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

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Date: February 17, 2000
Reply to: John Lohmeyer

To: T10 Membership
From: John Lohmeyer
Subject: SCSI Physical Working Group Meeting -- February 9-10, 2000
Huntington Beach, CA

Agenda

1. Opening Remarks
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3. Attendance and Membership
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   - 4.2 SPI-4 timing budget utilizing receiver signal deskew method (99-261) [Petty]
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   - 4.4 Proposal for Fast-160 to be included in SPI-4 (99-295) [Milligan]
   - 4.5 Proposal for turn-on/turn-off of a free-running clock (99-298) [Evans]
   - 4.6 Fast-160 Phase Encoded Data Enabling (99-323) [Moore]
   - 4.7 ISI Measurements for Ultra4 Discussion (99-326) [Smith]
   - 4.8 ISI Measurements (99-337) [Bridgewater/Bastiani]
   - 4.9 Compensation Techniques (00-104) [Bishop]
   - 4.10 Issues with Implementing Transmitter Pre-Compensation (00-103) [Uber]
   - 4.11 Ultra 320 Calibration Strategy (00-105) [Brown]
   - 4.12 Ultra 320 Summary and Recommendations (00-106) [Evans]
   - 4.13 Use of eye measurements (00-126) [Bastiani]
   - 4.14 Ultra320 SCSI Calibration Protocol (00-133) [Leshay]
   - 4.15 Proposal for training pattern to be included in SPI-4 (00-132) [Evans]
   - 4.16 Ultra320 SCSI vs. Ultra160 SCSI Eye Diagram Data (00-147) [Brown]
5. SPI-4 Protocol Topics
   - 5.1 SCSI out of band communications method (99-213) [Petty]
   - 5.2 Extended Addressing for SPI-4 (99-249, 99-250) [Monia]
   - 5.3 Margin Control (99-264) [Lamers]
   - 5.4 Flow Control & Continue I/O Process Flag (99-142) [Lamers]
   - 5.5 Expander Guidelines (99-282) [Lamers]
   - 5.6 Echo Buffer Considerations (99-306) [Lamers]
   - 5.7 Flow Control & Read Streaming (00-142) [Lamers]
   - 5.8 PPR Message Enhancements (99-283) [Lamers]

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 1:10 p.m., Wednesday February 9, 2000. He thanked Skip Jones of QLogic 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 the deletion of item 4.5:

4.5 Proposal for turn-on/turn-off of a free-running clock (99-298) [Evans] *{Agenda item deleted}*

During the course of the meeting, the following agenda items were added/revised:

4.1 SPI-4 ISI reduction via transmit pre-compensation (99-260, 99-332) [Petty] *{Agenda item deleted}*
4.2 SPI-4 timing budget utilizing receiver signal deskew method (99-261) [Petty] *{Agenda item deleted}*
4.9 Compensation Techniques (00-104) [Bishop] *{Agenda item deleted}*
4.11 Ultra 320 Calibration Strategy (00-105) [Brown] *{Agenda item deleted}*
4.16 Ultra320 SCSI vs. Ultra160 SCSI Eye Diagram Data (00-147) [Brown]
5.7 Flow Control & Read Streaming (00-142) [Lamers]
5.8 PPR Message Enhancements (99-283) [Lamers]

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. Lawrence J. Lamers	P	Adaptec, Inc.	ljlamers@ieee.org
Mr. Vincent Bastiani	A#	Adaptec, Inc.	bastiani@corp.adaptec.com
Mr. Wally Bridgewater	A#	Adaptec, Inc.	wally@eng.adaptec.com
Mr. Bill Galloway	P	BREA Technologies, Inc.	billg@breatech.com
Mr. Joseph Basista	O	C&M Corp.	joebasista@aol.com
Mr. Edward Haske	P	CMD Technology	haske@cmd.com
Mr. Robert C. Elliott	P	Compaq Computer Corp.	Robert.Elliott@compaq.com

Dr. William Ham	A	Compaq Computer Corp.	bill.ham@digital.com
Mr. Charles Tashbook	P	Dallas Semiconductor	charles.tashbook@dalsemi.com
Mr. Eugene Lew	P	Fujitsu	elew@fcpa.fujitsu.com
Mr. George O. Penokie	P	IBM Corp.	gop@us.ibm.com
Mr. John Lohmeyer	P	LSI Logic Corp.	lohmeyer@t10.org
Mr. Frank Gasparik	V	LSI Logic Corp.	frank.gasparik@lsil.com
Mr. Alan Littlewood	V	LSI Logic Corp.	alanl@lsil.com
Mr. William Petty	V	LSI Logic Corp.	william.petty@lsil.com
Mr. Larry Barnes	V	LSI Logic Corp.	larry.barnes@lsil.com
Mr. Michael Bratvold	V	LSI Logic Corp.	mike.bratvold@lsil.com
Mr. Brian Day	V	LSI Logic Corp.	brian.day@lsil.com
Mr. Makeshwar Kothandaraman	V	Lucent Technologies	makesh@lucent.com
Mr. Mark Strauss	V	Lucent Technologies	msstrauss@lucent.com
Mr. Jay Neer	P	Molex Inc.	jneer@molex.com
Mr. Richard Moore	A#	QLogic Corp.	r_moore@qlc.com
Mr. Dean Wallace	A	QLogic Corp.	d_wallace@qlc.com
Mr. Ting Li Chan	V	QLogic Corp.	t_chan@qlc.com
Mr. Richard L. Romaniec	V	QLogic Corp.	r_romaniec@qlc.com
Mr. Mark Evans	P	Quantum Corp.	mark.evans@quantum.com
Mr. Bruce Leshay	V	Quantum Corp.	bleshay@tdh.qntm.com
Mr. Richard Uber	V	Quantum Corp.	duber@tdh.qntm.com
Mr. Russ Brown	V	Quantum Corp.	russ.brown@quantum.com
Mr. Daniel (Dan) F. Smith	O	Seagate Technology	daniel_f_smith@notes.seagate.com
Mr. Mayank R. Patel	V	Seagate Technology	mayank_r_patel@notes.seagate.com
Mr. Bill Gintz	V	Seus, Inc.	wcgintz@ix.netcom.com
Mr. Ron Roberts	V	Sierra-Pac Technology	rkroberts@aol.com
Mr. Paul D. Aloisi	P	Texas Instruments	Paul_Aloisi@ti.com
Mr. Donald R. Getty	A#	Texas Instruments	donald_getty@ti.com
Mr. Mike Kosco	V	Texas Instruments	mike@mvbuilders.com

36 People Present

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

4. SPI-4 Physical Topics

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

Bill Petty asked that this item be deleted in favor of item 4.4.

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

Bill Petty asked that this item be deleted in favor of item 4.4.

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

Bill Petty presented 99-262r2, SPI-4 REQ/ACK ISI removal via qualified clocking method with combined Deskew Training method. Bill said that the main difference in this proposal is that it combines the training and clocking methods, which have to be considered together. Based on the input received, Bill said he would prepare another revision of his proposal to include on-demand training and toggling the signals prior to training to clear any ISI.

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

This topic was deferred to a future meeting.

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

Mark Evans asked that this item be deleted.

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

Richard Moore presented 99-323r2, Fast-160 Phase Encoded Data Enabling. George asked for a recommendation on the proposal. Larry Lamers and Bruce Leshay said that while they liked the concept and architecture, they felt that the training pattern is still premature. They prefered that the proposal not be adopted until there is agreement on the training pattern.

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

This topic was deferred to a future meeting.

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

This topic was deferred to a future meeting.

4.9 Compensation Techniques (00-104) [Bishop]

This topic was deleted.

4.10 Issues with Implementing Transmitter Pre-Compensation (00-103) [Uber]

Dick Uber presented 00-103r2, Issues with Implementing Transmitter Pre-Compensation. He said that the document was mostly a repeat of the same presentation from the December ‘99 meeting in Rochester.

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

This topic was deleted.

4.12 Ultra 320 Summary and Recommendations (00-106) [Evans]

Mark Evans presented 00-106r1, Ultra320 SCSI Summary and Recommendations. This document states the case for doing receiver equalization instead of transmitter precompensation. Wally Bridgewater asked for examples of parallel interfaces that use receiver equalization. Mark knew of none. Wally questioned whether receiver equalization would be stable enough to not introduce signal skews.

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

Vince Bastiani presented 00-126r1, Fast-160 Timing Specification. Bill Ham presented an impromptu foil on the case for defining a standard filter design for the purpose of measuring received signals. This provoked considerable discussion that converged on a request for Bill to write up his ideas. John assigned 00-149 to Bill to document his ideas.

4.14 Ultra320 SCSI Calibration Protocol (00-133) [Leshay]

Bruce Leshay presented 00-133r0, Ultra320 SCSI Calibration Protocol. Concern was expressed about the time to send the training pattern, which can exceed the data time. There were some suggestions on ways to minimize the impact by only training once per connection. Bruce plans to revise his proposal for the next meeting.

4.15 Proposal for training pattern to be included in SPI-4 (00-132) [Evans]

Mark Evans presented 00-132r0, Proposal for training pattern protocol to be included in SPI-4. He plans to revise the proposal for the next meeting.

4.16 Ultra320 SCSI vs. Ultra160 SCSI Eye Diagram Data (00-147) [Brown]

Russ Brown presented 00-147r0, Ultra320 SCSI vs. Ultra160 SCSI Eye Diagram Data. The data suggested that Ultra160 does not have adequate margin under worst case conditions. Increasing drive current beyond the minimum requirements in SPI-3 overcomes the problem. The Quantum people asserted that transmitter pre-compensation for Ultra320 would not work even with increased amplitude.

5. SPI-4 Protocol Topics

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

Bill Petty said he had made no changes to his proposal. He gave a brief overview of the proposal for the benefit of those who had not heard it before. He said that LSI had tested the protocol in the lab and had found no problems.

George Penokie questioned whether this proposal belongs in the SPI-4 document at all. It was suggested that the topic may more properly belong in the SDV project or in a new technical report project.

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

Larry Lamers asked that this topic be deleted from future agendas.

5.3 Margin Control (99-264) [Lamers]

Larry Lamers presented 99-264r3, Margin Control. There topic of whether the margin controls should be in a command or message was briefly debated with no resolution.

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

Larry Lamers asked that this topic be deleted from future agendas.

5.5 Expander Guidelines (99-282) [Lamers]

Larry Lamers asked that this topic be deleted from future agendas.

5.6 Echo Buffer Considerations (99-306) [Lamers]

Larry Lamers briefly presented 00-109r1, SPC-3 Echo Buffer Size. It was noted that this proposal is for SPC-2 and should be transferred to the SCSI Protocol WG agenda.

5.7 Flow Control & Read Streaming (00-142) [Lamers]

Larry Lamers presented 00-142r0, Flow Control & Read Streaming. His proposal uses the P0 signal to add flow control to read operations. Based on the discussion, he agreed to make several minor changes to rev 1 of his proposal.

5.8 PPR Message Enhancements (99-283) [Lamers]

Larry Lamers presented 99-283r1, PPR Message Enhancements. He noted that his marketing people had objected to calling speeds U1, U2, etc., so he now uses EWE1, EWE2, etc.

6. Domain Validation Technical Report Topics

Larry Lamers said that he expects to have a rev 0 document of the SDV technical report soon.

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 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 subsequent meetings of this group are March 27 starting at 1 pm and continuing to March 28 in Milpitas, CA and April 26 starting at 1 pm and continuing to April 27 in Colorado Springs, CO.

9. Adjournment

The meeting was adjourned at 12:40 p.m. on Thursday February 10, 2000.