

Accredited Standards Committee*

National Committee for Information Technology Standards (NCITS)

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Date: February 22, 2000

Reply to: John Lohmeyer

To: T10 Membership
From: Ralph Weber and John Lohmeyer
Subject: SCSI Physical Working Group Meeting -- January 10-11, 2000
Surfers Paradise, Queensland, Australia

Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. SPI-3 Topics
 - 4.1 SPI-3 Letter Ballot Comments Review [Penokie]
 - 4.2 Packetized L_Q IU type field changes (reflector messages) [Penokie]
 - 4.3 WDTR/SDTR/PPR Interactions (00-119) [Penokie]
 - 4.4 Breaking a multiple type command sequence (reflector messages) [Srinivasan]
5. SPI-4 Topics
 - 5.1 Load Compensation [Novak]
 - 5.2 SCSI out of band communications method (99-213) [Petty]
 - 5.3 Extended Addressing for SPI-4 (99-249, 99-250) [Monia]
 - 5.4 SPI-4 ISI reduction via transmit pre-compensation (99-260, 99-332) [Petty]
 - 5.5 SPI-4 timing budget utilizing receiver signal deskew method (99-261) [Petty]
 - 5.6 SPI-4 clocking proposal (99-262) [Petty]
 - 5.7 Margin Control (99-264) [Lamers]
 - 5.8 Flow Control & Continue I/O Process Flag (99-142) [Lamers]
 - 5.9 Proposal for Fast-160 to be included in SPI-4 (99-295) [Milligan]
 - 5.10 Proposal for turn-on/turn-off of a free-running clock (99-298) [Evans]
 - 5.11 Fast-160 Phase Encoded Data Enabling (99-323) [Moore]
 - 5.12 ISI Measurements for Ultra4 Discussion (99-326) [Smith]
 - 5.13 ISI Measurements (99-337) [Bridgewater/Bastiani]
 - 5.14 Expander Guidelines (99-282) [Lamers]
 - 5.15 Echo Buffer Considerations (99-306) [Lamers]
 - 5.16 Compensation Techniques (00-104) [Bishop]
 - 5.17 Implementing Transmit Precompensation (00-103) [Uber]
 - 5.18 Ultra 320 Calibration Strategy (00-105) [Brown]
 - 5.19 Ultra 320 Summary and Conclusions (00-106) [McGarrah]
 - 5.20 Use of eye measurements [Bastiani]

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6. Domain Validation Technical Report Topics
7. New Business
8. Meeting Schedule
9. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 1:40 p.m., Monday January 10, 2000. He thanked Dal Allan of ENDL Pacific Technologies for hosting the meeting.

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

2. Approval of Agenda

The draft agenda was approved with no changes.

No agenda items were added or revised 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 | Electronic Mail Address |
|-----------------------|----|---------------------------------|-------------------------------------|
| Mr. Vincent Bastiani | A# | Adaptec, Inc. | bastiani@corp.adaptec.com |
| Mr. Robert C. Elliott | P | Compaq Computer Corp. | Robert.Elliott@compaq.com |
| Mr. Neil Wanamaker | P | Crossroads Systems, Inc. | ntw@crossroads.com |
| Mr. George O. Penokie | P | IBM Corp. | gop@us.ibm.com |
| Mr. Dennis Moore | P | KnowledgeTek, Inc. | dmoore@ix.netcom.com |
| Mr. John Lohmeyer | P | LSI Logic Corp. | lohmeier@t10.org |
| Mr. Ralph O. Weber | A | LSI Logic Corp. | roweber@acm.org |
| Mr. Jay Neer | P | Molex Inc. | jneer@molex.com |
| Mr. Mark Evans | P | Quantum Corp. | mark.evans@quantum.com |
| Mr. Gene Milligan | P | Seagate Technology | Gene_Milligan@notes. seagate.com |
| Mr. Bill Gintz | V | Seus, Inc. | wcgintz@ix.netcom.com |
| Mr. Robert N. Snively | P | Sun Microsystems Computer Co | bob.snively@sun.com |
| Mr. Vit Novak | A | Sun Microsystems, Inc. | vit.novak@sun.com |
| Mr. Paul D. Aloisi | P | Texas Instruments | Paul_Aloisi@ti.com |

14 People Present

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

4. SPI-3 Topics

4.1 SPI-3 Letter Ballot Comments Review [Penokie]

George Penokie led a review of the comments resolution for the letter ballot on forwarding SPI-3 to first public review (99-350r1). George noted that Bill Ham of Compaq had reviewed the resolutions for his comments prior to this meeting.

Neil Wanamaker defended his letter ballot comment that the use of RESTORE DATA POINTERS in packetized for error recovery in SPI-3 lacks functionality that was present for parallel in SPI-2. George stated that the packetized definition was appropriate because packetized is a new feature that does not work the same as non-packetized SCSI and does not need the same error recovery capabilities in its RESTORE DATA POINTERS function.

In response to comments from Rob Elliott, the use of capitalization and small caps was changed in several places relating to the packetized failure code field.

In response to a comment from Gene Milligan, the group decided to continue allowing the use of TERMPWR for powering devices other than terminators, but to make the details of such use outside the scope of the standard, thus returning SPI-3 to nearly the same position as what appeared in SPI-2.

In response to comment 9.2.28 (see 99-350r1), the group agreed on specific wording changes to the definition of the REQ/ACK period.

The group investigated problems with the hot plugging behavior of the SCA-2 connector and agreed on several steps to be taken over the course of this meeting and the next meeting to finalize a response.

George discussed the Quantum comments with Mark Evans, noting that this was the first time Mark was able to attend a comments resolution review meeting. Mark agreed that all his comments had been resolved satisfactorily.

At the completion of the review, George stated that all comment resolutions had been discussed with the comment authors and that, in his opinion, the process of resolving the letter ballot comments was complete. He stated an intention to request approval of the letter ballot comment resolution at the plenary meeting.

4.2 Packetized L_Q IU type field changes (reflector messages) [Penokie]

George Penokie reported that this issue has been resolved in SPI-3 revision 12 and documented in the comments resolution document 99-350r1.

4.3 WDTR/SDTR/PPR Interactions (00-119) [Penokie]

George Penokie led the group in a discussion of how a target negotiates out of a transfer mode that cannot be entered except via a PPR (Parallel Protocol Request) message. Per an agreement from the December meeting, use of the PPR message is restricted to the initiator (to support legacy bus expanders). So, the target must have a way to use the SDTR (Synchronous Data Transfer Request) and WDTR (Wide Data Transfer Request) messages to negotiate out of a state that must have been established by a PPR message.

Following some discussions and inspections of old documents outside the meeting, George presented a substantially revised proposal. He showed that no conflicts occur in wording that previously thought to contain internal conflicts because one paragraph at issue referred to SDTR not WDTR. He proposed that a model section be developed for SPI-4. Then, he reviewed specific minor changes to be made in SPI-3.

In the absence of any objections, the group recommended approval of 00-119r1 (r0 as revised) for inclusion in SPI-3 coincident with the letter ballot comment resolution.

4.4 Breaking a multiple type command sequence (reflector messages) [Srinivasan]

In response to an e-mail message from Sriram Srinivasan, the group agreed to wording changes in SPI-3, to be handled as resolution of a letter ballot comment. The wording agreed to by the group differed from the wording proposed in the e-mail. George recorded the action agreed by the group in the comments resolution document (99-350r2) as comment number 178.5.

5. SPI-4 Topics

5.1 Load Compensation [Novak]

Vit reported that no new material is ready for presentation. He gave the group a brief review of his current work and the difficulties preventing further progress. Vit asked that this item be dropped from future agendas, until he requests time to present new information.

5.2 SCSI out of band communications method (99-213) [Petty]

This topic was deferred to a future meeting.

5.3 Extended Addressing for SPI-4 (99-249, 99-250) [Monia]

This topic was deferred to a future meeting.

5.4 SPI-4 ISI reduction via transmit pre-compensation (99-260, 99-332) [Petty]

This topic was deferred to a future meeting.

5.5 SPI-4 timing budget utilizing receiver signal deskew method (99-261) [Petty]

This topic was deferred to a future meeting.

5.6 SPI-4 clocking proposal (99-262) [Petty]

This topic was deferred to a future meeting.

5.7 Margin Control (99-264) [Lamers]

This topic was deferred to a future meeting.

5.8 Flow Control & Continue I/O Process Flag (99-142) [Lamers]

This topic was deferred to a future meeting.

5.9 Proposal for Fast-160 to be included in SPI-4 (99-295) [Milligan]

Gene Milligan presented a foil from 99-295 showing the setup and hold times. He asked the group how we should specify setup and hold timing given that the clocking signals will transition at the same time as the data signals. The conclusion was that since the skew compensation circuitry in the receiver creates the setup and hold times, the Fast-160 setup time will be specified as 0 +/- a tolerance and the hold time will be specified as the bit period with the same tolerance.

5.10 Proposal for turn-on/turn-off of a free-running clock (99-298) [Evans]

This topic was deferred to a future meeting.

5.11 Fast-160 Phase Encoded Data Enabling (99-323) [Moore]

This topic was deferred to a future meeting.

5.12 ISI Measurements for Ultra4 Discussion (99-326) [Smith]

This topic was deferred to a future meeting.

5.13 ISI Measurements (99-337) [Bridgewater/Bastiani]

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This topic was deferred to a future meeting.

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This topic was deferred to a future meeting.

5.17 Implementing Transmit Precompensation (00-103) [Uber]

This topic was deferred to a future meeting.

5.18 Ultra 320 Calibration Strategy (00-105) [Brown]

This topic was deferred to a future meeting.

5.19 Ultra 320 Summary and Conclusions (00-106) [McGarrah]

This topic was deferred to a future meeting.

5.20 Use of eye measurements (00-126r0) [Bastiani]

Vince Bastiani presented preliminary concepts for an eye diagram method to verify proper operation of a transmitter. The group raised several issues that were boiled down to lack of proper translation of the concepts to a parallel transfer environment from the serial Fibre Channel specifications that Vince used as a source for the presentation. Vince agreed to bring a revised presentation to the next meeting and to continue working on a formal proposal.

6. Domain Validation Technical Report Topics

This topic was deferred to a future meeting.

7. New Business

No new business was brought before the group.

8. Meeting Schedule

The next meeting of the SCSI Physical Working Group will be Wednesday, February 9, 2000 commencing at 1 p.m. recessing on Wednesday evening and resuming at 9 a.m. until 6 p.m. on Thursday, February 10, 2000 at the Hilton Waterfront Hotel (714-960-7873) in Huntington Beach, CA hosted by QLogic Corp. See 00-116 for meeting arrangements.

The subsequent meeting of this group is Tuesday, March 7, 2000 commencing at 9 a.m. until 8 p.m. at the Crowne Plaza Suites (972-233-7600) in Dallas, TX hosted by Texas Instruments.

The group proposed additional Physical Working Group meetings on March 27 starting at 1 pm and continuing to March 28 in Monterey, CA and April 27 starting at 1 pm and continuing to April 28 in Colorado Springs, CO.

Paul Aloisi requested that the Cable Performance and Signal Modeling Working Groups meeting schedules be included in these minutes. They are:

| Meeting | Date | Location / Contact |
|----------------|--------------------|------------------------------|
| Cable Perf. SG | 02/07/00 Mon 1:00p | Huntington Beach, CA / Jones |
| SCSI Model WG | 02/08/00 Tue 9:00a | Huntington Beach, CA / Jones |
| Cable Perf. SG | 02/29/00 Tue | Manchester, NH / Daggett |
| SCSI Model WG | 03/01/00 Wed | Manchester, NH / Daggett |
| Cable Perf. SG | 04/11/00 Tue | Monterey, CA / Abou-Jeyab |
| SCSI Model WG | 04/12/00 Wed | Monterey, CA / Abou-Jeyab |

9. Adjournment

The meeting was adjourned at 4:00 p.m. on Tuesday January 11, 2000.