

Accredited Standards Committee*

InterNational Committee for Information Technology Standards (INCITS)

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Date: July 17, 2002

Reply to: John Lohmeyer

To: T10 Membership
From: John Lohmeyer
Subject: Serial Attached SCSI Protocol Working Group Meeting -- July 15-16, 2002
Colorado Springs, CO

Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. Old Business
 - 4.1 SAS CRC Generation and Scrambling (02-231) [Coomes]
 - 4.2 SAS Working Draft Review [Elliott]
 - 4.3 SAS OOB timing (02-198) [Elliott]
 - 4.4 SAS Credit Not Ready (02-215) [Galloway]
 - 4.5 SAS SMP transport layer state diagrams (02-216) [Penokie]
 - 4.6 SAS Port Control State Diagram Update (02-202) [Worden]
 - 4.7 SAS initiator transport layer state machines for SSP (02-230) [Evans]
 - 4.8 Name consistency between port and transport layers (02-276) [Worden]
 - 4.9 SAS Pathway Recovery (02-256) [Hoglund]
 - 4.10 SAS COMMAND ID Removal (02-259) [Day]
5. New Business
 - 5.1 Initiator based discovery and configuration of the SAS topology, proposal (02-279) [Fairchild]
 - 5.2 Initiator based configuration for SAS, powerpoint presentation (02-280) [Fairchild]
 - 5.3 Target detection of I_T nexus loss [Byan]
 - 5.4 Arbitration clarification (02-222) [Galloway]
 - 5.5 SAS target transport layer state machines for SSP (02-287) [Evans]
6. Review of Recommendations to the Plenary
7. Meeting Schedule
8. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 1:30 p.m., Monday, July 15, 2002. He thanked LSI Logic for hosting the meeting.

As is customary, the people attending introduced themselves and a copy of the attendance list was circulated.

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2. Approval of Agenda

The draft agenda was approved with the following changes:

- 4.8 Name consistency between port and transport layers (02-276) [Worden]
- 5.1 Initiator based discovery and configuration of the SAS topology, proposal (02-279) [Fairchild]
- 5.2 Initiator based configuration for SAS, powerpoint presentation (02-280) [Fairchild]
- 5.3 Target detection of I_T nexus loss [Byan]

The following items were added/revised during the course of the meeting:

- 4.7 SAS initiator transport layer state machines for SSP (02-230) [Evans]
- 5.4 Reiteration clarification (02-222) [Galloway]
- 5.5 SAS target transport layer state machines for SSP (02-287) [Evans]

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 | Electronic Mail Address |
|-----------------------|----|--------------------------|-------------------------------|
| Mr. Ron Roberts | P | Adaptec, Inc. | Ron_Roberts@adaptec.com |
| Mr. Bill Galloway | P | BREA Technologies, Inc. | billg@breatech.com |
| Mr. John Tyndall | A | Crossroads Systems, Inc. | jtyndall@crossroads.com |
| Mr. Kevin Marks | P | Dell Computer Corp. | kevin_marks@dell.com |
| Mr. Ronald Stockford | A | Dell Computer Corp. | ron_stockford@dell.com |
| Mr. Gary S. Robinson | P | EMC Corp. | robinson_gary@emc.com |
| Mr. Robert H. Nixon | P | Emulex | bob.nixon@emulex.com |
| Mr. Ralph O. Weber | P | ENDL Texas | roweber@acm.org |
| Mr. Mike Fitzpatrick | P | Fujitsu | mfitzpatrick@fcpa.fujitsu.com |
| Mr. Rob Elliott | P | Hewlett Packard Co. | Elliott@hp.com |
| Mr. Steven Fairchild | V | Hewlett Packard Co. | Steve.Fairchild@compaq.com |
| Mr. Bruce Schober | V | Hewlett Packard Co. | bruce_schober@hp.com |
| Mr. Werner Glinka | AV | Hitachi America | werner.glinka@attglobal.net |
| Mr. Matt Otto | V | I-TECH Corp. | matt_otto@i-tech.com |
| Mr. George O. Penokie | P | IBM / Tivoli Systems | gop@us.ibm.com |
| Mr. Dan Colegrove | V | IBM Corp. | dcolegro@us.ibm.com |
| Mr. Chris Fournier | V | IBM Corp. | chrisfou@us.ibm.com |
| Mr. Pak Seto | V | Intel | pak-lund.seto@intel.com |
| Mr. Robert Sheffield | V | Intel Corp. | robert.l.sheffield@intel.com |
| Mr. Dennis Moore | P | KnowledgeTek, Inc. | dmoore@ix.netcom.com |
| Mr. John Lohmeyer | P | LSI Logic Corp. | lohmeier@t10.org |
| Mr. William Petty | A | LSI Logic Corp. | william.petty@lsil.com |
| Mr. Brian Day | V | LSI Logic Corp. | brian.day@lsil.com |
| Mr. Dave Gissel | V | LSI Logic Corp. | david.gissel@lsil.com |
| Mr. Tim Hoglund | V | LSI Logic Corp. | tim.hoglund@lsil.com |
| Mr. David Weber | V | LSI Logic Corp. | david.weber@lsil.com |

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|--------------------------|----|------------------------|--------------------------------|
| Ms. Jie Fan | P | Madison Cable Corp. | jie.fan@madisoncable.com |
| Mr. Mark Evans | P | Maxtor Corp. | mark_evans@maxtor.com |
| Mr. Pete McLean | A | Maxtor Corp. | pete_mclean@maxtor.com |
| Mr. Steve Byan | V | Maxtor Corp. | stephen_byan@maxtor.com |
| Mr. Martin Czekalski | V | Maxtor Corp. | marty_czekalski@maxtor.com |
| Mr. James R. (Bob) Davis | P | Network Appliance Inc. | bob@netapp.com |
| Mr. Edward A. Gardner | P | Ophidian Designs | eag@ophidian.com |
| Mr. Greg Casey | AV | QLogic Corp. | greg.casey@qlogic.com |
| Mr. Arie Krantz | V | QLogic Corp. | l_krantz@qlc.com |
| Ms. Deborah Laurion | V | Quantum Corp. | deborah.laurion@quantum.com |
| Mr. Gerald Houlder | P | Seagate Technology | gerry_houlder@seagate.com |
| Mr. Jim Coomes | V | Seagate Technology | jim_coomes@seagate.com |
| Mr. Willis Whittington | V | Seagate Technology | Willis.Whittington@seagate.com |
| Mr. John Worden | V | Seagate Technology | john.worden@seagate.com |
| Mr. Edward Haske | P | Silicon Image | haske@siliconimage.com |
| Mr. Paul D. Aloisi | P | Texas Instruments | Paul_Aloisi@ti.com |
| Mr. Phil Shelton | A | UNISYS Corporation | phil.shelton@unisys.com |
| Mr. Kenneth Hirata | P | Vixel Corp. | Ken.Hirata@Vixel.com |

44 People Present

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

4. Old Business

4.1 SAS CRC Generation and Scrambling (02-231) [Coomes]

Jim Coomes reviewed the example C algorithms for CRC generation and scrambling (02-231r1). Rob Elliott expressed concerns that the scrambling example uses a 16-bit algorithm to produce a 32-bit result. The group requested changes to address this and other issues.

Jim Coomes moved that 02-231r2 (r1 as revised) be recommended for inclusion in SAS. Bill Galloway seconded the motion. In the absence of any objections, the motion passed unanimously.

4.2 SAS Working Draft Review [Elliott]

Because of the late hour, Rob Elliott requested that discussion of this topic be deferred to the next meeting.

4.3 SAS OOB timing (02-198) [Elliott]

Rob Elliott reviewed the OOB proposal (02-198r5) in a joint meeting with the SAS PHY working group. Alvin Cox presented issues discovered by the SAS PHY working group. As a result of the discussion, the PHY group agreed to define the idle mode level. The group requested changes in the proposal.

Rob Elliott moved that 02-198r6 (r5 as revised) be recommended for inclusion in SAS. Bill Galloway seconded the motion. In the absence of any objections, the motion passed unanimously.

4.4 SAS Credit Not Ready (02-215) [Galloway]

Bill Galloway presented 02-215r1, SAS credit not ready.

Bill Galloway moved that 02-215r1 be recommended for inclusion in SAS. Mark Evans seconded the motion. In the absence of any objections, the motion passed unanimously.

4.5 SAS SMP transport layer state diagrams (02-216) [Penokie]

George Penokie led a review of the SMP transport layer state diagrams (02-216r4). The group requested several editorial changes.

George Penokie moved that 02-216r5 (r4 as revised) be recommended for inclusion in SAS. Bill Galloway seconded the motion. In the absence of any objections, the motion passed unanimously.

4.6 SAS Port Control State Diagram Update (02-202) [Worden]

John Worden reviewed the port control state diagram (02-202r1). The group requested numerous changes and John agreed to prepare a new revision. The group was unable to finish reviewing the entire proposal so John agreed to present the revised proposal at the next meeting.

4.7 SAS initiator transport layer state machines for SSP (02-230) [Evans]

Mark Evans reviewed the changes to initiator transport layer state diagrams (02-230r1). The group requested editorial changes.

Mark Evans moved that 02-230r2 (r1 as revised) be recommended for inclusion in SAS. Jim Coomes seconded the motion. In the absence of any objections, the motion passed unanimously.

4.8 Name consistency between port and transport layers (02-276) [Worden]

George Penokie moved that 02-203 be removed from the list of documents that have been recommended for inclusion in SAS. John Worden seconded the motion. In the absence of any objections, the motion passed unanimously.

John Worden presented a combined request-confirmation interactions table for the port, transport, and client/server layers (02-276r0). The group reviewed the table in detail. John took notes regarding numerous changes to be made in the proposal.

John Worden moved that 02-276r1 (r0 as revised) be recommended for inclusion in SAS. Mark Evans seconded the motion. In the absence of any objections, the motion passed unanimously.

4.9 SAS Pathway Recovery (02-256) [Hoglund]

Tim Hoglund presented a proposal for how failed path recovery is to be performed (02-256r0). The group discussed the way the information in the proposal should be presented to make it comprehensible. Operational details of the proposed mechanisms were also discussed.

Tim Hoglund moved that 02-256r2 (r1 as revised) be recommended for inclusion in SAS. Bill Galloway seconded the motion. In the absence of any objections, the motion passed unanimously.

4.10 SAS COMMAND ID Removal (02-259) [Day]

Brian Day requested that discussion of this topic be deferred to the next meeting.

5. New Business

5.1 Initiator based discovery and configuration of the SAS topology, proposal (02-279) [Fairchild]

Steve Fairchild reviewed the detailed proposal supporting the Edge router expander discussed in his earlier overview presentation (see item 5.2).

Bill Galloway raised concerns about the inability to discover wide connections in topology discovery due to the absence of one of two world wide name values in the discovery frame.

George Penokie questioned the presence of link rate information in the proposed identify frame because it contains no information that is critical to the function assigned to the identify frame.

There was broad agreement that the modified identify frame format and phy-based discovery are the two most important aspects of this proposal to resolve quickly. Resolving these issues was made a high priority for the telephone conference calls between now and the August meeting with final action targeted for the August meeting.

5.2 Initiator based configuration for SAS, powerpoint presentation (02-280) [Fairchild]

Steve Fairchild proposed that the internal construction of an Edge expander cloud be exposed in the SAS definitions (02-280r0). The purpose of the change was to simplify the construction of the Edge expander cloud by moving the Edge expander configuration function from the Edge expander cloud to the initiator HBA. The change would have the effect of introducing a new expander layer, increasing the number of expander layers from two to three.

The increase in SAS complexity met with substantial resistance.

The group agreed to recess for the evening and discuss the topic again on the second meeting day.

A straw poll supported proceeding with the development of this idea 10:3:10.

The group debated continuing with a review of the detailed proposal and agreed to continue with item 5.1.

5.3 Target detection of I_T nexus loss [Byan]

Steve Byan led a discussion of situations where the target is not in communication with an initiator but has pending actions with that initiator. If the initiator never responds, the target waits forever. Steve expressed the concern that the target might block useful progress on other initiators when one initiator goes belly up.

It was argued that if one initiator goes belly up, the onus should be on other initiators to detect the condition, not on the target. Steve agreed that the issue needed no further consideration.

5.4 Arbitration clarification (02-222) [Galloway]

Bill Galloway asked that discussion of this topic be deferred to the next meeting.

5.5 SAS target transport layer state machines for SSP (02-287) [Evans]

Mark Evans reviewed a preliminary draft of the proposal to specify the target transport layer state machines (02-287r0). Noting that only the state diagram picture was ready for review, Mark agreed to bring a revised proposal to the next meeting.

6. Review of Recommendations to the Plenary

John Lohmeyer noted that the following recommendations have been made to the T10 plenary:

Recommendations from the May 14, 2002 teleconference:

- that 02-169r2 be accepted for inclusion in the SAS working draft.
- that 02-170r1 be accepted for inclusion in the SAS working draft.

Recommendations from the May 21, 2002 teleconference:

none.

Recommendations from the June 5-7, 2002 working group meeting:

- that 02-179r1 (r0 as revised) be recommended for inclusion in the SAS working draft.
- 02-211r1 (r0 as revised) be accepted for inclusion in the SAS working draft.
- 02-212r1 (r0 as revised) be accepted for inclusion in the SAS working draft.
- 02-218r0, which recommends that the SMP FER Loopback function be removed, be accepted and that the SAS technical editor be directed to remove the SMP FER Loopback function.
- that 02-203r1 (r0 as revised) be recommended for inclusion in the SAS working draft (**removed by recommendation of this meeting**).
- that 02-217r0 be recommended for inclusion in the SAS working draft.
- that 02-214r1 be recommended for inclusion in the SAS working draft.

Recommendations from the June 18, 2002 teleconference:

- that 02-204r1 be recommended for inclusion in the SAS working draft.
- that 02-197r2 (r1 as revised) be recommended for inclusion in the SAS working draft.

Recommendations from the June 24-26, 2002 working group meeting:

- that 02-196r2 (r1 as revised) be recommended to T10 for inclusion in SAS.
- that 02-201r3 (r2 as revised) be recommended to T10 for inclusion in SAS.
- that 02-205r3 (r2 as revised) be recommended to T10 for inclusion in SAS.
- that in state SMP_SFR1 in figure 69 in SAS-R00C, that the protocol violation and the failed frame confirmations be deleted and any corresponding text be deleted.
- that 02-245r0 be recommended to T10 for inclusion in SAM-3.
- that 02-246r0 be recommended to T10 for inclusion in SPC-3.

Recommendations from the July 9, 2002 teleconference:

- that 02-219r3 (r2 as revised) be recommended to T10 for inclusion in SAS.

Recommendations from this meeting:

- 02-231r2 (r1 as revised) SAS CRC Generation and Scrambling
- 02-216r5 (r4 as revised) SAS SMP transport layer state diagrams
- 02-230r2 (r1 as revised) SAS transport layer state machines for SSP
- 02-276r1 (r0 as revised) Name consistency between port and transport layers
- 02-215r1 SAS Credit Not Ready
- 02-256r2 (r1 as revised) SAS Pathway Recovery
- 02-198r6 (r5 as revised) SAS OOB timing

7. Meeting Schedule

Serial Attached SCSI Working Group meetings are scheduled for:

Wednesday-Friday, August 21-23, 2002 commencing at 9:00 am on Wednesday and ending at noon on Friday in Shrewsbury, MA at Maxtor. Host contact: Mark Evans.

Monday-Tuesday, September 9-10, 2002 commencing at 1:00 p.m. on Monday and ending at 8:00 pm on Tuesday in Minneapolis, MN at the Hilton Minneapolis/St. Paul Airport Hotel (952-854-2100).

SAS Protocol teleconferences are scheduled for:

Tuesday July 30, 2002 and Tuesday August 13, 2002

11:00 am -- 2:00 pm EDT

10:00 am -- 1:00 pm CDT

9:00 am -- noon MDT

8:00 am -- 11:00 am PDT

USA Toll Free Number: 877-417-9828

Toll Number: +1-706-679-9028

Conference Code: 719 533 7560

WebEx Session: <http://seagate.webex.com/>

Meeting Name: SAS Protocol teleconference

Password: to be announced on T10 reflector

8. Adjournment

The meeting was adjourned at 6:35 pm on Tuesday, July 16, 2002.