

Minutes for RAID working group 02/15/94
Accredited Standards Committee
X3, Information Processing Systems

Doc. No.: X3T10/94-059R0

Date: February 15, 1994

Project:

Ref. Doc.:

Reply to: G. Penokie

To: Membership of X3T10

From: George Penokie and Howard Grill

Subject: Minutes of RAID Study Group Meeting
February 15, 1994

Agenda

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2. Attendance and Membership
3. Approval of Agenda
4. Report on last RAID Working Group
5. SCSI-3 Logical Unit Addressing (94-031r1)
6. SDA States and Types (94-041r1)
7. SDA Commands and Mode Pages (94-042r1)
8. SCSI Disk Array Model (94-040r3)
9. Additional Device Models (94-025r1)
10. Error Handling for SCSI Controllers (94-024r1)
11. Action Items
12. Meeting Schedule
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Results of Meeting

1. Opening Remarks

George Penokie the RAID Study Group Chair, called the meeting to order at 9:00 am, Tuesday, 15 February 1994. He thanked IBM 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 X3T10 and would be conducted under the X3 rules. Ad hoc meetings take no final actions, but prepare recommendations for approval by the X3T10 task group. The voting rules for the meeting are those of the parent committee, X3T10. 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 16th meeting of the RAID study group and the 3rd joint RAID Advisory Board/RAID study group meeting. 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 X3T10 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	Phone Number -or- Electronic Mail Address
Mr. Keith Weber		Amphenol	203-287-7456
Mr. Jerry Fredin		AT&T/GIS	316-636-8714
Mr. M.W. Jibbe		AT&T/GIS	316-636-8810
Mr. Doug Hagerman		Digital Equipment Corp.	hagerman@starch.enet. dec.com
Mr. Howard Grill		Formation	609-234-5020
Mr. Bill Hutchison		Hewlett Packard Co.	hutch@.boi.hp.com
Mr. Jeffrey Williams	P	Hewlett Packard Co.	jlw@hpdmd48.boi.hp.com
Mr. Giles Frazier		IBM Corp.	512-838-1802
Mr. George Penokie		IBM Corp.	gop@rchvmp3.vnet.ibm.com
Mr. John Baudrexl		Intellistor Fujiitsu	303-682-6512
Mr. David Fellingner		Mega Drive	310-247-0006
Mr. Dick McCormick		Peer Protocols	714-476-1016
Mr. Mike Fitzpatrick		Seagate	405-324-3478
Mr. Amir Majidimehr		Sony	415-964-7426
Mr. Tony Fung		Storage Concepts	714-852-8511
Mr. Robert N. Snively		Sun Microsystems, Inc	bob.snively@eng.sun.com

15 people present

Status Key: P - Principal ** Status not applicable at this
 A - Alternate meeting because X3T10 committee
 O - Observer not yet formed.
 L - Liaison
 S,V - Visitor

3. Approval of Agenda

The agenda developed at the meeting was approved.

4. Report on last RAID Working Group

Last RAID Working Group was held in San Diego, CA. Several members of the RAID Advisory Board were present. Minutes of the Colorado Springs meeting were published on the SCSI Reflector.

5. SCSI-3 Logical Unit Addressing (94-031r1) Penokie

George presented a revised version of the SCSI-3 Logical Unit Addressing proposal (X3T10/94-031r1). Except for clarifying the SDA base address as zero and that this address is used for a response to the Inquiry command, little discussion ensued for this document. 94-031r2 will be submitted to the X3T10 Committee.

6. SDA States and Types (94-041r1) Penokie

George presented a new document defining states of an SDA and the types of devices needed within Disk Arrays (X3T10/94-041r1). Reflecting comments of the previous meeting, power supplies, LEDs, fans, op panel, etc. are no longer listed as a peripheral device type. Whether to use a device type modifier or a peripheral qualifier for these is an open issue to be discussed at a later time.

A significant discussion occurred on the types and reporting of SDA states. The debate centered around the limitation of the SDA in identifying states of logical units (Volumes, Redundancy Groups) without first resolving its physical states. This was in line with the notion that the SDA (LUN 0) is the "spokesman" for the whole unit. To this end, physical SDA state types with appropriate definitions were listed as Ready, Available, Present, Failure, Abnormal, Addressable and Non-Addressable. Logical units would continue to identify the states as listed in the proposal with debate to continue on how to indicate array state types along with the tangential issue of device type reporting to account for something other than a disk device type.

7. SDA Commands and Mode Pages (94-042r1)

George presented a revision to the document defining the new commands and mode pages needed to implement SCSI disk arrays (X3T10/94-042r1). A brief review was held with the major emphasis placed on noting that all these commands are directed at P-LUI 0 of the SDA. It is expected that this document will be rolled into the appropriate physical and logical services sections of the SDA model.

A sidebar to the discussion was raised by Giles Frazier in his attempt to understand multi-level SDAs, multi-SCSI device types at each level, and the routing of AENs to/from the device type when the device types (e.g. Initiator, Target) exist under a single ID. Resolution of the issue was that SDA LUN 0, knowledgeable of all addresses, will route the AEN to the appropriate destination.

8. SCSI Disk Array Model (94-040r1)

George presented a revised version of the SCSI-3 Disk Array Model (X3T10/94-040r1). Except for a few minor changes and clarifications, the document was accepted as described. Discussion continued as to how to properly describe and control the "device types" within the SDA that do not have SCSI identifiers. These are the power supplies, fans, LEDs, OP Panel, cache, controllers, etc. Currently, they are included in P-LUIs; perhaps they should have a classifications to themselves. If so classified and if given a logical unit name (e.g. C-LUIs for component), then, via LUN 0 of the SDA, commands can be received that provide for their operation, configuration and control. Especially attractive is the applicability for dual controller operation, currently being looked into be interested Study Group members.

With the notion being accepted by the group, the C-LUI definition needs to be added to all appropriate sections of the document; similarly, where reference is currently made in the P-LUI, this needs to be stricken. This is to be done by George for the next meeting and prior to the the document submission to the X3T9.10 Committee.

9. Additional Device Models (94-025r1)

Doug Hagerman presented the current draft of the Additional Device Models (94-25r1) document. This document proposes access mechanisms to power supplies, fans, and consoles. As this was written prior to the notion of C-LUI as described above, it was decided to defer review until the C-LUI notion was documented in the SDA Model.

A significant outgrowth of the aborted discussion was the realization that though a C-LUI can be associated with a Redundancy Group(s) or a Redundancy Group of similar C-LUIs, through, of what appears to be an omission, no clear way exists of identifying a C-LUI with a Redundancy Group. The need to call out a C-LUI will be rectified in the next revision of the SDA model through the coordinated efforts of George and Doug.

11. Error Handling for SCSI Controllers (94-024r1)

Doug Hagerman presented the current draft of the Error Handling for SCSI Controllers (94-24r1) document. This document proposes additional error codes for errors encountered in RAID subsystems. Doug has listed ASC/ASCQ codes for device errors, bus and general errors, subsystem command errors, and errors that occur during operations of the RAID device. As the list is huge, a review is required to reduce the list to those not already covered in generic SCSI-3 and add those unique to RAID.

12. Action Items

- a) Penokie Revise the SCSI-3 Addressing (94-031) document and present this proposal to the next plenary for a vote.
- b) Penokie Revise the SDA States and Types (94-041) document.
- c) Penokie Revise the SDA Commands and Mode Pages (94-042) document.
- d) Penokie Revise the SCSI Disk Array Model (93-040) document and

present this proposal to the next plenary for a vote.

13. Meeting Schedule

The next meeting of the RAID Study Group is planned for Mar 15, 1994 at the Hyatt Hotel in Newport Beach, Ca. The meeting is expected to run from 9:00am-5:00pm. This meeting will be a joint RAID Advisory Board Host Interface Group and X3T10 RAID Study Group meeting.

14. Adjournment

The meeting was adjourned at 4:44 pm. on Tuesday, February 15 1994.