

Accredited Standards Committee*
InterNational Committee for Information Technology Standards (INCITS)

Doc. No.: T10/03-177r0

Date: May 7, 2003

Reply to: John Lohmeyer

To: T10 Membership
From: Ralph Weber and John Lohmeyer
Subject: SAS Protocol WG -- May 5-6, 2003
Nashua, NH

Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. Old Business
 - 4.1 SAS Working Draft Review (SAS) [Elliott]
 - 4.1.1 BREAK message upstream (Elliott)
 - 4.1.2 DATA frame before XFER_RDY (Evans)
 - 4.1.3 DONE clarifications (Elliott)
 - 4.1.4 Set Rate (Elliott)
 - 4.1.5 Unrecognized Target Port Transfer Tags
 - 4.1.6 I_T Nexus Loss timer [Coomes]
 - 4.2 SAS Revision 3 T10 letter ballot comment resolution (03-055) [Elliott]
 - 4.3 SAS-1.1: CRC on Frame Header [Roberts]
 - 4.4 SAS-1.1: Transport Layer Retries [Jones]
 - 4.5 SAS Requests and Confirmations (03-023) [Evans]
5. New Business
 - 5.1 SAS 1.1: SATA II Port Selector Interoperability (03-155) [Sheffield]
 - 5.2 SAS: Initiator Response Timeout timer (03-164) [Penokie]
 - 5.3 SAS: SATA information to Annex (03-168) [Penokie]
 - 5.4 Initiator Connection Tag Changes Detected by Target [Krantz]
6. Review of Recommendations
7. Meeting Schedule
8. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer called the meeting to order at 9:00 a.m. Monday, May 5, 2003. He thanked Zane Daggett of Hitachi Cable Manchester for hosting the meeting. As usual, the people present introduced themselves.

2. Approval of Agenda

The draft agenda was approved with the following changes:

- 4.1.1 BREAK message upstream (Elliott)
- 4.1.2 DATA frame before XFER_RDY (Evans)
- 4.1.3 DONE clarifications (Elliott)
- 4.1.4 Set Rate (Elliott)

The following items was added or revised during the course of the meeting:

- 4.1.5 Unrecognized Target Port Transfer Tags
- 4.1.6 I_T Nexus Loss timer [Coomes]
- 5.1 SAS 1.1: SATA II Port Selector Interoperability (03-155) [Sheffield]
- 5.4 Initiator Connection Tag Changes Detected by Target [Krantz]

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.	rkroberts@aol.com
Ms. Pat Thaler	V	Agilent Technologies	pat_thaler@agilent.com
Mr. John Tyndall	A	Crossroads Systems, Inc.	jtyndall@crossroads.com
Mr. Titkwan Hui	A	Dallas Semiconductor	tk.hui@dalsemi.com
Mr. Robert H. Nixon	P	Emulex	bob.nixon@emulex.com
Mr. Ralph O. Weber	P	ENDL Texas	roweber@acm.org
Mr. Douglas Wagner	P	FCI	dwagner@fciconnect.com
Mr. Mike Fitzpatrick	P	Fujitsu	mfitzpatrick@fcpa.fujitsu.com
Mr. Nathan Hastad	P	General Dynamics	nathan.hastad@gd-ais.com
Mr. Rob Elliott	P	Hewlett Packard Co.	Elliott@hp.com
Mr. Steven Fairchild	V	Hewlett Packard Co.	Steve.Fairchild@hp.com
Mr. Zane Daggett	P	Hitachi Cable Manchester	zdaggett@hcm.hitachi.com
Mr. George O. Penokie	P	IBM / Tivoli Systems	gop@us.ibm.com
Mr. Robert Sheffield	A	Intel Corp.	robert.l.sheffield@intel.com
Mr. John Lohmeyer	P	LSI Logic Corp.	lohmeier@t10.org
Mr. Brian Day	V	LSI Logic Corp.	brian.day@lsil.com
Mr. Tim Hoglelund	V	LSI Logic Corp.	tim.hoglelund@lsil.com
Mr. Steven Schauer	V	LSI Logic Corp.	steve.schauer@lsil.com
Mr. Mark Evans	P	Maxtor Corp.	mark_evans@maxtor.com
Mr. Martin Czekalski	V	Maxtor Corp.	marty_czekalski@maxtor.com
Mr. Bruce Leshay	V	Maxtor Corp.	bruce_leshay@maxtor.com
Mr. Bill Galloway	P	Pivot3, Inc.	billg@pivot3.com
Dr. Heng Liao	V	PMC-Sierra, Inc.	Liaoheng@pmc-sierra.com
Mr. Craig W. Carlson	A#	QLogic Corp.	craig.carlson@qlogic.com
Mr. Ting Li Chan	V	QLogic Corp.	ting.chan@qlogic.com
Mr. Arie Krantz	V	QLogic Corp.	l_krantz@qlc.com

Mr. Don Carothers	V	QLogic Corp.	don.carothers@qlogic.com
Mr. Jim Jones	A	Quantum Corp.	jim.jones@quantum.com
Mr. Gerald Houlder	P	Seagate Technology	gerry.houlder@seagate.com
Mr. Jim Coomes	V	Seagate Technology	jim.coomes@seagate.com
Mr. Vit Novak	P	Sun Microsystems, Inc.	vit.novak@sun.com
Mr. Paul D. Aloisi	P	Texas Instruments	Paul_Aloisi@ti.com
Mr. Robert Kando	A.	Texas Instruments	Robert_Kando@ti.com
Mr. Ron Mathews	P	UNISYS Corporation	ronald.mathews@unisys.com
Mr. David Woolf	V	University of New Hampshire	djwoolf@iol.unh.edu
Mr. Martin Braff	V	Velio Communications	martin@velio.com
Mr. Zoran Miljanic	V	Velio Communications	zoran@velio.com
Mr. Kenneth Hirata	P	Vixel Corp.	Ken.Hirata@Vixel.com

38 People Present

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

4. Old Business

4.1 SAS Working Draft Review (SAS) [Elliott]

4.1.1 BREAK message upstream [Elliott]

Rob Elliott reviewed a problem where BREAK messages that should be passed upstream are not necessarily received. He noted that a complete solution would require numerous changes. George Penokie noted that only one condition really needs to be covered in the standard.

In the absence of any objections, the group instructed the editor to make the minimal change covering the one change George described.

4.1.2 DATA frame before XFER_RDY [Evans]

Bruce Leshay questioned what a target should do when it receives DATA frame that is not covered by a previous XFER_RDY. Bruce, Jim Coomes, and George Penokie agreed that the DATA frame should be discarded. Rob Elliott pointed out that other parts of SAS require returning a CHECK CONDITION in such cases.

The group identified several cases similar to the specific case identified by Bruce but differing in the details regarding why the target views the DATA frame as unsolicited.

Rob asked that the group conduct a straw poll on the following question:

How should a target respond to a DATA frame that it has not requested (regardless of the form in which the condition occurs)?

- Terminate the command with a CHECK CONDITION status, with sense key of ABORTED COMMAND and a new additional sense code;
- Drop the DATA frame without reporting anything at any layer; or
- Treat the condition as an overlapped command (i.e., abort all commands for that initiator)

In the first straw poll the count was a8:b7:c2. John Lohmeyer eliminated option c. In the second straw poll the count was a4:b5.

Jim Coomes moved that the SAS editor be instructed to require targets to discard all DATA frames that have not been solicited with a XFER_RDY (or First Burst) with that requirement taking precedence over all other requirements listed at the end of 9.2.5.1. George Penokie seconded the motion. The motion passed on a vote of 9:3:1.

4.1.3 DONE clarifications [Elliott]

Rob Elliott proposed adding clarifying text regarding timers in the DONE primitive description and the group supported the changes.

4.1.4 Set Rate [Elliott]

Rob Elliott presented a problem concerning the "window" for 1.5 Gbs transmissions. The group agreed to changing SAS to clarify that the 1.5 Gbs "window" must always appear first.

4.1.5 Unrecognized Target Port Transfer Tags

Concerns were raised about a potential requirement on targets that do not implement the target port transfer tag. Based on some wording in 9.2.5.1 inexperienced readers of SAS might believe that the target is required to test incoming target port transfer tags even though they do not implement support for the feature.

George Penokie moved that the SAS editor be instructed to require that targets to discard all DATA frames with unrecognized Target Port Transfer Tags. Bill Galloway seconded the motion. The motion passed on a 13:0:3.

4.1.6 I_T Nexus Loss timer [Coomes]

At the request of Jim Coomes, the group agreed to instruct the SAS editor to change SAS to specify that an I_T Nexus Loss timer value of FFFF in the Protocol-Specific Port mode page means that I_T Nexus Loss conditions will be retried infinitely, 0000 means vendor specific retry behavior, and all other values mean the number of milliseconds during which retries shall be attempted.

4.2 SAS Revision 3 T10 letter ballot comment resolution (03-055) [Elliott]

Rob Elliott noted that the following documents are relevant:

- 03-055r6.pdf - comments sorted by author
- 03-055r6.zip - contains a zip file with sas-r03 with comments (PDF database)
- sas-r03g.pdf - latest version of SAS
- sas-r03g.zip - Frame source for SAS rev 3g

Rob also noted that 03-055r7 will be posted to reflect the results of this meeting.

The group discussed handling outstanding transfers upon receipt of a hard reset. It was agreed that SAS discussion of hard resets on other target ports should include a reference to SAM-3.

In addition, the SAM-3 editor agreed to clarify SAM-3 to reflect the fact that SAM-3 requirements regarding hard resets affecting other ports do not apply to the effects caused by the logical unit reset required during the processing of a hard reset.

Rob Elliott moved that 03-055r7 be recommended as resolving the SAS Letter Ballot comments and that SAS r04 be recommended as containing the SAS Letter Ballot comments resolution. Mark Evans seconded the motion. The motion passed on a vote of 16:0:0.

4.3 SAS-1.1: CRC on Frame Header [Roberts]

Ron Roberts asked that discussion of this topic be deferred to the next meeting.

4.4 SAS-1.1: Transport Layer Retries [Jones]

Rob Elliott led a discussion of the currently defined transport layer error detection and recovery mechanisms (03-186r0).

Rob asked Jim Jones which of the current behaviors need to be addressed. Jim responded that backup applications will terminate a backup whenever a command is aborted. Any changes that move in the direction of eliminating aborted commands are valuable.

The group walked through the various cases listed by Rob and tentatively proposed error recovery mechanisms that do not result in commands being aborted.

Rob Elliott and Jim Jones agreed to prepare a detailed proposal for consideration at the next meeting. Jim Jones agreed to prepare a set of ladder of diagrams matching the proposal.

4.5 SAS Requests and Confirmations (03-023) [Evans]

Mark Evans requested that this item be removed from future agendas.

5. New Business

5.1 SAS 1.1: SATA II Port Selector Interoperability (03-155) [Sheffield]

Bob Sheffield presented information from a draft SATA II specification (page 5 in 03-155r0) and asked the group if there was any interest in adding text to SAS 1.1 to handle SATA II Port Selectors. The group asked questions about how Port Selectors are expected to work.

Bob agreed to prepare a detailed proposal for consideration at the next meeting.

5.2 SAS: Initiator Response Timeout timer (03-164) [Penokie]

As the group reviewed the issues under contention in 03-164r3, it was discovered that all the proposed changes have already been incorporated in SAS r03g.

5.3 SAS: SATA information to Annex (03-168) [Penokie]

George Penokie proposed that all the SATA-only text be moved to a SAS annex.

George Penokie moved that 03-168r0 for inclusion in SAS as resolution for several rejected Letter Ballot comments. Ron Roberts seconded the motion.

Ralph Weber began reviewing the proposed changes individually.

Tim Hogle moved to call the question. Jim Coomes seconded the motion to call the question. The motion to call the question failed to achieve a two-thirds vote with a count of 5:4.

When Ralph completed his review there were no further objections to voting on the motion.

The motion to included 03-168r0 failed on a vote of 6:7:3

George Penokie moved that every occurrence of "(Informative)" be removed and that any remaining occurrences of "See SATA" be changed to "See ATA/ATAPI-7 Volume 3". Ron Robert seconded the motion. The motion passed on a vote of 11:1:4.

5.4 Initiator Connection Tag Changes Detected by Target [Krantz]

John Lohmeyer reported on a question from Arie Krantz on the action to be taken by an initiator if a change is detected in the Initiator Connection Tag. Bill Galloway responded that the target can do anything that is convenient except aborting all the outstanding commands.

The group discussed ways in which the wording could be improved to clarify the allowed behaviors. Rob Elliott took notes for resolving the issue as part of the SAS Letter Ballot.

6. Review of Recommendations

The following documents were recommended for approval during this meeting:

- 03-055r7 - SAS Letter Ballot comments resolution
- SAS r04 - SAS revision containing the Letter Ballot comments resolution

7. Meeting Schedule

SAS Protocol Working Group meetings are scheduled for:

Monday-Tuesday, July 7-8, 2003 commencing at 1:30 p.m. in Colorado Springs, CO at the Wyndham Colorado Springs Hotel (719-260-1800), hosted by LSI Logic. The group discussed the possibility of adjourning the meeting at noon on Tuesday and starting the CAP meeting a half-day early.

Additional teleconference calls may be announced on the T10 reflector as needed.

8. Adjournment

The meeting was adjourned at 12:10 p.m. on Tuesday May 6, 2003.