

T10/04-064r0

Voting Results on T10 Letter Ballot 04-063r0 on  
Forwarding OSD to First Public Review  
Ballot closed: 2004/03/24 12:00 noon MST

| Organization                 | Name                | S | Vote | Add'l Info |
|------------------------------|---------------------|---|------|------------|
| Adaptec, Inc.                | Tim Symons          | P | Yes  |            |
| Agilent Technologies         | Pat Thaler          | P | Yes  | Cmnts      |
| AMCC                         | Neil Wanamaker      | P | Yes  | Cmnts      |
| Amphenol Interconnect        | Michael Wingard     | P | Yes  |            |
| Brocade                      | Robert Snively      | P | Yes  | Cmnts      |
| Cisco Systems, Inc.          | Claudio DeSanti     | P | Yes  |            |
| Crossroads Systems, Inc.     | Robert Griswold     | P | Yes  |            |
| Dallas Semiconductor         | James A. Lott, Jr.  | P | Yes  |            |
| Dell, Inc.                   |                     |   | DNV  |            |
| EMC Corp.                    | David Black         | A | No   | Cmnts      |
| Emulex                       | Robert H. Nixon     | P | Abs  | Cmnts      |
| ENDL                         | Ralph O. Weber      | P | No   | Cmnts      |
| FCI                          | Douglas Wagner      | P | Yes  |            |
| Fujitsu                      | Mike Fitzpatrick    | P | Yes  |            |
| General Dynamics             | Nathan Hastad       | P | Yes  |            |
| Hewlett Packard Co.          | Rob Elliott         | P | Yes  | Cmnts      |
| Hitachi Cable Manchester     | Zane Daggett        | P | Yes  |            |
| Hitachi Global Storage Tech. | Dan Colegrove       | P | Yes  |            |
| IBM Corp.                    | George O. Penokie   | P | No   | Cmnts      |
| Intel Corp.                  | Robert Sheffield    | P | Yes  | Cmnts      |
| Iomega Corp.                 | David Hawks         | P | Yes  |            |
| LSI Logic Corp.              | John Lohmeyer       | P | No   | Cmnts      |
| Madison Cable Corp.          | Ashlie Fan          | P | Yes  |            |
| Maxtor Corp.                 | Mark Evans          | P | Yes  |            |
| Microsoft Corp.              | Emily Hill          | P | Abs  | Cmnts      |
| Molex Inc.                   | Jay Neer            | P | Yes  |            |
| Panasonic Technologies, Inc  | Terence J. Nelson   | P | Yes  |            |
| Philips Electronics          | William P. McFerrin | P | Yes  |            |
| Pivot3, Inc.                 | Bill Galloway       | P | Abs  | Cmnts      |
| QLogic Corp.                 | Skip Jones          | P | Yes  |            |
| Quantum Corp.                | Jim Jones           | A | Abs  | Cmnts      |
| Seagate Technology           | Gerald Houlder      | P | No   | Cmnts      |
| Storage Technology Corp.     | Erich Oetting       | P | Yes  |            |
| Sun Microsystems, Inc.       | Vit Novak           | P | Yes  |            |
| Texas Instruments            | Paul D. Aloisi      | P | Yes  |            |
| Toshiba                      | Hiroshi Suzuki      | P | Yes  |            |
| UNISYS                       | Ron Mathews         | P | Yes  |            |
| Veritas Software             | Roger Cummings      | P | No   | Cmnts      |

Ballot totals: (27:6:4:1=38)

27 Yes

6 No

4 Abstain

1 Organization(s) did not vote

38 Total voting organizations

15 Ballot(s) included comments

This 2/3rds majority ballot passed.

27 Yes are more than half the membership eligible to vote minus abstentions

[greater than 17] AND  
 27 Yes are at least 22 (2/3rds of those voting, excluding abstentions [33])  
 AND  
 27 Yes are equal to or exceed a quorum [12]

## Key:

P Voter is principal member  
 A Voter is alternate member  
 Abs Abstain vote  
 DNV Organization did not vote  
 Cmnts Comments were included with ballot  
 NoCmnts No comments were included with a vote that requires comments

\*\*\*\*\*

Comments attached to Yes ballot from Pat Thaler of  
 Agilent Technologies:

3.7.2 Perhaps I'm being excessively picky, but some of the statements here  
 seem to be contradictory:

"A data field that is described as being null-terminated shall have one byte  
 containing an ASCII null . and all other bytes in the field shall not contain  
 the ASCII null character. "

but farther down a data field that is described as being both null-terminated  
 and null-padded can have multiple null characters at the end. A "null-  
 terminated and null-padded field" is a kind of "null-terminated field" so it  
 shouldn't violate the null-terminated field rule. The first sentence could be  
 modified to "being null-terminated but that is not null-padded".

Also Note 1 seems to be wrong - The two sentences above say there is a  
 difference between pad byte contents - in one case they contain space and in  
 the other case null. This sentence says the null-padded and zero-padded

fields have the same pad byte contents and there is some difference in the other bytes of the field. Delete or correct the note.

3.7.1 As long as I'm being picky - according to the next section an ASCII data field can also contain the null character. Add "and the null code (00h).

The null code shall only be used where required for null-termination and null-

padding.

4.8.4.3 At the bottom of page 34, the paragraph referencing table 13 plus the table appear to duplicate the information in the previous paragraph (the two paragraphs starting "The OBJECT CREATION TIME field").

4.8.4.3 Permissions bit mask, WRITE bit - Presumably the WRITE bit is either ignored for the root, partition and collection object types - or setting the bit to 1 is an error for these types. Which is it?

4.8.4.3 NOTE 3 looks incorrect. From 4.6.2 there is no partition associated with Partition\_ID 0h. Table 2 says that Partitions have Partition\_IDs from 10000 h to all. Suggest deleting the NOTE 3.

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Comments attached to Yes ballot from Neil Wanamaker of AMCC:

| Identifier | T/E | Section | Page | Comment | Suggested remedy |
|------------|-----|---------|------|---------|------------------|
|            |     |         |      |         |                  |

AMCC-1 T 4.10. 53 Does not match 03-388r1 Provide for nonvolatile cache as in  
03-388r1.

AMCC-2 T 4.11.2 55 4.7.2 suggests that data-in segments could include  
get/set attributes. make consistent

AMCC-3 T 4.11.4 57 Minimum size for get/set segments is 256 bytes Allow for  
smaller increments

AMCC-4 T "4.13, par 3" 58 It is unspecified whether the byte is within the  
compass of the user object or the physical device; the former requires  
massaging before becoming useful for maintainability. Specify frame of reference.

AMCC-5 T "4.13, par 7" 58 should -> shall.

AMCC-6 E Table 30 60 RR not readily understood Add  
note reference or ?? to  
draw attention to key at bottom of diagram

AMCC-7 T 5.1 61 "Since the CDB length is fixed, why not assign a group code to  
these, and treat them as fixed?"

AMCC-8 T Table 31 61 "Either last entry sb n-1, or additional length = n-8"  
make consistent

AMCC-9 T "Table 55, and following paragraph" 90 The status of REPORT LUNS  
is  
somewhat ambiguous here - is support required for both LUN 0 and the  
well-known LUN? Neither? Clarify

AMCC-10 E Table 57 92 taSk

AMCC-11 TQ 6.13 92 On what basis are tags unique? I\_T\_L?  
I\_T\_L\_Object?

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Comments attached to Yes ballot from Robert Snively of Brocade:

Comments may follow

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Comments attached to No ballot from David Black of EMC Corp.:

EMC letter ballot comments on OSDr09. EMC votes "No" due primarily to the four comments marked with "\*\*\*". [3] is a significant functional omission from the standard. [5], [9], and [13] appear to be significant weaknesses or omissions in the specified security.

[1] Section 4.9.2 Trust Assumptions

A crucial assumption has been omitted: the capability keys must be kept secret. All of the security properties depend on the attacker not being able to obtain the capability key that goes with a credential. This requires that the unspecified Application Client to Security Manager protocol be protected against eavesdropping (e.g., via encryption). In addition all participants (OSBD, security manager, and application) must protect capability keys from being disclosed to unauthorized parties.

[2] Section 4.9.2 Trust Assumptions

The nonce processing described in Section 4.9.6.2 may depend on synchronized clocks. This assumption needs to be stated, along

with the need to protect clocks from being changed by an attacker. There is some text about this in 4.9.5.2, but it is applied only to credential expiry, which may be less sensitive to clock synchronization than nonce validation.

[3] \*\* Section 4.9.2 Trust Assumptions

There is no specification of the security functions of the security manager. This needs to be provided to explain how the server generates credentials and capability keys. This comment is tagged as being against Section 4.9.2, but is actually about an omission in the entire security section.

[4] 4.9.3.1 Introduction

The table seems to define "forgery of credential" as the ability of an attacker to construct a new valid credential from scratch. Based on the comment on CAPKEY (EMC comment [5]), another line appears to be needed to capture the "unauthorized use of credential" threat. In its current form, CAPKEY does not protect against this threat.

[5] \*\* 4.9.3.3 CAPKEY

CAPKEY is equivalent in strength to password-in-the-clear in that an attacker who can observe a credential and integrity check value can make use of both via impersonating the initiator, as the integrity check value is calculated over only the initiator and

target identities. In essence, the CAPKEY <credential, integrity check> pair functions as a limited use password for the initiator with the target - this is weaker than the CHAP authentication in iSCSI and Fibre Channel. CAPKEY's integrity check should be redefined to prevent reuse of the <credential, integrity check> value pair in a different I\_T Nexus. One possibility would be to have the target generate a nonce for each I\_T nexus, and include that value in all integrity check calculations on that I\_T nexus. The passive observer who does not have the capability key is then thwarted by the fact that this nonce changes when she creates a new I\_T nexus to impersonate the initiator.

[6] 4.9.3.3 CAPKEY

The specification of the security token is insufficiently precise about format and padding of the initiator and target identifiers. This is sufficiently important that appealing to the SCSI transport specs for the definition of these identifiers is not sufficient - they should be defined here with precise instructions on how to construct the security token.

[7] 4.9.3.4 and 4.9.3.5 CMDRSP and ALLDATA

These sections need to state that nonce verification is required as part of these security methods.

[8] 4.9.5.3 Reconstructing the Credential

Reconstruction steps 1) A), 1) B) a), and 1) B) b) modify the credential received in the CDB in a fashion that will cause device server integrity verification of a credential to fail if the modification causes any change. These steps appear to implement permission enforcement (e.g., CREATE PARTITION requires a credential for the root partition). At a minimum, this needs to be stated explicitly, but the specification would be improved by

- incorporating the A) check into the credential validation algorithm.
- incorporating the the B a) and B) b) checks into Table 19 (e.g., the partition ID in the credential MUST be zero for a CREATE PARTITION command)

[9] \*\* 4.9.6.2 Device server validation of request nonces

The fact that timestamp checks are optional allows record-and-replay attacks on device servers that don't use timestamp checks. The specific attack of concern is:

- Stimulate client to produce commands to be replayed and record them
- Corrupt the commands in flight (e.g. overwrite nonces) so the server doesn't record their nonces being as being used
- Replay the commands at some later point in time

The root of this problem is that a device server cannot detect replay of a nonce that it has never seen - this is not a problem for sequence-based and time-based mechanisms. The timestamp checks should be made mandatory including recommendations for delta values



to avoid this exposure.

[10] 4.9.6.3 Far-in-the-future nonces

This appears to be an invitation to record-and-replay attacks even in the presence of timestamp checks. It needs to be removed from the standard or heavily justified.

[11] 4.9.8.1 (Secret keys) Introduction

The Capability key row in Table 22 should say that the key is new with each Capability, not Credential.

[12] 4.9.8.1 (Secret keys) Introduction

Footnote d refers to a short time interval during which the Capability key is valid. The fact that the time interval must be short (and what "short" means) is not specified. This is probably part of the larger problem specification of security manager functions has been omitted.

[13] \*\* 4.9.8.3 Computing updated generation keys and new authentication keys

This functionality cannot provide forward secrecy. If any master key is ever compromised, all keys based on it (including subsequent master keys) are potentially compromised. This can be disastrous.

Versions of SET KEY and SET MASTER KEY are needed that perform some sort of cryptographic key exchange so that forward secrecy can be provided if desired. A particularly disastrous situation is that when the OBSD owner changes, if the old owner (who knows the previous master generation key value) can observe the seed value in the new owner's SET MASTER KEY command, she can determine the new master keys (generation and authentication). This is undesirable for obvious reasons.

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Comments attached to Abs ballot from Robert H. Nixon of Emulex:

The subject matter of this draft standard is not relevant to the business of my organization.

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Comments attached to No ballot from Ralph O. Weber of ENDL:

ENDL 1 Technical

PDF pg 1, pg i, Global

Incorporate 04-095 to define additional quota enforcement features, new sense data descriptors, and additional error reporting features.

ENDL 2 Technical

PDF pg 1, pg i, Global

Incorporate 04-100 to separate capability checking from security, the object version tag from security, and define basic object fencing features.

ENDL 3

PDF pg 37, pg 18, 4.6.4, p 2, s 2

user object [s/b] partition [The ID under discussion is a Partition\_ID  
not a User\_Object\_ID.]

ENDL 4 Technical

PDF pg 39, pg 20, 4.7.2

There is no description of the order in which commands are processed.  
In the Error Handling document I posted in January, there were two  
ordering that the error group thought essential. They are:

The reporting of errors during initial command processing is important  
to avoid leaking any information when security may be compromised.  
Therefore, the REPORTING of errors should proceed in the following  
order.

1. Any security errors against the integrity of the credential (and  
cmd/data if requested) should be reported first. The including  
verifying any INTEGRITY CHECK values, key version, credential format,  
and checksum algorithm requested.
2. Any errors due to NONCE processing must be reported.
3. Any errors in the capability permissions, expired capability, unknown  
object, invalid create time or version number

Only the first error in this ordering should be reported. This ordering  
does not mandate that a device process a command in this order. Only  
that the device report errors in the specified order.

ENDL 5

PDF pg 42, pg 23, 4.7.5, Table 5, r 3, c 3

partition [s/b] collection [This row is describing the Collection Directory, not the Partitiion Directory.]

ENDL 6 Technical

PDF pg 43, pg 24, 4.8.3

The spec says that 'tests for quota errors may be made at any time during the processing of a command.' This presents several problems. First, writes may be partially complete when quota errors occur, terminating in a partial write, which might have partially overwritten data. Second, if (quota < already-used-space), any space-consuming command should immediately terminate. However, because quota tests can be performed at any time during the processing of the command, it is possible for the OSD to allow a write-like command to consume more space before terminating with an error.

We recommend that tests for quota should occur before any data or attributes have been modified or newly written. In other words, a command that would result in exceeding quota is terminated before any permanent OSD object-state has been modified.

ENDL 7 Technical

PDF pg 45, pg 26, 4.9.3.1, 1st s after Table 6

Why is security defined on a per-partition basis? I thought that the partition (and/or root object) encoded the MINIMUM level of security and that every capability encoded the actual level of security used to

generate the capability?

This is important because if every object w/in a partition (or root device) must use the same level of security, then providing different clients with different security needs becomes impossible. For example, a client that sits behind a firewall may need a much lower level of security than a client outside the firewall.

ENDL 8 Technical

PDF pg 87, pg 68, 6.1, table 39

PERSISTENT RESERVE IN and PERSISTENT RESERVE OUT should be optional implement, despite the statements made in approved document T10/02-260r1 and disregarding the written request from Ed Gardner that T10/02-260r1 be observed in OSD. These two commands make virtually no sense in an OSD device because of the vastly more versatile security capabilities feature. Requiring their implementation places an unreasonable burden on OSD products.

ENDL 9

PDF pg 90, pg 71, 6.2, 2nd p on pg

This paragraph is a total nonsense. A sentence ends without a period.

There is a missing cross reference.

ENDL 10

PDF pg 92, pg 73, 6.3, 1st a,b,c list on pg, item a

Actually, the device server shall not allow the same ID to be associated with more than one user-object or collection-object(remember that user and collection objects share the same namespace)

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Comments attached to Yes ballot from Rob Elliott of  
Hewlett Packard Co.:

Summary of Comments on SCSI  
Object-Based Storage Devices (OSD)

HPQ #1

PDF Page vii

Abstract

What is "peer-to-peer" about OSD? It follows the usual SCSI model of  
client/server =initiator/target.

HPQ #2

PDF Page xviii

Page xviii

Change "Storage Industry Network Association" to "Storage Networking  
Industry Association (see <http://www.snia.org>)"

HPQ #3

PDF Page xix

Introduction

Add a Gene Milligan dedication page since he edited the original drafts of  
this standard. See SBC-2 for picture and text.

HPQ #4

PDF Page 1

1 Scope

Change "device type field" to "PERIPHERAL DEVICE TYPE field" with small  
caps

HPQ #5

PDF Page 2

1 Scope

Delete "At the time this standard was generated, examples of the SCSI  
general structure included:" and the list that follows on  
pages 2-3. It's always out of date and generally irrelevant to OSD itself.

HPQ #6

PDF Page 5

2.5 Ref under def

Format "([www.t10.org](http://www.t10.org))" like other web page references

HPQ #7

PDF Page 5

2.5 Ref under def

Format "([www.incits.org](http://www.incits.org))" like other web page references

HPQ #8

PDF Page 8

3.1.47 greenwich

Capitalize the city name Greenwich (and possible Mean and Time too).  
According to the reference and other pages, UTC is probably more correct  
than UT.

HPQ #9

PDF Page 13

3.7.2 Data field termination and padding requirements

Delete "and all other bytes in the field shall not contain the ASCII null  
character." and/or phrase the condition as "as being  
null-terminated but not null-padded"

Null padding means other bytes are set to null.

There are current no uses of "null-terminated" in the standard except in  
3.7.2. Perhaps the attribute value strings (see 7.1.2.4for  
the first example) should be - or are they null-terminated null-padded? If  
so, then just "null-padded" should suffice.

HPQ #10

PDF Page 13

3.7.2 Data field termination and padding requirements

null-terminated and null-padded

There is only one use of "null-padded" in the standard, and no uses of  
null-terminated on its own.

HPQ #11

PDF Page 16

4.4 Elements of the example configuration

Delete clients (or make application singular)

HPQ #12

PDF Page 18

4.6.3 Root object

Change "status, the sense key shall be set to ILLEGAL REQUEST and the  
additional

sense code shall be set to INVALID FIELD IN CDB."

to "status status with the sense key set to ILLEGAL REQUEST and the  
additional

sense code set to INVALID FIELD IN CDB."

HPQ #13

PDF Page 18

4.6.2 Identifying OSD objects

Add comma between object and each

HPQ #14

PDF Page 18

4.6.4 Partitions

Broken cross-reference to CREATE COLLECTIONS; 6.5 should be 6.6

HPQ #15

PDF Page 19

4.6.4 Partition object

Change "status, the sense key shall be set to ILLEGAL REQUEST and the  
additional

sense code shall be set to INVALID FIELD IN CDB."

to "status status with the sense key set to ILLEGAL REQUEST and the  
additional

sense code set to INVALID FIELD IN CDB."

HPQ #16

PDF Page 19

4.6.6 Collections

Change "status, the sense key shall be set to ILLEGAL REQUEST and the additional

sense code shall be set to INVALID FIELD IN CDB."

to "status status with the sense key set to ILLEGAL REQUEST and the additional

sense code set to INVALID FIELD IN CDB."

HPQ #17

PDF Page 20

4.7.2

Change Processing to Process

HPQ #18

PDF Page 20

4.7.1 Overview

Change store to stored (or set)

HPQ #19

PDF Page 20

4.7.2

Move and to row 4) from row 3)

HPQ #20

PDF Page 21

4.7.3 Attributes pages (global)

P, C, and R are difficult to search for. How about slightly longer acroyms like P\_BASE, C\_BASE, and R\_BASE?

HPQ #21

PDF Page 21

4.7.3 Attributes pages

Table 3 - Attributes page numbers

Change use to used

HPQ #22

PDF Page 21

4.7.3 Attributes pages

Change needed to used

HPQ #23

PDF Page 21

4.7.2

Change Processing to Process

HPQ #24

PDF Page 21

4.7.2 Command function ordering

Each command section that has unusual processing orders (GET ATTRIBUTES, SET ATTRIBUTES, REMOVE, REMOVE

PARTITION, and REMOVE COLLECTION) should cross-reference back to here.

If you get the Root Information page number of partitions value, it



reflects the value before not after removing a partition.

HPQ #25

PDF Page 21

#### 4.7.3 Attributes pages

It is not clear if the attributes page numbers form one numbering space across the entire logical unit. Please state the scope explicitly.

HPQ #26

PDF Page 22

#### 4.7.4 Attributes

Not sure I follow this, "all attribute values" attribute is represented in what format? And how is this useful beyond a boolean value ( i.e. beyond whether or not attributes are present)? Or is just a boolean value meant here?

HPQ #27

PDF Page 23

#### 4.7.5 Attributes directories

Change may not to shall not

HPQ #28

PDF Page 23

#### 4.8.1 [Quotas] introduction

This entire line is a messed up cross reference. "c) The COLLECTIONS PER USER OBJECT field contains the value of the collections per user object attribute. (see )." It should just be User Object Quotes attributes page (see 7.1.2.14)."

HPQ #29

PDF Page 24

#### 4.8.4 Changing quotas

"As long as the quota value remains set to a value that is less than the applicable resources already consumed, all commands that attempt to consume the applicable resource shall be terminated with a quota error."

If:

- 1) the quota is set to a high value Z
- 2) objects are creating consuming that amount
- 3) the quota is reduced to a lower value Y
- 4) a command is run which reduces the number of objects but not to a value below Y

Is the command required to be accepted or might it run into a quota problem? This wording could be interpreted as letting such commands be terminated, because they end up still above the quota. It should allow any commands which reduce the number of objects even if the current quota is exceeded.

HPQ #30

PDF Page 24

#### 4.9.1

add ; after row a)

HPQ #31

PDF Page 24

## 4.9.1 Basic security model

This description oversimplifies the fact. Definitions 3.1.4 and 3.1.11 are better descriptions, suggest adopting text from them here.

HPQ #32

PDF Page 26

## 4.9.1 Basic security model

I think it helps to state that the OSD device server does not authenticate via an explicit protocol. An indirect authentication takes place via the checking of the integrity checksums.

HPQ #33

PDF Page 27

## 4.9.3.3 The CAPKEY security method

These terms are obsolete in SAM-3:

"1) Initiator identifier; and

2) Target identifier."

(used 3 times each in this section)

Use "Initiator port identifier" and "Target port identifier" if that is what is intended.

HPQ #34

PDF Page 27

## 4.9.3.3 The CAPKEY security method

Change Nexus to nexus (global except when referring to a Nexus argument in a function call)

HPQ #35

PDF Page 27

## 4.9.3.1 Introduction

I think the following is implied in this text. Please make it explicit if it's truly implied.

The application client shall recompute the security token on receiving the I\_T Nexus Loss event notification.

HPQ #36

PDF Page 29

## 4.9.3.5.

Change ; to : in "segments (see 4.11.3);"

HPQ #37

PDF Page 30

## 4.9.3.5

Change ; to : in "Buffer;"

HPQ #38

PDF Page 31

## 4.9.3.5

Change ; to : in "segments (see 4.11.2);"

HPQ #39

PDF Page 31

## 4.9.3.5

Change ; to : in "Buffer;"

HPQ #40  
PDF Page 32  
4.9.4.1  
Add . after "in 4.9.4.3"

HPQ #41  
PDF Page 32  
4.9.4.1 Credential format  
Somewhere around here, it needs to be stated that the scope of a credential is one object on the OSD logical unit. OBJECT CREATION TIME that shows up later is the first hint to this effect.

HPQ #42  
PDF Page 32  
4.9.4.1 Credential format  
It would help if it is clarified whether the credential on root "partition" is qualitatively different from that on any other object (I think the answer is no). This sentence without any additional clarification would make the reader wonder if there's something here that's different.

HPQ #43  
PDF Page 34  
4.9.4.3 Capability format  
This entire paragraph is completely redundant with Table 13. Suggest deleting.

HPQ #44  
PDF Page 35  
4.9.4.3 Capability format  
Table 14  
Drop "objects" for consistency.

HPQ #45  
PDF Page 35  
4.9.4.3 Capability format  
Table 14  
Drop "object" for uniformity.

HPQ #46  
PDF Page 36  
4.9.4.3 Capability format  
Table 14  
This elaborate protocol structure with OBJECT DESCRIPTOR TYPE is simply confusing. Seeing that 1OBJECT is the only allowed type, I can only surmise that this structure is intended to allow future expansions that allow a single set of permission bits (and capability) to be shared across multiple objects. If this true, it is good to state that explicitly. As of now, the Object Descriptor Type is a simple valid/invalid bit.

HPQ #47  
PDF Page 45  
4.9.5.2 Credential and capability validation  
is should be in  
or delete and change use to used

HPQ #48  
PDF Page 45  
4.9.5.2 Credential and capability validation  
is should be in  
or delete and change use to used

HPQ #49  
PDF Page 45  
4.9.5.2 Credential and capability validation  
should be 4.9.3.3 or not here at all

HPQ #50  
PDF Page 47  
4.9.6.1 Request nonce format  
Change "January 1, 1970" to "1 January 1920"  
4.9.5.4 Computing the credential integrity check value (and global)  
What is a "drive"?  
Change "drive key" to "root key"

HPQ #52  
PDF Page 48  
4.9.6.2 Device server validation of request nonces  
shall not be accepted a second time with the same nonce value?

HPQ #53  
PDF Page 48  
4.9.6.2 Device server validation of request nonces  
The maximum number of far in the future nonces might be useful to know too.

HPQ #54  
PDF Page 49  
4.9.6.3.2  
Change "a sense key of ILLEGAL  
REQUEST, and an additional sense code of SECURITY AUDIT VALUE FROZEN."  
to "a sense key set to ILLEGAL  
REQUEST, and an additional sense code set to SECURITY AUDIT VALUE FROZEN."

HPQ #55  
PDF Page 49  
4.9.6.3.3  
Change "a sense key of  
ILLEGAL REQUEST, and an additional sense code of SECURITY WORKING KEY  
FROZEN;"  
to "a sense key set to  
ILLEGAL REQUEST, and an additional sense code set to SECURITY WORKING KEY  
FROZEN;"

HPQ #56  
PDF Page 50  
4.9.8.1 Introduction  
What is the granularity of ownership implied here? 3.1.26 for OBSD says  
that it's a SCSI device. I tend to think that a SCSI LU is  
implied here for SET MASTER KEY.

HPQ #57  
PDF Page 50

## 4.9.8.1 Introduction

Change As to "As a" or delete entirely

HPQ #58

PDF Page 50

## 4.9.8.1 Introduction

Please give a sense of what "very short" is - of the order of minutes or microseconds? If the answer is "it depends", then the same can be attributed to the "is very short" description.

HPQ #59

PDF Page 51

## 4.9.8.1 Introduction

In addition to the key in question or instead of?

HPQ #60

PDF Page 51

## 4.9.8.1 Introduction

Is this the same as the working key in the case of working keys?

HPQ #61

PDF Page 53

## 4.10 Data persistence model

change lost to loss

HPQ #62

PDF Page 53

## 4.10 Data persistence model

Somewhere around this clause, a discussion and mandatory features of fencing need to be added in. The discussion on the SNIA OSD TWG is at best inconclusive and at least one company believes that lack of fencing support in OSD could lead to undetected data corruptions. The OSD TWG however did not arrive at any conclusions on this opinion as of 3/23/04. Before the Letter Ballot process is closed, OSD TWG (and perhaps T10 at large) needs to drive this issue to closure.

HPQ #63

PDF Page 54

## 4.11.1 OSD meta data

I presume this is meant to address the set/get attr operations, but this brings up another question. It would be good to clarify on bidirectional commands.

HPQ #64

PDF Page 56

## 4.11.3 OSD Data-Out Buffer format

and SET ATTRIBUTES OFFSET?

HPQ #65

PDF Page 58

## 4.13 Error reporting

This implies that the caption in Table 10 of SPC-3 r16 needs changing. S/optional for all others/OSD/

HPQ #66

PDF Page 59

#### 4.15 Reservations

Only one "I" can be associated with an "I\_T" nexus. So, is "every initiator port associated with the released registrations" meant?

HPQ #67

PDF Page 61

#### 5.1 OSD CDB format

Change "additional sense code of" to additional sense code set to"

HPQ #68

PDF Page 61

#### 5.1 OSD CDB format

Change "additional sense code of" to additional sense code set to"

HPQ #69

PDF Page 61

#### 5.1 OSD CDB format

Why would you think they would be encrypted? Delete the sentence

HPQ #70

PDF Page 65

#### 5.2.3 Options byte

The READ command has an options byte, but FUA only means results of a command being written. Is the intent to force the read to be sourced from the stable storage, as it does in SBC-2?

HPQ #71

PDF Page 71

#### 6.2 APPEND

Fix "in the The COLLECTIONS

PER USER OBJECT field contains the value of the collections per user object attribute. (see ), then"

HPQ #72

PDF Page 72

#### 6.3 CREATE

I think this should also be followed with a sentence like the following (the same comment applies to CREATE and WRITE).

The assigned User\_Object\_ID shall be placed in the created User\_Object\_ID attribute of the Current Command attributes page (see 7.1.2.24).

HPQ #73

PDF Page 75

#### 6.4 CREATE AND WRITE

Fix "in the

The COLLECTIONS PER USER OBJECT field contains the value of the collections per user object attribute. (see ), then"

HPQ #74

PDF Page 75

#### 6.4 CREATE AND WRITE

If CREATE AND WRITE encounters a quota error, did the CREATE work or not? Quota errors can be checked at any time during the command according to 4.8.3. The same question applies to any CREATE

command with a set attributes operation that fails for any reason (quota, invalid attribute number, etc). It would be easiest for software if the CREATE operation completed before the WRITE operation or attribute modification begins, so the object is assumed created if a CHECK CONDITION for one of those reasons occurs.

HPQ #75

PDF Page 78

#### 6.6 CREATE PARTITION

Change "object count quota" to "partition count". This paragraph was probably copied from CREATE, CREATE AND WRITE , and CREATE COLLECTION, but those deal with the "object count quota" field.

HPQ #76

PDF Page 78

#### 6.7 FLUSH OBJECT

There should be a FLUSH COLLECTION command to flush a collection object to stable storage, perhaps flushing all the user objects that are part of that collection.

HPQ #77

PDF Page 78

#### 6.7 FLUSH OBJECT

Other commands like CREATE and REMOVE have separate versions for user data objects and partitions. Why is this one combined? What does this have OBJECT in its title?

I suggest splitting it into FLUSH, FLUSH COLLECTION, and FLUSH PARTITION.

HPQ #78

PDF Page 79

#### 6.7 FLUSH OBJECT

Table 46

Change List to List of

HPQ #79

PDF Page 79

#### 6.7 FLUSH OBJECT

Table 46

Change "listed" to "all of the listed"

HPQ #80

PDF Page 81

#### 6.8 FORMAT OSD

It might be helpful to include a note here mentioning that, because a set attributes can be included with the FORMAT OSD CDB, happen the command can "complete" at the SCSI level with some attributes in the R range set.

HPQ #81

PDF Page 81

#### 6.8 FORMAT OSD

Change "a sense key of NOT READY with the additional sense code set to LOGICAL UNIT NOT READY

FORMAT IN PROGRESS,"

to "GOOD status with parameter data containing a sense key set to NOT READY

and an additional sense code set to LOGICAL  
UNIT NOT READY FORMAT IN PROGRESS"

HPQ #82

PDF Page 99

6.19 SET KEY

add (MSB) and (LSB) to SEED. The text below actually refers to the "least significant bit" of the field.

HPQ #83

PDF Page 101

6.20 SET MASTER KEY

Add (MSB) and (LSB) to SEED field. The text below actual refers to the "least significant bit".

HPQ #84

PDF Page 103

6.21 WRITE

Delete all this text that only belongs in the CREATE AND WRITE section.

"If a CREATE AND WRITE command causes the value in the user object logical length attribute in the User Object Information

attributes page (see 7.1.2.11) to exceed the value in the maximum user object length attribute in the The COLLECTIONS PER

USER OBJECT field contains the value of the collections per user object attribute., then a quota error shall be generated (see

4.8.2). The quota testing principles described in 4.8.3 apply to the testing of the maximum user object length quota.

If a CREATE AND WRITE command causes the value in the used capacity attribute in the Partition Information attributes page

(see 7.1.2.9) to exceed the value in the capacity quota attribute in the Partition Quotas attributes

page (see 7.1.2.13), then a quota error shall be generated (see 4.8.2). The quota testing principles described in 4.8.3 apply to the

testing of the capacity quota."

HPQ #85

PDF Page 105

7.1.2.1 Attributes pages overview

Table 67

should indicate which pages have defined page formats and which use the list format

HPQ #86

PDF Page 106

7.1.2.2 Add "null-terminated" before "null-padded" or delete

"null-terminated" from the 3.7.2

HPQ #87

PDF Page 106

7.1.2.2 Attribute number 0h in all attributes pages

Change INCITS to:

the ASCII characters "INCITS"

HPQ #88

PDF Page 106

7.1.2.3



Change unidentified to undefined

HPQ #89

PDF Page 106

7.1.2.2

"With the exception of the Root Directory and Partition Directory attributes pages, all attribute pages ... shall have attribute number 0h."

The Collection Directory, User Object Directory, and Null pages should be included in this exclusion list.

The Collection Directory attributes are all C+ page numbers; it doesn't mention if attribute 0h is supported too.

The User Object Directory attributes are all 0+ page numbers, where attribute 0h contains just a string for the User Object Directory, not the vendor ID and page identification string indicated by table 68.

The Null page isn't really a page, and it doesn't have an attribute 0h describing it compliant with table 68.

HPQ #90

PDF Page 108

7.1.2.5

Nowhere is it defined that these Attribute Values are null-terminated.  
See 3.1.7.2

HPQ #91

PDF Page 111

7.1.2.8 Root Information attributes page

use small caps for field names like code set (several times in this page)

HPQ #92

PDF Page 112

7.1.2.8 and global

Change "states may not" to "states shall not".

The table has a row for "may: yes or no". It's providing a choice of "may or may not" vs "shall not".

Apply to all uses of "states may not" in the document.

HPQ #93

PDF Page 112

7.1.2.8 Root Information attributes page

Change January 1, 1970 to 1 January 1970

7.1.2.8 Root Information attributes page

Change serial number to product serial number to match the SPC-3 name and the 3 preceding attribute names.

HPQ #95

PDF Page 113

7.1.2.9 Partition Information attributes page

Are there any requirements that the username attribute be an ASCII or UTF-8 string, or is treated as an arbitrary binary field?

This question also applies to the Collection Information (7.1.2.10) and User Object Information (7.1.2.11) attributes pages.

HPQ #96

PDF Page 115

## 7.1.2.11

What is an "unwritten byte"? It'd be safest for software if bytes of 00h could be assumed to be written, rather than vendor-specific data (probably previous object contents). The tradeoff is slower performance.

## HPQ #97

PDF Page 116

## 7.1.2.12 Root Quotas attributes page

Given that "All attributes in the Root Quotas attributes page are quotas" why not include "quota" or "maximum" in all their names (or in none of their names)?

"Partition capacity quota" and "Default maximum user object length" are clearly named, but the others are not.

"Partition object count" and "Partition count" sound like current values not maximums. "Maximum partition object count" and

"Maximum partition count" would be better.

"Partition collections per user object" could pass as a limit; "Maximum partition collections per user object" would be better.

## HPQ #98

PDF Page 116

## 7.1.2.12 Root Quotas attributes page

Change 0001 to 1

## HPQ #99

PDF Page 116

## 7.1.2.12 Root Quotas attributes page

Change 0001 to 1

## HPQ #100

PDF Page 116

## 7.1.2.12 Root Quotas attributes page

Change 0002 to 2

## HPQ #101

PDF Page 116

## 7.1.2.12 Root Quotas attributes page

In table 78 on the next page, the partition count field is shown as 4 bytes, not 8 bytes.

## HPQ #102

PDF Page 116

## 7.1.2.12 Root Quotas attributes page

"All attributes in the Root Quotas attributes page are quotas" is not true for number 0h.

## HPQ #103

PDF Page 116

## 7.1.2.12 Root Quotas attributes page

There are two attributes called "default maximum user object length attribute", one in the Root Quotas page and the other in the Partition Quotas page. Since the partition values can be changed after created, they should use different names. Following the convention of other fields, call the root level attribute the "Partition default maximum user object length" attribute.

HPQ #104

PDF Page 117

7.1.2.12 Root Quotas attributes page

In table 77, partition count is an 8 bit value, implying this should be 43 and the page length should be 24h.

(or, change table 77 to make the partition count 4 bytes)

HPQ #105

PDF Page 118

7.1.2.13 Partition Quotas attributes page

Change "in the" to "in the User Object Quotas attribute page."

HPQ #106

PDF Page 118

7.1.2.13 Partition Quotas attributes page

Delete "The COLLECTIONS PER USER OBJECT field contains the value of the collections per

user object attribute. (see ) for each user object, when it is created." which seems like a cut-and-paste error.

HPQ #107

PDF Page 118

7.1.2.13 Partition Quotas attributes page

"All attributes in the

Partition Quotas attributes page are quotas" is not true for number 0h.

7.1.2.13 Partition Quotas attributes page

Add "If setting an attribute causes the capacity quota to be exceeded, a quota error shall be generated."

See last paragraphs of 5.2.1.2 and 5.2.1.3

HPQ #109

PDF Page 119

7.1.2.14 User Object Quotas attributes page

"All attributes in the User

Object Quotas attributes page are quotas" is not true for number 0h.

HPQ #110

PDF Page 121

7.1.2.15 Root Timestamps attributes page

This section needs to incorporate the formula hashed out on the SNIA OSD mailing list - that a FFh value would leave the timestamp control to the CDB timestamp bypass value.

HPQ #111

PDF Page 123

7.1.2.16 Partition Timestamps attributes page

What if you get the data modified attribute with a CREATE or REMOVE CDB? Do you get the future time where that command is estimated to complete, or the time the last CREATE or REMOVE command ran, or the time the create or remove operation part of the command completed?

This applies to all the fields that return a timestamp which can be affected by the command carrying the get attributes itself (either by the core command operation or by a set attributes that was also specified).

HPQ #112  
 PDF Page 124  
 7.1.2.16 Partition Timestamps attributes page  
 Table 87 - Partition Timestamps attributes page format  
 Fix border  
 7.1.2.19 Collections attributes page  
 Add mention of the collections per user object quota check that is performed when setting this page

HPQ #114  
 PDF Page 130  
 7.1.2.19 Collections attributes page  
 Add:  
 The PAGE NUMBER field contains the attributes page number of the Collection attributes page.  
 The PAGE LENGTH field contains the number of additional bytes in the page format of the Collection attributes page.

HPQ #115  
 PDF Page 132  
 7.1.2.20 Root Security attributes page  
 Change January 1, 1970 to 1 January 1970

HPQ #116  
 PDF Page 146  
 7.1.3.3  
 Delete extra "in the"

HPQ #117  
 PDF Page 146  
 7.1.3.2 List entry format for retrieving attributes for this OSD object  
 Change that to the

HPQ #118  
 PDF Page 146  
 7.1.3.2 List entry format for retrieving attributes for this OSD object  
 Change all to each  
 (or change having a non-zero attribute length" to "having non-zero attribute lengths")

HPQ #119  
 PDF Page 146  
 7.1.3.2 List entry format for retrieving attributes for this OSD object  
 "one attribute"  
 If attribute number is FFFFFFFFh, more than one attribute is going to be returned. Use of "one" is incorrect

\*\*\*\*\*

Comments attached to No ballot from George O. Penokie of IBM Corp.:

IBM-001

PDF pg 3, pg iii, Revision Information

The revision information has to be removed before this goes to public review.

IBM-002

PDF pg 17, pg xvii, Foreword, 2nd paragraph

This is no need to the << input/output >> terminology in front of logical units.

IBM-003

PDF pg 17, pg xvii, Foreword, 2nd paragraph

The statement << scope of the SCSI command set. >> should be << scope of this

SCSI command set. >>

IBM-004

PDF pg 17, pg xvii, Foreword, 6th paragraph

The statement << 200X. >> should be << 2004.>> as I assume this will get done

this year.

IBM-005

PDF pg 17, pg xvii, Foreword, 6th paragraph

The statement << Most of its features have been tested in pilot products implementing these concepts in conjunction with standard transport protocols. >> is marking hype and should be removed.

IBM-006

PDF pg 21, pg 2, 1 Scope

There is no point in listing all the SCSI standards. The entire list should be

deleted.

IBM-007

PDF pg 23, pg 4, 2.2 Approved ISO references

The standards reference << ISO/IEC 14776-452, SCSI Primary Commands - 2

(SPC-2) [ANSI NCITS.351-2001] >> should be deleted as the only place SPC-2 is

used is in the acronym list.

IBM-008

PDF pg 25, pg 6, 3.1.3 attributes:

This << Data (sometimes called meta data) that >> should be << Data, sometimes

called meta data, that >>.

IBM-009

PDF pg 27, pg 8, 3.1.39 security method:

The statement << zero or more >> seems pointless and should be deleted.

IBM-010

PDF pg 27, pg 8, 3.1.41 sense data:

The statement <<server delivers to an application

client as described in SPC-3. >> should be << server delivers to an application

client. See SPC-3. >>

IBM-011

PDF pg 27, pg 8, 3.1.42 sense key:

The statement << field in the sense data (see 3.1.41). >> should be << field

in the sense data. See 3.1.41. >>.

IBM-012

PDF pg 27, pg 8, 3.1.46 task:

The statement << or a group of linked commands >> should be deleted as linked

commands are not allowed for this command set.

IBM-013

PDF pg 27, pg 8, 3.1.49 User\_Object\_ID:

The statement << user object (see 4.6.1). >> should be << user object. See 4.6.1. >>

IBM-014

PDF pg 28, pg 9, 3.2 Acronyms

The SPC-2 acronym should be deleted as it is not used in this standard.

IBM-015

PDF pg 32, pg 13, 3.2 Acronyms, 1st paragraph

The statement << and all other bytes in the field shall not contain the ASCII

null character. >> would read better as << and no other bytes in the field shall contain the ASCII null character. >>

IBM-016

PDF pg 33, pg 14, 4.1 The request-response model, 2nd paragraph

This should be an ab,c list << CDB, Data-Out Buffer, Data-Out Buffer Size, Data-In Buffer, Data-In Buffer Size, and Sense Data. >>

IBM-017

PDF pg 37, pg 18, 4.6.2 Identifying OSD objects, first sentence in 4.6.2.

'identifies the root object, each partition,\203' is not clear syntactically.

(IBM)

IBM-018

PDF pg 37, pg 18, 4.6.4 Partitions, 1st paragraph

The statement << be many partitions, >> should be << be any number of partitions, >>

IBM-019

PDF pg 37, pg 18, 4.6.4 Partitions

Device shall terminate these commands applied to a partition object:  
append,

read, remove, write. (IBM)

IBM-020

PDF pg 37, pg 18, 4.6.4 Partitions

a.Second paragraph should be 'when the partition is created'.

b.Last sentence, should be (see 6.6)

c.Contrast partition zero with all other partitions (IBM)

IBM-021

PDF pg 38, pg 19, 4.6.6 Collections



device shall terminate these commands applied to a collection object:  
append,

read, remove, write. (IBM)

IBM-022

PDF pg 39, pg 20, 4.7.1 Overview, a.b.c list

Item d should be << d) A user object; or >>

IBM-023

PDF pg 39, pg 20, Global

The use of the format << (see table 3 in x.x.x), >> should not be used as  
there is no obvious rule as to when the x.x.x is there and when it is not.

There is no way you can say that if the table or figure is on the same page  
then there is no x.x.x because there is no way to know when a table will  
move

to a different page as the document is modified. So either remove the << in  
x.x.x >> and make it consistent with all the other standards (which is my  
choice) or make all figures and tables have the << in x.x.x >> format.

IBM-024

PDF pg 39, pg 20, 4.7.1 Overview, Last paragarph

I woul d like to see the stament << and by other written documentation. >>  
deleted. But if not deleted then at least delete the term << written >>.

IBM-025

PDF pg 39, pg 20, 4.7.2 Command function ordering for commands that get  
and/or

set attributes, 2nd paragraph

The statement << shall be performed in the following order: >> should be <<  
shall be processed in the following order: >>

IBM-026

PDF pg 39, pg 20, 4.7.2 Command function ordering for commands that get and/or

set attributes, 1st 1,2,3 list

The << and >> should be moved from item 2 to item 3.

IBM-027

PDF pg 39, pg 20, 4.7.2 Command function ordering for commands that get and/or

set attributes

Remove may implicitly change some attributes (e.g. capacity). Therefore the order of these changes with respect to other operations should be explicitly

state like in other commands in this section. (IBM)

IBM-028

PDF pg 40, pg 21, 4.7.2 Command function ordering for commands that get and/or

set attributes, 3rd paragraph

The statement << shall be performed in the following order: >> should be << shall be processed in the following order: >>

IBM-029

PDF pg 40, pg 21, 4.7.2 Command function ordering for commands that get and/or

set attributes, 4th paragraph

The statement << shall be performed in the following order: >> should be << shall be processed in the following order: >>

IBM-030

PDF pg 40, pg 21, 4.7.2 Command function ordering for commands that get and/or

set attributes, 5th paragraph

The statement << shall be performed in the following order: >> should be << shall be processed in the following order: >>:

IBM-031

PDF pg 41, pg 22, 4.7.3 Attributes pages, Table 4

The distinction between 'Defined by OBSD manufacturer product specifications'

and 'Vendor Specific' is not clear to us. (IBM)

IBM-032

PDF pg 42, pg 23, 4.7.5 Attributes directories

Does attribute page FFFFFFFE (Current Command Page) appear in the directory-page of specific-object-type ? it doesn't appear in the examples in

section 7. (IBM)

IBM-033

PDF pg 42, pg 23, 4.8.1 Introduction

Missing quota attribute page for user-object. (IBM)

IBM-034

PDF pg 42, pg 23, 4.8.1 Introduction, Item c

There is a missing refernce in item c.

IBM-035

PDF pg 43, pg 24, 4.8.2 Quota errors, a,b,c list

You should combine items a), b), and c) into an item a\

IBM-036

PDF pg 43, pg 24, 4.8.2 Quota errors

What type of sense-data-descriptor should be used to specify violated quota attribute? Can this be explicitly explained in the document? (IBM\

IBM-037

PDF pg 43, pg 24, 4.8.4 Changing quotas, 1st paragaph

So in the statement << command with an appropriate capability. >> what exactly

is the << appropriate capability. >> supposed to be? That kind of wording is

not appropriate for a standard. Either be more specific or delete it.

IBM-038

PDF pg 44, pg 25, 4.9.1 Basic security model, Figure 4

should be 'Send credential to the device' (IBM)

IBM-039

PDF pg 44, pg 25, 4.9.1 Basic security model, 1st paragraph under figure 4

The statement << a integrity check >> should be << an integrity check >>.

IBM-040

PDF pg 44, pg 25, 4.9.1 Basic security model, 2nd paragraph under figure 4

The statement << by this standard; however, the >> should be << by this standard. However, the >>

IBM-041

PDF pg 44, pg 25, 4.9.1 Basic security model, item B

The statement << are to be performed. >> should be << re to be processed. >>

IBM-042

PDF pg 45, pg 26, 4.9.3.1 Introduction, Table 6

NOSEC Description should be 'No security, access control only' (IBM)

IBM-043

PDF pg 47, pg 28, 4.9.3.3 The CAPKEY security method, Last sentence in 4.9.3.3

'from forging, modifying a credential or replaying it on a different secure channel' (IBM)

IBM-044 Technical

PDF pg 48, pg 29, 4.9.3.4 The CMDRSP security method, 2nd to last paragraph

The statement << One possible action is to request a new credential from the

security manager and retry the command. >> should not be here as the previous

sentence states the action is not defined by this standard. If you reject this

recommendation then at a minimum the statement needs to be stated as a example

in an (e.g., .. ).

IBM-045

PDF pg 48, pg 29, 4.9.3.5 The ALLDATA security method, first sentence

Add 'validates the integrity of all data, mete data included, in transit' . (IBM)

IBM-046 Technical

PDF pg 50, pg 31, 4.9.3.5 The ALLDATA security method, 2nd to last paragraph

The statement << One possible action is to request a new credential from the

security manager and retry the command. >> should not be here as the previous

sentence states the action is not defined by this standard. If you reject this

recommendation then at a minimum the statement needs to be stated as a example

in an (e.g., .. ).

IBM-047

PDF pg 51, pg 32, 4.9.4.1 Credential format

Change 'root partition' to 'partition zero' (IBM)

IBM-048

PDF pg 53, pg 34, 4.9.4.3 Capability format, 2 paragraphs above table 13

OBJECT CREATION TIME is explained twice. (IBM)

IBM-049

PDF pg 55, pg 36, 4.9.4.3 Capability format, NOTE 3

This looks more like norminate text than a note << NOTE 3 A Partition\_ID of

zero specifies that access is allowed to both the partition numbered zero and

the root object. >> and as such should be included as the main line text.

IBM-050

PDF pg 61, pg 42, 4.9.4.4 Credentials and commands allowed, Table 20

Applies to all ROOT entries: do attribute pages of partition. (IBM)

## IBM-051 Technical

PDF pg 64, pg 45, 4.9.5.2 Credential and capability validation, 4th paragraph

The statement << In most cases the order in which the >> is just a tease to the reader as there is no indication as to cases in which the order is important. I recommend deleting << In most cases >>.

## IBM-052 Technical

PDF pg 65, pg 46, 4.9.5.2 Credential and capability validation, last paragraph

The statement << shall not be altered in any detectable way. >> implies there

is an undetectable way to alter the information. Why have that in a standard?

I suggest deleting << in any detectable way >>.

## IBM-053

PDF pg 66, pg 47, 4.9.5.5 Invalidating credentials

Should be 'security version tag attribute (and not key)

## IBM-054

PDF pg 66, pg 47, 4.9.6.1 Request nonce format, 1st paragraph

The statement << to thwart attempts to capture OSD commands (e.g., FORMAT OSD)

and replay them. >> is not needed in the standard and should be deleted.

## IBM-055

PDF pg 67, pg 48, 4.9.6.2 Device server validation of request nonces, 6th paragraph

In the statement << Commands containing request nonces with timestamps that are greater than the contents of the clock attribute in the Root Information

attributes page plus a delta value may be terminated with... >> the may implies a may not but there is no description of what happens if the choice is to not error. This needs to be fixed. It looks like that may be described below. If that is the case then just add a reference to where it is defined.

IBM-056

PDF pg 69, pg 50, 4.9.6.2 Device server validation of request nonces, 1st paragraph

The statement << bytes for integrity check values, meaning that the HMAC-SHA1

function output of 160 bits is truncated into 96 bits. >> should be << bytes

for integrity check values, as a result the HMAC-SHA1 function output of 160

bits is truncated into 96 bits. >>

IBM-057

PDF pg 69, pg 50, 4.9.8.1 Introduction, Table 22 footnote d

The statement << meaning that, even though the security manager computes it,

the computation is based on values beyond the security manager's control >> should be << (i.e., even though the security manager computes it, the computation is based on values beyond the security manager's control) >>

IBM-058

PDF pg 70, pg 51, 4.9.8.1 Introduction, 3rd paragraph from end

The statement << provided, but the two values may be identical. >> should be



<< provided, and the two values may be identical. >>

IBM-059

PDF pg 71, pg 52, 4.9.9 OSD security interactions with SPC-3 commands and SAM-3 task management functions, 3rd paragraph in 2 places

This << performed. >> should be << processed >>

IBM-060

PDF pg 72, pg 53, 4.10 Data persistence model

Should the new FUA\_NV bit be used in these commands?

IBM-061

PDF pg 73, pg 54, 4.11.1 OSD meta data, a,b,c list

This looks like it should be an << and/or >> list rather than an << and >> list.

IBM-062

PDF pg 76, pg 57, 4.11.4 Data-In and Data-Out buffer offsets, 4th and 5th paragraphs

The term << offset field >> is used but I see no field titled offset nor is offset is small caps. As a result I have no idea what the offset field is supposed to be. This needs to be fixed.

IBM-063

PDF pg 77, pg 58, 4.13 Error reporting

What type of sense data descriptor should be used for OSD object identification? (IBM)

IBM-064

PDF pg 77, pg 58, 4.13 Error reporting, NOTE 5

This note looks like norminate text to me. I think it should be placed in main

line text.

IBM-065

PDF pg 80, pg 61, 5.1 OSD CDB format, table 31

The << (n-7) >> should be << 166 >> as that is the requirement stated below the table.

IBM-066

PDF pg 80, pg 61, 5.1 OSD CDB format, Table 31

The byte number labled << n >> should be << 173 >> as that is the requirement

stated below the table.

IBM-067

PDF pg 82, pg 63, 5.2.1.2 Get an attributes page and set an attribute, 3rd paragraph under table 33

The statement << allocation length; this shall not be >> should be << allocation length and shall not be >>

IBM-068

PDF pg 87, pg 68, 6 Commands for OSD type devices

A general comment for section 6: all write/create commands violating total device capacity should also be aborted. (IBM)

IBM-069

PDF pg 87, pg 68, 6.1 Summary of commands for OSD type devices, 1st paragraph

The term << perform. >> should be << process. >>

IBM-070

PDF pg 90, pg 71, 6.2 APPEND, 9th paragraph

The statement << in the maximum user object length attribute in the The COLLECTIONS PER USER OBJECT field contains the value of >> makes no sense and needs to be fixed.

IBM-071

PDF pg 90, pg 71, 6.2 APPEND, 9th paragraph

There is a missing cross reference << (see ), >>.

IBM-072

PDF pg 91, pg 72, 6.3 CREATE

Quota violation for partition capacity:

Creating a user object can also cause quota violation of the partition capacity. (IBM)

IBM-073

PDF pg 94, pg 75, 6.4 CREATE AND WRITE, 2nd to last paragraph

The statement << to exceed the value in the maximum user object length attribute in the The COLLECTIONS PER USER OBJECT field contains the value of >> makes no sense and needs to be fixed.

IBM-074

PDF pg 94, pg 75, 6.4 CREATE AND WRITE, 2nd to last paragraph

There is a missing cross reference << attribute. (see ), then >>.

IBM-075

PDF pg 95, pg 76, 6.5 CREATE COLLECTION

Quota violation for partition capacity:

Creating a collection object can also cause quota violation of the partition

capacity. (IBM)

IBM-076

PDF pg 96, pg 77, 6.6 CREATE PARTITION

User object should be replace with partition object in a few instances and creating a partition may cause a violation of the root capacity (IBM)

IBM-077

PDF pg 97, pg 78, 6.7 FLUSH OBJECT

What exactly should be performed when flush is done on collection-object, other than flushing attributes associated with it? (IBM)

IBM-078

PDF pg 100, pg 81, 6.8 FORMAT OSD, 2nd to last a,b,c list item c

The statement << progress indication (as described in SPC-3). >> should be <<

progress indication as described in SPC-3. >> or << progress indication (see

SPC-3). >>

IBM-079

PDF pg 106, pg 87, 6.11 LIST COLLECTION

The allocation length field definition is repeated in several commands. It should only be defined one time then referenced from that point on.

IBM-080

PDF pg 106, pg 87, 6.11 LIST COLLECTION

The additional length h field definition is repeated in several commands. It

should only be defined one time then referenced from that point on.

IBM-081

PDF pg 106, pg 87, 6.11 LIST COLLECTION

In fact the whole parameter data seems to be a duplicate of the list commands. A

single reference to that would prevent duplicate definitions.

IBM-082

PDF pg 108, pg 89, 6.12 PERFORM SCSI COMMAND

The name of the PERFORM SCSI COMMAND should be changed to PROCESS SCSI command.

IBM-083

PDF pg 108, pg 89, 6.12 PERFORM SCSI COMMAND, 1st paragraph in 2 places

The term << performed >> should be << processed >>.

IBM-084

PDF pg 109, pg 90, 6.12 PERFORM SCSI COMMAND, 5th paragraph after table 54

The term << performed >> should be << processed >>.

IBM-085

PDF pg 110, pg 91, 6.13 PERFORM TASK MANAGEMENT FUNCTION

The PERFORM TASK MANAGEMENT FUNCTION should be renamed to PROCESS TASK MANAGEMENT FUNCTION.

IBM-086

PDF pg 110, pg 91, 6.13 PERFORM TASK MANAGEMENT FUNCTION, 1st paragraph in 2

places

The term << performed >> should be << processed >>.

IBM-087

PDF pg 111, pg 92, 6.13 PERFORM TASK MANAGEMENT FUNCTION, 5th paragraph iafter

table 56

The term << performed >> should be << processed >>.

IBM-088

PDF pg 111, pg 92, 6.13 PERFORM TASK MANAGEMENT FUNCTION, Table 57

The term << SAM-3 taSk >> should be << SAM-3 Task >>. (IBM)

IBM-089

PDF pg 113, pg 94, 6.14 READ, 1st abc list

Items b,c and d should be combined into an item b) to make the wording more consistent with other error words in the standard.

IBM-090

PDF pg 113, pg 94, 6.14 READ, 2nd abc list

Items b,c and d should be combined into an item b) to make the wording more consistent with other error words in the standard.

IBM-091

PDF pg 118, pg 99, 6.19 SET KEY

It should be impossible for a SET KEY command to violate quota. (IBM\

IBM-092

PDF pg 120, pg 101, 6.20 SET MASTER KEY

The key identifier and seed fields are defined in another command and therefore there should only be a reference to those definition at this point.

IBM-093 Technical

PDF pg 122, pg 103, 6.21 WRITE, 2nd to last paragraph and last paragraph

What have the << CREATE AND WRITE command >> description have to do with the

WRITE command description??

IBM-094

PDF pg 122, pg 103, 6.21 WRITE, 2nd to last paragraph

The statement << exceed the value in the maximum user object length attribute

in the The COLLECTIONS PER USER OBJECT field contains the value of the collections per user object attribute., then a quota error shall be generated

(see 4.8.2). >> makes no sense and needs to be fixed.

IBM-095

PDF pg 123, pg 104, 7.1.1 Attributes parameter formats, 2nd paragraph

The term << them >> is not specific enough. What them is being referred to?

IBM-096

PDF pg 125, pg 106, 7.1.2.3 Attribute number 0h for unidentified attributes pages, 1st paragraph

The statement << page as preferred by this standard. >> should be << page as

defined by this standard. >>

IBM-097 Technical

PDF pg 130, pg 111, 7.1.2.8 Root Information attributes page, Table 73

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-098

PDF pg 131, pg 112, 7.1.2.8 Root Information attributes page

Global

What the heck is << (number xh) >> supposed to mean? I see no point in calling

a hex value a number what else could it be? Why is it not just << (xh) >>?  
I

recommend all the << (number xh) notations be changed to << (xh) >>.

IBM-099 Technical

PDF pg 131, pg 112, 7.1.2.8 Root Information attributes page, last paragraph

This statement << states may not be set, the >> looks like you are taking a



may and making it into a shall. This needs to be fixed.

IBM-100 Technical

PDF pg 132, pg 113, 7.1.2.9 Partition Information attributes page, Table 74

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-101 Technical

PDF pg 132, pg 113, 7.1.2.9 Partition Information attributes page, last paragraph

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-102 Technical

PDF pg 133, pg 114, 7.1.2.10 Collection Information attributes page, Table 75

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-103 Technical

PDF pg 133, pg 114, 7.1.2.10 Collection Information attributes page, last paragraph

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-104 Technical

PDF pg 134, pg 115, 7.1.2.11 User Object Information attributes page, Table 76

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-105 Technical

PDF pg 134, pg 115, 7.1.2.11 User Object Information attributes page, last paragraph

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-106 Technical

PDF pg 135, pg 116, 7.1.2.12 Root Quotas attributes page, Table 77

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-107 Technical

PDF pg 136, pg 117, 7.1.2.12 Root Quotas attributes page, 2nd paragraph above

table 78 paragraph

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-108

PDF pg 137, pg 118, 7.1.2.13 Partition Quotas attributes page

Quota violation for partition capacity:

Reference to CREATE and CREATE COLLECTION commands for the capacity quota (IBM)

IBM-109 Technical

PDF pg 137, pg 118, 7.1.2.13 Partition Quotas attributes page, Table 79

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-110

PDF pg 137, pg 118, 7.1.2.13 Partition Quotas attributes page, 2nd paragraph after table 79

The statement << ...user object length attribute in the The COLLECTIONS PER USER OBJECT field contains the value of the collections per user object attribute. >> does not make any sense. This needs to be fixed.

IBM-111

PDF pg 137, pg 118, 7.1.2.13 Partition Quotas attributes page, 2nd paragraph after table 79

There is a missing cross reference << (see ) >>

IBM-112 Technical

PDF pg 137, pg 118, 7.1.2.13 Partition Quotas attributes page, 2nd paragraph above table 80 paragraph

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-113 Technical

PDF pg 138, pg 119, 7.1.2.14 User Object Quotas attributes page, Table 81

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-114

PDF pg 139, pg 120, 7.1.2.14 User Object Quotas attributes page, 2nd paragraph

under table 81

The statement << value the allow in >> should be << value the allowed in >> (IBM)

IBM-115 Technical

PDF pg 139, pg 120, 7.1.2.14 User Object Quotas attributes page, 2nd paragraph

above table 82 paragraph

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-116 Technical

PDF pg 140, pg 121, 7.1.2.15 Root Timestamps attributes page, Table 83

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-117 Technical

PDF pg 140, pg 121, 7.1.2.15 Root Timestamps attributes page, 2nd paragraph

above table 85 paragraph

This statement << states may not be set, the >> looks like you are taking a

may and making it into a shall. This needs to be fixed.

IBM-118

PDF pg 142, pg 123, 7.1.2.16 Partition Timestamps attributes page

Sections 7.1.2.16 - 7.1.2.18, what if the operation on the data (e.g. READ) failed. Should the data accessed time attribute be modified? (IBM)

IBM-119 Technical

PDF pg 142, pg 123, 7.1.2.16 Partition Timestamps attributes page, Table 86

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-120

PDF pg 142, pg 123, 7.1.2.16 Partition Timestamps attributes page, 5th paragraph under table 86

LIST COOLECTION may also affects the data accessed time attribute. (IBM)

IBM-121 Technical

PDF pg 143, pg 124, 7.1.2.16 Partition Timestamps attributes page, 2nd paragraph above table 87 paragraph

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-122 Technical

PDF pg 144, pg 125, 7.1.2.17 Collection Timestamps attributes page, Table 88

What is the point in the << May Be Set No >> column? If give no useful

information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-123 Technical

PDF pg 145, pg 126, 7.1.2.17 Collection Timestamps attributes page, 2nd paragraph above table 89

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-124 Technical

PDF pg 146, pg 127, 7.1.2.18 User Object Timestamps attributes page, Table 90

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-125 Technical

PDF pg 146, pg 127, 7.1.2.18 User Object Timestamps attributes page, 2nd paragraph above table 91

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-126 Technical

PDF pg 147, pg 128, 7.1.2.19 Collections attributes page, Table 92

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-127 Technical

PDF pg 148, pg 129, 7.1.2.19 Collections attributes page, 2nd paragraph above

table 93

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-128

PDF pg 150, pg 131, 7.1.2.20 Root Security attributes page

We suggest to clarify that the supported (non zero valued) algorithms should

appear consecutively. (IBM)

IBM-129 Technical

PDF pg 150, pg 131, 7.1.2.20 Root Security attributes page, Table 94

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-130 Technical

PDF pg 152, pg 133, 7.1.2.20 Root Security attributes page, 2nd paragraph above

table 97

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-131

PDF pg 154, pg 135, 7.1.2.20 Root Security attributes page, Last paragraph

In the statement <<The 16 SUPPORTED INTEGRITY CHECK VALUE ALGORITHM fields >>

the term << 16 >> is used but in other places the term << sixteen >> is used.

Pick one and use it consistently.

IBM-132 Technical

PDF pg 154, pg 135, 7.1.2.21 Partition Security attributes page, Table 98

What is the point in the << May Be Set No >> column? If give no useful information as it could just as easily be read as << May or may not >> be set.

Either change it to a should or a shall or remove it.

IBM-133

PDF pg 155, pg 136, 7.1.2.21 Partition Security attributes page, 3rd paragraph

above table 100

Text describing newest valid nonce is a copy of the text describing oldest valid nonce. This should be edited. (IBM)

IBM-134 Technical

PDF pg 156, pg 137, 7.1.2.21 Partition Security attributes page, 2nd paragraph

above table 101

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-135

PDF pg 158, pg 139, 7.1.2.21 Partition Security attributes page, Last paragraph

In the statement <<The sixteen WORKING KEY IDENTIFIER fields contain the >>



the term << sixteen >> is used but in other places the term << 16 >> is used.

Pick one and use it consistently.

IBM-136 Technical

PDF pg 159, pg 140, 7.1.2.22 Collection Security attributes page, 2nd paragraph

above table 103

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-137 Technical

PDF pg 160, pg 141, 7.1.2.23 User Object Security attributes page, 2nd paragraph above table 105

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-138 Technical

PDF pg 161, pg 142, 7.1.2.24 Current Command attributes page, 2nd paragraph above table 107

This statement << states may not be set, the >> looks like you are taking a may and making it into a shall. This needs to be fixed.

IBM-139

PDF pg 167, pg 148, 7.4 Mode parameters, 3rd paragraph

The statement << OSD type devices shall treat the following mode parameter header fields (see SPC-3) as reserved: >>

should be << OSD type devices shall reserve the following mode parameter header fields (see SPC-3): >>.

IBM-140

PDF pg 171, pg 152, A.1 Attributes page numbers assigned by other standards,

1st paragraph

The statement << publication is shown in >> should be << publication are shown

in >>

IBM-141 Technical

Changing the semantics of the NOSEC security mode.

Currently NOSEC security method supports any command, ignoring the capability.

We would like to change the semantics as follows:

a. Under the NOSEC security method, all commands should carry a capability, like in other security methods. The NOSEC method should enforce the same rules regarding Permission bits, security version tag, expiration time, audit etc.

However, no integrity check computations will be done or enforced, and as a result no key maintenance is required.

b. We suggest splitting section 4.9.1 into two sections: one on the 'Basic Access Control model' and the other on the 'Basic security model'. The first section will specify all the relevant items from current 4.9.1 that have to do

with access control only and not integrity enforcement. For example, only item

c) on page 25. The access control model should also be accompanied with a Figure similar to Figure 4 but without the capability key components.

c. Section 4.9.2. should indicate the trust assumptions under NOSEC - all parties are supposed to 'behave' according to the protocol. Specifically,

the

client is trusted to copy the capability exactly as obtained from the security

manager without any modification into the CDB. Moreover, if the capability was

requested for partition p then the client must use it in a CDB with

Partition\_ID p (as there is no way to verify this). Even under these trust

assumptions, other unintentional errors/mistakes that may occur at the client

can be detected by NOSEC.

d. Page 8, Definition 3.1.39 - remove 'zero or more'

e. Revise 4.9.3.2

f. Persistent reservations should have the same status in NOSEC as otherwise,

that is it should be performed as a PERFORM SCSI COMMAND with a device management permission bit.

g. Table 10 - indicate that the CREDENTIAL INTEGRITY CHECK VALUE is zero for

the NOSEC method.

h. Section 4.9.4.3 needs references to the NOSEC model.

i. Suggest to change the name 'Security Version Tag' to 'Access Version Tag',

as it is relevant now to the NOSEC as well; clarify that it is used to deny access.

j. SET KET and SET MASTER KEY should not be serviced if the corresponding security model of the partition or the device is NOSEC.

IBM-142 Technical

The model of the Data-out integrity information format (section 4.9.3.5) seems

to open a potential security hole. Since it is the client that indicates the

NUMBER OF bytes it includes in the integrity check computation, the client may

actually compute the integrity check on less bytes than it actually transfers.

To close this hole, we suggest adding in the validation process at the server

(p. 30) that only these bytes (on which the integrity check is computed) will

affect the command. Or maybe there is another way to verify that the check was

done on the entire data, without relying on the application to specify this?

Need to reflect this on page 32 also.

#### IBM-143 Technical

We suggest adding another bit to the capability permission bits called

'Set\_new\_attr'. This bit, if set to one, allows creating a new attribute that

has not been defined before on the OSD. This will avoid creation of such

attributes 'by mistake' - note that the mechanism for creating new attributes

is trivial - simply set\_att with a page number and attribute name that hasn't

been seen before.

#### IBM-144 Technical

We suggest adding an Object Type Value (ROOT, PARTITION, COLLECTION, USER) as

specified in Table 14 to the CDB in addition to the capability; alternatively,

can use 4 out of the 64 bits of the Object\_ID and Partition\_ID values for that.

#### IBM-145 Technical

Support for Collections is optional. The device should have a mean to notify

whether it supports this feature, either via INQUIRY or through an attribute

in the Root page.

#### IBM-146 Technical

Same notification requirement applies to the model of volatile storage at the

device. The device should be able to notify whether it supports it.

#### IBM-147 Technical

As an optimization, suggest that when the security manager grants a credential

to the client, it also indicates the security method for this partition. Since

the security manager is expected to be aware of the security method currently

employed by every partition, it can save a new client from going thru the

discovery process of this attribute, a process that requires a few commands.

#### IBM-148 Technical

The offset field format in Table 29 section 4.11.4 may waste buffer space for

small data segments. One possible solution is to have an exception whereby if

the exponent equals 0, then byte offset = mantissa \* (2<sup>exponent</sup>).

#### IBM-149 Technical

Is it meaningful to consider an ABORT TASK and QUERY TASK for a USER, COLLECTION or PARTITION object?

IBM-150 Technical

We suggest to maintain the capacity of the entire device as follows:

a. Capacity quota in the Partition Quotas page of partition zero should imply

a quota on the capacity used by all partitions (entire device, excluding space

used for root attribute pages).

b. Used capacity in the Partition Information page of partition zero should not exceed the Capacity quota in the Partition Quotas page of partition zero.

IBM-151 Technical

Invalidation of keys:

a. We suggest that a valid key shall have a key identifier with a non-zero length. Therefore, a SET KEY command shall not use an empty key identifier. An

invalid key shall have a zero length key identifier.

b. Upon changing the security method attribute of a partition (including partition zero and root), the working keys for the relevant partition should

be invalidated by the OS, before changing the security method.

c. On page 132, 2nd paragraph before last, since a device always comes with an

(initial) Master Key, the master key identifier attribute length shall never

be zero. It is possible to define a standard name for this initial master key.

\*\*\*\*\*

Comments attached to Yes ballot from Robert Sheffield of Intel Corp.:

Intel #1  
PDF Page 18  
Storage Industry Network Association  
s/b Storage Networking Industry Association (SNIA)

Intel #2  
PDF Page 20  
Figure 1 shows the relationship of this standard to the other standards  
"This standard" is not shown in the figure.

Intel #3  
PDF Page 20  
Device-Type Specific Command Sets  
OSD sits here?

Intel #4  
PDF Page 36  
4.6.1 Stored data object types / b) Partition:/ "(i.e. inherited)"  
This is inconsistent with the normal usage of inheritance in OOA.  
Inheritance says a Partition is a "type of" Root object, and therefore has, at least as a subset, the same structure of attributes, though not necessarily the same values for each attribute. The default values of attributes are specified at object instantiation, and normally does not depend on the values of the object "type" it inherits from.  
What you're calling 'inheritance' here is more like functional decomposition, not inheritance as used in OOA.

Intel #5  
PDF Page 36  
4.6.1 Stored data object types / a) Root object:/ "contain" s/b specify

Intel #6  
PDF Page 36  
4.5 Description of the OSD Architecture/ "Abstracted"  
s/b "The term, 'abstracted',"

Intel #7  
PDF Page 37  
4.6.4 Partitions/ "between"  
s/b among

Intel #8  
PDF Page 37  
4.6.4 Partitions/ "There may be many partitions, up to the capacity of the OSD logical unit."  
alt wording:  
There may be as many partitions as can be accommodated within the capacity of the OSD logical unit.

Intel #9  
PDF Page 37  
root object s/b root object,

Intel #10

PDF Page 38

4.6.6 Collections/ "deleted using the REMOVE COLLECTION command"

Does this also delete the user objects in the collection? If so, what happens to the other collections of which the user object was a member? Does removing all the individual user objects in a collection also delete the collection containing them?

Intel #11

PDF Page 38

4.6.6 Collections/ "collections each of which may contain zero or more user objects."

Is it really a collection if it has less than two elements?  
Can collections collect collections?

Intel #12

PDF Page 39

4.7.2 Command function ordering for commands that get and/or set attributes "3) Process any set attributes command functions specified in the CDB; 4) Process any get attributes command functions specified in the CDB."

Why in this order? Generally the application client already knows the value of set attributes, so wouldn't it be more useful to return the value of the get attributes as they were prior to processing the set attributes? A useful extension would be to check the get attributes against some criteria before processing either the write command or set attributes functions.

Intel #13

PDF Page 39

4.7.1 Overview "store" s/b stored

Intel #14

PDF Page 40

4.7.2 Command function ordering for commands that get and/or set attributes "3) Process any set attributes command functions specified in the CDB." This doesn't sound like an expected function of a GET ATTRIBUTES command. If both GET ATTRIBUTES and SET ATTRIBUTES are capable of setting and getting attributes, why have two commands? Why not simply have an ATTRIBUTES command that does both get and set functions?

Intel #15

PDF Page 43

4.9.1 Basic security model "...set of OSD objects." s/b "...collection of OSD objects."?

Intel #16

PDF Page 45

4.9.3.1 Introduction "...the preparations for the ALLDATA security method include the preparations that are necessary for the CMDRSP security method)." This sounds like a "shall" requirement, and if so, should not be written as a parenthetical "e.g."

Intel #17

PDF Page 45

4.9.1 Basic security model "propriety of the application client220s



actions." Is the common English definition of "propriety" sufficient for this context?

Intel #18

PDF Page 48

4.9.3.4 The CMDRSP security method (second to last paragraph) "the presence of malicious entities perpetrating a denial of service attack should be considered." The term, "considered", isn't very precise. Perhaps, "the application client should generate a user alert that a possible denial of service attack has been detected."

Intel #19

PDF Page 68

4.9.6.3.1 Introduction "reduce" Perhaps, "limit" is a better word.

Intel #20

PDF Page 68

4.9.6.3.2 Capability restrictions with far in the future nonces "reduce" Perhaps, "limit" is a better word.

Intel #21

PDF Page 69

Table 22 204 OSD secret key hierarchy "Drive" Is this the right term in SCSI context? Does this mean a "disk drive"? Perhaps "Target", or "Device", or "Device Server" is better suited?

\*\*\*\*\*

Comments attached to No ballot from John Lohmeyer of LSI Logic Corp.:

JL #1

PDF Page iii

Revision Information

The Revision History should be deleted before forwarding (but you already knew that).

JL #2

PDF Page xviii

Foreword

Can we get a list of the SNIA OSD TWG members to insert in the foreword?

JL #3

PDF Page 8

3.1.51 volatile cache

'rest event' should be 'reset event'.

JL #4

PDF Page 16

4.4 Elements of the example configuration

The "e.g." in the paragraph below Figure 3 should be "i.e." because it includes the phrase "or other storage devices".

JL #5 (Technical)

PDF Page 16

4.6.1 Stored data object types

The third-from-last paragraph requires an OSD device to report GOOD status even with a head crash for FORMAT OSD and several other OSD commands. I suspect this was not intended. Either remove this paragraph or re-word it to deal with all error conditions.

JL #6

PDF Page 18

4.6.1 Stored data object types

Penultimate paragraph

The phrase, shall never, seems inappropriate for a standard. I think this paragraph should be replaced with, "The FORMAT OSD command is not intended to be used for error recovery."

JL #7

PDF Page 18

4.6.1 Stored data object types

Last paragraph

This paragraph adds no value and should be deleted.

JL #8

PDF Page 20

4.7.2 Command function ordering for commands that get and/or set attributes  
second paragraph

The "and" at the end of item 2) seems misplaced. I think it belongs at the end of item 3).

JL #9

PDF Page 20

4.7.1 Attributes parameters

fifth paragraph

The "All OSD object types" item is confusing. Perhaps an example might help.

JL #10

PDF Page 23

4.8.1 Introduction

Item c) in the first list references a blank destination.

JL #11

PDF Page 24

4.8.4 Changing quotas

first paragraph

The phrase "by command" should be "by a command".

JL #12

PDF Page 48

4.9.6.2 Device server validation of request nonces  
(global)

The phrase "far in the future" should be "far-in-the-future".

JL #13

PDF Page 53

4.10 Data persistence model

The phrase "rest event" should be "reset event".

JL #14

PDF Page 152

Annex A

Since there are none at this point in time, a note saying so would make this annex less confusing.

I agreed to attach the following comments from Joe Breher of Lingua Data to my letter ballot:

These are comments on the T10 OSD letter ballot - r09.

Generated by Joe Breher of lingua data

joe@lingua-data.com

(303) 919-8403

=====

lingua data #1  
Editorial

Title page (i)

lower right corner

"ISO/IEC 14776-131 : 200x"

conflicts with ISO/IEC # on pg 3, which lists doc as "ISO/IEC 14776-381"

Which is proper?

-----

lingua data #2  
editorial

pg vii

"Secretariat  
National Committe for Information Technology Standards"

s/b

"Secretariat  
InterNational Committe for Information Technology Standards" ?

-----

lingua data #3  
editorial

pg xvii, penultimate paragraph

"Secretariat, National Committe for Information Technology Standards"

s/b

"Secretariat, InterNational Committe for Information Technology Standards" ?

-----

lingua data #4

editorial

pg xviii, last sentence

"Storage Industry Network Association"

s/b

"Storage Networking Industry Association"

-----  
lingua data #5  
editorial

pg 1, section 1, list item a

"...data over an SCSI..."

s/b

"...data over a SCSI..."

to match all other appearances of 'a SCSI'

-----  
lingua data #6  
editorial

pg 3, 2/3 down page

"Object-based Storage Devices Commands"

s/b

"Object-Based Storage Device Commands"

to match title

-----  
lingua data #7  
editorial

pg 4, sec 2.2

should SAM-2 be listed as an approved reference?

-----  
lingua data #8  
editorial

pg 8, sec 3.1.44 stable storage

"...may result in the lost of data..."

s/b

"...may result in the loss of data..."

-----  
lingua data #9

editorial?

pg 8, sec 3.1.48 user object

"...referenced by byte offset..."

s/b

"...referenced by User\_Object\_ID (see 3.1.49) identifying the OSD object, and the byte offset..."

-----  
lingua data #10  
editorial

pg 8, sec 3.1.51 volatile cache

"Storage is lost..."

s/b

"Storage that is lost..."

-----  
lingua data #11  
editorial

pg 11, sec 3.6.1, 1st paragraph thereof

"When this standard requires one or more bytes to contain specific encoded character, the specific characters are enclosed in double quotation marks. The double quotation marks identify the start and end of the characters that are required to be encoded but are not themselves to encoded. The characters that are to be encoded are shown in exactly the case that is to be encoded."

s/b

"When this standard requires one or more bytes to contain specific encoded characters, the specific characters are enclosed in double quotation marks. The double quotation marks identify the start and end of the characters that are required to be encoded but these quotation marks are not themselves to be encoded. The characters that are to be encoded are shown in exactly the case that is to be encoded."

plural in first sentence, clarify with 'these qotation marks', add 'be' to 2nd sentence

-----  
lingua data #12  
editorial

pg 15, third para up from bottom

"The storage management component is focused on mapping logical constructs (e.g., files or database entries) to the physical organization of the storage media. In the OSD model, the logical constructs are called user objects. The root object (see 4.6.3), partitions (see 4.6.4), and collections (see 4.6.6) provide additional navigational aids for user objects."

s/b

"The storage management component is focused on mapping logical constructs (e.g., files or database entries) to the physical organization of the storage media. In the OSD model, the logical constructs are called user objects (see 4.6.5). The root object (see 4.6.3), partitions (see 4.6.4), and collections (see 4.6.6) provide additional navigational aids for user objects."

added reference to 4.6.5 for consistency with other references in para.

-----  
 lingua data #13  
 editorial?

pg 16 - 3 references on page

Consider eliminating references to 'policy/storage manager'. This page is the only place this term appears. It adds nothing of value to the spec.

-----  
 lingua data # 14  
 technical

pg 18, list item a)

I would like to see the ability to have a mechanical 'lockout' (e.g. by means of a jumper) to prevent FORMAT OSD from being executed. This would necessitate this command to be removed form this list.

-----  
 lingua data #15  
 editorial

pg 21, table 3

add Current Command attribute page to list

-----  
 lingua data #16  
 editorial

pg 23, sec 4.8.1, list item c)

"(see )"

s/b  
 "(see 7.1.2.13)"

-----  
 lingua data #17  
 editorial

pg 23, sec 4.8.1, list

add item "d) User Object Quotas attributes page (see 7.1.2.14)"

-----  
lingua data #18  
editorial

pg 26, table 6

Add column for Value

Values corresponding to each of the Security methods currently undefined

-----  
lingua data #19  
technical

pg 27, sec 4.9.3.3, enumerated list item 2)

"Target identifier"

s/b

"Logical Unit Name"

OK, I see that the target identifier at least \*looks\* symmetric to the initiator identifier. However, the relationship which has security attributes is really the relationship between the app client and the LU. The fact that we have no app client name seems poor justification for similarly crippling the other side of the connection. I would advocate that the best we can do, given the lack of app client names, is create a security token from the Initiator Identifier and the Logical Unit Name.

-----  
lingua data #20  
editorial

pg 28, 2nd para

"provides the same as the ALLDATA security method."

s/b

"provides the same protections as the ALLDATA security method."

-----  
lingua data #21  
editorial for SPC-3

The latest version of SPC-3 on the T10 website is spc3r17. Therein, clause 4.5.2.9, paragraph 1 still refers to security methods "2 or 3". These references should be changed to "CMDRSP or ALLDATA". If I just missed a proposal, I apologize.

-----  
lingua data #22  
editorial

pg 29, last para of 4.9.3.4

"The CMDRSP security method protects against corruption of the command and CDB parameters while avoiding the overhead that may be required to protect all transferred data."

s/b

"The CMDRSP security method protects against corruption of the command and CDB parameters, as well as the response STATUS and Sense parameters, while avoiding the overhead that may be required to protect all transferred data."

-----  
lingua data #23  
editorial

bottom of pg 34

The last paragraph on this page, along with the associated table 13, are seamntically identical to the preceding paragraph. Suggest keeping the version with the table.

-----  
lingua data #24  
editorial

bottom of page 34 - same material as previous comment

refereneces to "creation time"

s/b

"created time"

In order to match terminology from attributes pages.

-----  
lingua data #25  
editorial

bottom of page 34 - same material as previous comment

Eliminate refereneces to 'creation time from Root Timestamps attributes page'. This page does not have a creation time attribute.

-----  
lingua data #26  
editorial

pg 35, table 14

"OSO object type"

s/b

"OSD object type"

-----  
lingua data #27  
editorial



pg 37, 1st para of 4.9.4.4

"The validity of a specific command and some of the function-related fields in that command is determined by the presence of specific combinations of values in capability fields as shown in table 19. Any command may retrieve or set attributes and combinations of capability fields that allow those functions are shown in table 20."

s/b

"The validity of a specific command and some of the command function-related fields in that command is determined by the presence of specific combinations of values in capability fields as shown in table 19. Any command may retrieve or set attributes, and combinations of capability fields that allow those command functions are shown in table 20."

Changed for clarity: 'command function' is a defined term. More important for comprehension was adding the comma.

-----  
lingua data #28  
editorial

Table 19

Table is hard to navigate. I tend to use the command as the primary index. If this navigation method is shared by others, I would suggest creating separate rows for "FORMAT OSD" and "PERFORM SCSI COMMAND".

-----  
lingua data #29  
technical

pg 40

Should not require Root, DEV\_MGMT, and GLOBAL for (e.g.) LOG SENSE under PERFORM SCSI COMMAND.

-----  
lingua data #30  
editorial

pg 42, table 20, entry for USER, GET\_ATTR, NONE

"As part of a CREATE command or CREATE AND WRITE command, the retrieval of attributes from any attributes page associated with the user object with a Partition\_ID matching the value in the credential PARTITION\_ID field and the largest valued User\_Object\_ID created."

s/b

"As part of a CREATE command or CREATE AND WRITE command, the retrieval of attributes from any attributes page associated with the user object with a Partition\_ID matching the value in the credential PARTITION\_ID field and the largest valued User\_Object\_ID created by that command."

lingua data #31  
technical (springing form editorial?)

pg 42, 43, table 19, \*each\* entry with SET\_ATTR, but without SECURITY (7 items)

Attribute-related functions are misconstructured due to ordering of terms. Terms need order reversal.

Example:

"The setting of attributes in any attributes page other than User Object Security attributes page associated with the user object with a Partition\_ID matching the value in the credential PARTITION\_ID field and a User\_Object\_ID matching the value in the object descriptor SINGLE OBJECT\_ID field."

s/b

"The setting of attributes in any attributes page associated with the user object with a Partition\_ID matching the value in the credential PARTITION\_ID field and a User\_Object\_ID matching the value in the object descriptor SINGLE OBJECT\_ID field, with the exception of than the User Object Security attributes page."

-----  
lingua data #32  
editorial

pg 45, list item 3) B) a)

"(see 4.9.3.2)"

s/b

"(see 4.9.3.3)"

-----  
lingua data #33  
editorial

pg 46, para 2

"If the capability object type, permissions bit mask, and object descriptor do not allow a command..."

s/b

"If the capability OBJECT TYPE, PERMISSIONS BIT MASK, and OBJECT DESCRIPTOR are set to values that do not allow a command..."

-----  
lingua data #34  
technical

pg 46, 4.9.5.3, list item 1) B) a)

Why does the Credential's partition id not match that of the command? Intutively, it would seem to make sense that it should. Indeed, this mechanism has no possibility of working for commands to LIST all User objects in a partition, as that would require a nonzero PARTITION\_ID.

Additionally, FORMAT OSD is the only command listed herein that does not have a PARTITION\_ID field.

I am herein advocating that a PARTITION ID field be added to FORMAT OSD (which must be set to 0), and eliminating this entire special case (all of item 1 B a).

-----  
lingua data #35  
technical

pg 46, 4.9.5.3, list item 1) B) b)

While my particular view is that Task Management Functions are directed to LUs, (not (e.g) User Objects), the definition in 6.13 of this command allows the direction of certain TMFs to User Objects. If this (ill advised) construct is to survive, then the PARTITION\_ID field cannot be herein set to 0. (I have more to say about TMFs being sent to User objects later on...)

-----  
lingua data #36  
editorial

pg 46, 4.9.5.3

add list item "3) Concatenating the computed credential integrity check value (see 4.9.5.4)."

-----  
lingua data #37  
editorial

pg 49, 1st para of 4.9.7

"An integrity check values..."

s/b

"Integrity check values..."

-----  
lingua data #38  
editorial

pg 53, item a) A)

"...rest event..."

s/b

"...reset event..."

-----  
lingua data # 39  
editorial

pg 53, item b)

"...lost of storage..."

s/b

"...loss of storage..."

-----  
 lingua data #40  
 editorial

pg 53

"Individual OBSD (see 3.1.26) implementations may use whatever technologies they choose to implement stable storage (e.g., an OBSD may implement stable storage as a combination is non-volatile random access memory and disk devices)."

s/b

"Individual OBSD (see 3.1.26) implementations may use whatever technologies they choose to implement stable storage (e.g., an OBSD may implement stable storage as a combination of non-volatile random access memory and disk devices)."

(replace 'is' with 'of')

-----  
 lingua data #41  
 editorial

pg 59, 1st sentence fragment

"OSD logical unit is not zero,..."

s/b

"OSD logical unit is not NOSEC..."

-----  
 lingua data #42  
 technical

pg 62, 63

Eliminate entire mechanism of page oriented get & set attributes.

There is absolutely no reason to have both these formats. No device can assume that all initiators will only use the page oriented mechanism. Accordingly, they will have to implement the list oriented mechanism, which is a functional superset of the page oriented, as well as the page oriented. This illusory flexibility of mechanisms brings no benefit whatsoever. It does, however carry a requirement to develop and test both mechanisms where only one would do.

-----  
 lingua data #43  
 editorial

page 92, table 57

"SAM-3 taSk..." in header

s/b

"SAM-3 task..."

-----  
lingua data #44  
technical

sec 6.13

Require that all TMFs be sent to root object.

TMFs are NOT specific to objects -

They operate on Tasks in the Task Set

Operation is performed by the Task Manager

- this all happens in the LU, but OUTSIDE the Device Server

Also, the Task Router isn't even in the LU - it is in the Port

Device Server knows only the the Current Task - relies on the Task Manager  
to feed it in an efficient manner.

\*\*\*\*\*

Comments attached to Abs ballot from Emily Hill of  
Microsoft Corp.:

Does not currently affect us.

\*\*\*\*\*

Comments attached to Abs ballot from Bill Galloway of  
Pivot3, Inc.:

Not materially affected by this proposal.

\*\*\*\*\*

Comments attached to Abs ballot from Jim Jones of  
Quantum Corp.:

Not materially affected by this proposal.

\*\*\*\*\*

Comments attached to No ballot from Gerald Houlder of  
Seagate Technology:

Summary of Seagate Comments on SCSI  
Object-Based Storage Devices (OSD)

Seagate (RiedelE) #1 Page 17 (comment 1 on page)  
should be "collection"

Seagate (RiedelE) #2 Page 18 (comment 1 on page)  
This sentence is confusing in what it is trying to limit. Perhaps it could just read "the above commands shall never..." rather than seeming to apply to any error anywhere in the document.

Seagate (RiedelE) #3 Page 18 (comment 2 on page)  
missing ", "

Seagate (RiedelE) #4 Page 19 (comment 1 on page)  
should also include (i.e. exclude) CREATE, REMOVE, CREATE&WRITE

Seagate (RiedelE) #5 Page 20 (comment 1 on page)  
should be "stored" with "d"

Seagate (RiedelE) #6 Page 23 (comment 1 on page)  
dangling reference to nowhere

Seagate (RiedelE) #7 Page 26 (comment 1 on page)  
the information about which security method a request was prepared for needs to be in the CDB. The device must be able to report an error (via the "may complete" below) if the request was prepared with ALLDATA and CMDRSP is in use. This means that the client is not getting the security level they think they are, and that should be reportable as an error. Irrespective of this, the security level needs to be known in the CDB for reasonable performance at the device (no wasted checksum work).

Seagate (RiedelE) #8 Page 27 (comment 1 on page)  
this should be reworded to be specific about which security features are no used. E.g. permission bits are still checked, version numbers are still checked - just no hashes checked or keys used. The current wording of "no OSD security feature" is imprecise and too broad. For example, are SET KEY and SET MASTER KEY "security features"?

Seagate (RiedelE) #9 Page 33 (comment 1 on page)  
capability needs to contain an indication of the security method used to create it - as already noted on page 26

Seagate (RiedelE) #10 Page 34 (comment 1 on page)  
this paragraph is redundant with Table 13 and should be removed.

Seagate (RiedelE) #11 Page 35 (comment 1 on page)  
request addition of a separate permissions bit for APPEND - want to allow clients to append at end of file without being able to scribble in the middle

Seagate (RiedelE) #12 Page 37 (comment 1 on page)  
APPEND instead of WRITE

Seagate (RiedelE) #13 Page 45 (comment 1 on page)  
should be 4.9.3.3

Seagate (RiedelE) #14 Page 45 (comment 2 on page)

"is" should be "in"

Seagate (RiedelE) #15 Page 47 (comment 1 on page)  
order of the phrases makes this confusing - the key is the partition, not the KEY VERSION field - suggest moving "identified by the KV field in the cap" to the end of the sentence

Seagate (RiedelE) #16 Page 47 (comment 2 on page)  
this is confusing to the non-cogniscenti. Please include "(e.g. if the version key is changed to a value that has been used before, then capabilities that had been invalid may become valid again)" or similar explanatory words

Seagate (RiedelE) #17 Page 49 (comment 1 on page)  
This "Should" should be "Shall", there really is no way to get around not doing this.

Seagate (RiedelE) #18 Page 50 (comment 1 on page)  
Why is this truncation suggested? Perhaps the concern is over space in the CDB. Using the full 20 byte SHA1 would more closely follow usage of SHA1 in other areas and enable interoperability (as well as higher security). A truncation to 16 bytes is also common usage. 12 bytes is very much non-standard usage.

Seagate (RiedelE) #19 Page 50 (comment 2 on page)  
remove "is"

Seagate (RiedelE) #20 Page 51 (comment 1 on page)  
is this computation/authentication required regardless of the security level? If so, it should state that.

Seagate (RiedelE) #21 Page 51 (comment 2 on page)  
OSD saves only one key (auth key) for working keys, gen key is not stored (or "saved")

Seagate (RiedelE) #22 Page 55 (comment 1 on page)  
this is very confusing - the device is creating these bytes, how can it not "alter" them? does this mean fill with zeros? Suggest that this phrase be stricken.

Seagate (RiedelE) #23 Page 55 (comment 2 on page)  
the size of this segment and the wording needs to be consistent with Table 9 on page 31. Likely also should provide a ref to that table/section.

Seagate (RiedelE) #24 Page 56 (comment 1 on page)  
needs to be consistent with Table 8 on page 30

Seagate (RiedelE) #25 Page 67 (comment 1 on page)  
a section 5.2.9 on Collection\_Object\_ID is missing here

Seagate (RiedelE) #26 Page 67 (comment 2 on page)  
New Timestamp Bypass Mechanism for OSDv1 Rev 10 (as agreed upon)  
The 1-byte otimestamp bypassso attribute remains the same except a new value is defined as follows:  
00h Timestamps are updated  
01h - 7Eh Reserved

7Fh Timestamps are not updated

80h - DFh Reserved

E0h - FEh Vendor specific

FFh Use CDB otimestamps controlo field

A otimestamps controlo field remains the same except that the 1-bit ATTR-BYP field is eliminated (merged into the other field). The new values of the timestamps control field are defined as:

0h Timestamps are updated

01h - 7Eh Reserved

7Fh Timestamps are not updated

80h - DFh Reserved

E0h - FFh Vendor specific

Seagate (RiedeleE) #27 Page 71 (comment 1 on page)

some type of cut & paste error starting at "The COLLECTIONS..." - also happens on page 75 and page 103 in a similar paragraph.

Seagate (RiedeleE) #28 Page 79 (comment 1 on page)

include "or collection object"

Seagate (RiedeleE) #29 Page 79 (comment 2 on page)

reference 5.2.9 about COLLECTION\_OBJECT\_IDS

Seagate (RiedeleE) #30 Page 80 (comment 1 on page)

the security level is an attribute and should not be set to defaults (should be left as-is)

Seagate (RiedeleE) #31 Page 85 (comment 1 on page)

could there be some additional explanatory text here? something like "The LIST IDENTIFIER is intended only to allow a device to know if the LSTCHG bit should be set - i.e. for the device to determine if the list of OSD objects has changed since a given LIST IDENTIFIER was returned. The position in the list and the location of restart is completely determined by the CONTINUATION OBJECT\_ID and does not use the LIST IDENTIFIER." This makes it more clear what each piece is used for and does not seem to exceed the amount of "for example" text allowed in other parts of the standard.

Seagate (RiedeleE) #32 Page 90 (comment 1 on page)

To increase clarity, suggest that there be a footnote in this table that marks INQUIRY, REPORT LUNS, REQUEST SENSE, and TEST UNIT READY and reads "these commands may be issued as normal SCSI commands at all security levels. If further security protection is desired, then PERFORM SCSI COMMAND can be used to issue them as higher security. See Table 39. All other commands in this table may be issued only via PERFORM SCSI COMMAND when operating at higher security levels."

Seagate (RiedeleE) #33 Page 96 (comment 1 on page)

Why doesn't this text about non-existent object errors occur on page 95 for plain REMOVE and plain objects?

Seagate (RiedeleE) #34 Page 103 (comment 1 on page)

this should be just WRITE not CREATE AND WRITE, ditto next paragraph. Also, the funny cut & paste from The COLLECTIONS... happens here as well - mentioned in a previous comment.

Seagate (RiedeleE) #35 Page 106 (comment 1 on page)



should include "and Collection Directory"

Seagate (RiedelE) #36 Page 107 (comment 1 on page)

Perhaps add a note here that this information can only be retrieved with a list format get attributes.

Seagate (RiedelE) #37 Page 108 (comment 1 on page)

Seagate (RiedelE) #38 Page 111 (comment 1 on page)

"logical unit id" is missing from this list - was present in Rev 8

Seagate (RiedelE) #39 Page 113 (comment 1 on page)

This should be the "username" attribute from partition 0, rather than the OSD name.

Seagate (RiedelE) #40 Page 116 (comment 1 on page)

The term "Default" in these type of attributes is used inconsistently. We believe that all attributes that are "copied into" other attributes on creation/whatnot (e.g. Partition object count in this list) are prefaced with the term "Default"

Seagate (RiedelE) #41 Page 116 (comment 2 on page)

The term "quota" should be used consistently - e.g. in this list "Partition count" should be "Partition count quota" just like "Partition capacity quota"

Seagate (RiedelE) #42 Page 118 (comment 1 on page)

consistent use of "quota" - suggest "Capacity quota" and "Object count quota"

Seagate (RiedelE) #43 Page 118 (comment 2 on page)

the proverbial cut & paste problem starting at "The COLLECTION..."

Seagate (IrenS) #44 Page 118 (comment 3 on page)

Add the following statement: "For partition zero, the default maximum user object length attribute will be zero".

Seagate (IrenS) #45 Page 118 (comment 4 on page)

Add the following statement: "For partition zero, the collections per user object attribute will be set to zero."

Seagate (IrenS) #46 Page 118 (comment 5 on page)

Add the following statement:

"For partition zero, the object count attribute will be set to zero."

Seagate (IrenS) #47 Page 120 (comment 1 on page)

change "the allow" to "allowed"

Seagate (IrenS) #48 Page 121 (comment 1 on page)

change "shall update" to "shall be updated"

Seagate (IrenS) #49 Page 147 (comment 1 on page)

change "the each" to "each"

\*\*\*\*\*

Comments attached to No ballot from Roger Cummings of Veritas Software:

VERITAS 1

PDF pg 3, pg iii, Abstract

"peer-to-peer" is not used throughout the document, and is only used in a limited sense in SAM-3. It adds no value, and does not align with common usage.

Proposed Resolution:

Delete "peer-to-peer"

VERITAS 2

PDF pg 17, pg xvii, Foreword

"peer-to-peer" is not used throughout the document, and is only used in a limited sense in SAM-3. It adds no value, and does not align with common usage.

Proposed Resolution:

Delete "peer-to-peer"

VERITAS 3

PDF pg 25, pg 6, 3.1.3 Attributes

Section 3.1.3 defines attributes as data "not accessible via read or write command functions". Since any command (including READ and

WRITE) can potentially access and change attributes, is this true?

Proposed Resolution:

Define attributes as data associated with an object that 1) requires special capabilities to access or change, and 2) is addressed by attribute number instead of offset (like user data).

VERITAS 4

PDF pg 25, pg 6, 3.1.6 collection

from single

Proposed Resolution:

from a single

VERITAS 5

PDF pg 26, pg 7, 3.1.26 object-based storage device (OBSD)

"A SCSI device that implements this standard in which data is organized and accessed as objects." has much redundancy.

Proposed Resolution:

"A SCSI device that implements this standard."

VERITAS 6

PDF pg 27, pg 8, 3.1.44 stable storage

lost

Proposed Resolution:

loss

VERITAS 7

PDF pg 27, pg 8, 3.1.47 universal time (UT)

greenwich mean time

Proposed Resolution:

"Greenwich Mean Time

VERITAS 8

PDF pg 27, pg 8, 3.1.51 Volatile Cache

Storage Is lost after a power on or rest event

Proposed Resolution:

Storage whose contents are lost after a power on or reset event

VERITAS 9

PDF pg 28, pg 9, 3.2 Acronyms

OSD Object-based Storage Devices Commands (this standard, see clause 1)

Proposed Resolution:

OSD Object-based Storage Device Commands (this standard, see clause 1)

VERITAS 10

PDF pg 30, pg 11, 3.6.1 Notation for byte encoded character strings, 1st para,

3rd line

to encoded

Proposed Resolution:

to be encoded

VERITAS 11

PDF pg 30, pg 11, 3.6.1 Notation for byte encoded character strings, 3st para,

2nd line

same writing

Proposed Resolution:

same as writing

VERITAS 12

PDF pg 30, pg 11, 3.6.1 Notation for byte encoded character strings

ASCII is not listed in acronyms or references. Also, is it not current policy to reference UTF-8 instead?

Proposed Resolution:

Correct reference

VERITAS 13

PDF pg 35, pg 16, 4.4 Elements of the example configuration

Section 4.4 states "When sending credentials to an application client, the security manager shall use a private, authenticated communications mechanism. The security manager may reside in the OBSD, in applications clients, or as a separate entity, but the security requirements on the communications mechanism shall not change based on the location of the security manager."

Communications between the security manager and clients are outside the scope of this standard, so it doesn't make sense to place mandatory requirements on it.

Proposed Resolution:

Change "shall" to "should".

VERITAS 14

PDF pg 35, pg 16, 4.4 Elements of the example configuration

This section should indicate the parts of the example configuration that are outside of the scope of the document.

Proposed Resolution:

Add two sentences in appropriate places. "The detailed operation of the Policy/Storage Manager and its interface to the service delivery subsystem is outside of the scope of this standard." "Definition of the interfaces between the Security manager and an Initiator Device, and between the Security Manager and an OSBD, are outside of the scope of this standard."

VERITAS 15

PDF pg 35, pg 16, 4.4 Elements of the example configuration, 3rd para under figure 3

or as

Proposed Resolution:

or exist as

VERITAS 16

PDF pg 36, pg 17, 4.5 Description of the OSD Architecture

"Abstracted subsets" is unclear and does not reflect the terminology used elsewhere in the document.

Proposed Resolution:

"Data is stored in abstract containers called objects that contain operating system and application constructs."

VERITAS 17

PDF pg 36, pg 17, 4.5 Description of the OSD Architecture

The sentence "The OSD logical unit allocates space for data and delivers

to the application client a unique identifier." is incorrect. The unique

identifier may be given to the OSD LU at part of the CREATE command.

Proposed Resolution:

Change to something like: "The data is addressed using a unique identifier

which can either be assigned by the OSD logical unit or be given to the

OSD

logical unit by the client. The OSD logical unit allocates space for the

data."

VERITAS 18

PDF pg 36, pg 17, 4.6.1 Stored data object types

"An OSD contains" should reference an OBSD?

Proposed Resolution:

"An OBSD contains"

VERITAS 19

PDF pg 36, pg 17, 4.6.1 Stored data object types



Is "OSD Logical Unit" a synonym for OBSD? Can an OBSD have multiple LUs?

OSD Logical Unit is not defined in the glossary but is used throughout the document.

Proposed Resolution:

Either replace OSD Logical Unit with another term or add it to the glossary and explain the relationship to OBSD.

VERITAS 20

PDF pg 36, pg 17, 4.6.1 Stored Data Object Types

In discussion of the Root Object, the sentence "Its data contains the list

of Partition\_IDs." appears. This is misleading since it implies that a client may issue a READ command to the Root Object. In fact, a READ command

issued to the Root Object is an error.

Proposed Resolution:

Change to "The Root Object maintains the list of PARTITION\_IDS contained

on

the logical unit. This list is accessed with the LIST command"

VERITAS 21

PDF pg 36, pg 17, 4.6.1 Stored Data Object Types

In discussion of Partition Objects, the sentence "The data component of a partition is the list of User\_Object\_IDs." appears. This is misleading since it implies that a client may issue a READ command to a Partition Object. In fact, a READ command issued to a Partition Object is an error.

Proposed Resolution:

Change to "Partition Objects maintain the list of USER\_OBJECT\_IDS contained in the partition. This list is accessed with the LIST command"

VERITAS 22

PDF pg 36, pg 17, 4.6.1 Stored data object Types

An OSD logical unit shall always contain a root object and an OSD object for partition zero with at least the attributes (see 4.7) defined by this standard.

Proposed Resolution:

Is the root object a member of partition 0? 3.1.31 suggests yes.

VERITAS 23

PDF pg 36, pg 17, 4.6.1 Stored Data Object Types

In discussion of Collection Objects, the sentence "The data component of a partition is the list of User\_Object\_IDs." appears. This is misleading since it implies that a client may issue a READ command to a Collection Object.

In fact, a READ command issued to a Collection Object is an error. It is also wrong since it is supposed to be about Collection Object, not Partition Objects.

Proposed Resolution:

Change to "Collection Object maintains the list of USER\_OBJECT\_IDS contained in the collection. This list is accessed with the LIST command."

VERITAS 24

PDF pg 36, pg 17, 4.6.1 Stored Data Object Types

In the discussion of Collection Objects, the sentence "It is used for fast indexing of user objects and operations involving multiple user objects." appears. There currently are no operations that involve multiple objects.

Proposed Resolution:

Strike "and operations involving multiple user objects" from the

sentence.

VERITAS 25

PDF pg 37, pg 18 Identifying OSD Objects

The notes for Table 2 suggest that PARTITION\_IDs and USER\_OBJECT\_ID's are

always assigned by the OSD logical unit. This is not true. Clients can assign both PARTITION\_IDs and USER\_OBJECT\_IDs.

Proposed Resolution

Change the notes on Table 2 to reflect the fact that PARTITION\_IDs and USER\_OBJECT\_IDs may be assigned by the client.

VERITAS 26

PDF pg 37, pg 18, 4.6.2 Identifying OSD objects

object each

Proposed Resolution:

object, each

VERITAS 27

PDF pg 37, pg 18, 4.6.4 Partitions

The sentence "Partitions have a User\_Object\_ID of zero and a Partition\_ID

(see

4.6.2) that is assigned by the OSD logical unit when the user object

is  
created."

is not accurate. Partition\_ID can be assigned by the client.

Proposed Resolution

Change sentence to reflect Client assigned Partition\_IDs.

VERITAS 28

PDF pg 37, pg 18, 4.6.4 Partitions

partition OSD

Proposed Resolution:

OSD partition

VERITAS 29

PDF pg 37, pg 18, 4.6.4 Partitions, 2nd para

user object

Proposed Resolution:

partition

VERITAS 30

PDF pg 37, pg 18, 4.6.4 Partitions, 3rd para

partition OSD

Proposed Resolution:

an OSD partition

VERITAS 31

PDF pg 38, pg 19, 4.6.5 User objects

User objects have the Partition\_ID of

Proposed Resolution:

User objects contain the Partition\_ID of

VERITAS 32

PDF pg 38, pg 19, 4.6.5 User objects

A user object is a member of only one partition.

Proposed Resolution:

A user object shall be a member of only one partition.

VERITAS 33

PDF pg 38, pg 19, 4.6.5 User Objects

The sentence "User objects have the Partition\_ID of the partition to which they

belong and a User\_Object\_ID (see 4.6.2) that is assigned by the OSD logical unit

when the user object is created." is not accurate. User\_Object\_IDs can be

assigned by the client.

Proposed Resolution

Change sentence to reflect Client assigned User\_Object\_IDs.

VERITAS 34

PDF pg 38, pg 19, 4.6.6 Collections

The sentence "Collections have the Partition\_ID of the partition to which

they

belong and a Collection\_Object\_ID (see 4.6.2) that is assigned by the OSD

logical

unit when the collection is created." is inaccurate.

Collection\_Object\_IDs can

be assigned by the client.

Proposed Resolution

Change sentence to reflect Client assigned Collection\_Object\_IDs

VERITAS 35

PDF pg 39, pg 20, 4.7.1 Overview

"SBC-based systems" is unclear - does this mean to exclude SBC-2 based systems?

Proposed Resolution:

"systems that use random access to blocks"

VERITAS 36

PDF pg 39, pg 20 4.7.1 Overview

The sentence "With the exception of attributes pages in the attributes  
page number

range assigned to all OSD object types (see table 3 in 4.7.3), the  
same

attributes

page shall not be associated with more than one OSD object." doesn't  
seem

right. Is

this a typo? Should it be "more than one OSD object type"?

Proposed resolution

Fix as needed.

VERITAS 37

PDF pg 39, pg 20, 4.7.1 Overview, 3rd para

store

Proposed Resolution:

stored

VERITAS 38

PDF pg 39, pg 20 4.7.1 Overview

The special nature of the current command page (i.e. it can always be



retrieved)

should be noted here.

Proposed Resolution

Call out the special nature of the current command page.

VERITAS 39

PDF pg 39, pg 20, 4.7.2 Command function ordering for commands that get and/or

set attributes

an command

Proposed Resolution:

a command

VERITAS 40

PDF pg 39, pg 20, 4.7.2 Command function ordering for commands that get and/or

set attributes

the command functions

Proposed Resolution:

command function

VERITAS 41

PDF pg 40, pg 21, 4.7.2 processing of a GET ATTRIBUTES command...

2) Process any get attributes command functions specified in the CDB;

and

Proposed Resolution:

(Question) I do not understand why getting attributes happens prior to the set attributes in this case alone. I think it should be consistent with the other two cases (below) and the general case (above).

VERITAS 42

PDF pg 41, pg 22, 4.7.3 Attributes pages

The distinction between "Defined by OBSD (see 3.1.26) manufacturer product specifications" and "Vendor specific" in Table 4 is unclear. The former sure sounds vendor specific to me - is the difference that those pages are read-only. read-only?

Proposed Resolution:

Clarify

VERITAS 43

PDF pg 42, pg 23, 4.7.5 Attributes directories, 2nd para under table

in attribute number 0h to make

Proposed Resolution:

to attribute number 0h in order to make

VERITAS 44

PDF pg 42, pg 23,

Reference on item c) is incomplete

Proposed Resolution:

VERITAS 45

PDF pg 44, pg 25, 4.9.1 Basic security model

In Figure 4 "OSD Device" should be OBSD.

Proposed Resolution:

Correct figure

VERITAS 46

PDF pg 44, pg 25, 4.9.1 Basic security model, next to last paragraph on page

value, meaning that application

Proposed Resolution:

value. Consequently, the application

VERITAS 47

PDF pg 44, pg 25, 4.9.1 Basic security model, next to last paragraph on

page

does allow delegation of a credential if a application client

Proposed Resolution:

allows delegation of a credential in an application client

VERITAS 48

PDF pg 44, pg 25, 4.9.1 Basic security model, last paragraph on page

perform and sends those capabilities in those credentials

Proposed Resolution:

perform. It sends those capabilities and those credentials

VERITAS 49

PDF pg 44, pg 25, 4.9.1 Basic security model, last paragraph on page

While the application client is not trusted to follow this protocol, the

protocol is structured in a way that makes it in the application client's self-interest to follow the protocol. An application client that does not follow the protocol is unlikely to receive service from the OSD device server.

Proposed Resolution:

While the application client is not trusted to follow this protocol, an application client that does not follow the protocol is unlikely to receive

service from the OSD device server.

VERITAS 50

PDF pg 45, pg 26, 4.9.1 Basic security model, first paragraph on page

send by

Proposed Resolution:

sent by

VERITAS 51

PDF pg 45, pg 26, 4.9.2 Trust assumptions, 4th paragraph

and the

Proposed Resolution:

and by the

VERITAS 52

PDF pg 45, pg 26, 4.9.2 Trust assumptions, 2nd paragraph under table

mode other

Proposed Resolution:

method other

VERITAS 53

PDF pg 46, pg 27, 4.9.3.2 The NOSEC security method

PERFORM SCSI COMMAND command (see 6.11)

Proposed Resolution:

PERFORM SCSI COMMAND command (see 6.12)

VERITAS 54

PDF pg 47, pg 28, 4.9.3.3 The CAPKEY security method

The credential should appear to have been tampered with when this is not truly the case. The problems caused by multiple SCSI domains may be solved by using a different security method (e.g., the CMDRSP security method).

Proposed Resolution:

The credential could appear to have been tampered with when this is not actually the case. The problems caused by multiple SCSI domains can be solved by using a different security method (e.g., the CMDRSP security method, see 4.9.3.4).

VERITAS 55

PDF pg 48, pg 29, 4.9.3.4 The CMDRSP security method, 1st paragraph under list.

presence of malicious entities perpetrating a denial of service attack should be considered.

Proposed Resolution:

(question) why this set of circumstances suggest a denial of service attack?

VERITAS 56

PDF pg 51, pg 32, 4.9.3.5 The ALLDATA security method, first paragraph at top of page

presence of malicious entities perpetrating a denial of service attack should be considered.

Proposed Resolution:

(question) why this set of circumstances suggest a denial of service attack?

VERITAS 57

PDF pg 52, pg 33, 4.9.4.2 Capability key, first paragraph at top of page

copied to the CDB.

Proposed Resolution:

copied into the CDB.

VERITAS 58

PDF pg 52, pg 33, 4.9.4.2 Capability key, first paragraph at top of page

- 1) Reconstructing the credential containing

Proposed Resolution:

- 1) Reconstruct the credential containing

VERITAS 59

PDF pg 52, pg 33, 4.9.4.2 Capability key, first paragraph at top of page

- 2) Computing the credential integrity check

Proposed Resolution:

- 2) Compute the credential integrity check

VERITAS 60

PDF pg 53, pg 34, 4.9.4.3 Capability format, 2nd paragraph under table

supported integrity check value algorithm attributes in the Root  
Security

Proposed Resolution:

supported integrity check value algorithm attribute in the Root  
Security

VERITAS 61

PDF pg 55, pg 36, 4.9.4.3 Capability format, 3rd paragraph from bottom of  
page

of OSD object



Proposed Resolution:

of the OSD object

VERITAS 62

PDF pg 56, pg 37, 4.9.4.4 Credentials and commands allowed

attributes and combinations of capability fields

Proposed Resolution:

attributes. Combinations of capability fields

VERITAS 63

PDF pg 56, pg 37, 4.9.4.4 Credentials and commands allowed

the retrieval and setting of attributes by combining the permission bits

values described

Proposed Resolution:

retrieving and setting attributes by combining permission bit values described

VERITAS 64

PDF pg 58, pg 39, Table 19, 3rd row

both equal to zero or a FORMAT OSD command.

Proposed Resolution:

both equal to zero. Also a FORMAT OSD command. (question) Why doesn't

FORMAT OSD require global permission?

VERITAS 65

PDF pg 64, pg 45, 4.9.5.2 Credential and capability validation

A NOSEC target should do everything listed in this section except for validating the integrity check values.

Proposed resolution

"This subclause describes the process for validating a capability received in a CDB. If the security method is NOSEC, the integrity check defined herein shall not be performed.

VERITAS 66

PDF pg 64, pg 45, 4.9.5.2 Credential and capability validation, 1st para

method is use

Proposed Resolution:

method in use

VERITAS 67

PDF pg 64, pg 45, 4.9.5.2 Credential and capability validation, 3rd para

method is use

Proposed Resolution:

method in use

VERITAS 68

PDF pg 68, pg 49, 4.9.7 Integrity check values

key. An integrity

Proposed Resolution:

key. Integrity

VERITAS 69

PDF pg 69, pg 50, 4.9.7 Integrity check values

check value is has

Proposed Resolution:

check value has

VERITAS 70

PDF pg 69, pg 50, 4.9.8.1 Introduction

c) The definition of the defining the SET KEY

Proposed Resolution:

c) The definition of the SET KEY

VERITAS 71

PDF pg 69, pg 50, Table 22 OSD secret key hierarchy

d As dual purpose number,

Proposed Resolution:

d As a dual purpose number,

VERITAS 72

PDF pg 70, pg 51, 4.9.8.1 Introduction

may be protected by tamper resistant software shield.

Proposed Resolution:

may be protected by a tamper resistant software shield.

VERITAS 73

PDF pg 72, pg 53, 4.10 Data persistence model

rest event (see SAM-3)

Proposed Resolution

rest event (see SAM-3)

VERITAS 74

PDF pg 72, pg 53, 4.10 Data persistence model

the lost of data

Proposed Resolution:

the loss of data

VERITAS 75

PDF pg 72, pg 53, 4.10 Data persistence model

combination is non-volatile random

Proposed Resolution:

combination of non-volatile random

VERITAS 76

PDF pg 74, pg 74, 4.11.2 OSD Data-In Buffers Format

The sentence "The device server shall not alter unused bytes in the Data-In Buffer"

doesn't make sense. The device server has to send these bytes to the initiator and

the bytes therefore will be modified in the initiator buffers.

Proposed Resolution

Replace offending sentence with "The contents of the unused bytes in the

Data-In

Buffer is undefined".

VERITAS 77

PDF pg 78, pg 59, 4.15 Reservations

OSD logical unit is not zero, the PERSISTENT RESERVE IN

Proposed Resolution:

OSD logical unit is not NOSEC, the PERSISTENT RESERVE IN

VERITAS 78

PDF pg 80, pg 61, 5.1 OSD CDB format

a CDB containing service action

Proposed Resolution:

a CDB containing a service action

VERITAS 79

PDF pg 83, pg 64, 5.2.1.3 Get and set attributes lists

zero specifies that there is no get attributes list is

Proposed Resolution:

zero specifies that no get attributes list is

VERITAS 80

PDF pg 84, pg 65, 5.2.3 Options byte

Is it necessary to add a paragraph explaining behavior if both DPO and

FUA are set?

Proposed Resolution:

If both DPO and FUA each have a value of one, then the device server should place no data in the volatile cache and the device server shall not return status until the data transferred by this command has been written to stable storage.

VERITAS 81

PDF pg 85, pg 66, 5.2.4 Partition\_ID

"If the partition identified by the PARTITION\_ID field does not exist, the command

shall be terminated ...". What about CREATE\_PARTITION with PARTITION\_ID !

= 0?

Proposed Resolution

Call out exception for CREATE\_PARTITION.

VERITAS 82

PDF pg 86, pg 67, 5.2.7 Timestamps control

previously updated or not updated timestamp attribute

Proposed Resolution:

previously established timestamp attribute

VERITAS 83

PDF pg 87, pg 68, 5.2.8 User\_Object\_ID

"If the user object identified by the USER\_OBJECT\_ID field does not exist, the

command shall be terminated ...". What about CREATE & CREATE\_AND\_WRITE with

User\_Object\_ID != 0?

Proposed Resolution

Call out exception for CREATE & CREATE\_AND\_WRITE.

VERITAS 84

PDF pg 87, pg 68, Table 39 Commands for OSD type devices (part 1 of 2)

PRESISTENT RESERVE IN and PRESISTENT RESERVE OUT should be optional commands, because capability checking other than the integrity check computation should happen for NOSEC

Proposed resolution

Modify table to declare PERSISTENT RESERVE IN and PRESISTENT RESERVE OUT

are optional.

VERITAS 85

PDF pg 87, pg 68, Table 39 Commands for OSD type devices (part 1 of 2)

8800h and 8F7Fh that not listed

Proposed Resolution:



8800h and 8F7Fh that are not listed

VERITAS 86

PDF pg 88, pg 69, Table 39 Commands for OSD type devices (part 2 of 2)

8800h and 8F7Fh that not listed

Proposed Resolution:

8800h and 8F7Fh that are not listed

VERITAS 87

PDF pg 90, pg 71, 6.2 APPEND

maximum user object length attribute in the The COLLECTIONS PER USER OBJECT field contains the value of the collections per user object attribute.

(see ), then a

Proposed Resolution:

maximum user object length attribute (see 7.1.2.14), then a

VERITAS 88

PDF pg 93, pg 74, 6.4 CREATE AND WRITE

If the REQUESTED USER\_OBJECT\_ID field contains zero any User\_Object\_ID may be assigned.

Proposed Resolution:

If the REQUESTED USER\_OBJECT\_ID field contains zero, any User\_Object\_ID

may be assigned.

VERITAS 89

PDF pg 94, pg 75, 6.4 CREATE AND WRITE (3 instances)

in 4.8.3 apply to the testing of the

Proposed Resolution:

in 4.8.3 apply when testing the

VERITAS 90

PDF pg 94, pg 75, 6.4 CREATE AND WRITE

maximum user object length attribute in the The COLLECTIONS PER USER  
OBJECT field contains the value of the collections per user object attribute.

(see ), then a

Proposed Resolution:

maximum user object length attribute (see 7.1.2.14), then a

VERITAS 91

PDF pg 95, pg 76, 6.5 CREATE COLLECTION

Partition\_ID of partition in which

Proposed Resolution:

Partition\_ID of the partition in which

VERITAS 92

PDF pg 96, pg 77, 6.5 CREATE COLLECTION

in 4.8.3 apply to the testing of the

Proposed Resolution:

in 4.8.3 apply when testing the

VERITAS 93

PDF pg 96, pg 77, 6.6 CREATE PARTITION

the command shall terminated

Proposed Resolution:

the command shall be terminated

VERITAS 94

PDF pg 96, pg 77, 6.6 CREATE PARTITION

in 4.8.3 apply to the testing of the

Proposed Resolution:

in 4.8.3 apply when testing then

VERITAS 95

PDF pg 103, pg 84, 6.10 LIST

has allocated for returned list.

Proposed Resolution:

has allocated for the returned list.

VERITAS 96

PDF pg 104, pg 85, 6.10 LIST

INITIAL OBJECT\_ID field of that command.

Proposed Resolution:

INITIAL OBJECT\_ID field of that new command.

VERITAS 97

PDF pg 107, pg 88, 6.11 LIST COLLECTION

LIST IDENTIFIER field of that command.

Proposed Resolution:

LIST IDENTIFIER field of that new command.

VERITAS 98

PDF pg 108, pg 89, 6.12 PERFORM SCSI COMMAND

An OBSD should support this command even when the security level is NOSEC.

Proposed resolution

Clarify that NOSEC devices SHALL support PERFORM SCSI COMMAND

VERITAS 99

PDF pg 110, pg 91, 6.13 PERFORM TASK MANAGEMENT FUNCTION

An OSD should support this command even when the security level is NOSEC.

Proposed resolution

Clarify that NOSEC devices SHALL support PERFORM TASK MANAGEMENT FUNCTION

VERITAS 100

PDF pg 115, pg 96, 6.16 REMOVE COLLECTION

the collection contains user object,

Proposed Resolution:

the collection contains user objects,

VERITAS 101

PDF pg 122, pg 103, 6.21 WRITE (2 instances)

in 4.8.3 apply to the testing of the

Proposed Resolution:

described in 4.8.3 apply when testing the

VERITAS 102

PDF pg 122, pg 103, 6.21 WRITE

References to CREATE\_AND\_WRITE in last 2 paragraphs don't belong. This section

is on WRITE.

Proposed Resolution

Change CREATE\_AND\_WRITE to WRITE.

VERITAS 103

PDF pg 123, pg 104, 7.1.1 Attributes parameter formats

The sentence "Those attributes pages that do not have a defined page format are

not accessible via page format parameter data (e.g., the Root Directory

attributes

page defined in 7.1.2.4)." What does this mean? Who defines the page formats? This

spec? Can vendors define pages that can be accessed with page format?

What is the Root Directory page an example of?

Proposed resolution

Clarify.

VERITAS 104

PDF pg 123, pg 104, 7.1.1 Attributes parameter format

The sentence "Attribute access is limited to the". Is this for both page

an list

format?

Proposed resolution

Clarify if that this applies to both page and list formats.

VERITAS 105

PDF pg 123, pg 104, 7.1.1 Attributes parameter format

Then sentence "If an attribute value that has not been previously established is

requested, a list entry format value (see 7.1.3.3) having zero in the ATTRIBUTE

LENGTH field shall be returned."

After considering the issue, we think it would be nice to distinguish a

zero length

attribute from an empty attribute.

Proposed resolution

Reserve the attribute length FFFF FFFF for empty attributes. Change wording here

and in 7.1.3.3 to reflect this change.

VERITAS 106

PDF pg 123, pg 104, 7.1.1 Attributes parameter formats

allows retrieval of them in formatted pages

Proposed Resolution:

allows retrieval of attribute values in formatted pages

VERITAS 107

PDF pg 124, pg 105, Table 67 - Attributes pages

The following attribute page ranges are not described in this table:

80 to P - 1 (2FFF FFFFh)

P + 80 (3000 0080h) to C - 1 (5FFF FFFFh)

C + 80 (6000 0080h) to 8FFF FFFFh)

R + 80 (9000 0080h) to EFFF FFFFh)

Proposed resolution

Describe the missing ranges in the table, and who each range is defined

by.

VERITAS 108

PDF pg 124, pg 105, Table 67 - Attributes pages

Not all attribute pages on this table can be accessed in page format

(For example, the information pages)

This information should appear in this table.



Proposed resolution

Add a "Page Format Available" column to this table.

VERITAS 109

PDF pg 131, pg 112, 7.1.2.8 Root Information attributes page

(number C0h) shall contain the number partitions present

Proposed Resolution:

(number C0h) shall contain the number of partitions present

VERITAS 110

PDF pg 135, pg 116, Table 77, Root Quotas attribute page contents

Fields that are set by the OSD when FORMAT'ed should be marked as 'YES' in the "OSD Logical Unit Provided" column.

Proposed resolution

All "OSD Logical Unit Provided" entries currently marked 'NO' should be changed to 'YES'.

VERITAS 111

PDF pg 137, pg 118, Table 79, Partition Quotas attribute page contents

Fields that are set by the OSD at CREATE\_PARTITION time should be marked

as

'YES' in the "OSD Logical Unit Provided" column.

Proposed resolution

All "OSD Logical Unit Provided" entries currently marked 'NO' should be changed to 'YES'.

VERITAS 112

PDF pg 137, pg 118, 7.1.2.13 Partition Quotas attributes page

maximum user object length attribute in the The COLLECTIONS PER USER OBJECT field contains the value of the collections per user object attribute.

(see )

Proposed Resolution:

maximum user object length attribute in the User Object Quotas attributes page (see 7.1.2.14)

VERITAS 113

PDF pg 138, pg 119, Table 81, User Object Quotas attribute page contents

Fields that are set by the OSD at CREATE or CREATE\_AND\_WRITE time should

be marked as 'YES' in the "OSD Logical Unit Provided" column.

Proposed resolution

All "OSD Logical Unit Provided" entries currently marked 'NO' should be changed to 'YES'.

VERITAS 114

PDF pg 139, pg 120, 7.1.2.14 User Object Quotas attributes page

(number lh) specifies the maximum value the allow in the user

Proposed Resolution:

(number lh) specifies the maximum value allowed in the user

VERITAS 115

PDF pg 140, pg 121, 7.1.2.15 Root Timestamps attributes page (2 instances)

whose CDB get and set attributes parameters (see 5.2.1)

Proposed Resolution:

whose CDB get attributes parameters (see 5.2.1)

VERITAS 116

PDF pg 146, pg 127, 7.1.2.18 User Object Timestamp attributes page

Does modifying the logical size of an object by writing to "User Object Logical Length" attribute of the User Object Information page update the Data Modified Time? We think that modifying the logical length should update both the data modified time and the attribute modified time.

Proposed Resolution

Update description to include changing the logical length as something

that

causes the data modified time to be updated.

VERITAS 117

PDF pg 151, pg 132, 7.1.2.20 Root Security attributes page

to maintain value in the adjustable clock attribute value outside

Proposed Resolution:

to maintain a value in the adjustable clock attribute is outside

VERITAS 118

PDF pg 156, pg 137, 7.1.2.21 Partition Security attributes page (two instances)

(see 5.2.1.3) contains an request

Proposed Resolution:

(see 5.2.1.3) contains a request

VERITAS 119

PDF pg 159, pg 140, 7.1.2.22 Collection Security attributes page

(see 5.2.1.3) contains an request

Proposed Resolution:

(see 5.2.1.3) contains a request

VERITAS 120

PDF pg 160, pg 141, 7.1.2.23 User Object Security attributes page

(see 5.2.1.3) contains an request

Proposed Resolution:

(see 5.2.1.3) contains a request

VERITAS 121

PDF pg 165, pg 146, 7.1.3.3 List entry format....

by the ATTRIBUTE NUMBER field in the in the attributes page

Proposed Resolution:

by the ATTRIBUTE NUMBER field in the attributes page

\*\*\*\*\* End of Ballot Report \*\*\*\*\*