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Date: March 20, 1993

Project:

Ref. Doc.:

Reply to: G. Penokie

To: Membership of X3T9.2

From: Larry Lamers & George Penokie

Subject: Minutes of RAID Study Group Meeting (3/15/93)

Agenda

1. Opening Remarks
2. Attendance and Membership
3. Approval of Agenda
4. SCSI Disk Array Model (93-003r2) [Penokie]
5. Action Items
6. Meeting Schedule
7. Adjournment

Results of Meeting

1. Opening Remarks

George Penokie the RAID Study Group Chair, called the meeting to order at 5:00 pm, Monday March 15, 1993. He thanked Skip Jones of Emulex 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 fifth meeting of the RAID study group. The purpose of the group is to deal with interface issues related to using RAID's. 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. Denni Rash	O		75450.3313@compuserve.com
Mr. Norm Harris	P	Adaptec, Inc.	nharris@adaptec.com
Mr. Skip Jones	P	Emulex Corp.	sk_jones@emulex.com
Mr. Denni Rash	T	FileNet Corp.	75450.3313@compuserve.com
Mr. Jeffrey L. Williams	P	Hewlett Packard Co.	jlw@hpdmd48.boi.hp.com
Mr. George Penokie	P	IBM Corp.	gop@rchvmp3.vnet.ibm.com
Mr. Lawrence J. Lamers	P	Maxtor Corp.	71540.2756@compuserve.com
Mr. Ron Roberts	A	Maxtor Corp.	ron_roberts@maxtor.com
Mr. Raymond C. Yule	O	Micropolis Corp.	
Mr. John Lohmeyer	P	NCR Corp.	john.lohmeyer@ftcollinsco.ncr.com
Mr. Rod DeKoning	S	NCR Corp.	Rod.DeKoning@WichitaKS.NC.R.COM
Mr. Stephen F. Heil	P	Panasonic Technologies, Inc	
Mr. Gene Milligan	A	Seagate Technology	Gene_Milligan@notes.seagate.com
Mr. Forrest Crowell	P	SGS-Thomson Microelectronics	crowell@isnet.inmos.com

14 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 (93-003r2) [Penokie]

George Penokie presented his latest model incorporating concepts from CAM. The transparent array and a concept of primary/secondary devices has been abandoned in favor of LUI.INPUT, LUI.OUTPUT, and DACLs. See 93-003r2 for details.

This caused some confusion at the outset, particularly with the question of where the check data exists within the addressing space.

Data compression issues were raised with regard to the addressing space and physical location. Compression results in a variable mapping, but not a change in addressing. An LBA set does not have to be contiguous, it is a range.

It was noted that manipulation of logical addresses has been done in non-RAID implementations. Applying manipulation to the unit number and the logical address is a point of confusion.

The generic layer definition is: LUI.INPUT = LUI.OUTPUT and LBA.INPUT = LBA.OUTPUT. No mapping occurs.

The DACL layer modifies either the LUI or the LBA or both, mapping the input to the output. The DACL layer applies to RAIDs in which the mapping is unique and invariant, other conversion layers are possible, i.e, compression, defect management. The DACL may create information i.e., checksums.

A SCSI Disk Array is a device that processes an SCSI Command Descriptor Block and performs the services of a DACL.

The DACL Services are:

- set lba range
- set lui range
- expand lba quantity
- contract lba quantity
- data mapping
- check data mapping

There was a debate on whether or not devices exist in model. This was a drive-centric vs system-centric view of the storage space.

It was stated that reconstruction is not needed at the X layer. How does a reconstruction get initiated?. Should reserved lbas be visible at the X layers?. These questions led to a discussion of a pass-through mechanism.

This led to yet another question of whether or not pass-through should be a service or a vendor-specific. Bob Snively stated that in fibre channel protocol they use an FCP hierarchical access identifier to solve the pass-through issue. It was noted that the FCP identifier is but one method and is not prevented by the model but that other methods are allowed.

5. Action Items

- 1) George Penokie to prepare revision 3 of the RAID Model.

6. Meeting Schedule

The next meeting of the RAID Study Group is planned for April 19, 1993 at the Tradewinds Hotel in St. Petersburg Beach, FL. The meeting is expected to start at 4:00pm-5:00pm following the X3T9.2 plenary meeting. Plan to stay till 8:00pm.

7. Adjournment

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