Accredited Standards Committee*
National Committee for Information Technology Standards (NCITS)

To: Membership of T10

From: Ralph Weber, Secretary T10
           Larry Lamers, Vice-chair T10
           John Lohmeyer, Chair T10

Subject: Minutes of SCSI Working Group Meetings
           Colorado Springs, CO -- July 15-16, 1997

Agenda

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    7.11 SPI-2 Revision 12 Protocol Topics Review [Penokie]
    7.12 High-Availability Profile (HAP) [Milligan]

8. Meeting Schedule

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<center>**Results of Meeting**</center>

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 9:00 a.m., Tuesday July 15, 1997. He thanked Symbios Logic 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 T10 were made available to those attending.

2. Approval of Agenda

The draft agenda was approved with the following additions:

> 4.2 REQ/ACK Glitch Filters [Ham]
> 4.3 Latching and Counting (97-182) [Novak/Ham]
> 4.4 Initiator Monitoring of Bus Free [Williams]
> 4.5 EPI Grounding Clauses [Ham/McSorley]
> 4.6 Hot Plugging [Ham]
> 4.7 EPI Summary
> 7.8 Naming of Dual-Clocking SCSI
> 7.9 Persistent Reservations [Snively]
> 7.10 SPI-2 Protocol Topics Review [Penokie]

The following agenda items were moved to a separate agenda for the SCSI Protocol Study Group:

> 5. SCSI Protocol {Tuesday Afternoon}
> 5.1 CRC Attach (97-197) [Asami]
> 5.2 Status/Message Simplification (97-198) [Asami]
> 5.3 Quick Arbitrate & Select (97-199) [Kosco]
> 5.4 Broadcast Command Packet (97-200) [Kosco]
> 5.5 Comments on 97-198r0, Status/Message Simplification 997-205) [Lohmeyer]
> 5.6 Higher Performance SCSI [Ham]

3. Attendance and Membership

John reminded the group that attendance at working group meetings does not count toward minimum attendance requirements for T10 membership. He noted that 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:

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        Name            S        Organization        Electronic Mail Address
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Mr. Norm Harris        P  Adaptec, Inc.            nharris@eng.adaptec.com
Mr. Vincent Bastiani   A# Adaptec, Inc.            bastiani@corp.adaptec.com
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Mr. Tak Asami          V  Adaptec, Inc.            asami@itc.adaptec.com
Mr. Bill Gintz         V  Adaptec, Inc.            bgintz@corp.adaptec.com
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Dr. William Ham         A# Digital Equipment Corp.    ham@subsys.enet.dec.com
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Mr. Zane Daggett        P  Hitachi Cable               zdaggett@hcm.hitachi.com
                           Manchester,Inc
Mr. Kirk Rogers         A  Hitachi Cable               krogers@hcm.hitachi.com
                           Manchester,Inc
Mr. George Penokie      P  IBM Corp.                   gop@us.ibm.com
Mr. Dan Colegrove       A# IBM Corp.                   colegrov@us.ibm.com
Mr. Barry H. Wiley      V  IMP, Inc.                   bhwiley@impinc.com
Mr. Dean Wallace        P  Linfinity Micro             75671.3443@compuserve.com
Mr. Louis Grantham      A  Linfinity Micro             lgdatcom@ix.netcom.com
Mr. Alan Littlewood     P  LSI Logic Corp.             alanl@lsil.com
Mr. Pete McLean         P  Maxtor Corp.                pete_mclean@maxtor.com
Mr. Edward A. Gardner   P  Ophidian Designs            eag@ophidian.com
Mr. Skip Jones          P  QLogic Corp.                sk_jones@qlc.com
Mr. James McGrath       P  Quantum Corp.               JMCGRATH@QNTM.COM
Mr. Richard Uber        V  Quantum Corp.               duber@tdh.qntm.com
Mr. Pat McGarrah        V  Quantum Corp.               pmcgarra@tdh.qntm.com
Mr. Gene Milligan       P  Seagate Technology          Gene_Milligan@notes.
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Mr. Daniel (Dan) F.     A# Seagate Technology          daniel_f_smith@notes.
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Mr. Gerald Houlder      A  Seagate Technology          Gerry_Houlder@notes.
                                                       seagate.com
Mr. Dave Guss           P  Silicon Systems, Inc.       dave.guss@tus.ssi1.com
Mr. John Lohmeyer       P  Symbios Logic Inc.          john.lohmeyer@symbios.com
Mr. Ralph O. Weber      A  Symbios Logic Inc.          roweber@acm.org
Mr. Frank Gasparik      V  Symbios Logic Inc.          frank.gasparik@symbios.com
Mr. Tracy Spitler       V  Symbios Logic Inc.          tracy.spitler@symbios.com
Mr. Andy Brown          V  Symbios Logic Inc.          andrew.brown@symbios.com
Mr. Bill Schmitz        V  Symbios Logic Inc.          bill.schmitz@symbios.com
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Weston-Lewis
Mr. Kevin Gingerich     O  Texas Instruments, Inc.     k-gingerich@ti.com
Mr. Paul D. Aloisi      P  Unitrode Corporation        aloisi@unitrode.com
Mr. Gregory Kapraun     V  Western Digital Corp.       kapraun@wdroc.wdc.com

45 People Present

Status Key:  P   -  Principal
             A,A# - Alternate
             O   -  Observer
             L   -  Liaison
             V   -  Visitor
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4. EPI {Tuesday Morning}

4.1 Load Compensation [Novak]

Bill Ham had no new input on this topic and Vit Novak was unable to attend. So, this topic was deferred to the next meeting.

4.2 REQ/ACK Glitch Filters [Ham]

There was a lengthy discussion on the topic of glitch filters, based on a proposal from Bill Ham (97-215). George Penokie demanded that glitch filtering be made mandatory, but at somewhat reduced times from those in Bill's proposal. Two straw polls set the direction: 1) the working group recommended (13-3) to include wording on glitch filtering in SPI-2; 2) the working group recommended (12-2) that the wording be a recommendation and not a mandatory requirement.

Dave Guss offered some exceptional wording for the philosophy of filtering. He accepted an action to work with Bill Ham to revise the proposal.

4.3 Latching and Counting [Novak/Ham]

Bill Ham and Dave Guss presented a document prepared by Dave (97-216). The document started with tutorial information about how synchronous data transfers are processed. The tutorial was followed by a discussion of the types of failures that can occur. The group discussed the failure modes briefly.

Dave's conclusions included the belief that counting REQs and ACKs is beneficial only at the target. This conclusion was news to the group and required clarifying discussion.

4.4 Initiator Monitoring of Bus Free [Williams]

Jeff Williams reminded Bill Ham of a problem that needs to be included in the EPI results of the latching and counting work. The problem that concerned Jeff is a case where an initiator assumed that the bus would go free after a Disconnect message and failed to monitor the BSY signal thus missing a transition to Status phase driven by the target. The result was a hung bus.

4.5 EPI Grounding Clauses [Ham/McSorley]

Bill Ham reviewed the grounding text from EPI, submitted by Greg McSorley. A few changes were made as a result of the review.

4.6 Hot Plugging [Ham]

Bill Ham presented a figure showing the four stages of a connector mating process. Bill reviewed the four stages and the issues and mechanical concerns associated with each one.

The group also discussed hot plugging timing concerns with the text in SPI-2 revision 12. The main problem was the inability to verify conformance to the requirements, as worded. George Penokie agreed to add a note to the next revision of SPI-2.

4.7 EPI Summary

Bill Ham expressed an intention to bring a complete EPI draft document for discussion to the next meeting.

5. SCSI Protocol {Tuesday Afternoon}

See the separate minutes for the SCSI Protocol Study Group in 97-211.

6. Enclosure Profile Study Group {Wednesday Morning}

George Penokie announced that SCC-2 revision 2 is available in printed copy at this meeting. He informed the group that he is resolving comments from Ralph Weber, which are editorial and would have been delivered as letter ballot comments if not processed at this time. George announced plans to process SCC-2 revision 3 via letter ballot toward first public review. In the absence of any objections, the working group recommended that T10 issue a letter ballot on forwarding SCC-2 revision 3 toward first public review.

Rod DeKoning presented a proposal for development of a profile Technical Report that would describe how SCC-2 and SES can be used for open, general RAID storage management (97-217). Gene Milligan asked for an explanation of how the proposed work relates to the DMTF (Desktop Management Task Force). The group discussed DMTF at length and concluded that the proposed profile does not conflict with the DMTF activities, and might act as a new, important input to DMTF work.

Rod agreed to work with Doug Hagerman to rationalize the scope of the enclosure profile and the HAP project.

Rod's summary concepts were received positively by the group. The process of writing a project proposal for the technical report was discussed. It was decided that forwarding of the project proposal will not occur until the

September meeting. A draft outline of the TR will be developed in the interim, mostly to promote broader interest in the work. It was agreed that another study group meeting will be held on Wednesday morning of the general working group meeting (10 September 1997). The draft project proposal will be distributed at least two weeks prior to that meeting.

> Chair's Note: The Enclosure Study Group meeting was moved to Wednesday afternoon (10 September 1997) as the result of a request made at the T10 plenary meeting.

7. General Topics {Wednesday Afternoon}

7.1 Addressing Model for SAM-2 (was REPORT LUNS Issue) (97-122r3) [Penokie]

George Penokie presented a proposal the net effect of which would be incorporating the salient aspects of the SCC hierarchical LUN addressing mechanisms in SAM-2 and SPC-2. George accepted several changes to the proposal. George agreed to bring a revised draft of the proposal to the next working group meeting.

7.2 STS Review [Johansson]

Peter Johansson was unable to attend the meeting and discussion of this topic was deferred to the next meeting.

7.3 SCSI Socket/SSL Services (SSS) Review (97-201r0) [Parker]

Keith Parker presented a review of the current concepts in the SSS project, 97-201. A major thrust of the review as a proposal that the SCSI commands be defined in terms of remote procedure calls. Keith proposed the creation of a second project to contain the remote procedure calls definitions. Gene Milligan and Bob Snively proposed that the upper layers of the proposed bifurcated specification appear as an annex in the currently proposed document.

The group discussed the concepts and advantages of socket services. Issues regarding the assignment of a device type and an embedded capability bit in the Inquiry data also were discussed. However, specific action was deferred until a draft SSS document was available for review.

Keith agreed to prepare a draft SSS document for group consideration. He felt that the draft would not be available in time for the next committee mailing, but hoped it would be available by the next meeting.

7.4 QErr Recovery in HAP (97-187) [Monia]

Charles Monia was unable to attend this meeting and this issue was deferred to the next meeting.

7.5 Prevent Allow Medium Removal Issue (96-___) [Oetting]

Erich asked that this item be dropped from this and future agendas.

7.6 Should I/O be allowed to be asserted during SCAM Selections? (reflector messages) [Tony DeLaCruz]

Gerry Houlder said that I/O signal should not be set during SCAM, but could find no written requirement that I/O shall not be set. John Lohmeyer proposed that the SCAM Annex in SPI-2 be changed to include a requirement that I/O shall not be set during SCAM.

Gerry Houlder and Jim McGrath said that a blanket statement does (or should) exist that limits signal level changes to those specified in the standard. The group struggled with the wording of a blanket statement, but Jim McGrath and Larry Lamers expressed a strong belief that a blanket statement would cause more confusion than it would resolve. Larry felt that no change at all might be the best resolution for the problem.

The only conclusion reached was that the discussion of this topic will be dropped from the next agenda.

7.7 Warning/PFA ASC Reporting Selection (97-203) [Penokie]

George Penokie presented revisions 0 and 1 of a proposal to provide additional reporting controls in the informational exceptions control mode page. He reviewed the history of the proposal and noted one additional change based on discussions on the SCSI Reflector. In the absence of any objections, the group recommended that the Plenary accept 97-203r2 (the proposal presented, as revised) for inclusion in SPC-2.

7.8 Naming of Dual-Clocking SCSI

The group agreed to defer the naming decision regarding clocking on the leading and trailing edges of REQ and ACK pulses to STA. (Chair's note: STA decided to not create a name for this feature; they do not want to explain it. I suggest T10 internally call it 'double-edge clocking'.)

7.9 Persistent Reservations (97-218) [Snively]

Bob Snively presented three problems with the SPC text defining persistent reservations (97-218r0). The group asked Bob to move some of the concepts in his proposal out of the clauses that are specific to persistent reservations to the clause defining the general model for reservations, in effect making some of the concepts common to both SCSI-2 (or regular) reservations and persistent reservations.

Bob agreed to bring a new revision of the proposal to the next meeting.

7.10 REPORT LUNs Command Requirement (97-219) [Oetting]

Erich Oetting presented a proposal regarding when support for the REPORT LUNS command is mandatory. The group discussed the proposal and made several corrections. In the absence of any objections, the working group recommended that T10 accept the proposal, as revised, for inclusion in SAM-2 and SPC-2.

7.11 SPI-2 Revision 12 Protocol Topics Review [Penokie]

George Penokie lead the group in a review of the protocol topics in SPI-2, formerly SIP. He started the discussion by announcing that bus 'phases' are back and 'service interfaces' are gone. George accepted several corrections for SPI-2 in the protocol clauses and agreed to provide a revised SPI-2 document for the next meeting.

George informed the group that he has heavily rewritten Annex C (SCSI Bus Fairness Techniques) from the committee approved proposal document. He asked everyone to review Annex C carefully.

In addition, the following issues were identified for further consideration, with the intent that they be specifically reviewed during the next meeting:

   a) RE: editor's note 30; what is the real intent of 96-268 and how does that affect the current content of SPI-2?
   b) Look at SAM to make sure that clause 11.5.4 correctly describes how to respond to task management functions.
   c) What does Annex A apply to, who has to meet it's requirements?

George announced that an editorial review meeting is being planned for August 27 in San Jose, hosted by Unitrode. This meeting may be changed to a teleconference or both. Contact George Penokie for details.

7.12 High-Availability Profile (HAP) [Milligan]

Doug Hagerman reported no progress on rewriting HAP. Gene Milligan, George Penokie, Ralph Weber, and Doug discussed when and how a queue should be frozen in the presence of an error. The SAM requirement for a single work queue per logical unit (as opposed to a work queue per initiator per logical unit) was discussed as it relates to the freezing of activities in the presence of an error.

The group agreed that HAP will be reworded to reflect the SCSI-3 queuing model with respect to handling of Contingent Allegiance. In addition, Gene Milligan will prepare a proposal that expands the handling of errors in SCSI-3 to allow continued processing of commands from initiators other than the initiator that received the error. Gene's proposal will include identification of the new behavior via some additional usage of an existing mode page.

8. Meeting Schedule

The next meeting of SCSI Working Group will be September 9-10, 1997, in Nashua, NH at the Crowne Plaza Nashua Hotel (603-886-1200), hosted by Unitrode.

9. Adjournment

The meeting was adjourned at 5:00 p.m. on Wednesday July 16, 1997.