

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

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Reply to: John Lohmeyer

To: T10 Membership
From: Ralph Weber & John Lohmeyer
Subject: SPI-3 Working Group Meeting -- July 12-13, 1999
Colorado Springs, CO

Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. SPI-3 Topics
 - 4.1 Review of SPI-3 working draft [Penokie]
 - 4.2 Normal Arbitration Fairness Control in SPI-3 (99-160r3) [Elliott/Houlder]
 - 4.3 Implied Assumptions in SPI-3 Timing Budget (99-127r6) [Aloisi]
 - 4.4 Asynchronous Information Protection (99-119r6) [Evans/Leshay]
 - 4.5 Proposal to change MSE High-Z Current Specification in SPI-3 (99-187r1) [Lohmeyer]
 - 4.6 Change CRC timing values (99-185r2) [Elliott & Childs]
 - 4.7 SPI-3 Table Restructuring (99-188r0) [Smith]
 - 4.8 Release Glitch Management for QAS (99-191r0) [Moore]
 - 4.9 Packetized error handling changes in SPI-3 (99-212r1) [Penokie]
 - 4.10 "Cable Stuff" (99-111r3 and 98-219r4) [Ham]
5. SPI-4 Topics
 - 5.1 Staged Contact Resistance (98-240r0) [Herrmann]
 - 5.2 Load Compensation [Novak]
 - 5.3 Cable/System Simulation Issues [Wallace]
 - 5.4 Next Generation Cable Performance [Ham]
 - 5.5 SCSI out of band communications method (99-213) [Petty]
6. New Business
 - 6.1 Domain Validation TR Project Proposal (99-214r0) [Lamers]
7. Meeting Schedule
8. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 1:10 p.m., Monday July 12, 1999. He thanked LSI Logic for hosting the meeting.

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

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2. Approval of Agenda

The draft agenda was approved with the following additions and changes:

4.3 Implied Assumptions in SPI-3 Timing Budget (99-127r6) [Aloisi]

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

- 4.10 "Cable Stuff" (99-111r3 and 98-219r4) [Ham]
- 6. New Business
- 6.1 Domain Validation TR Project Proposal (99-214) [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. Robert Frey	O	Advansys	bobf@advansys.com
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Mr. Bill Mable	P	Amphenol Interconnect	bmable@spectra.net
Mr. Gregg Neely	P	Andataco	greggn@andataco.com
Mr. Ron Roberts	A	Apple Computer	rkroberts@aol.com
Mr. Douglas Wagner	P	Berg Electronics	wagnerdl@bergelect.com
Mr. Joseph Basista	O	C&M Corp.	
Mr. Dennis Lang	A	Circuit Assembly Corp.	dennisl@circuitassembly.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. Ricardo Dominguez	O	Dell Computer	ricardo_dominguez@dell.com
Mr. Keith W. Parker	V	Diogenes SCSI	diogenes@europa.com
Mr. Paul Navarrez	V	FCI/Berg	
Mr. Stephen Jarvis	O	Foxconn	
Mr. Don Soracco	O	Foxconn I/O	
Mr. Eugene Lew	A	Fujitsu	elew@fcpa.fujitsu.com
Mr. Ben-Koon Lin	P	Fujitsu (FCPA)	blin@fcpa.fujitsu.com
Mr. Robert Starr	V	Hewlett Packard Co.	rstarr@hp.com
Ms. Jacqueline Sylvia	A	Hitachi Cable Manchester	jsylvia@hcm.hitachi.com
Mr. Anthony Yang	P	Hitachi Storage Products	anthony.yang@hal.hitachi.com
Mr. George O. Penokie	P	IBM Corp.	gop@us.ibm.com
Mr. Louis Grantham	P	Linfinit Micro	lgrantham@linfinity.com
Mr. John Lohmeyer	P	LSI Logic Corp.	lohmeier@ix.netcom.com
Mr. Ralph O. Weber	A	LSI Logic Corp.	roweber@acm.org

Mr. Frank Gasparik	V	LSI Logic Corp.	frank.gasparik@lsil.com
Mr. Alan Littlewood	V	LSI Logic Corp.	alanl@lsil.com
Mr. David Steele	V	LSI Logic Corp.	david.steele@lsil.com
Mr. Larry Barnes	V	LSI Logic Corp.	larry.barnes@lsil.com
Mr. Barry Caldwell	V	LSI Logic Corp.	barry.caldwell@lsil.com
Mr. William Petty	V	LSI Logic Corp.	william.petty@lsil.com
Mr. Arthur G. Rodgers	V	LSI Logic Corp.	art.rodgers@lsil.com
Ms. Jie Fan	P	Madison Cable Corp.	jfan@madisoncable.com
Mr. Chuck Grant	A	Madison Cable Corp.	cgrant@madisoncable.com
Mr. Pete McLean	P	Maxtor Corp.	pete_mclean@maxtor.com
Mr. Robert Griswold	V	Microsoft	rogris@microsoft.com
Mr. Martin Ogbuokiri	O	Molex Inc.	mogbuokiri@molex.com
Mr. Dean Wallace	A	QLogic Corp.	d_wallace@qlc.com
Mr. Richard Moore	V	QLogic Corp.	r_moore@qlc.com
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Mr. Richard Uber	V	Quantum Corp.	duber@tdh.qntm.com
Mr. Gene Milligan	P	Seagate Technology	Gene_Milligan@notes. seagate.com
Mr. Gerald Houlder	A	Seagate Technology	Gerry_Houlder@notes. seagate.com
Mr. Daniel (Dan) F. Smith	O	Seagate Technology	daniel_f_smith@notes. seagate.com
Mr. Van Ton	V	Seagate Technology	van_t_ton@seagate.com
Mr. Bill Gintz	V	Seus, Inc.	wcgintz@ix.netcom.com
Mr. Robert Morris	P	Silicon Systems, Inc.	bob.morris@ti.com
Mr. Stephen G. Finch	A	Silicon Systems, Inc.	steve.finch@tus.ssil.com
Mr. Paresh Sheth	V	SPG / TI	paresh.sheth@ti.com
Mr. Jeffrey Schroeder	O	ST Microelectronics	jeffrey.schroeder@st.com
Mr. Vit Novak	A	Sun Microsystems, Inc.	vit.novak@sun.com
Mr. Bruce Pearman	V	Trimm Technologies	bpearman@trimm.com
Mr. Paul D. Aloisi	P	Unitrode Corporation	aloisi@unitrode.com
Mr. Donald R. Getty	A	Unitrode Corporation	gettd@unitrode.com
Mr. Jeffrey L. Williams	P	Western Digital Corporation	Jeffrey.L.Williams@wdc. com

61 People Present

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

4. SPI-3 Topics

4.1 Review of SPI-3 working draft [Penokie]

During the review, the group discussed increasing the data length field size from three to four bytes in the SPI L_Q information unit. The straw poll was a 3:3 draw and George took no action to make a change. George Penokie recommended that anyone interested in increasing the field size bring a proposal to the working group.

The group reviewed all the editor's notes. All the comments from Gerry Houlder, Bruce Leshay, and Paul Aloisi were discussed. George agreed to complete SPI-3 revision 8 for distribution as soon as possible.

4.2 Normal Arbitration Fairness Control in SPI-3 (99-160r3) [Elliott/Houlder]

Rob Elliott presented the SPI-specific arbitration fairness proposal. Jeff Williams expressed concerns that the agreement from the May meeting had been dropped out of the proposal. In particular, Jeff favored the fairness counter discussed in May, but Rob expressed the belief that the May group had agreed on the proposal he was presenting. No changes were made in the proposal. On a vote of 11:1:4, the group recommended that 99-160r3 be approved for inclusion in SPI-3.

4.3 Implied Assumptions in SPI-3 Timing Budget (99-127r6) [Aloisi]

Paul Aloisi reported on the results of the special meeting on 26 & 27 May in Colorado Springs. Concerns were raised regarding the use of the word 'stable' in the timing diagram, but it was felt that a smaller discussion group could devise wording that did not rely on 'stable'. The square edges on the receiver mask diagram left open the possibility of very large rates of change in signal waveforms and how best to restrict the behavior was discussed. Paul retired to the hall to develop a new revision.

Paul revised the proposal, producing r7, which the group discussed. Additional revisions were requested. Paul generated a draft r8, containing the requested changes. The group discussed the measurement of signal change rates in the receiver mask diagram and agreed on changes to r8.

Paul Aloisi moved that 99-127r8 be recommended for inclusion in SPI-3. Wally Bridgewater seconded the motion. In the absence of any objections, the group unanimously recommended that 99-127r8 be approved by T10 for inclusion in SPI-3.

4.4 Asynchronous Information Protection (99-119r6) [Evans/Leshay]

Mark Evans reviewed the changes in the proposal since r4. Gene Milligan asked about the inclusion of information on the error detection properties of the proposed CRC code and was shown where that information is present in the proposal.

Mark Evans moved that the working group recommend 99-119r6 for inclusion in SPI-3 as an informative annex. Gene Milligan seconded the motion.

George Penokie presented a rebuttal to the proposal (that he had posted to the T10 reflector) showing that there is no technical need for the proposed CRC protection.

The motion passed 6:4:10.

4.5 Proposal to change MSE High-Z Current Specification in SPI-3 (99-187r1) [Lohmeyer]

Gene Milligan questioned why the figure covers operating ranges that should not occur in devices built to the requirements in other parts of the standard. It was noted that devices built to previous standards might operate in these ranges.

The group asked that the slope be removed from the figure and John agreed, noting that the effect would be to eliminate the figure and to return to his original proposal of just reducing the voltage range on the leakage current specification to 0 to 3 volts. Wally Bridgewater asked for 3.01 volts to avoid a step in the active negation driver specification and John agreed.

John revised the proposal, producing 99-187r2. In the absence of any objections, the group unanimously recommended that 99-187r2 be approved for inclusion in SPI-3.

4.6 Change CRC timing values (99-185r2) [Elliott & Childs]

Rob Elliott presented three related changes requested by bus expander designers. In the absence of any objections, the group unanimously recommended that 99-185r2 be approved for inclusion in SPI-3.

4.7 SPI-3 Table Restructuring (99-188r0) [Smith]

Dan Smith presented a proposal for changing the SPI-3 paragraphs supporting tables 15 and 17. The group compared the two tables and noted conflicts between them and then worked toward resolving the conflicts by changing aspects of table 15. Paul Aloisi noted that table 15 is the 'smoke out' table, but those words don't appear around table 15. The group developed new wording for the title and contents of table 15.

The group substantially reworked other parts of the proposal too.

Dan prepared r1 and the group reviewed it. Paul Aloisi moved that 99-188r1 be recommended for inclusion in SPI-3. Dan Smith seconded the motion. The motion passed 7:2:0.

4.8 Release Glitch Management for QAS (99-191r0) [Moore]

Richard Moore presented a proposal to handle release glitches during QAS. He noted that the problem he was trying to address had been surfaced during a recent working group meeting. The group agreed to adopt the second alternative in the proposal and made changes to the text of that alternative. Richard agreed to provide a revised proposal containing the changes. In the absence of any objections, the group unanimously recommended that T10 approve 99-191r1 (r0 as revised) for inclusion in SPI-3.

During preparation of r1, Richard noticed an additional needed correction. He presented this change and the complete revised proposal to the group and no comments were made. In the absence of any objections, the group unanimously recommended that T10 approve 99-191r1 (as presented) for inclusion in SPI-3.

4.9 Packetized error handling changes in SPI-3 (99-212r1) [Penokie]

George Penokie described changes to tighten initiator and target handling of failures in packetized mode, with specific emphasis on failures that occur when the nexus is not fully formed. The group requested one change in the proposal and George agreed to prepare a r2. In the absence of any objections, the group unanimously recommended that 99-212r2 (r1 as revised) be approved for inclusion in SPI-3.

4.10 "Cable Stuff" (99-111r3 and 98-219r4) [Ham]

Bill Ham presented two proposals for incorporation in SPI-3. 99-111r3 proposes normative changes for cable performance. 98-219r4 proposes an additional normative annex that describes how to perform the performance tests made normative by 99-111r3. In introducing the proposal, Bill noted that adoption of the proposal will have the effect of placing some existing cables in violation of the standard.

Bill reviewed the content of 99-111r3 in detail. Concerns were raised that extended distance requirements were not strict enough. Bill Ham and Larry Barnes presented a case for why the requirements were appropriate for SPI-3. Part of the case concerned the fact that the requirement and associated test are very new to SCSI and the body of test results data is not yet sufficient to support setting a stricter requirement.

Bill Ham moved that the working group recommend incorporation of the technical content of 99-111r3 in SPI-3 upon acceptance of 99-219r4. Vit Novak seconded the motion. The motion passed on a vote of 18:1:2.

5. SPI-4 Topics

5.1 Staged Contact Resistance (98-240r0) [Herrmann]

George Penokie reported that activity on this topic has moved to SFF and asked that this topic be removed from future agendas.

5.2 Load Compensation [Novak]

Vit Novak presented new simulation results for load compensation. He agreed to provide his presentation to John for the mailing. Previous data from Vit on this topic is in 98-239r2.

5.3 Cable/System Simulation Issues [Wallace]

Bill Ham reported on the activities of the interconnect modeling working group meeting in Manchester (minutes in 99-205). He reported that the group plans future meetings on July 29 in Manchester, on September 1 in Colorado Springs, CO, September 29 on in Irvine, CA.

5.4 Next Generation Cable Performance [Ham]

Bill Ham requested that discussion of this topic be deferred to the September meetings.

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

Bill Petty presented a preliminary proposal for communicating with bus expanders. The group discussed some aspects of the proposal and identified open issues. Alternate communications mechanisms were proposed, including assignment of a bus ID to the expander. Bill noted that the limit of 16 IDs on one SCSI bus could become a severe configuration limitation if some of those bus IDs had to be assigned to expanders. Also, his proposal supports a broadcast mechanism for talking to all expanders at once; this is not possible by just assigning normal device IDs.

6. New Business

6.1 Domain Validation TR Project Proposal (99-214r0) [Lamers]

Larry Lamers presented a project proposal for a Technical Report on Domain Validation. He noted that Adaptec will volunteer an editor for the project, in the absence of other volunteers. Larry stated that the proposal would be presented again to the General SCSI Working Group, where a recommendation for T10 approval would be sought.

7. Meeting Schedule

The next meeting of the SPI-3/SPI-4 Working Group will be Monday, September 13, 1999 commencing at 1 p.m. recessing on Monday evening and continuing until 6 p.m. on Tuesday, September 14, 1999 at the Hilton Waterfront Hotel (714-960-7873) in Huntington Beach, CA hosted by QLogic Corp.

A SPI-3 editing session is tentatively scheduled in Rochester, MN on Monday, August 2, 1999 with T11.

8. Adjournment

The meeting was adjourned at 6:30 p.m. on Tuesday July 13, 1999.