

Date: Nov 10, 1994

X3T9.2/94-228 rev 0

To: X3T9.2 Committee (SCSI)

From: George Penokie (IBM)

Subject: SCC Leter Ballot Comment Resolutions

IBM:

1-The peripheral device descriptor fields within the peripheral device associations descriptor (table 28 page 50) of the Report Peripheral Device Associations service action should be changed to the logical unit descriptor.

The peripheral device descriptor is defined in table 25 on page 47 and the logical unit descriptor is defined in table 21 on page 45.

The reason for this change is because the peripheral device descriptor only allows for reporting peripheral devices that are associated with the requested peripheral device(s). By changing to the logical unit descriptor the service action will be able to report all logical units associated with the requested peripheral device(s).

>>>IBM comment accepted

Unitrode:

Introduction

The second paragraph third sentence:
commands that assist coordination between multiple systems.

I think should read:

This standard defines commands that assist coordination between multiple systems.

>>>Comment Accepted

The third paragraph second and third sentences should be combined for clarity.

>>>Comment Accepted

This standard defines the SCSI commands the may apply to SCSI-3 Storage Arrays and the SCSI commands that must be implemented by SCSI-3 Storage Arrays.

>>>Comment Accepted

4 General

First Paragraph the third paragraph second and third sentences should be combined for clarity.

>>>Paragraph changed according to GEMs

This standard defines the SCSI commands the may apply to SCSI-3 Storage Arrays and the SCSI commands that must be implemented by SCSI-3 Storage

Arrays.

>>>Paragraph changed according to GEMs

The third Paragraph, second sentence:

This standard does not devine all possible instances of the procedure inputs and outputs. devine should be define. (Devine issues are beyond the scope of this committee.) procedure doesnt sound like the right word, may be procedure call.

>>>Comment Accepted

5.2 Model for SCSI-3 storage arrays

a through c are used on what appears to be a single sentence, this is confussing. Three direct statements or one sentence should be used without the letters.

>>> Not accepted: Notation is consistant with SCSI editing practices.

Shouldn't "a" end with initiator, instead of target? or target/initiator?

>>> Not accepted: Target is correct.

5.2.2.2 Association of objects

Last sentence of the second paragraph; The only requirements on such associations is that they shall be reported using the report service actions defined in this standard. Remove s from requirements.

>>>Comment Accepted

5.2.2.7 Removing Objects

The first sentence the word "readded" replace with "available". The device with either be corrected and put back in service or replaced and recreated.

>>>Comment Accepted

5.2.2.12 (page 24) first sentence "goup" should be "group".

>>>Comment Accepted

b & c number of units of should be for and should be corrected in the paragraphs below on page 24 and on page 26.

>>>Comment Rejected: This is a field name.

Page 56 under table 35 first paragraph last sentence: and access to the target is limited. Change to to of.

>>>Comment Rejected.

The next sentence should read:

The access of a target during the readying state is a vendor specific limit.

>>>Comment Accepted

Gene Milligan (Seagate):

>>>The following comments were accepted:

1,2,3,4,5,6,7,8,9,10,11,12,13,14,16,17,18,19,21,22,23,24,25,26,28,30,
31,32,35,36,37,38,39,40,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56
57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,75,77,78,79,80,81,82,83,
84,85,86,87,88,92,94,95,96,97,98,99,100,101,102,103,104,105,106,109,
110,111,112,113,114,115,116,117,118,119,122,123,124,125,126,128,130
131,133,134,135,136

>>>The following comments were rejected:

15 - It was agreed by GEM no change is required
20 - It was agreed by GEM no change is required
27 - It was agreed by GEM no change is required
29 - It was agreed by GEM no change is required
33 - GEM will check to see if ITTU has been assigned to CCITT, if it has
ITTU will be changed to ITTY.
34 - It was agreed by GEM no change is required
41 - It was agreed by GEM no change is required
72 - It was agreed by GEM no change is required
73 - It was agreed by GEM no change is required
74 - It was agreed by GEM no change is required
76 - It was agreed by GEM no change is required
89 - After thought on changing this I decided the least confusing thing to
do was leave it the way it is in Rev 3
90 - It was agreed by GEM no change is required
91 - It was agreed by GEM no change is required
93 - It was agreed by GEM no change is required
107- It was agreed by GEM no change is required
108- It was agreed by GEM no change is required
120- It was agreed by GEM no change is required
121- There is no error code 'DELETE VOLUME SET FAILED'
127- Is was agreed by GEM no change is required
129- There is no error code 'DELETE SPARE FAILED'
123- The length of 252 bytes is to allow for 31 LUNs to be addressed

I presume all or the bulk of the comments can be dealt with in short order. If there are any comments that are accepted to be dealt with but which would require an extended period of time to resolve, I suggest that those comments be deferred to SCSI-4 CC or SCC-2.

These comments are in the order of occurrence in the document and not arranged according to impact. The comments are numbered to facilitate a reply.

- 1) The document should be a dpANS rather than a Working Draft in numerous places.
- 2) The X3 Secretariat point of contact also has an E-Mail address - lbarra@cbema.org
- 3) In the abstract delete "the" from "the SCSI-3 storage array devices".
- 4) Change "systems integrator and suppliers" to "system integrators and suppliers".
- 5) Add a statement to the abstract that "This standard is not intended as a command set alternative to the SCSI-3 Block Commands standard."
- 6) Who has the action to check with ANSI prior to publication that the last paragraph on page iii is still

valid at that time?

7) Delete the content of page iv.

8) It is not clear if the introduction refers to SCSI command sets in general or to this specific standard. If it is specific the commanded entity needs to be changed to a "controller for".

9) In the introduction and in GENERAL change "This standard defines the SCSI commands that shall be implemented by SCSI-3 Storage Arrays." to "This standard defines SCSI commands that are uniquely for SCSI-3 Storage Arrays." In addition consider whether in this instance and other similar instances SCSI-3 should be changed to SCSI.

10) In the junk about Bulletins change "intended solely at supplementary" to "intended solely as supplementary".

11) Change "these bulletins" to "any such bulletins" or some other words that do not imply that the bulletins which do not exist, do exist.

12) In the Scope and probably elsewhere I have presumed array devices would also implement SBC commands. I presume the document needs to be corrected to reflect this assumption.

13) Why does the scope require that arrays shall not implement any vendor unique commands (as indicated by "fully specify")?

14) Objective (d) was handy in the project proposal but should be deleted from the scope.

15) The definition of SCSI terms should be moved from the scope to Clause 3.

16) In Clause 2 delete the term "Working Draft".

17) In 3.1.9 change "structure up to 16 bytes" to "structure of up to 16 bytes".

18) Thank you for at least one "a SCSI".

19) In 3.11 change "a the rules" to "the rules".

20) Either the distinction between "association" and "covering" needs more explanation or the distinction between "storage array objects" and "spare objects" does. Can there not be spare storage array objects?

21) In 3.1.15 unsupported seems more illegal than reserved does. I suggest making the definition "a reserved or unsupported field or code value." What is the difference between a field or code value? Does the classification of reserved in this sense fly in the face of the X3T10 decision on checking of reserved fields?

22) It is tough to swallow "group" as being independent from one another.

- 23) Why is the Logical unit number definition different than the one in SAM?
- 24) In 3.1.23 change "must" to "shall".
- 25) Change the definition of p_extent from "within a single peripheral device" to "within a single peripheral device of a storage array".
- 26) To prevent sweating over the definition, change 3.1.29 from "Recreation" to "Re-creation" and in 3.1.30, 3.1.31 & 3.1.43.
- 27) Does 3.1.32 prevent plain text from being recorded within a redundancy group? Plain text has numerous forms of redundancy as has amply been demonstrated by compression programs and spelling checkers.
- 28) In 3.1.35 is "covered" used to mean the past tense of "linking spare objects"?
- 29) Clause 3.1.37 is the incomplete product of a cut and paste without the needed edit.
- 30) I think the term being defined by 3.1.39 should be "SCC target" rather than "target".
- 31) There are not an infinite number of logical blocks. Change 3.1.40 to "the addressable logical blocks that are input to the SACL. Check data is not part of the addressable logical blocks."
- 32) 3.1.44 implies that a logical unit can contain more than one volume set but that a volume set can not be larger than a single logical unit. Is this correct? Should volume be defined?
- 33) I vaguely recall that the CCITT has changed its name to ITTU. If this is correct the ITTU acronym may prove troublesome.
- 34) The convention of distinguishing the size of capitals seems an unfortunate one. Quotes over Internet will not preserve such a convention and it may require a visual resolution that could be construed as discriminatory.
- 35) Put the "the" deleted earlier between "per" and "SCSI-3" in Clause 4. Consider changing it to "In accordance with the SCSI-3".
- 36) Change "in the procedure call above." to "in the above procedure call."
- 37) I'm sure the writers were mortal and I agree the standard does not, nor is it, "devine" but I suggest changing "devine" to "define".
- 38) The members of the SACL a-j set need to be edited to the same sense as functions.
- 39) Since CAM is being used in the standard, it should be added to section 2 and Figure 1.

- 40) In 5.2 (a), what does "under a single target" mean? Perhaps "under" should be "as".
- 41) In Table 1 it is not clear why for a Redundancy group the space addressed is protected and for Volume set it is user data. I would think they could either both be protected or both user data.
- 42) How can there be a requirement for the application client to address unaddressable items? The requirement would be consistent if it were changed from "shall address" to "shall access".
- 43) Change "may by defined" to "may be defined".
- 44) In 5.2.1.2 "LUN structure see table 2." needs additional punctuation.
- 45) In Table 4 what is the relationship between "X" and "n"?
- 46) In 5.2.1.4 change "storage arrays are not required to support all SCSI commands" to "storage arrays are only required to support mandatory SCSI commands".
- 47) In the second paragraph after Table 6 change "the address of the peripheral device that the SCSI-3 storage array shall relay" to "the address of the peripheral device to which the SCSI-3 storage array shall relay".
- 48) The second and third sentences of that paragraph are inside out or at least awkward. This applies also to the next paragraph.
- 49) Note 3 is not strictly correct. I presume SIP defines 0-7, 0-15, and 0-31.
- 50) In Note 4 replace the "mays" with "mights".
- 51) In the paragraph after Note 4 make the analogous change as (46).
- 52) In the next paragraph what is a "predefined SACL" and where is it predefined?
- 53) The sentence after Table 7 is incomplete or confused.
- 54) In numerous places the "shall" requirements seem to be incomplete. An example is 5.2.2.1 which states "Objects that have been added to a SCSI-3 storage array shall be addressable by an application client." But there is no specificity on how they are addressable. Another example of this problem is after Table 78 which states "The LUN_R field specifies the address of the redundancy group that shall have its check data recalculated." These requirements should be stated in the active rather than the passive tense.
- 55) In 5.2.2.3 is it true that "the only requirement on such attachments" (presumably vendor specific attachments) "is that they shall be reported using the report service actions defined in this standard"? Does this mean they do not need to be addressable per the "shall" in 5.2.2.1?

56) In 5.2.2.4 the apparent fact that objects are covered by like objects in the first sentence seems contradictory to the third paragraph and to Note 7.

57) In 5.2.2.5 what does "shall be made" mean?

58) In 5.2.2.10 The second paragraph accidentally, I presume, requires that user data not be recorded in consecutive addressable logical blocks since "All the consecutive addressable logical block addresses on a single peripheral device shall be grouped into a single unassigned p_extent."

59) Under Figure 11, change "redundancy goup" to "redundancy group" This implies that a spell checker should be run.

60) Under Figure 12 the listing begun under Figure 11 is continued. However the two lists appear to be different aspects and continuation of the item identification is confusing at best.

61) The first sentence of 5.2.2.12 is awkward. What does "requests no redundancy user data is not protected" mean? Does it mean some redundancy user data is protected? I presume the problem is that plain text without capitalization is being used as a handle rather than as words in a sentence but how is the reader to know? This is a problem in several places.

62) If the requirement is to be established by Note 8, Note 8 should not be a note, but should be part of the body. Otherwise the note should be worded without a "shall". This comment also applies to Note 9, and 10 (but don't make 10 part of the body).

63) Many of the sentences are missing articles. Will an editor add the articles or is the terse sentence form now an acceptable if somewhat guttural form? 5.2.2.12.4 is an example of this.

64) In 5.2.2.13 I think that in the third sentence of the second paragraph "contain" should be "contains". In that same sentence I think the second "shall be" should be changed to "is".

65) On the assumption that a failure is a characteristic, I think the next paragraph should be changed from "After an automatic exchange the spare takes on all the characteristics of the failed" should be changed to "After an automatic exchange the spare takes on the essential characteristics of the failed".

66) In the same paragraph change "device shall on longer be available" to "device shall no longer be available".

67) In the second paragraph after Note 12 delete "unique". Unique implies that the depth field can not have the same value or must have a different number of bits.

68) In 5.2.3.3 if the recreated protected space is not saved, is anything useful done with it?

- 69) In the last paragraph of 5.2.4 it is not clear what "In that case" refers to.
- 70) Make the last word in 5.2.5 plural and then make it the next to last word by adding "standard".
- 71) In 6 change "that apply to SCSI-3 disk array" to "that apply only to SCSI-3 disk array". In addition I thought this standard was to apply to array controllers for more than disc.
- 72) Referring to Table 12, why is the P_EXTENT STATE defined so far from this table (21 pages).
- 73) In the second paragraph after Table 14, 56 and 62 delete "on" two places each and patch the resulting sentences. (The search may be difficult but I consider this a global comment.)
- 74)) Referring to Table 16, why is the COMPONENT DEVICE STATE defined so far from this table (19 pages) and why is component device not capitalized?
- 75) The first sentence after Table 18 is missing words or confused.
- 76) Comment 73 applies to the Table 18 description.
- 77) In Table 28 Byte 7 should be Byte 8.
- 78) In the description of Table 28 "LOGICAL UNIT DESCRIPTOR" should be "PERIPHERAL DEVICE DESCRIPTOR".
- 79) Why does Table 30 use Byte 0 twice?
- 80) If the IDENTIFIER is vendor specific why is it half defined?
- 81) Under Table 31 I think "logical unit contained within the LUN field" should be changed to "logical unit designated by the LUN field".
- 82) In Table 32 item 10b I think "shall determine" should be "designates".
- 83) After Table 32 "that contain" should be "that indicates" and "list and a list" should be "list plus a list".
- 84) After Table 34 and after Table 45 change "Primary Command" to "Primary Commands standard". Make this a global change.
- 85) Add "in which" to the paragraph (sentence) prior to Table 35.
- 86) After Table 35 change "shall indicate" to "indicates" in six places. Change "are indicating" to "have" in two places.
- 87) Why isn't "NONCFAIL" "NONAFAIL"? I am confused by the fact the zero condition emphasizes "non-addressable" and the one condition emphasizes "non-component".

- 88) In Note 13 change "targets" to "target's".
- 89) In Table 36 items 03h and 0Ch and Table 37 items 01h and 0A change "a failure causes a loss of data" to "a failure could cause a loss of data"
- 90) Note 15 is redundant to an earlier note. Delete it.
- 91) Regarding Table 40, do commands allow reporting more than one state or is it implementations that do? I thought such behavior was an implementation option, not a command option.
- 92) The definition of item 05h reads like Catch 22.
- 93) Referring to Table 42, I suggest that the ADDPORC bit be renamed the POLITICIAN bit and the Table 45 BRKPORC bit be changed to the CNCRNDCTZN bit. However this is an optional comment.
- 94) After Table 45 change "shall contain" to "contains" three places. Make this a global change.
- 95) In the first paragraph of 6.2.1.5 change "requests the target" to "requests that the target"
- 96) In the second paragraph after Table 50 change "0000h" to "00000000h".
- 97) In Note 18 change "groups be configured" to "groups to be configured" and "group may be expanded" to "group to be expanded".
- 98) After Table 62 change "header that contains the length" to "header that defines the length".
- 99) In the last paragraph of 6.4.1.1 change "data shall disabled" to "data shall be disabled".
- 100) Is the requirement for a SETLUN bit of one clear? Not to me.
- 101) The definition of RECALIM in Table 70 seems inverse to the name and therefore probably will cause wrong implementations. I suspect this is due to using an analogy to the IMMED bit but if the implementor does not draw the analogy confusion may reign.
- 102) In Table 73 and 76 item 00b and 10b change "must be successfully rebuilt " to "is successfully rebuilt".
- 103) Change item 01b from " must only be successfully" to "shall only be successfully".
- 104) In Table 78 why is the definition for "all redundancy group bit" ALLRU rather than ALLRG?
- 105) In the definition for Table 78 why are uncorrectable failures reported which occur after the VERIFY CHECK DATA service action rather than during the service action?

- 106) In Note 20 the explanation refers to "continuous" rather than the "continuously" used in the body.
- 107) In this same note should the address of volume sets be plural as indicated by LBA_Vs?
- 108) The definition of LUN_V is not complete enough to understand if the requirement in 6.5.1.1 points to the start of, explicitly to, or within a volume set.
- 109) In Table 83 the variable byte should be "n-10" rather than "n-19".
- 110) Under Table 84 what is the more precise meaning of "contiguous units" and is this meaning of "units" defined within the standard?
- 111) The last sentence of section 6.6.1.1 is very difficult to parse.
- 112) I think the last paragraph of 6.6.1.2 should refer to CONTROL WRITE OPERATIONS rather than CONTROL GENERATION CHECK DATA in two places.
- 113) In 6.6.1.3 why, in two places, is it LOGICAL UNIT FAILED rather than CREATE/MODIFY VOLUME SET FAILED?
- 114) After Table 88 the first sentence is awkward. I think "that" should be deleted.
- 115) In the fourth paragraph after Table 88, is the logical unit number to be assigned vendor unique or should it be according to some standardized algorithm?
- 116) In the second paragraph after Table 89 I presume it was an accident to require "even" multiples of ps_extents and that it was intended to require "exact" multiples in two places.
- 117) In the next paragraph I presume "onto" should be "into". The last sentence of that same paragraph is injured and I presume "unit" should be replaced with "until".
- 118) The next paragraph needs a "," after "request".
- 119) The next paragraph (first before Table 90) should explain how the target shall control the user data or remove the requirement.
- 120) It is not clear how the requirements of the sentence pairs in the third paragraph after Table 90 are different or if they are repeated requirements.
- 121) Why is the error in 6.6.1.4 "REMOVE OF LOGICAL UNIT FAILED" rather than "DELETE VOLUME SET FAILED".
- 122) In the third paragraph after Table 92 what does "that underlay" mean?
- 123) Based upon earlier sections, in Table 93 I presume "LBA_VS" should be "LBA_Vs". This comment also applies to the following paragraphs.

124) The meaning of the first sentence after Table 94 is not clear.

125) The next paragraph has a badly injured first sentence. Probably "one least" needs to be changed to "at least".

126) The third paragraph after Table 95 is difficult to parse.

127) In the next to last paragraph before Table 102 I again complain about "report on".

128) In table 103 the penultimate byte should be "n-23" rather than `n-11".

129) In the paragraph after Table 111 why is the error "REMOVE OF LOGICAL UNIT FAILED" rather than "DELETE SPARE FAILED"?

130) In 6.9.1 numerous places why is there a request to "see SCSI-3 Controller Command" when I presume that refers to the standard that 6.9.1 is a part of?

131) Why does 6.9.1.1 refer explicitly only to SIP and I suspect the indication that other protocols will supply more information is a hollow promise?

132) Why is the LUN mapping page 252 bytes in length?

133) In the description after Table 113 is the term "bus" applicable to the serial transports?

134) In Annex B.1.7 where are the "your shift address rules" defined?

135) In B.1.8 what does "LUN address emitted" mean?

136) In B1.9 what does "fifth layer must be understood to have only single LUN devices" mean?