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Reply to: John Lohmeyer

To: Membership of T10

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

Subject: Minutes of SCSI Working Group Meeting
Natick, MA -- May 6-7, 1997

Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. EPI Topics
 - 4.1 Grounding
 - 4.2 Latching and Counting
 - 4.3 Load Compensation
5. Physical Topics
 - 5.1 Double ACK [Williams]
6. Protocol Topics
 - 6.1 Command Exception Conditions (95-352r3) [Monia]
 - 6.2 SAM-2
 - 6.2.1 Addressing Model for SAM-2 (was REPORT LUNS Issue) (97-122r0) [Penokie]
 - 6.3 STS Review [Johannson]
 - 6.4 Unit Attention Requirements for Humungous Numbers of Initiators [Milligan]
 - 6.5 QErr Recovery [Monia]
7. Command Set Topics
 - 7.1 SPC-2
 - 7.1.1 Prevent Allow Medium Removal Issue (96-266) [Basham]
 - 7.1.2 Persistent Reservations (97-183) [Coughlan]
 - 7.2 Additional Device Types for ASC/ASCQs for SCC-2 (97-170 r1) [Penokie]
8. Other Topics
 - 8.1 Higher Performance SCSI [Ham]
 - 8.2 Request for Interpretation of "multiple-byte field" (97-187) [Monia]
9. Meeting Schedule
10. Adjournment

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Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 9:00 a.m., Tuesday May 6, 1997. He thanked Charles Monia of Digital Equipment for hosting and arranging 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:

- 4.1 Grounding
- 4.2 Latching and Counting
- 4.3 Load Compensation
- 5.1 Double ACK [Williams]
- 6.4 Unit Attention Requirements for Humungous Numbers of Initiators [Milligan]
- 6.5 QErr Recovery [Monia]
- 7.1.2 Persistent Reservations (97-183) [Coughlan]

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:

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. Vincent Bastiani	A#	Adaptec, Inc.	bastiani@corp.adaptec.com
Mr. Wally Bridgewater	V	Adaptec, Inc.	wally@eng.adaptec.com
Mr. Bob Atkinson	O	AMP, Inc.	rdatkins@amp.com
Mr. Douglas Wagner	P	Berg Electronics	jpxw76a@prodi gy.com
Mr. Bob Gannon	O	C&M Corp.	bobg848740@aol.com
Mr. Peter Johansson	P	Congruent Software, Inc.	pjohansson@aol.com
Mr. Greg McSorley	P	Data General / Clariion	greg_mcsorley@dgc.ceo.dg.com
Mr. Charles Monia	P	Digital Equipment Corp.	charles.monia@shr.mts.dec.com
Mr. William Dallas	A#	Digital Equipment Corp.	dallas@wasted.enet.dec.com
Dr. William Ham	A#	Digital Equipment Corp.	ham@subsys.enet.dec.com
Mr. Tom Coughlan	V	Digital Equipment Corp.	tom.coughlan@zko.mts.dec.com
Ms. Constance Kephart	P	Exabyte Corp.	conniek@exabyte.com
Mr. Mark Hammang	A#	FCPA Intellistor (Fujitsu)	mhammang@intellistor.com
Mr. Gordon Yen	V	Foxconn International	gordony@honhai.com
Mr. Chris Nieves	P	Fujitsu	cnieves@fcpa.fujitsu.com
Mr. Don Vohar	A#	Fujitsu (FCPA)	dvohar@fcpa.fujitsu.com
Mr. George Penokie	P	IBM Corp.	gop@rchvmp3.vnet.ibm.com
Mr. Dan Colegrove	A#	IBM Corp.	colegrove@vnet.ibm.com
Mr. Dean Wallace	P	Linfinity Micro	75671.3443@compuserve.com

Mr. Louis Grantham	A	Linfinity Micro	lgdatcom@ix.netcom.com
Mr. Alan Littlewood	O	LSI Logic	alanl@lsi.com
Mr. Robert Bellino	P	Madison Cable Corp.	robert_bellino@madisonusa.com
Mr. Edward A. Gardner	P	Ophidian Designs	gardner@acm.org
Mr. Skip Jones	P	QLogic Corp.	sk_jones@qlc.com
Mr. James McGrath	P	Quantum Corp.	JMCGRATH@QNTM.COM
Mr. Mark Evans	A	Quantum Corp.	mevans@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. Dave Guss	P	Silicon Systems, Inc.	dave.guss@tus.ssi.com
Mr. Janek Rebal ski	O	Sony Electronics, Inc.	janek_rebal ski@asd.sel.sony.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. Arlan P. Stone	A	UNISYS Corporation	arlan.stone@unisys.com
Mr. Paul D. Aloisi	P	Unitrode Corporation	al oisi@unitrode.com
Mr. Gregory Kapraun	V	Western Digital Corp.	kapraun@wdroc.wdc.com
Mr. Jeffrey L. Williams	P	Western Digital Corporation	jwilliam@wdroc.wdc.com

43 People Present

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

4. EPI Topics

Bill Ham reviewed EPI revision 9 updates. Rule 6 on REQ/ACK offset has been added regarding the addition and removal of segments. The bridging clauses still need some work.

4.1 Grounding

Definitions were discussed for the following types of grounds:

- signal return
- external chassis ground
- earth ground
- shield ground

The definition for earth ground will be something like: green wire tied to neutral at the power distribution box. Ground wires are not intended to conduct power current. The cable shield is connected to external chassis at both ends of the cable. The signal return for multimode connects to the ground driver, protocol chip or terminator. For single-ended, the signal return connects to logic ground of the protocol chip.

Chassis ground and (logic ground) signal return should not be connected on devices. This connection, logic ground to chassis ground, occurs in the enclosure.

These concepts will be captured in the next revision of EPI.

4.2 Latching and Counting

Vit Novak presented wording on the REQ/ACK mismatch (97-182). Vit has noticed some errors in testing where the REQ/ACK count is in error. The proposed solution is to add a counter to each device to track the offset count. This counter needs to be able to handle negative numbers. One alternative offered was to have a dead-man timer.

Wording based on Vit's document needs to be drafted for EPI. This wording will need to be reviewed, since there was some consternation over the marriage of latching and counting. In particular, Gene Milligan was opposed to wording that dictated a specific implementation.

4.3 Load Compensation

Since each capacitance creates an impedance mismatch it can be compensated for with an inductance along with a resistor to reduce oscillation. Dean Wallace commented that it is a resonant circuit and the edge rate affects the value of R and L (the solution is frequency dependent). Also, if the device is removed then the compensation needs to be removed as well. It may work in the backplane environment, but will be hard to deal with in the cabled environment. Vit volunteered to bring some simulation data to the next meeting.

5. Physical Topics

5.1 Double ACK [Williams]

Jeff Williams gave a preliminary presentation describing a problem that arises when a glitch occurs on the ACK line during transmission of a Disconnect message. He asked the question, "Should the target report the error, or just go bus free?" Jeff informed the group that he plans to bring a request for interpretation to T10 during the next meeting week.

It was noted that some of the discussion from the EPI review in the morning applies to this issue. The group discussed the problem, offering Jeff advice regarding what might be the result of a request for interpretation. Based on the strong recommendation of the group, Jeff agreed to join the group developing a proposal for changes in SPI-2 resulting from the EPI work.

6. Protocol Topics

6.1 Command Exception Conditions (95-352r3) [Monia]

Charles requested that this item be dropped from this and future agendas.

6.2 SAM-2

6.2.1 Addressing Model for SAM-2 (was REPORT LUNS Issue) (97-122r0) [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.

6.3 STS Review [Johansson]

Peter described STS as a draft standard that describes how to transport SCSI commands over 1394, based on the SBP-2 transport mechanisms. The group discussed how STS complies with SAM and the meaning of SAM compliance. Concerns were expressed regarding easy readability the documents based on the layered interface model associated with SAM. Most of the discussion revolved around Clause 5 of STS, which describes most of the relationships between STS and SAM.

6.4 Unit Attention Requirements for Humungous Numbers of Initiators [Milligan]

Gene Milligan raised concerns about a device server having to 'remember' a Unit Attention condition for very large numbers of initiators (such as are possible in a Fibre Channel). Suppose an initiator "logs in" to a Fibre Channel disk. Does that disk have to report all the Unit Attention conditions it's sent to other initiators since the last power cycle?

The group discussed this problem and proposed several ways to address it. Charles agreed to develop SAM-2 wording that limits the applicability of Unit Attentions in a protocol-specific manner.

6.5 QErr Recovery (97-187) [Monia]

Charles Monia presented a proposal to add wording to SAM-2 that requires named, specific, queue error recovery behaviors. The proposal met with substantial opposition. After a lengthy discussion, Charles agreed to move the proposed text from SAM-2 to the High-Availability Profile.

7. Command Set Topics

7.1 SPC-2

7.1.1 Prevent Allow Medium Removal Issue (96-266) [Basham]

Erich Oetting offered to take-over leadership on this topic, under cover of a new document number. Erich described his plans to bring the new document to the next working group meeting. [Note: This topic was discussed by the SSC/SMC working group. See 97-188 for minutes.]

7.1.2 Persistent Reservations (97-183) [Coughlan]

Tom Coughlan presented a proposal that persistent reservations clarify the handling of duplicate key values for multiple initiators. The group asked many questions regarding Tom's proposal. After discussing the proposal, the group agreed to consider detailed wording changes for SPC-2, when Tom brings a written proposal to the group.

7.2 Additional Device Types for ASC/ASCQs for SCC-2 (97-170 r1) [Penokie]

George Penokie presented a request for new ASC/ASCQ codes to be used by various Unit Attention conditions in SCC-2. The group discussed the need for Unit Attention conditions in some cases. The relationship of the proposal to SES configuration changes also was discussed. In the absence of any objections, the working group recommended that the plenary accept 97-170r1 for inclusion in SPC-2

8. Other Topics

8.1 Higher Performance SCSI [Ham]

Bill Ham requested that this item be deferred to the July meeting and no other group members brought forward topics for discussion regarding higher performance SCSI.

8.2 Request for Interpretation of "multiple-byte field" (97-187) [Monia]

Charles presented a request for interpretation of clause 8.2.14.1 in SCSI-2. The group unanimously recommended that the plenary adopt the following statement of its position regarding the sense-key specific data for the ILLEGAL REQUEST sense key:

- 1) A multi-byte field is a defined field in a CDB or parameter list whose length exceeds one byte; and
- 2) The contents of the sense-key specific data for the ILLEGAL REQUEST sense key is not specified by SCSI-2 when the error occurs in a reserved field.

9. Meeting Schedule

The group discussed the meeting road-map for July and the list of meeting hosts for 1999.

Gene Milligan asked that some of the 1999 meeting dates be marked as tentative, because the committee workload seems to be decreasing. Bob Snively suggested that the January and July meetings be dropped from the schedule. Bob also suggested that, alternatively, the meeting week be reduced from 4 days to 3 days. The group discussed the proposals made by Bob and Gene. Reducing the number of plenary meetings per year, without reducing the working group meetings, also was discussed.

The next meeting of SCSJ Working Group will be July 15-16, 1997, in Colorado Springs, CO at the Red Lion Hotel (719-576-8900), soon to be called the Double Tree World Arena Hotel, hosted by Symbios Logic Inc.

10. Adjournment

The meeting was adjourned at 12:30 p.m. on Wednesday May 7, 1997.