

To: Membership of X3T10

From: Ralph Weber, Secretary X3T10
Larry Lamers, Vice-chair X3T10
John Lohmeyer, Chair X3T10

Subject: Minutes of X3T10 SCSI Working Group Meeting
Natick, MA -- September 10-11, 1996

Agenda

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 - 5.3 SAM-2 Changes & Layered Architecture (96-191r0) [Monia] {Tuesday 5:30 pm}
 - 5.4 Add Mode Page for fibre channel features (96-195) [Houlder] {November '96}
 - 5.5 Tape Support on FC-AL (Reflector Messages) [Hagerman] {Wednesday pm}
 - 5.6 SBP-2 Status [Johansson]
 - 5.7 SAM ISO Comments Review (96-236r0) [Monia]
 - 5.8 Logical Unit Reset Question [Monia]
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 - 6.2 SCSI-3 Block Commands (SBC) [Milligan]
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 - 6.2.3 Additional Medium Type Codes for 3.5-inch Flexible Disk Medium (reflector message)
 - 6.2.4 SCSI-2 and SBC Error in FDD Table regarding Pin 4 usage (reflector message) [Milligan]
 - 6.2.5 ESDI Reference [Milligan]
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 - 6.2.7 Security Initialization Proposal for SBC (96-186r1) [Weber/Lohmeyer]
 - 6.3 Review of SCSI-3 Enclosure Services (SES) Letter Ballot Comments [Snively]
 - 6.4 SPC-2 Project Proposal (96-225r0) [Weber]
 - 6.4.1 Proposal for Additional Persistent Reservation Functions (96-233r0) [Coughlan]
 - 6.4.2 Questions on Persistent Reservations (reflector message) [Monia]
 - 6.4.3 SPC Link Event Timeout (96-248r0) [Stephens]

6.5 Commands required by SCSI-2 and optional in SCSI-3 (96-230r0) [Penokie]

7. Other Topics

- 7.1 Greater than 8GB Technical Report Review [Lamers/Penman]
- 7.2 High Availability SCSI Profile (1224-DT) [Hagerman] {Wednesday pm}
- 7.3 SAM-2 First Draft (1157-D & 96-169r1) [Monia]

8. Meeting Schedule

9. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the X3T10 Chair, called the meeting to order at 9:00 a.m., Tuesday September 10, 1996. He thanked Charles Monia of Digital Equipment for hosting the meeting.

As is customary, the people attending introduced themselves and a copy of the attendance list was circulated. Copies of the draft agenda and general information on X3T10 were made available to those attending.

2. Approval of Agenda

The draft agenda was approved with the following additions:

- 5.7 SAM ISO Comments Review (96-236r0) [Monia]
- 5.8 Logical Unit Reset Question [Monia]
- 6.2.5 ESDI Reference [Milligan]
- 6.2.6 SBC Revision 5 review [Milligan]
- 6.2.7 Security Initialization Proposal for SBC (96-186r1) [Weber/Lohmeyer]
- 6.4.2 Questions on Persistent Reservations (reflector message) [Monia]
- 6.4.3 SPC Link Event Timeout (96-248r0) [Stephens]
- 6.5 Commands required by SCSI-2 and optional in SCSI-3 (96-230r0) [Penokie]
- 7.3 SAM-2 First Draft (1157-D & 96-169r1) [Monia]

3. Attendance and Membership

Attendance at working group meetings does not count toward minimum attendance requirements for X3T10 membership. Working group meetings are open to any person or organization directly and materially affected by X3T10's scope of work.

The following people attended the meeting:

Name	S	Organization	Electronic Mail Address
Mr. Norm Harris	P	Adaptec, Inc.	nharris@eng.adaptec.com
Mr. Lawrence J. Lamers	A	Adaptec, Inc.	ljlammers@aol.com
Mr. Edward Fong	P	Amdahl Corp.	esf10@amail.amdahl.com
Mr. Michael Wingard	O	Amphenol Interconnect	mikwingard@aol.com
Mr. Ron Roberts	A	Apple Computer	rkroberts@aol.com
Mr. Peter Johansson	P	Congruent Software, Inc.	pjohansson@aol.com
Mr. Greg McSorley	O	Data General Corp.	greg_mcsorley@dgc.ceo.dg.com
Mr. Charles Monia	P	Digital Equipment Corp.	monia@shr.dec.com
Mr. William Dallas	A#	Digital Equipment Corp.	dallas@wasted.enet.dec.com
Mr. Douglas Hagerman	A#	Digital Equipment Corp.	hagerman@starch.enet.dec.com
Mr. Tom Coughlan	V	Digital Equipment Corp.	coughlan@star.enet.dec.com

Mr. Mark Hammang	V	FCPA Intellistor (Fujitsu)	m hammang@intellistor.com
Mr. Andy Chen	A	Fujitsu Computer Prods Amer	achen@fcpa.fujitsu.com
Mr. George Penokie	P	IBM Corp.	gop@rchvmp3.vnet.ibm.com
Mr. Geoffrey Barton	P	Iomega Corp.	glbarton@iomega.com
Mr. Dennis Moore	P	KnowledgeTek, Inc.	dmoore@netcom.com
Mr. Dean Wallace	P	Linfinity Micro	75671.3443@compuserve.com
Mr. Robert Bellino	P	Madison Cable Corp.	robert_bellino@madisonusa .ccmail.compuserve.com
Mr. Pete McLean	P	Maxtor Corp.	pete_mclean@maxtor.com
Mr. Edward A. Gardner	P	Ophidian Designs	gardner@acm.org
Mr. Skip Jones	P	QLogic Corp.	sk_jones@qlc.com
Mr. Mark Evans	A	Quantum Corp.	mevans@qntm.com
Mr. Gene Milligan	P	Seagate Technology	Gene_Milligan@notes.seagate.com
Mr. Erich Oetting	P	Storage Technology Corp.	Erich_Oetting@Stortek.com
Mr. Robert N. Snively	P	Sun Microsystems Computer Co	bob.snively@eng.sun.com
Mr. Vit Novak	A	Sun Microsystems, Inc.	vit.novak@sun.com
Mr. John Lohmeyer	P	Symbios Logic Inc.	john.lohmeyer@symbios.com
Mr. Ralph O. Weber	A#	Symbios Logic Inc.	roweber@acm.org
Mr. Rod DeKoning	A	Symbios Logic Inc.	rod.dekoning@symbios.com
Mr. Kenneth J. Hallam	P	UNISYS Corporation	ken.hallam@mv.unisys.com
Mr. Paul D. Aloisi	P	Unitrode Integrated Circuits	Aloisi@uicc.com
Mr. Jeffrey L. Williams	P	Western Digital Corporation	jwilliam@wdroc.wdc.com

32 People Present

Status Key: P - Principal
A,A# - Alternate
O - Observer
L - Liaison
V - Visitor

4. Physical Topics

4.1 Review of SPI Amendment (SPI Amnd) Letter Ballot Comments [Lamers/Johansson]

Larry Lamers described his comments on the SPI amendment. He noted that his comments included ISO letter ballot comments for SPI. Larry said that all his comments were editorial. Then, Larry reviewed all the ISO comments. All of Larry's comments (and the ISO comments) were accepted.

Gene Milligan reviewed his comments. The resolution for Gene's comment 1 was decided to be the creation of a separate clause for each annex. In response to one of Gene's comments 2 and 3, the working group decided to add an agenda item to discuss and revise the SCSI Roadmap, the standards family bibliography, and the definition of SCSI vs. SCSI-3 at the next general working group meeting. Larry declared comments 2 and 3 unresolved, pending the discussion at the next working group meeting.

Based on Gene's comment 5, it was agreed that a correction is required in section 10.4.1 bullet f. The phrase "shall change any signals" needs to be corrected to read "shall not change any signals".

The working group took special note of Gene's comment 7, to wit: "... be prepared to answer the question, 'why in the case of SCAM did we use the opposite signal convention (asserted low) as compared to the convention in the rest of the document?'"

4.2 Arbitration Fairness (96-172) [Lohmeyer]

The working group recommended that 96-172 be developed into the proper format for inclusion into SPI-2.

4.3 Document Strategy

John Lohmeyer reviewed the status of Project 1142-D and pointed out that the issue of whether the SIP layer is included in Project 1142 is still open. Gene Milligan stated that including the SIP function in SPI-2 has the advantage of simplifying of the documentation by eliminating the awkward service interface. Various members of the group questioned Gene's statement, asserting that the service interface would be needed in any case.

George Penokie (the SIP technical editor) was pressed to approve or disapprove of merging SIP into SPI-2. George was reluctant to state an opinion, resulting from his lack of due consideration of the problem. John expressed the belief that SCAM and arbitration fairness would benefit from merging SIP into SPI-2. George was not convinced, noting that all the arbitration fairness issues could be covered in SPI-2, because arbitration is already covered almost totally in SPI.

The group explored various questions of benefit or difficulty associated with merging SIP into SPI-2. Some members thought that merging the documents would be beneficial, but others felt that the merged document would be more difficult to deal with. The working group reached no specific resolution regarding merging SIP into SPI-2.

4.4 Missing SPI Requirement (reflector message) [Milligan]

The SPI-2 working group on Monday agreed to added the "missing requirement" to SPI-2. The missing requirement was that a node's capacitance is measured at the end of the stub (not necessarily the device connector).

5. Protocol Topics

5.1 Problem with Non-interlocked Busses (96-173r0) [Monia]

Charles Monia requested that this topic be removed from this agenda and future agendas.

5.2 New Task Management Models for SAM (96-198r2) [Johansson]

Peter Johansson presented what he felt would be the final revision of the proposal defining the basic queuing model. He noted that the affected documents would be SPC and SAM-2. The group discussed the proposal and made minor revisions. Peter agreed to generate a new draft containing the working group changes. The working group agreed to make a favorable recommendation to the November plenary regarding acceptance of the revised proposal for inclusion in SAM-2 and SPC-2. The working group was reluctant to consider the proposal at this (the September) plenary, due to the far-reaching effects of the proposal.

5.3 SAM-2 Changes & Layered Architecture (96-191r0) [Monia] {Tuesday 5:30 pm}

Charles Monia requested that this topic be dropped from this and future agendas.

5.4 Add Mode Page for Fibre Channel features (96-195) [Houlder] {November '96}

By email, Gerry Houlder requested that this item be deferred until November.

5.5 Tape Support on FC-AL (Reflector Messages) [Hagerman] {Wednesday pm}

Doug requested that discussion of this topic deferred to the November working group meeting. He noted that Bill Dallas is preparing a description of three proposed solutions. The serial concerns study group requested that Bill's proposal be considered under this topic at the next working group meeting.

5.6 SBP-2 Status [Johansson]

Peter reported that a SBP-2 working group met on September 9 and 10 in Natick, MA (co-located with this working group meeting) and discussed SBP-2 revision 1b. The SBP-2 working group focused its review on those sections that specify asynchronous devices (i.e., the customary model where data is transferred between medium and a buffer address). The isochronous sections were deferred to a later review.

SBP-2 is evolving into a protocol document that has general applicability for the transport of command, data and status for most any command set, not only SCSI. Early focus of use for SBP-2 is expected to be mass storage, although the command set of choice depends on whom is doing the choosing.

The SBP-2 working group schedule is:

Sept 23-24, Irvine, CA
Oct 10-11, Redmond, WA
Nov 11-12, Irvine, Ca

Peter asked people interested in information about SBP-2 working group activities to contact him at pjohansson@aol.com.

Peter was asked about SAM compliance and SBP-2. Peter responded that SBP-2 is moving toward being completely command set independent. He noted that development on SBP-2 is being guided toward allowing SAM compliant usage of the SBP-2 protocol for transmission of SCSI commands and responses. This was a sufficiently obtuse response to generate a lengthy explanation and discussion.

5.7 SAM ISO Comments Review (96-236r0) [Monia]

Charles reviewed 96-236r0 which contains his proposed responses to the ISO comments regarding SAM. In his opinion, all changes are editorial.

5.8 Logical Unit Reset Question [Monia]

Charles ask the group to consider logical unit resets in the case where there is a hierarchy of logical units under (behind) a given logical unit address. Charles was referred to the hierarchy definition in SCC. The group discussed the usage of addressing hierarchy as it is used in SCC, today.

6. Command Set Topics

6.1 Obsolete Field Checking (96-237r0) [Milligan]

Gene Milligan read the message he had posted to the reflector. While researching the proposal, he noticed that there is no statement requiring a particular action when a target receives a command containing an unsupported operation code. Gene felt that obsolete field checking should be dealt with on a case-by-case basis. In the case of RESERVE(6) and RELEASE(6), Gene proposed that the following wording be added to a future version of SPC:

“Obsolete Bits 1 through 4 of Byte 1 provided a method, limited to device addresses 0 through 7, to handle third party reservations in earlier versions of the SCSI standard. The obsolete method has been replaced by the RESERVE(10) and RELEASE(10) and/or the PERSISTENT RESERVE commands. If Byte 1, Bit 4 is equal to one device servers not implementing the obsolete method shall terminate the command with CHECK CONDITION status and the sense key shall be set to ILLEGAL REQUEST.”

It was noted that Persistent Reservations do not include the concept of third-party reservations. Bob Snively said that until XOR functions were added, only COPY commands needed third-party functions, which he felt was of little value. He may want to re-visit the third-party function in Persistent Reservations. Gene expressed a preference for either eliminating third-party from RESERVE and RELEASE or adding third-party to Persistent Reservations.

The working group recommended that Gene's proposed wording, minus the phrase about PERSISTENT RESERVE, be accepted for a future version of SPC.

6.2 SCSI-3 Block Commands (SBC) [Milligan]

6.2.1 Should READ(6) be mandatory? (96-229) [Penokie]

George Penokie presented a proposal that READ(6) be changed from optional (as approved at the last meeting) to mandatory (as was the case prior to July 1996). George's proposal listed several reasons for undoing the actions of the last meeting. The group conducted a discussion of what is SCSI-2 and what is SCSI-3 and then returned to the specific issues of READ(6).

Gene Milligan presented a proposed revision of SBC showing three categories (A, B, and C) for implementations. Each category had slightly different requirements for mandatory, optional, and obsolete commands. Gene described Category A as covering disk drives using 512 byte blocks and formatted for capacities up to 1 GigaByte. Category B would cover disks up to 2 TeraBytes. Category C was the only category that made any commands obsolete. Questions were raised about the need for three categories.

A straw poll was taken regarding returning READ(6) to mandatory. The straw poll favored making READ(6) mandatory 10 to 3, with 4 having no opinion. A straw poll was taken regarding the concept of command set categories (using Gene's presentation as an example but not the exact choice being balloted). There were 2 votes favoring the category proposal and 7 votes against.

6.2.2 Should SEEK be obsolete? [Milligan]

After a brief discussion, the group decided that SEEK had never been made obsolete, by a plenary vote. It further was agreed that SEEK should not be made obsolete.

6.2.3 Additional Medium Type Codes for 3.5-inch Flexible Disk Medium (reflector message)

John Lohmeyer said that he added this item to the agenda after receiving a request for more information regarding high-density 3.5-inch flexible disk medium. No resolution was reached regarding addition of a density code (mostly because no one was familiar with any applicable medium standards).

6.2.4 SCSI-2 and SBC Error in FDD Table regarding Pin 4 usage (reflector message) [Milligan]

Gene Milligan described a problem with table 84 in revision 5. With the unanimous consent of the group, he was authorized to adopt the proposal in the editor's note in revision 5.

6.2.5 ESDI Reference [Milligan]

Gene noted that the sentence immediately before table 96 on page 120 of SBC revision 5 contains a reference to the ESDI standard. George Penokie suggested that the reference should be removed and the group concurred.

6.2.6 SBC Revision 5 review [Milligan]

Gene Milligan led the group in a review of the changes from previous revisions found in SBC revision 5. Gene noted that he had added as mandatory the 10-byte forms of RESERVE and RELEASE to the command tables for optical memory block devices and write-once block devices.

The working group recommended that density codes 02h and 07h be removed from the list of density codes and, thus, be made reserved. Ken Hallam noted that no products had ever been built using the 02h and 07h density codes.

The group requested an all-day SBC editing on November 8, to be followed by a letter ballot on forwarding SBC to first public review.

6.2.7 Security Initialization Proposal for SBC (96-186r1) [Weber/Lohmeyer]

Gene Milligan noted that the proposal has been incorporated in SBC revision 5. A plenary vote must be taken to support inclusion of the proposal in SBC at the September meeting.

6.3 Review of SCSI-3 Enclosure Services (SES) Letter Ballot Comments [Snively]

Bob Snively led a review of the letter ballot comments and proposed responses for SES. Bob noted that the majority of the comments are editorial in nature, and probably not controversial. Bob then turned to discussing the controversial comments.

The first controversial comment was one requesting that Annex A (sub-enclosure addressing) be removed. After a brief discussion, the group agreed that the comment should be rejected and Annex A should remain. Discussion of Annex A was followed by several discussions of various editorial and style issues. The group reached consensus regarding the resolution of each editorial and style issue.

Several technical changes were discussed, modified, and approved. Bob agreed to prepare a comments and resolutions document covering all the letter ballot comments for SES. He described his plans to prepare a new SES revision based on the final contents of the comments and resolutions document.

6.4 SPC-2 Project Proposal (96-225r0) [Weber]

The group reviewed the proposal for a next-generation SPC (a.k.a. SPC-2), suggested some minor changes, and recommended that X3T10 forward the project proposal to X3.

6.4.1 Proposal for Additional Persistent Reservation Functions (96-233r0) [Coughlan]

Tom Coughlan presented 96-233r0, which would add a new “shared access, registrants only” reservation type to Persistent Reservations. This reservation type only locks out initiators that have not issued the same reservation type. The group response to the proposal was generally favorable. Tom agreed to write a more specific proposal for SPC-2.

6.4.2 Questions on Persistent Reservations (reflector message) [Monia]

Charles Monia asked whether the clear action for preempt and clear applies to both ACA and CA. Currently, it only applies to ACA. Feedback was that it should apply to both. Charles will prepare a proposal for SPC-2 and SAM-2.

6.4.3 SPC Link Event Timeout (96-248r0) [Stephens]

Gary Stephens described a need for an addition to the disconnect-reconnect mode page based on the Private Loop Device Attach profile (for FC-AL). The group discussed the need for the proposed parameter at length. The group also discussed other mechanisms for passing the proposed parameter from the initiator to the target. Gary agreed to revise the proposal based on the discussion at the working group. The group generally agreed with the proposal, but declined to formally recommend the proposal at this meeting.

6.5 Commands required by SCSI-2 and optional in SCSI-3 (96-230r0) [Penokie]

George described a proposal for enhancing Inquiry data to provide information on SCSI-2 command support in INQUIRY data returned by SCSI-3 devices. The group discussed the proposal and reached no conclusion. George agreed to reconsider the wording of the proposal and bring an equivalent proposal to the next working group meeting.

7. Other Topics

7.1 Greater than 8GB Technical Report Review [Lamers/ ???]

At the request of Dan Colegrove (with agreement from Larry Lamers), discussion of this topic was deferred to the November working group meeting. We are still looking for a volunteer to edit this technical report.

7.2 High Availability SCSI Profile (1224-DT) [Hagerman] {Wednesday pm}

Doug Hagerman distributed revision 1 of the draft Profile for SCSI Components Used in High Availability Environments. Doug asked the group to review the draft and send comments to him. The group discussed several standards wording issues, including terminology and patents. Gene noted that the current ANSI patent policy does not cover technical reports, which represents an issue for this project.

Doug noted that the new draft covers only parallel SCSI busses, other busses and protocols have been dropped from the draft.

7.3 SAM-2 First Draft (1157-D & 96-169r1) [Monia]

Charles led a review of the changes in SAM-2 (with respect to SAM) thus far (96-169r1). During the discussion of new material in SAM-2, it was noted that SAM-2 should contain a discussion of multi-port SCSI devices. There was a lengthy discussion of the meaning of, and need for, a formal definition of "send" and "return". Several other proposed changes in 96-169r1 generated questions and debate.

8. Meeting Schedule

The next meeting of X3T10 SCSI Working Group will be November 5-6, 1996, in Palm Springs, CA at the Hyatt Regency Hotel (619-322-9000), hosted by Adaptec.

9. Adjournment

The meeting was adjourned at 5:00 p.m. on Wednesday September 11, 1996.