

Minutes for RAID working group 12/07/93  
Accredited Standards Committee  
X3, Information Processing Systems

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Date: Dec 07, 1993

Project:

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Reply to: G. Penokie

To: Membership of X3T9.2

From: George Penokie & Paul Massiglia

Subject: Minutes of RAID Study Group Meeting (12/07/93)

### Agenda

1. Opening Remarks
2. Attendance and Membership
3. Approval of Agenda
4. Report on last RAID Working Group
5. SCSI-3 Addressing (93-161r1)
6. SDA States and Types (93-191r0)
7. SDA Commands and Mode Pages (93-192r0)
8. SCSI Disk Array Model (93-140r2)
9. Dual-Controller Overview
10. Action Items
11. Meeting Schedule
12. Adjournment

### Results of Meeting

1. Opening Remarks

George Penokie the RAID Study Group Chair, called the meeting to order at 8:00 am, Tuesday, 07 December 1993. He thanked Vitro Corporation 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 and the next RAID Advisory Board mailing.

George stated that this is the 13th meeting of the RAID study group and the first 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 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. Mark Finney	O	CD Int.	
Mr. Jay Mork	O	CD Int.	
Mr. Doug Hagerman	O	Digital Equipment Corp.	hagerman@starch.enet.dec.com
Mr. Paul Massiglia	O	Digital Equipment Corp.	massiglia@genral.enet.dec.com
Mr. Howard Grill	O	Formation	
Mr. David Reilly	O	Formation	
Mr. Bill Hutchison	O	Hewlett Packard Co.	hutch@.boi.hp.com
Mr. George Penokie	P	IBM Corp.	gop@rchvmp3.vnet.ibm.com
Mr. Rick Thompson	O	IBM Corp.	
Mr. Carl M. Conliffe	O	Jaycor	
Mr. Marlin Gwaltney	O	NCR Corp	
Mr. Herb Silverman	O	Peer Protocols Inc.	
Mr. Joe Molina	O	Technology Forums	

13 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. Report on last RAID Working Group

Last RAID Working Group was held in Colorado Springs, CO. Several members of the RAID Advisory Board were present. Minutes of the Colorado Springs meeting

were published on the SCSI Reflector.

#### 5. SCSI-3 Addressing (93-161r1) Penokie

George presented a revised version of the SCSI-3 Addressing proposal (X3T9.2/93-161r0).

It was agreed that the expanded identify message be removed from the proposal.

Next topic was a review of some written comments on the model that had been forwarded by Charles Binford. One substantive upshot was a decision to add some clarifying language to the description of VolSel -- =0 for vendor-specific defaults; =1 for use of volume sets set up by the model's create/modify services.

It was pointed out that reserve is a problem. The model does not provide for the situation in which a device is reserved by an initiator, followed by a second initiator changing the mapping mode (and therefore the meaning of the address that the first initiator thinks it has reserved). The discussion did not result in a resolution -- George is to look into the problem further. One suggestion was that reserve be changed into 'reserve target' and 'reserve LUN', with the former blocking all access to the reserved device, and the latter blocking configuration operations only.

#### 6. SDA States and Types (93-191r0) Penokie

George presented a new document defining states of a SDA and the types of devices needed within Disk Arrays (X3T9.2/93-191r0).

It was generally agreed that a device type needs a model, and that models are lacking for fans, power supplies, LEDs, operator panels, etc. Doug Hagerman agreed to draft models for these. Later, UPS, temperature indicators, cache, and (maybe) pagers were added to Doug's list.

Next, a discussion on device states ensued. There was no clear resolution on the 'what states are valid for what objects' table in the model, but sentiment seemed to favor retaining it with perhaps some thought as to what the states mean and which ones are valid for which objects. George declared that he would not change the document unless he got some written input from other attendees. One minor editorial point: it was agreed that the term 'available' would generally convey the desired meaning more accurately than 'active' as used in the document.

#### 7. SDA Commands and Mode Pages (93-192r0)

George presented a new document defining new commands and mode pages needed to implement SCSI disk arrays (X3T9.2/93192r0).

The first issue was the 'get geographic location' service. After some discussion it was agreed that the model needs to provide 3 services:

- Set geographic location string & replaceability

-Get all P-LUIs and the device type of each, and,

-Get a specific P-LUI's type and location string.

As an aside, it was agreed that all parameter lists should be constructed so they were multiples of 4 bytes in length.

## 8. SCSI Disk Array Model (93-140r2)

George presented a revised version of the SCSI-3 Disk Array Model (X3T9.2/93-140r2).

Two substantive model issues arose:

-(DEC) recalculation should provide for finer granularity than just an entire redundancy group. It may be desirable as part of a host-assisted recovery procedure to recalculate the parity on a specific range of V-LBAs. This also applies to verification.

-(DEC) DEC renewed its request for a mechanism that would allow initiator-directed throttling of rebuild and recalculate I/O; i.e., to allow some degree of host control over the amount of subsystem capacity to be reserved for application I/O during a rebuild or recalculation.

Discussion around spares arrived at a tentative conclusion that a "spare in use" state may be required instead of the current notion that a spare is no longer a spare when it is in use. Doug and George will discuss this off-line. The question of how to remove an association of a spare with a volume set was answered by stating that the spare should be deleted and recreated without the undesired association(s). While awkward, this is consistent with how the model deals with the deletion of other objects.

Discussion around rebuild-regeneration- recalculation clarified the definitions of these terms. The group agreed that the term 'protected space contents' should replace 'user data' throughout these discussions, as the model is not generally concerned with whether genuine user data is stored in protected space or not.

There was discussion about the SAM meaning of the term 'object', and the question of whether the model needs its own definition of that term. George agreed to review the SAM document and make a determination.

It was noted that the question of whether a given service would be mandatory or not will be deferred until the actual commands used to implement the services are defined; the model will not contain a mandatory/optional state for services.

The question of what state an exchanged P-LUI takes on was left open.

The model's provision for only permitting exchange between like device types was removed (relaxed?).

In Sections 5.2.1.2 and 5.2.1.3, the services need to be augmented with an additional parameter so that either one or all LUIs can be signified.

It was agreed that 'rebuild P-Extent' needs to be augmented with a 'rebuild P-PUI' service.

A discussion of whether section 6 of the model is actually needed was not resolved. George will look at it and make a determination.

The discussion of the model ended at about 3PM. The RAB/RSG plan is to make the above mentioned minor edits to the model and submit it along with the addressing document to ANSI for vote at its January meeting. George expects that a detailed command set specification could be submitted to ANSI for vote by March, 1994.

#### 9. Dual-Controller Overview

Howard Grill presented a dual-controller overview and there was a brief discussion. The meeting stalled a bit on procedural issues -- what must be presented to ANSI and how? While the energy level was low (late in the day), the group agreed that the right approach would be to firm up the proposal in the RAB/RSG and present a more complete concrete document to ANSI.

#### 10. Action Items

- a) Penokie - Revise the SCSI-3 Addressing (93-161) document and present this proposal to the next plenary for a vote.
- b) Penokie - Revise the SDA States and Types (93-191) document.
- c) Penokie - Revise the SDA Commands and Mode Pages (93-192) document.
- d) Penokie - Revise the SCSI Disk Array Model (93-140) document and present this proposal to the next plenary for a vote.

#### 11. Meeting Schedule

The next meeting of the RAID Study Group is planned for Jan 11, 1994 at the Catamaran Hotel in San Diego, 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 X3T9.2 RAID Study Group meeting.

#### 12. Adjournment

The meeting was adjourned at 03:30 pm. on Tuesday, December 07 1993.