanimously.

8.3 SAS-2 Zone management proxy device (06-215) [Symons]

Tim Symons presented a proposal for adding a proxy device to ensure consistency of zone table management (06-215r1). Rob Elliott expressed concerns that the proposed arrangement would not allow detected problems to be reported. No resolution was reached regarding the conflicting opinions and the group agreed to defer resolution to one or more telephone conference calls.

8.4 SAS-2: Reporting ZONE PARTICIPATING CAPABLE in the IDENTIFY address frame (06-210) [Marks]

Kevin Marks presented a proposal to define a process for switching a phy from non-participating to participating in a zoned service delivery subsystem (06-210r0). The group noted that the proposal failed to account for some hot-plug cases and Kevin agreed to consider the issues while preparing a new revision of the proposal for consideration at the next meeting.

9. SMP function topics

9.1 SAS-2 Add expander change count to all SMP functions (06-197) [Elliott]

Due to the late hour, discussion of this topic was deferred to the next meeting.

9.2 SAS-2 Restrict access to SMP write functions (06-208) [Elliott]

Due to the late hour, discussion of this topic was deferred to the next meeting.

9.3 SAS-2 SMP Lists (DISCOVER LIST) (06-037) [Johnson]

Due to the late hour, discussion of this topic was deferred to the next meeting.

9.4 SAS-2 REPORT GENERAL additions for zoning and self configuration (06-213) [Johnson]

Due to the late hour, discussion of this topic was deferred to the next meeting.

9.5 SAS-2 SMP CONFIGURE PHY ZONE function (06-201) [Symons]

Due to the late hour, discussion of this topic was deferred to the next meeting.

9.6 SAS-2 SMP REPORT ZONE PERMISSION function (06-203) [Symons]

Due to the late hour, discussion of this topic was deferred to the next meeting.

9.7 SAS-2 SMP CONFIGURE ZONE PERMISSION function (06-202) [Symons]

Due to the late hour, discussion of this topic was deferred to the next meeting.

9.8 SAS-2 SMP REPORT ZONE ROUTE TABLE function (06-204) [Symons]

Due to the late hour, discussion of this topic was deferred to the next meeting.

9.9 SAS-2 Expander Routing Table (REPORT EXPANDER ROUTE TABLE) (06-078) [Johnson]

Due to the late hour, discussion of this topic was deferred to the next meeting.

9.10 SAS-2 Expander Route Table (CONFIGURE EXPANDER ROUTE TABLE) (06-214) [Johnson]

Due to the late hour, discussion of this topic was deferred to the next meeting.

10. New Business

No new business was brought before the group.

11. Review of Recommendations

The following document was recommended for inclusion in SAS-2 during this meeting:

For inclusion in SAS-2:

06-161r0 (Alternate icon) [Elliott]

06-119r2 (BREAK_REPLY) [Hoglund]

06-164r2 (Require expanders transmit three AIPs) [Elliott]

06-199r1 (No BROADCASTs before link reset sequence completes) [Tuikov, Elliott]

06-044r3 (BROADCAST (ASYNCHRONOUS EVENT)) [Fairchild]

06-177r3 (BROADCAST processing clarifications) [D'Avignon/Elliott]

06-097r4 (Configuring bit) [Symons]

06-212r1 (Zone Group of an Expander's SMP) [D'Avignon]

12. Meeting Schedule

A SAS Protocol Working Group meeting is scheduled for:

Tuesday, June 20, 2006 commencing at 9:30 a.m. in Denver, CO at a hotel near the airport hosted by LSI Logic Corp.

Monday, July 10, 2006 commencing at 9:00 a.m. in Colorado Springs, CO the Antlers Hilton Hotel (1-719-955-5600) hosted by LSI Logic Corp.

Teleconference calls for SAS-2 Zoning will be held weekly and announced on the T10 reflector. Other teleconference calls will be announced on the T10 reflector as needed.

13. Adjournment

The meeting was adjourned at 8:25 p.m. on Monday May 8, 2006.