

Accredited Standards Committee*
X3, Information Processing Systems

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Date: February 25, 1993

Project:

Ref. Doc.:

Reply to: G. Penokie

To: Membership of X3T9.2
From: George Penokie, Chair RAID Study Group
Subject: Minutes of RAID Study Group Meeting (2/15/93)

Agenda

1. Opening Remarks
2. Attendance and Membership
3. Approval of Agenda
4. Summary of SCSI Disk Array Items Submitted in the RAID Study Group (93-002) [Penokie]
5. SCSI Disk Array Model (93-003) [Penokie]
6. Dual Array Controllers [Todd]
7. Meeting Schedule
8. Adjournment

Results of Meeting

1. Opening Remarks

George Penokie the RAID Study Group Chair, called the meeting to order at 4:45 pm, Monday February 15, 1993. He thanked Mike Shoemake of Motorola for hosting the meeting.

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

It was stated that the meeting had been authorized by X3T9.2 and would be conducted under the X3 rules. Ad hoc meetings take no final actions, but prepare recommendations for approval by the X3T9.2 task group. The voting rules for the meeting are those of the parent committee, X3T9.2. These rules are: one vote per company; and any participating company member may vote.

The minutes of this meeting will be posted to the SCSI BBS and the SCSI Reflector and will be included in the next committee mailing.

George stated that this is the fourth meeting of the RAID study group. The purpose of the group is to deal with interface issues related to using RAIDs. The study group will assess the issues and then formulate a strategy for dealing with them.

2. Attendance and Membership

Attendance at working group meetings does not count toward minimum attendance requirements for X3T9.2 membership. Working group meetings are open to any person or company to attend and to express their opinion on the subjects being discussed.

The following people attended the meeting:

RAID Study Group Meeting Attenders			
Name	S	Organization	Electronic Mail Address
Mr. Norm Harris	P	Adaptec, Inc.	nharris@adaptec.com
Mr. Michael Wingard	A	Amphenol Interconnect	
Mr. Jan V. Dedek	P	Ancot Corp.	
Mr. Scott Smyers	P	Apple Computer	smyers.s@applelink.apple.com
Mr. Mark Lippitt	O	Array Technology Corp.	
Mr. Drouot	O	Bull SA	
Mr. Clifford E. Strang Jr.	P	BusLogic	
Mr. William Galloway	O	Compaq Computer Corp.	
Mr. Jeffrey Brown	O	Data General Corp.	
Mr. Charles Monia	P	Digital Equipment Corp.	monia@starch.enet.dec.com
Mr. William Dallas	A	Digital Equipment Corp.	dallas@wasted.enet.dec.com
Mr. Ralph Weber	A	Digital Equipment Corp.	weber@star.enet.dec.com
Mr. Tom Treadway	O	DPT	70022.1545@compuserve.com
Mr. Paul R. Nitza	A	Emulex Corp.	p_nitza@emulex.com
Mr. I. Dal Allan	P	ENDL	2501752@mcimail.com
Mr. Howard Grill	O	Formation	
Mr. Robert Liu	P	Fujitsu Computer Products, Am	
Mr. Mike Kosco	O	Future Domain	
Mr. Jeffrey L. Williams	P	Hewlett Packard Co.	jlw@hpdmd48.boi.hp.com
Mr. Kurt Chan	A	Hewlett Packard Co.	kc@core.rose.hp.com
Dr. Sam Karunanithi	P	Hitachi Micro Systems, Inc.	skarunan@hmsi.hitachi.com
Mr. Gary R. Stephens	A	IBM Corp.	gsthen@tucvm2.vnet.ibm.com
Mr. John Lohmeyer	P	NCR Corp.	john.lohmeyer@ftcollinsco.ncr.com
Mr. Stephen F. Heil	P	Panasonic Technologies, Inc	
Mr. Gene Milligan	A	Seagate Technology	Gene_Milligan@notes.seagate.com
Mr. Vit Novak	A	Sun Microsystems, Inc.	vit.novak@eng.sun.com
Mr. Alan Wetzel	A	Texas Instruments	4274968@mcimail.com
Mr. Alan Ebright	P	Toshiba America, Inc.	
Mr. Arlan P. Stone	A	UNISYS	
Mr. Jeff Stai	P	Western Digital	382-5280@mcimail.com or stai@wdc.com
Mr. Tak Asami	A	Western Digital	asami@wdc.com
Mr. Greg Leonhardt	P	Zenith Data Systems	g.leonhardt@mi04p.zds.com

32 people present

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

3. Approval of Agenda

The agenda developed at the meeting was approved.

4. SCSI Disk Array Model (93-003r1) [Penokie]

George presented his latest model incorporating concepts from CAM. There is a concept of a transparent array and a concept of primary/secondary devices. The aim of the study group is to work on the primary devices, i.e., raid controller, instead of the secondary devices, i.e., disk drive.

Can drives be primary devices? They should not be. George will re-think the

primary-secondary terminology in terms of topology. The new terms will be Root, Branch, and Leaf.

The next model is of a hybrid array system in which part of the function is in the OS and part is in the disk drive.

	Logical	Physical
	P	S
Host	Virtual	Real
Host	Intermediate	Terminal
Root	Branch	Leaves
	Primary	Virtual Primary

5. Performance Issues in Protocol Conversions [Chan]

Does RAID need a lighter weight interface? A lighter weight interface would be used to reduce SCSI overheads.

Should a SCSI-Lite evolve which:

- eliminates queing or fixes the queing to a depth of 2
- reduces checking required for reserved fields
- reduces the number of mandatory features and optional commands
- focuses on 20% of code causing 80% of problems

Descussion indicated that todays high performance devices already have overheads of 210 us on the host and 400 us on the target. It was also noted that, soon devices devices will approach 70 us. The real problem on overhead with disk drives is with mechanical motion and rotational latency. These two items account for milliseconds where the interface overheads account for only microseconds, therefore, even a large reduction in SCSI overhead would only result in a small increase in overall system performance.

As a result of this descussion Kurt agreed that it would not do much good to pursue a SCSI-Lite proposal

6. Software Problems in RAIDS (93-xxx) [Dallas]

Bill Dallas stated that he currently needs five drivers to support multi-vendor arrays. Error recovery and configuration are the major issues.

7. Meeting Schedule

The next meeting of the RAID Study Group is planned for March 15, 1993 at the Hyatt Hotel in Newport Beach, CA. The meeting is expected to start at 4:00pm-5:00pm following the X3T9.2 plenary meeting. Plan to stay till 8:00pm.

8. Adjournment

The meeting was adjourned at 8:00 p.m. on Monday February 15, 1993.