

T10/05-126r1

Voting Results on T10 Letter Ballot 05-125r0 on  
Forwarding SAS-1.1 to First Public Review  
Ballot closed: 2005/04/19 12:00 noon MDT

(Rev 1 is exactly the same as rev 0 except it includes Nvidia's Yes vote,  
which was not received due to an email delivery problem.)

Organization	Name	S Vote	Add'l Info
Adaptec, Inc.	Tim Symons	P Yes	
Agilent Technologies	Pat Thaler	P Yes	
Amphenol Interconnect	Michael Wingard	P Yes	
Broadcom Corp.	Paul Griffith	P Yes	
Brocade	Robert Snively	P Abs	Cmnts
Cisco Systems, Inc.	Claudio DeSanti	P Abs	Cmnts
CNT	David Peterson	P Yes	
Crossroads Systems, Inc.		DNV	
Dallas Semiconductor	James A. Lott, Jr.	P Yes	
Dell, Inc.	Kevin Marks	P No	Cmnts
EMC Corp.	David Black	A Yes	
Emulex	Robert H. Nixon	P No	Cmnts
ENDL	Ralph O. Weber	P Yes	
FCI	Douglas Wagner	P Yes	
Foxconn Electronics	Elwood Parsons	P Yes	
Fujitsu	Mike Fitzpatrick	P Yes	
General Dynamics	Nathan Hastad	P Yes	
Hewlett Packard Co.	Rob Elliott	P No	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 No	Cmnts
Iomega Corp.	David Hawks	P Yes	
Lexar Media, Inc.	Martin Furuhjelm	A Yes	
LSI Logic Corp.	John Lohmeyer	P No	Cmnts
Maxtor Corp.	Mark Evans	P No	Cmnts
Microsoft Corp.	Jeff Mastro	A Yes	
Molex Inc.	Jay Neer	P No	Cmnts
Nvidia Corp.	Mark Overby	P Yes	
Panasonic Technologies, Inc	Terence J. Nelson	P Yes	
Philips Electronics	William P. McFerrin	P Yes	
Pivot3, Inc.	Bill Galloway	P Yes	
PMC-Sierra	Bill Lye	A Yes	Cmnts
QLogic Corp.	Craig W. Carlson	A Yes	Cmnts
Quantum Corp.	Paul Entzel	P Yes	
Seagate Technology	Gerald Houlder	P No	Cmnts
Sierra Logic, Inc.	William Martin	P Yes	Cmnts
Storage Technology Corp.	Erich Oetting	P Yes	
Sun Microsystems, Inc.	Vit Novak	P Yes	
Texas Instruments	Paul D. Aloisi	P Yes	
Toshiba	Yutaka Arakawa	P Yes	
TycoElectronics	Ashlie Fan	P No	Cmnts
Veritas Software	Roger Cummings	P Abs	Cmnts
Vitesse Semiconductor	Gregory Tabor	P Yes	
Western Digital	Curtis Stevens	P Yes	

Xiotech Corp.

Jeff Williams

P Yes

Ballot totals: (32:10:3:1=46)

32 Yes

10 No

3 Abstain

1 Organization(s) did not vote

46 Total voting organizations

16 Ballot(s) included comments

This 2/3rds majority ballot passed.

32 Yes are more than half the membership eligible to vote minus abstentions [greater than 21] AND

32 Yes are at least 28 (2/3rds of those voting, excluding abstentions [41]) AND

32 Yes are equal to or exceed a quorum [15]

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 Abs ballot from Robert Snively of Brocade:

This is outside the area of interest of Brocade Communications

\*\*\*\*\*

Comments attached to Abs ballot from Claudio DeSanti of Cisco Systems, Inc.:

I don't know enough this technology.

\*\*\*\*\*

Comments attached to No ballot from Kevin Marks of Dell, Inc.:

DELL comment number 1

Page=40 Subtype=Highlight Author=Kevin\_Marks

Comment=

1 Scope

Figure 1 - SCSI document relationships

Change

"Protocols"

to

"SCSI Transport Protocols"

DELL comment number 2  
Page=40 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
1 Scope

In Figure 1 - SCSI document relationships  
Change  
"Primary command set"  
to  
"Primary Command Set"

DELL comment number 3  
Page=41 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
1 Scope

In Figure 2 - ATA document relationships  
Change  
"Primary command set"  
to  
"Primary Command Set"

DELL comment number 4  
Page=41 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
1 Scope

In Figure 2 - ATA document relationships  
Change  
"ATA/ATAPI register set  
(ATA/ATAPI-7 Volume 1)"  
to  
"ATA/ATAPI Logical register set  
(ATA/ATAPI-7 Volume 1)"

DELL comment number 5  
Page=43 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
2.3 References under development

Because of the inclusion of 05-107r1 (overlap command handling), does SAM-4 need to be included?

DELL comment number 6  
Page=43 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
2.4 Other References

Change  
"(SATA2-PHY)"  
to

"(SATAII-PHY)"

There is already enough industry confusion between SATA2 and SATAII.

DELL comment number 7  
Page=43 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
2.4 Other references  
change  
"http://www.serialata.org"  
to  
"http://www.sata-io.org"

DELL comment number 8  
Page=43 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
2.4 Other references

Change "Internal Serial Attachment Connector"  
to  
"Unshielded Dual Port Serial Attachment Connector"

DELL comment number 9  
Page=43 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
2.4 Other References

Change  
"(SATA2-EXT)"  
to  
"(SATAII-EXT)"

DELL comment number 10  
Page=43 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
2.4 Other References

Change  
"(SATA2-PS)"  
to  
"(SATAII-PS)"

DELL comment number 11  
Page=43 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
2.4 Other references

for SFF-8484  
change  
"Multi Lane Internal Serial Attachment Connector"  
to  
"Multi Lane Unshielded Serial Attachment Connector"

DELL comment number 12  
Page=46 Subtype=Highlight Author=Kevin\_Marks

Comment=

3.1.23 clock data recovery (CDR)  
change

"The function is provided by the receiver circuit ..."

to

"A function provided by the receiver circuit ..."

DELL comment number 13

Page=46 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

3.131 connector

Remove

"Connectors may introduce physical disturbances to the transmission path due to impedance mismatch, crosstalk, etc. These disturbances may introduce jitter and other forms of signal degradation under certain conditions."

Although true, does not belong in the definition of connector..

DELL comment number 14

Page=50 Subtype=Highlight Author=Kevin\_Marks

Comment=

3.1.88 identification sequence

change

"See 4.4."

to

"See 4.1.2" or "See 7.9"

This is where the identification sequence is first talked about.

DELL comment number 15

Page=50 Subtype=Highlight Author=Kevin\_Marks

Comment=

3.1.98 idle dword

change (Global)

"vendor-specific"

to

"vendor specific"

vendor specific is a keyword and does not contain a dash. Through out draft the dash is used.

DELL comment number 16

Page=52 Subtype=Highlight Author=Kevin\_Marks

Comment=

3.1.118 media

Change

"...part of connectors."

to

"...part of connectors or a plural of medium."

Because the word media is used multiple times in the power conditions state

machine, .i.e. rotating media. This may additionally add a definition for medium as

"medium: The material on which data is stored (e.g., a magnetic disk)."

DELL comment number 17

Page=54 Subtype=Highlight Author=Kevin\_Marks

Comment=

3.1.164 SAS Address

Change

"unique name assigned"

to"

"unique name or identifier assigned"

SAS Ports do not have names, only identifiers.

DELL comment number 18

Page=55 Subtype=Highlight Author=Kevin\_Marks

Comment=

3.1.188 SCSI port

Change"

3.1.188 SCSI port: A SCSI initiator port or a SCSI target port. See SAM-3."

to

"3.1.188 SCSI port: A SCSI initiator port, a SCSI target port or a SCSI target/initiator port. See SAM-3."

DELL comment number 19

Page=55 Subtype=Highlight Author=Kevin\_Marks

Comment=

3.1.182 SATA port selector:

Change

"(see SATA2-PS)."

to

"(see SATAII-PS)."

DELL comment number 20

Page=56 Subtype=Highlight Author=Kevin\_Marks

Comment=

3.1.196 Serial Management Protocol (SMP)

Change

"... used by SAS devices to communicate management information with other SAS devices in a SAS domain."

to

".. used by SMP initiator ports to communicate with SMP target ports for the purpose of communicating management information in a SAS domain."

DELL comment number 21

Page=70 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 9 - State machine conventions

Many of the state machines in the standard contain only a single state.

When the State designator:State\_Name format is used, the text never references this state, and a search for this State designator:State\_Name would only hit the state machine state on the figure.

I propose that for state machines that only have a single state, that the state name be left off and a sentence that follows be added to the paragraph after Figure 9. "For state machines that only contain a single state, only the state designator may be used."

DELL comment number 22

Page=71 Subtype=Highlight Author=Kevin\_Marks

Comment=

3.7 Bit and byte ordering

Change

"NOTE 5 - SATA numbers bits within fields the same as this standard, but uses little-endian byte ordering."

to

"NOTE 5 - SATA numbers bits within fields are the same as in this standard, but uses little-endian byte ordering."

DELL comment number 23

Page=73 Subtype=Highlight Author=Kevin\_Marks

Comment=

4.1 Architecture

Change

".... one SMP port."

to

"... one SMP target port."

DELL comment number 24

Page=77 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

4.1.2 Physical links and phys

Second paragraph, first sentence after Figure 12.

Remove

"(i.e., the transceiver)"

The phy consists of more than the transceiver.

DELL comment number 25

Page=90 Subtype=Highlight Author=Kevin\_Marks

Comment=

4.1.9 Pathways

1st Paragraph, 3rd Sentence

change

"phy, there are multiple potential pathways, each"

to

"phy, there may be multiple potential pathways, each"

DELL comment number 26

Page=91 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
4.1.9 Pathways

Last Paragraph

change

"A partial pathway is blocked when path resources it requires are held by another partial pathway (see 7.12)."

to

"A partial pathway is blocked when path resources it requires are held by another partial pathway or pathway (see 7.12)."

DELL comment number 27  
Page=91 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
4.1.10 Connections  
5th Paragraph,1st Sentence

Change

"One connection may be active on a physical link at a time"

to

"Only one connection may be active on a physical link at a time."

DELL comment number 28  
Page=93 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
4.2.1 Names and identifiers overview

1st Sentence

Change

"Device names are worldwide unique names for devices within a transport protocol (see SAM-3)."

to

"Device names are worldwide unique names for devices within a SCSI transport protocol (see SAM-3)."

DELL comment number 29  
Page=93 Subtype=StrikeOut Author=Kevin\_Marks  
Comment=  
4.2.1 Names and identifiers overview.

Remove 2nd Sentence

"Port names are worldwide unique names for ports within a transport protocol."

Since port names are not used in SAS, why define their uniqueness in relation to SAM-3.

DELL comment number 30



Page=95 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
4.2.5 Port names  
1st Sentence

Change  
"SCSI"  
to  
"the SCSI Architectural Model"  
or  
"SAM-3"

DELL comment number 31  
Page=99 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 32

Change  
"SSP\_TC (transmit credit) state machine"  
to  
"SSP\_TC (transmit credit control) state machine"

DELL comment number 32  
Page=99 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 32  
Change  
"SSP\_TF (transmit frame) state machine"  
to  
"SSP\_TF (transmit frame control) state machine"

DELL comment number 33  
Page=111 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
4.6.2 Expander ports  
5 Paragraph, 1st Sentence  
Change  
"with a peripheral device type of SCSI enclosure services (SES))."  
to  
"with a peripheral device type of enclosure services device (SES))."

To match SPC-3 type 0dh.

DELL comment number 34  
Page=111 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
4.6.2 Expander ports  
6th Paragraph, 1st Sentence  
Change  
"... internal SMP port using ..."  
to  
"... internal SMP target port using ..."

DELL comment number 35  
Page=111 Subtype=StrikeOut Author=Kevin\_Marks

Comment=  
4.6.3 Expander connection manager (EMC)  
b) list

Remove  
"addressing"

DELL comment number 36  
Page=116 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Table 12 - ECM to expander phy confirmations (part 2 of 2)

Message Row - (Arb Reject (Bad Destination))

change

"...the EM has not chosen to return Arb..."  
to  
"...the ECM has not chosen to return Arb..."

DELL comment number 37  
Page=118 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Table 15 - Expander phy to BPP requests

Table Row - Broadcast Event Notify (Phy Not Ready)

Change

"or because a virtual phy has been disabled (see 10.4.3.10). See 7.11."  
to  
"or because a phy or virtual phy has been disabled (see 10.4.3.10). See 7.11."

I do not believe that when a phy is disabled via SMP PHY CONTROL, that it would transition to the SPO:OOB\_COMINIT state. I would think that the SP state machine would be stopped, waiting on a link or hard reset to re-enable it.

DELL comment number 38  
Page=122 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
4.7.1 Discovery process overview

Last Sentence

Change

"The discover process may be aborted prior to completion if there is an indication that it may be based on incorrect information (e.g., arrival of a BROADCAST (CHANGE))."

to

"The discover process may be aborted and need to be restarted prior to completion if there is an indication that it may be based on incorrect information (e.g., arrival of a BROADCAST (CHANGE))."

DELL comment number 39

Page=122 Subtype=Text Author=Kevin\_Marks  
Comment=Unmarked set by Kevin\_Marks

DELL comment number 40  
Page=123 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
4.7.3 discover process optimization  
5th Paragraph, list a)

"a) when an OPEN\_REJECT (NO DESTINATION) is received for a connection request to a SAS address that is expected to be in an existing expander device route table;"

Add an example for what is an expected SAS address to be present or remove a).

This whole section is so vendor specific, that an example might help.

DELL comment number 41  
Page=123 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
4.7.3 discover process optimization  
6th Paragraph, 1st Sentence

"...detects an inconsistency in the expander route tables..."

What is defined as an inconsistency, add example?

DELL comment number 42  
Page=132 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 50 - SAS internal cabled environments  
Top figure

Change  
"SATA-style signal cable receptacle"  
to  
"SATA-style signal cable receptacle connector"

DELL comment number 43  
Page=132 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 50 - SAS internal cabled environments  
Bottom figure

Change  
"SATA-style signal cable receptacle"  
to  
"SATA-style signal cable receptacle connector"

DELL comment number 44  
Page=132 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 50 - SAS internal cabled environments

Bottom figure

Change

"SATA-style signal cable receptacle"  
to  
"SATA-style signal cable receptacle connector"

DELL comment number 45

Page=133 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 52 - SAS external cabled environment

change

"(SAS external cable connects the Tx signal pins to  
the Rx signal pins on each physical link)"  
to  
"(the cable connects the Tx signal pins to  
the Rx signal pins on each physical link)"

This removes reference to whether it is compact or not.

DELL comment number 46

Page=133 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 53 - Internal wide cabled environment - controller to backplane -  
symmetric cable

change

"(symmetric SAS internal wide cable connects the Tx signal pins to the Rx  
signal pins  
within each physical link)"  
to  
"(the cable connects the Tx signal pins to the Rx signal pins  
within each physical link)"

This removes reference to whether it is compact or not.

DELL comment number 47

Page=133 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 53 - Internal wide cabled environment - controller to backplane -  
symmetric cable  
under Controller

change

"SAS internal wide plug or internal compact wide receptacle (4 physical  
links)"  
to  
"SAS internal wide plug or internal compact wide receptacle connector (4  
physical links)"

DELL comment number 48

Page=134 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 54 - Internal wide cabled environment - controller to controller -

symmetric cable

change

"(SAS internal wide cable connects the Tx signal pins to the Rx signal pins within each physical link)"

to

"(the cable connects the Tx signal pins to the Rx signal pins within each physical link)"

This removes reference to whether it is compact or not.

DELL comment number 49

Page=139 Subtype=Highlight Author=Kevin\_Marks

Comment=

Table 23 - SAS internal connector pin assignments

Note c

Change

"(see SATA2-EXT)."

to

"(see SATAII-EXT)"

DELL comment number 50

Page=142 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

5.2.3.3.5 SAS external compact cable plug connector

1st Sentence

Remove

"with latch"

Since no other option is defined in SFF-8088.

DELL comment number 51

Page=142 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.2.3.3.5 SAS external compact cable plug connector

2nd Sentence

change

"SFF-8086 defines the circuit board, which is common ...."

to

"SFF-8086 defines the circuit board layout, which is common ...."

DELL comment number 52

Page=142 Subtype=Text Author=Kevin\_Marks

Comment=

5.2.3.3.5 SAS external compact cable plug connector

SFF-8086 define 4 different circuit board layout sizes(26,36,50,68). No where in the SAS external compact cable plug or receptacle sections does it indicate that the 26 ckt version is used. It can only be inferred by looking at table 25, adding up A1-A13 and B1-B13. Need to add that it uses 26 ckt version in 8086.

DELL comment number 53

Page=142 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

5.2.3.3.5 SAS external compact cable plug connector  
2nd paragraph, 1st and 2nd sentences

Remove

"The SAS external compact cable plug connector shall not include keys and may include key slots. Key slots are not defined by this standard."

As keying is defined.

DELL comment number 54

Page=143 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 63 - SAS external compact cable plug connector

Add text indicating A1 is on bottom, or add B1 indicator coming from top.

DELL comment number 55

Page=143 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.2.3.3.6 SAS external compact receptacle connector  
1st paragraph, 2nd sentence

change

"... interface (the receptacle body is common to both internal and external connectors)"

to

"... interface layout (the receptacle body is common to both internal and external connectors)"

DELL comment number 56

Page=143 Subtype=Text Author=Kevin\_Marks

Comment=

5.2.3.3.6 SAS external compact receptacle connector

SFF-8086 define 4 different mating interface layout sizes(26,36,50,68). No where in the SAS external compact cable plug or receptacle sections does it indicate that the 26 ckt version is used. It can only be inferred by looking at table 25, adding up A1-A13 and B1-B13. Need to add that it uses 26 ckt version in 8086.

DELL comment number 57

Page=143 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.2.3.3.6 SAS external compact receptacle connector

Insert two paragraphs below before

"Table 25 (see 5.2.3.3.7) defines the pin assignments."

text to be inserted:

A SAS external compact receptacle connector may be used by one or more SAS

devices (e.g., one SAS device using "physical links 0 and 3, another using physical link 1, and a third using physical link 2).

A SAS external compact receptacle connector shall be used by only one expander device at a time, and all physical links shall be used by the same expander port (i.e., all the expander phys shall have the same routing attribute (e.g., subtractive or table) (see 4.6.2))."

DELL comment number 58

Page=143 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

5.2.3.3.6 SAS external compact receptacle connector  
2nd Paragraph, 1st and 2nd Sentence

Remove

"The SAS external compact receptacle connector shall not include keys and may include key slots. Key slots are not defined by this standard."

Keying is defined.

DELL comment number 59

Page=144 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 64 - SAS external compact receptacle connector

Add text indicating A1 is on bottom, or add B1 indicator coming from top.

DELL comment number 60

Page=145 Subtype=Text Author=Kevin\_Marks

Comment=Update per T10/05-138r0.

DELL comment number 61

Page=145 Subtype=Text Author=Kevin\_Marks

Comment=

SFF-8088 currently defines 5 different key and slot locations. Need to explicitly add which locations are used for each version.

3 on receptacle

1 for table route or enclosure out port on receptacle and 1-3 for plug  
5 for subtractive or enclosure in port on receptacle and 3-5 for plug

DELL comment number 62

Page=146 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 65 - SAS external compact connector keys for end devices

Remove plug picture, and add text above figure that table (enclosure out port) and subtractive (enclosure in port) plug both plug into end device receptacle.

Suggest putting end device figure last, so that the two subtractive and table plugs are defined.

DELL comment number 63

Page=146 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 66 - SAS external compact connector keys for expander device table routing phys

Receptacle only needs key in position 1.

DELL comment number 64

Page=146 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.2.3.3.8 External compact connector keying

1st Sentence after Figure 65.

Change

"...used by expander device table routing phys, and the key slots..."

to

"...used by expander device table routing phys (e.g. Enclosure out port), and the key slots..."

DELL comment number 65

Page=147 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 67 - SAS external compact connector keys for expander device subtractive routing phys

Receptacle only needs key in position 5.

DELL comment number 66

Page=147 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.2.3.3.8 External compact connector keying

1st Sentence after Figure 66.

change

"....used by expander device subtractive routing phys, and the key slots..."

to

"....used by expander device subtractive routing phys (e.g. Enclosure in port), and the key slots..."

DELL comment number 67

Page=147 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.2.3.4.1 SAS internal wide connectors overview

2nd Paragraph, 1st Sentence

change

"...expander devices with external ports shall use..."

to

"...expander devices with internall ports shall use..."

DELL comment number 68

Page=147 Subtype=Text Author=Kevin\_Marks

Comment=

Reject proposed changes in T10/05-139r0 unless modified to change:

1. If using Alternate Table 26Z -- Controller SAS internal pin assignments



and physical link usage - does not define pin assignments, only signal usage for link widths.

2. In the statement "The use of the sideband signals by a backplane is vendor-specific. One implementation of the sideband signals by a backplane is an SGPIO target interface (see SFF-8485). Other implementations shall be compatible with the signal levels defined in SFF-8485." - SFF-8485 does not currently define a mapping for the external compact version of the cable, and because there are 8 sidebands, the mapping is not obvious.

Additionally, I question the "shall be compatible with the signal levels", because the mapping of the signals to sidebands in SFF-8485 is in an informative section.

3. If removing the tables defining the signal to pin mapping and relying on the cabling diagrams, then the external cable should use the same delivery style, i.e. remove table and add diagram of cabling.

4. Add that the internal compact wide cable plug connector uses the 36 pin version of SFF-8086 and the circuit board layout is common, and not the circuit board.

5. Add that the internal compact wide receptacle connector uses the 36 pin version of SFF-8086 and the the receptacle mating interface layout is common, and not the receptacle mating interface.

DELL comment number 69

Page=150 Subtype=Text Author=Kevin\_Marks

Comment=

5.2.3.4.5 SAS internal compact wide cable plug connector

SFF-8086 define 4 different circuit board layout sizes (26,36,50,68). No where in the SAS external compact cable plug or receptacle sections does it indicate that the 36 ckt version is used. It can only be inferred by looking at table 28, adding up A1-A18 and B1-B18. Need to add that it uses 36 ckt version in 8086.

DELL comment number 70

Page=150 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.2.3.4.5 SAS internal compact wide cable plug connector

1st paragraph, 2nd sentence

change

"SFF-8086 defines the circuit board, which is common to both internal...."

to

"SFF-8086 defines the circuit board layout, which is common to both internal...."

DELL comment number 71

Page=151 Subtype=Text Author=Kevin\_Marks

Comment=

5.2.3.4.6 SAS internal compact wide receptacle connector

SFF-8086 define 4 different receptacle mating interface layout sizes(26,36,50,68). No where in the SAS internal compact wide cable plug or receptacle sections does it indicate that the 36 ckt version is used. It can only be inferred by looking at table 28, adding up A1-A18 and B1-B18. Need to add that it uses 36 ckt version in 8086.

DELL comment number 72

Page=151 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.2.3.4.6 SAS internal compact wide receptacle connector  
1st paragraph, 2nd sentence  
change

"SFF-8086 defines the receptacle mating interface, which is common to...."  
to

"SFF-8086 defines the receptacle mating interface layout, which is common  
to...."

DELL comment number 73

Page=151 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 70 - SAS internal compact wide cable plug connector

Add text indicating A1 is on bottom, or add B1 indicator coming from top.

DELL comment number 74

Page=152 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 71 - SAS internal compact wide receptacle connector

Add text indicating A1 is on bottom, or add B1 indicator coming from top.

DELL comment number 75

Page=156 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 72 - SAS single-port internal cable assembly and destination pin  
assignments

on SAS initiator device or expander device

Change

"GROUND 7

RP+ 6

RP- 5

GROUND 4

TP- 3

TP+ 2

GROUND 1"

to

"GROUND 7

RX+ 6

RX- 5

GROUND 4

TX- 3

TX+ 2

GROUND 1"

DELL comment number 76

Page=157 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 73 - SAS dual-port internal cable assembly and destination pin  
assignments

On both SAS initiator device or expander device

## Change

"GROUND 7  
RP+ 6  
RP- 5  
GROUND 4  
TP- 3  
TP+ 2  
GROUND 1"  
to  
"GROUND 7  
RX+ 6  
RX- 5  
GROUND 4  
TX- 3  
TX+ 2  
GROUND 1"

DELL comment number 77  
Page=158 Subtype=Text Author=Kevin\_Marks  
Comment=  
5.2.4.2 SAS external cables

If T10/05-139r0 is approved, would like to see diagrams of signal pin mapping for the 3 defined external cables a),b) and c), like figure 74.

DELL comment number 78  
Page=158 Subtype=Text Author=Kevin\_Marks  
Comment=  
5.2.4.3.1 SAS internal wide cables overview

If T10/05-139r0 is approved, would like to see a diagram of signal pin mapping for option c) under symmetric cables, similar to figure 74.

DELL comment number 79  
Page=162 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 77 - SAS internal wide cable with SAS internal compact wide cable plug connectors attaching controller to controller

Whether the sidebands are correct or not, the text for the sideband should be in black and not in italic.

DELL comment number 80  
Page=167 Subtype=Text Author=Kevin\_Marks  
Comment=  
Figure 82 - SAS internal wide cable with SAS internal compact wide cable plug connectors with two key slots

this figure should be added to the external keying section. This should be the only keyed version of the cable. One end fits end devices or subtractive and the other end fits end device or table.

DELL comment number 81  
Page=167 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

5.2.4.3.5 SAS internal compact wide cable keying

Remove all of section 5.2.4.3.5 or change all internal "references" to "external", as on further review, this section looks like it is for the external keying.

Phy working group did not ask for keying on internal cables and additionally plugs are the external versions

DELL comment number 82

Page=168 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

device subtractive routing phys. The cable should include the SAS icons described in figure M.7 at each end (see M.2.3). " and Figure 93.

This is a continuation from previous cross-out

DELL comment number 83

Page=184 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.3.3 General electrical characteristics

5th Paragraph, b) list

change

"...levels (see SATA2-PHY) but..."

to

"...levels (see SATAII-PHY) but..."

DELL comment number 84

Page=186 Subtype=Highlight Author=Kevin\_Marks

Comment=

Table 36 - Receiver device general electrical characteristics

In note a

change

"...V3 and SATA2-PHY)."

to

"...V3 and SATAII-PHY)."

DELL comment number 85

Page=192 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.3.7.3 Transmitter device signal output characteristics as measured with each test load

Table 38 - Transmitter device signal output characteristics as measured with each test load at transmitter device compliance points IT and CT

IT column for row:

1. Maximum peak to peak voltage (i.e.,  $2 \times Z2$ ) if a SATA device can be attached

2. Minimum eye opening (i.e.,  $2 \times Z1$ ), if a SATA device can be attached

change

"see SATA2-PHY"  
to  
"see SATAII-PHY"

DELL comment number 86

Page=192 Subtype=Highlight Author=Kevin\_Marks  
Comment=

Table 38 - Transmitter device signal output characteristics as measured  
with each test load at transmitter device compliance points IT and CT  
In note g:

change

"...0) dwords (see SATA2-PHY)."  
to  
"...0) dwords (see SATAII-PHY)."

DELL comment number 87

Page=192 Subtype=Highlight Author=Kevin\_Marks  
Comment=

5.3.7.3 Transmitter device signal output characteristics as measured with  
each test load

Table 38 - Transmitter device signal output characteristics as measured  
with each test load at transmitter device compliance points IT and CT

IT column for row:

"Minimum OOB burst amplitude d, if attaching a SATA device is supported"

Change

"225^f 225^g"

to

"see SATAII-PHY ^e"

DELL comment number 88

Page=193 Subtype=Highlight Author=Kevin\_Marks  
Comment=

5.3.7.5 Transmitter device signal output levels for OOB signals

1st sentence.

change

"...signal levels (see SATA2-PHY) during..."

to

"...signal levels (see SATAII-PHY) during..."

DELL comment number 89

Page=193 Subtype=Highlight Author=Kevin\_Marks  
Comment=

5.3.7.5 Transmitter device signal output levels for OOB signals

1st Paragraph, 5th Sentence

Change

"...COMINIT at SATA 1.0 signal levels..."

to

"...COMINIT at SATA Gen1i or Gen2i signal levels..."

DELL comment number 90

Page=193 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.3.7.5 Transmitter device signal output levels for OOB signals  
3rd Paragraph, 1st Sentence

Change

"...voltage levels and repeat the OOB sequence."

to

"...voltage levels and restart the OOB sequence."

DELL comment number 91

Page=194 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.3.8.2 Delivered signal characteristics

In Table 40 - Delivered signal characteristics as measured with the zero length test load at receiver device compliance points IR and CR (part 1 of 2)

IR column, row - Maximum peak to peak voltage (i.e., 2 x Z2) if a SATA device is attached

change

"see SATA2-PHY"

to

"see SATAII-PHY"

DELL comment number 92

Page=194 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.3.8.2 Delivered signal characteristics

In Table 40 - Delivered signal characteristics as measured with the zero length test load at receiver device compliance points IR and CR (part 1 of 2)

Remove

"or Gen1x levels"

from

Row "Minimum eye opening (i.e., 2 x Z1), if a SATA device using Gen1i or Gen1x levels is attached and the interconnect is characterized with the TCTF test load (see 5.3.2.3)"

The SATAII, Electrical Specification does not define a usage model or allow for having the Gen1x or Gen2x phy electrical specification on a SATA device.

DELL comment number 93

Page=194 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

5.3.8.2 Delivered signal characteristics

In Table 40 - Delivered signal characteristics as measured with the zero length test load at receiver device compliance points IR and CR (part 1 of 2)

Remove row

"Minimum eye opening (i.e., 2 x Z1), if a SATA device using Gen2x levels is attached and the interconnect is characterized with the TCTF test load (see 5.3.2.3)"

The SATAII, Electrical Specification does not define a usage model or allow for having the Gen1x or Gen2x phy electrical specification on a SATA device.

DELL comment number 94

Page=195 Subtype=Highlight Author=Kevin\_Marks

Comment=

Table 40 - Delivered signal characteristics as measured with the zero length test load at receiver device compliance points IR and CR (part 2 of 2)

In note g

change

"...ALIGN (0) dwords (see SATA2-PHY)."

to

"...ALIGN (0) dwords (see SATAII-PHY)."

DELL comment number 95

Page=197 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.3.9 Spread spectrum clocking

2nd Paragraph, 1st Sentence

change

"clocking (see ATA/ATAPI-7 V3 and SATA2-PHY)."

to

"clocking (see ATA/ATAPI-7 V3 and SATAII-PHY)."

DELL comment number 96

Page=198 Subtype=Highlight Author=Kevin\_Marks

Comment=

5.4 READY LED signal electrical characteristics

Note 15

change

"....staggered spin-up disable (see SATA2-EXT). The output..."

to

"....staggered spin-up disable (see SATAII-EXT). The output..."

DELL comment number 97

Page=207 Subtype=Highlight Author=Kevin\_Marks

Comment=

Table 47 ,, Control characters

Make blue text black in table.

DELL comment number 98

Page=208 Subtype=Highlight Author=Kevin\_Marks

Comment=  
Table 49 ,, Delayed code violation example

Make blue text black in table and not underlined.

DELL comment number 99  
Page=215 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
6.6.4 Transmitting the SATA port selection signal  
1st paragraph, 1st sentence  
Change  
"...the active phy (see SATA2-PS)."  
to  
"...the active phy (see SATAII-PS)."

DELL comment number 100  
Page=216 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
6.7.2.1 SATA OOB sequence  
1st paragraph, 2nd sentence  
Change  
"...and SATA2-PHY for detailed requirements."  
to  
"...and SATAII-PHY for detailed requirements."

DELL comment number 101  
Page=216 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 109 ,, SATA OOB sequence

Seems to be missing SATA device Calibrate and COMWAKE, as this is part of the SATA OOB.

DELL comment number 102  
Page=217 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
6.7.2.2 SATA speed negotiation sequence  
1st Paragraph, 2nd Sentence  
  
change  
"...and SATA2-PHY for detailed requirements."  
to  
"...and SATAII-PHY for detailed requirements."

DELL comment number 103  
Page=217 Subtype=StrikeOut Author=Kevin\_Marks  
Comment=  
6.7.3 SAS to SATA phy reset sequence  
  
5th Paragraph, 2nd Sentence

Remove "initiate" from sentence.

DELL comment number 104  
Page=223 Subtype=Highlight Author=Kevin\_Marks



Comment=

#### 6.7.4.2 SAS speed negotiation sequence

1st Paragraph, 2nd Sentence after Table 114  
Change

"...reported in the PHY RESET PROBLEM field in..."  
to

"...reported in the PHY RESET PROBLEM COUNT field in..."

DELL comment number 105

Page=224 Subtype=Highlight Author=Kevin\_Marks

Comment=

#### 6.7.5 Phy reset sequence after devices are attached

3rd Sentence, B) in a,b,c list

change

"b) SAS initiator phys should originate a new phy reset sequence after every hot-plug timeout; and"

to

"b) SAS initiator phys should originate a new phy reset sequence after every hot-plug timeout, if implemented; and"

hot-plug timeout timer is optional in SAS initiators.

DELL comment number 106

Page=228 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 117 - SP (phy layer) state machine - OOB sequence states

The SP7:00B\_AwaitCOMSAS state in Figure 117 is missing the SATA Spinup Hold confirmation to the link layer, based on text for transition to SP26:SATA\_SpinupHold.

I do not believe the text is correct, the SATA Spinup Hold confirmation to the link layer belongs in the entry to the SP26:SATA\_SpinupHold state as is currently indicated in Figure 121.

DELL comment number 107

Page=231 Subtype=Highlight Author=Kevin\_Marks

Comment=

#### 6.8.3.9.2 Transition SP7:00B\_AwaitCOMSAS to SP2:00B\_NoCOMSASTimeout

1st Sentence

Change

"This transition shall occur if the phy does not support SATA and the COMSAS Detect Timeout timer expires."

to

"This transition shall occur if the phy does not support attachment to a SATA device and the COMSAS Detect Timeout timer expires."

DELL comment number 108

Page=232 Subtype=Highlight Author=Kevin\_Marks

Comment=

#### 6.8.3.9.4 Transition SP7:00B\_AwaitCOMSAS to SP16:SATA\_COMWAKE

1st Sentence, a) in a,b,c list

change

"a) the phy supports attachment to SATA devices;"

to

"a) the phy supports attachment to a SATA device;"

DELL comment number 109

Page=232 Subtype=Highlight Author=Kevin\_Marks

Comment=

6.8.3.9.5 Transition SP7:00B\_AwaitCOMSAS to SP26:SATA\_SpinupHold

1st Paragraph, 1st Sentence

Change

"This state shall send a SATA Spinup Hold confirmation to the link layer and perform this transition if."

to

"This transition shall occur if:"

The SATA Spinup Hold confirmation to the link layer belongs in the entry in to SP26:SATA\_SpinupHold.

If this is not accepted, need a colon after if.

DELL comment number 110

Page=234 Subtype=Highlight Author=Kevin\_Marks

Comment=

6.8.4.2.3 Transition SP8:SAS\_Start to SP9:SAS\_RateNotSupported

1st Sentence

change

"This transition shall occur after the RCDT timer expires if the current speed negotiation window rate is not supported."

to

"This transition shall occur after the RCDT timer expires and the current speed negotiation window rate is not supported."

DELL comment number 111

Page=234 Subtype=Highlight Author=Kevin\_Marks

Comment=

6.8.4.2.4 Transition SP8:SAS\_Start to SP10:SAS\_AwaitALIGN

1st Sentence

change

"This transition shall occur after the RCDT timer expires if the current speed negotiation window rate is supported."

to

"This transition shall occur after the RCDT timer expires and the current speed negotiation window rate is supported."

DELL comment number 112

Page=243 Subtype=Highlight Author=Kevin\_Marks

Comment=

6.8.7.1 State description

1st Paragraph, 2st Sentence

change if not removed by previous comment.

"...upon detection of a COMSAS detect timeout if the phy supports SATA, the phy supports SATA spinup hold, and..."

to

"...upon detection of a COMSAS detect timeout and the phy supports attachment to a SATA device, the phy supports SATA spinup hold, and..."

DELL comment number 113

Page=243 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 121 - SP (phy layer) state machine - SATA spinup hold state

Based on text in the OOB state machine, the SATA Spinup Hold confirmation to the link layer belongs in SP7:OOB\_AwaitCOMSAS.

I believe this is incorrect and is correct as shown.

DELL comment number 114

Page=243 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

6.8.7.1 State description

1st Paragraph, 2nd Sentence

Remove

"This state shall be entered from the SP7:OOB\_AwaitCOMSAS state upon detection of a COMSAS detect timeout if the phy supports SATA, the phy supports SATA spinup hold, and the MgmtReset state machine variable is set to zero."

This sentence proposed for removal is redundant, and described in the SP7:OOB\_AwaitCOMSAS to SP26:SATA\_SpinupHold state transition.

Add

"This state shall send a SATA Spinup Hold confirmation to the link layer."

DELL comment number 115

Page=243 Subtype=Highlight Author=Kevin\_Marks

Comment=

6.8.7.2 Transition SP26:SATA\_SpinupHold to SP0:OOB\_COMINIT

1st Paragraph, 2nd Sentence

change

"...a Management Reset Request from the..."

to

"...a Management Reset request from the..."

DELL comment number 116

Page=249 Subtype=Highlight Author=Kevin\_Marks

Comment=

6.10 Spin-up

2nd Paragraph, 1st sentence

change

"...SATA spin-up rules (see ATA/ATAPI-7 V3 and SATA2-EXT)."

to

"...SATA spin-up rules (see ATA/ATAPI-7 V3 and SATAII-EXT)."

DELL comment number 117

Page=249 Subtype=Highlight Author=Kevin\_Marks

Comment=

6.10 Spin-up

Note 19

Change

"NOTE 19 - Enclosures supporting both SATA devices and SAS target devices may need to sequence power to each attached device to avoid excessive power consumption during power on, since the SATA devices may spin-up automatically after power on."

to

"NOTE 19 - Enclosures supporting both SATA devices and SAS target devices may need to sequence power to each attached device to avoid excessive power consumption during power on, since the SATA devices may spin-up automatically after power on if staggered spin-up is not implemented (see SATAII-EXT)."

DELL comment number 118

Page=249 Subtype=Highlight Author=Kevin\_Marks

Comment=

6.10 Spin-up

2nd Paragraph, 1st Sentence

"If a SAS target device supporting SATA does not receive COMSAS during the reset sequence, it shall follow SATA spin-up rules (see ATA/ATAPI-7 V3 and SATA2-EXT)."

Sentence seems confusing. What is a SAS target device supporting SATA? Is this a device supporting STP target protocol. Clarify or remove sentence.

DELL comment number 119

Page=265 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.2.5.4 BROADCAST

4th Paragraph, 1st Sentence after Table 71.

change

"....logical units with peripheral device types of SCSI enclosure services (SES) in the SAS domain."

to

"....logical units with peripheral device type of enclosure services device (SES) in the SAS domain."

The peripheral device type for SES is enclosure services device.

DELL comment number 120

Page=267 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.2.5.9 NOTIFY

Note 22 after 2nd Paragraph after Table 73

change

"...configured by a NVRAM programming..."  
to  
"...configured by a NVRAM programming..."

DELL comment number 121

Page=289 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.9.1 Identification and hard reset sequence overview  
8th Paragraph, 1st Sentence

change

"If a phy receives a HARD\_RESET, it shall be considered a reset event and cause a hard reset (see 4.4.2) of the port containing that phy."

to

"If a phy receives a HARD\_RESET following a phy reset sequence, it shall be considered a reset event and cause a hard reset (see 4.4.2) of the port containing that phy."

DELL comment number 122

Page=291 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.9.5.1 SL\_IR state machines overview

In Figure 136 - SL\_IR (link layer identification and hard reset) state machines

change bottom state machine title "IDENTIFY and HARD\_RESET Control"

to "Identification and hard reset control" to make it match text.

DELL comment number 123

Page=291 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.9.5.1 SL\_IR state machines overview

In Figure 136 - SL\_IR (link layer identification and hard reset) state machines

change bottom state machine state SL\_IR\_IRC1:Idle message Enable Disable SAS Link (Disable) send to "SL" to "SL or XL" to make it match text.

DELL comment number 124

Page=295 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.10 Power management

The 1st Paragraph, 1st Sentence "SATA interface power management is not supported in SAS." seems to contradict section 6.8.5.1 SATA host emulation states overview, which states that SATA PM may be used on SAS initiators directly connect to SATA devices.

From 6.8.5.1

"The power management states defined in this standard are for SAS initiator devices that support being attached to SATA devices; expander devices attached to SATA devices do not support power management in this standard."

Add paragraph from 6.8.5.1 to 7.10.

DELL comment number 125  
 Page=296 Subtype=Highlight Author=Kevin\_Marks  
 Comment=  
 7.11 SAS domain changes

NOTE 30 - This occurs when the expander phy is reset or disabled with the SMP PHY CONTROL function DISABLE, LINK RESET, HARD RESET, or TRANSMIT SATA PORT SELECTION SIGNAL phy operations (see 10.4.3.10) as well as when dword synchronization is unexpectedly lost;

Remove references to disable as transitions to SPO:OOB\_COMINIT should not happen if the phy is disabled. BROADCAST (CHANGE) caused by disabling the phy in handled by b) in list with the next comment..

DELL comment number 126  
 Page=296 Subtype=Highlight Author=Kevin\_Marks  
 Comment=  
 7.11 SAS domain changes  
 3rd Paragraph b) in a,b,c list

Change

"b) after a virtual phy has been disabled with the SMP PHY CONTROL function DISABLE phy operation or internally begun reset with the LINK RESET or HARD RESET phy operations (see 10.4.3.10);"

to

"b) after a phy or virtual phy has been disabled with the SMP PHY CONTROL function DISABLE phy operation or virtual phy has internally begun reset with the LINK RESET or HARD RESET phy operations (see 10.4.3.10);"

DELL comment number 127  
 Page=296 Subtype=Highlight Author=Kevin\_Marks  
 Comment=  
 7.11 SAS domain changes  
 1st Paragraph, 1st Sentence

Change

"After power on or receiving BROADCAST (CHANGE), an application client in each SAS..."

to

"After power on or receiving BROADCAST (CHANGE), the management application client in each SAS..."

DELL comment number 128  
 Page=299 Subtype=StrikeOut Author=Kevin\_Marks  
 Comment=  
 7.12.3 Arbitration fairness  
 Remove "NOTE 1" from NOTE 31.

DELL comment number 129  
 Page=310 Subtype=Highlight Author=Kevin\_Marks  
 Comment=  
 Figure 141 - SL (link layer for SAS phys) state machines (part 1)

change state machine title from "Connection Control (part 1)" to "connection control (part 1)" to match text.

DELL comment number 130

Page=311 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 142 - SL (link layer for SAS phys) state machines (part 2)

change state machine name from "Connection Control " to "connection control (part 2)" to match text and figure 141..

DELL comment number 131

Page=311 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 142 - SL (link layer for SAS phys) state machines (part 2)

change state machine name from "Receive OPEN Address Frame" to "receive OPEN address frame" to match text.

DELL comment number 132

Page=311 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 142 - SL (link layer for SAS phys) state machines (part 2)

In Receive OPEN Address Frame state machine, change

"SL\_RA1:RxOpen"

to

"SL\_RA" as it is the only state as proposed in note on Figure 9.

DELL comment number 133

Page=335 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.16.5 Interlocked frames

I question why the Interlock Frames section is in the link layer material, when the SSP link layer state machines do not seem to directly deal with "interlocked-ness" other than ACK/NAK balance issues. The Transport Layer would seem more appropriate for the material, since this is where it seems to enforce it along with the PL\_OC.

DELL comment number 134

Page=340 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 151 - SSP (link layer for SSP phys) state machines (part 1 - frame transmission)

In figure 151, change state machine names to low case to match text.

DELL comment number 135

Page=340 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 151 - SSP (link layer for SSP phys) state machines (part 1 - frame transmission)

In Transmit Interlocked Frame Monitor

Change "SSP\_TIM:Tx\_Interlock\_Monitor" state name to "SSP\_TIM" as it is a single state state machine as proposed in a note on Figure 9.

DELL comment number 136

Page=340 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 151 - SSP (link layer for SSP phys) state machines (part 1 - frame transmission)

In Transmit Frame Credit Monitor

Change "SSP\_TCM:Tx\_Credit\_Monitor" state name to "SSP\_TCM" as it is a single state state machine as proposed in a note on Figure 9.

DELL comment number 137

Page=340 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 151 - SSP (link layer for SSP phys) state machines (part 1 - frame transmission)

In DONE Control

Change "SSP\_D:DONE\_Wait" state name to "SSP\_D" as it is a single state state machine as proposed in a note on Figure 9.

DELL comment number 138

Page=341 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 152 - SSP (link layer for SSP phys) state machines (part 2 - frame reception)

In Transmit ACK/NAK Control state machine

Change "SSP\_TAN:Tx\_ACK/NAK Control" state name to "SSP\_TAN" as it is a single state state machine as proposed in note on Figure 9.

DELL comment number 139

Page=341 Subtype=Text Author=Kevin\_Marks

Comment=

Figure 152 - SSP (link layer for SSP phys) state machines (part 2 - frame reception)

In figure 152, change state machine names to low case to match text.

DELL comment number 140

Page=341 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 152 - SSP (link layer for SSP phys) state machines (part 2 - frame reception)

In Receive Frame Control

Change "SSP\_RF:Rcv\_Frame" state name to "SSP\_RF" as it is a single state state machine as proposed in note on Figure 9.



DELL comment number 141

Page=341 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 152 - SSP (link layer for SSP phys) state machines (part 2 - frame reception)

In Receive Frame Credit Monitor

Change "SSP\_RCM:Rcv\_Credit\_Monitor" state name to "SSP\_RCM" as it is a single state state machine as proposed in note on Figure 9.

DELL comment number 142

Page=341 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 152 - SSP (link layer for SSP phys) state machines (part 2 - frame reception)

In Transmit Credit Control

Change "SSP\_TC:Tx\_Credit\_Control" state name to "SSP\_TC" as it is a single state state machine as proposed in a note on Figure 9.

DELL comment number 143

Page=341 Subtype=Highlight Author=Kevin\_Marks

Comment=

Figure 152 - SSP (link layer for SSP phys) state machines (part 2 - frame reception)

In Receive Interlocked Frame Monitor

Change "SSP\_RIM:Rcv\_Interlock\_Monitor" state name to "SSP\_RIM" as it is a single state state machine as proposed in a note on Figure 9.

DELL comment number 144

Page=344 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.16.7.6.1 SSP\_TF state machine overview

Add

"This state machine shall start in the SSP\_TF1:Connected\_Idle state." after the a,b,c list.

DELL comment number 145

Page=347 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.16.7.7 SSP\_RF (receive frame control) state machine

5th paragraph b) list.

change

"SSP\_TAN1:Idle state"

to

"SSP\_TAN"

to match state machine name in state diagram, and since it is a single state state machine.

DELL comment number 146

Page=347 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.16.7.7 SSP\_RF (receive frame control) state machine

6th paragraph c) list.

change

"SSP\_TAN1:Idle state"

to

"SSP\_TAN"

to match state machine name in state diagram, and since it is a single state state machine.

DELL comment number 147

Page=347 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.16.7.7 SSP\_RF (receive frame control) state machine

7th paragraph, 1st sentence

change

"SSP\_TAN1:Idle state"

to

"SSP\_TAN"

to match state machine name in state diagram, and since it is a single state state machine.

DELL comment number 148

Page=347 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.16.7.7 SSP\_RF (receive frame control) state machine

7th paragraph c) list.

change

"SSP\_TAN1:Idle state"

to

"SSP\_TAN"

to match state machine name in state diagram, and since it is a single state state machine.

DELL comment number 149

Page=358 Subtype=Highlight Author=Kevin\_Marks

Comment=

In Figure 158.

Change

"SMP\_IP (link layer for SMP initiator ports) state machine"

to

"SMP\_IP (link layer for SMP initiator phys) state machine"

DELL comment number 150

Page=359 Subtype=Highlight Author=Kevin\_Marks

Comment=

7.18.4.4 SMP\_TP (link layer for SMP target ports) state machine

Change section heading to

"7.18.4.4 SMP\_TP (link layer for SMP target phys) state machine"

DELL comment number 151

Page=360 Subtype=Highlight Author=Kevin\_Marks

Comment=

In Figure 159

Change

"SMP\_TP (link layer for SMP target ports) state machine"

to

"SMP\_TP (link layer for SMP target phys) state machine"

DELL comment number 152

Page=360 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

7.18.4.4.2.1 State description

3rd Paragraph, 1st Sentence

remove

"If this state receives an Invalid Dword Received message or an ERROR Received message after receiving an SOF Received message and before receiving an EOF Received message, then this state shall discard the Data Dword Received messages received before the subsequent SOF Received message."

Sentence is incorrect, and case of INVALID DWORD or ERROR received is covered in the 5th paragraph.

DELL comment number 153

Page=373 Subtype=Highlight Author=Kevin\_Marks

Comment=

8.2.2.3.8 Transition PL\_OC2:Overall\_Control to PL\_OC1:Idle

1st Paragraph, 1st Sentence -a) in a,b list

Change

"a) sending a HARD\_RESET Received confirmation to the link layer; or"

to

"a) sending a HARD\_RESET Received confirmation to the transport layer; or"

DELL comment number 154

Page=373 Subtype=Text Author=Kevin\_Marks

Comment=

8.2.3.1 PL\_PM state machine overview

Add Arbitration Wait Time Timer to Table 106 - PL\_PM state machine timers, as this timer is created, initialized and set to the value received as an argument in Tx Open message in the PL\_PM state machine.

DELL comment number 155

Page=386 Subtype=Highlight Author=Kevin\_Marks

Comment=

9.2.2.1 COMMAND information unit

2nd Paragraph,1st Sentence after Table 110 - Command information unit

change

"...that the SSP target port shall transfer first burst data..."

to

"...that the SSP initiator port shall transfer first burst data..."

DELL comment number 156

Page=386 Subtype=Highlight Author=Kevin\_Marks

Comment=

9.2.2.1 COMMAND information unit

2nd Paragraph,2st Sentence after Table 110 - Command information unit

Change

"...specifies that the SSP target port shall not transfer first burst data..."

to

"...specifies that the SSP initiator port shall not transfer first burst data..."

DELL comment number 157

Page=388 Subtype=Text Author=Kevin\_Marks

Comment=

9.2.2.2 TASK information unit

In Table 113 - TASK MANAGEMENT FUNCTION field

Remove the "Uses LOGICAL UNIT NUMBER field" column in table.

It provides no value, as they are all yes.

DELL comment number 158

Page=389 Subtype=Highlight Author=Kevin\_Marks

Comment=

9.2.2.3 XFER\_RDY information unit

2nd Paragraph, 1st Sentence after Table 114 - XFER\_RDY information unit

change

"If the ENABLE FIRST BURST field in the COMMAND frame (see 9.2.2.1) was set to one, then in the initial XFER\_RDY frame for the command, the SSP target port shall set the REQUESTED OFFSET field to the value indicated by the FIRST BURST SIZE field in the Disconnect-Reconnect mode page (see 10.2.7.1.5)."

to

"f the ENABLE FIRST BURST field in the COMMAND frame (see 9.2.2.1) was set to one, then in the initial XFER\_RDY frame for the command, the SSP target port shall set the REQUESTED OFFSET field to the value indicated by the FIRST BURST SIZE field (i.e., the amount of write data in 512-byte increments times the value in the FIRST BURST SIZE field) in the Disconnect-Reconnect mode page (see 10.2.7.1.5)."

DELL comment number 159

Page=392 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.2.5.3 RESPONSE information unit RESPONSE\_DATA format  
2nd Paragraph, 1st Sentence

Change

"Table 118 defines the RESPONSE DATA field, which contains information describing protocol failures detected during processing of a request received by the SSP target port."

to

"Table 118 defines the RESPONSE DATA field, which contains information describing protocol failures detected during processing of a request received by the SSP target port or the completion status of a task management function."

"

DELL comment number 160

Page=396 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.4.1 SSP transport layer handling of link layer errors overview  
2nd Paragraph, 1st Paragraph

Change

"...in the Protocol Specific Logical Unit..."

to

"...in the Protocol-Specific Logical Unit..."

DELL comment number 161

Page=396 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.4.2 COMMAND frame - handling of link layer errors  
6th Paragraph, 1st Sentence

"An SSP initiator port should retransmit each COMMAND frame that does not receive an ACK at least one time." - seems to contradict the statements above in section 9.2.4.2, in that if the SSP initiator port receives a XFER\_RDY, showing that the command was received, why would it re-send the command and cause an overlapped condition? A better statement may be

"If the SSP initiator port does not receive an ACK, XFER\_RDY frame or RESPONSE frame for a COMMAND frame sent, it should retry the COMMAND frame at least once."

DELL comment number 162

Page=399 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.4.5.3 DATA frame without transport layer retries

Last sentence

Change

"If an SSP initiator port transmits a write DATA frame and receives a NAK for that frame, the device server aborts the command (see 10.2.2)."

to

"If an SSP initiator port transmits a write DATA frame and receives a NAK for that frame, the application client aborts the command (see 10.2.2)."

"Device server" contradicts 10.2.2, which says that SSP initiator port will abort the command with an ABORT TASK when a NAK is received. Unless the reference to 10.2.2 should be 10.2.3 (device server error handling), but this does not seem to make sense, because the write data could be for another command's XFER\_RDY, so the device server does not know which command to abort and is discarded in the link layer. The application client should abort the task with ABORT TASK.

DELL comment number 163  
Page=399 Subtype=Highlight Author=Kevin\_Marks  
Comment=

#### 9.2.4.5.3 DATA frame without transport layer retries

2nd to last paragraph

Change

"2) the device server aborts the command (see 10.2.2)."

to

"2) the application client aborts the command (see 10.2.2)."

Since it is Write Data, the ACK could have been lost forcing ACK/NAK Timeout. The application client should abort the command on the next connection, not the device, as it has no knowledge of the lost ACK.

DELL comment number 164  
Page=399 Subtype=Highlight Author=Kevin\_Marks  
Comment=

#### 9.2.4.6 RESPONSE frame - handling of link layer errors

4th Paragraph, 2nd Sentence

Change

"If the ST\_TFR state machine and the ST\_TTS state machine not previously received the RESPONSE frame, they considers the RESPONSE frame to be the valid RESPONSE frame."

to

"If the ST\_TFR state machine and the ST\_TTS state machine have not previously received the RESPONSE frame, they shall consider the RESPONSE frame to be the valid RESPONSE frame."

DELL comment number 165  
Page=400 Subtype=Highlight Author=Kevin\_Marks  
Comment=

#### 9.2.5.3 SSP target port error handling summary

4th Paragraph, end of sentence.

Change

"(see 10.2.1.3)."

to

"(see 10.2.1.4)"

Seems more appropriate that this would reference Send Command Complete than SCSI Command Received, as Send Command Complete has the service response argument for reporting status.

DELL comment number 166

Page=400 Subtype=Highlight Author=Kevin\_Marks  
Comment=

9.2.5.3 SSP target port error handling summary  
5th Paragraph

Change

"If an SSP target port receives:

a) a COMMAND frame with a tag that is already in use for a task management function; or  
b) a TASK frame with a tag that is already in used for a command or another task management function,  
the ST\_TFR state machine may process this as an I\_T nexus loss event (see 9.2.6.3.2)."

to

"If an SSP target port receives:

a) a COMMAND frame with a tag that is already in use for a task management function; or  
b) a TASK frame with a tag that is already in used for a command or another task management function,  
the device server may return a RESPONSE frame with the DATAPRES field set to RESPONSE\_DATA and the RESPONSE CODE field set to OVERLAPPED TAG ATTEMPTED (see ?????)."

Depending on if the target port receives a) or b), the (see ?????) could be

- a) (see 10.2.1.4)
- b) (see 10.2.1.14)

based on incorporation of 05-107r1.

DELL comment number 167

Page=403 Subtype=Highlight Author=Kevin\_Marks  
Comment=

Figure 168 - ST\_I (transport layer for SSP initiator ports) state machines

In ST\_IFR (initiator frame router)

Change "ST\_IFR:Initiator\_Frame\_Router" state name to "ST\_IFR" as it is a single state state machine as proposed in a note on Figure 9.

DELL comment number 168

Page=405 Subtype=StrikeOut Author=Kevin\_Marks  
Comment=

9.2.6.2.2 ST\_IFR (initiator frame router) state machine  
14th Paragraph, 1st Sentence

Remove

"based on the content of the DATAPRES and RESPONSE DATA fields"

Depending on whether the RESPONSE frame was for a command or task management function the RESPONSE DATA field may not exits (i.e. zero bytes).

DELL comment number 169  
Page=405 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.6.2.2 ST\_IFR (initiator frame router) state machine  
14th Paragraph, 1st Sentence  
"items"  
s/b  
"fields"

DELL comment number 170  
Page=405 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.6.2.2 ST\_IFR (initiator frame router) state machine  
15th Paragraph, 1st Sentence  
"items"  
s/b  
"fields"

DELL comment number 171  
Page=405 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.6.2.2 ST\_IFR (initiator frame router) state machine  
17th Paragraph, 1st Sentence  
"items"  
s/b  
"fields"

DELL comment number 172  
Page=407 Subtype=Text Author=Kevin\_Marks  
Comment=  
9.2.6.2.3.3.1 State description

Used thru out ST\_ITS and ST\_TTS state machines:

"...send a Transmit Frame (Interlocked) request to the port layer."

Transmit Frame(Interlocked) request does not seem to be a request that is received or mentioned in the in the port layer. This would also applies to Transmit Frame (Non-interlocked) request used through out this clause. Understandably this would turn into TX Frame (Balanced Required) or Tx Frame (Balanced Not Required) request to the link layer.

DELL comment number 173  
Page=409 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.6.2.3.3.1 State description

In Table 121 - Messages sent to the ST\_IFR state machine based on port layer confirmations  
1st Row, 1st Column

Change  
"Transmission Status (ACK Received)"  
to  
"Transmission Status (ACK Received)"



DELL comment number 174  
Page=412 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.6.2.3.5.2 Transition ST\_ITS4:Prepare\_Task to  
ST\_ITS2:Initiator\_Send\_Frame

Section header needs to be in Bold.

DELL comment number 175  
Page=415 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
Figure 169 - ST\_T (transport layer for SSP target ports) state machines

In ST\_TFR (target frame router)

Change "ST\_TFR:Target\_Frame\_Router" state name to "ST\_TFR" as it is a  
single state state machine as proposed in a note on Figure 9.

DELL comment number 176  
Page=417 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.6.3.2 ST\_TFR (target frame router) state machine  
14th Paragraph, 1st Sentence  
"items"  
s/b  
"fields"

DELL comment number 177  
Page=417 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.6.3.2 ST\_TFR (target frame router) state machine  
15th Paragraph, 1st Sentence  
"items"  
s/b  
"fields"

DELL comment number 178  
Page=417 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.6.3.2 ST\_TFR (target frame router) state machine  
20th Paragraph, 1st Sentence  
"items"  
s/b  
"fields"

DELL comment number 179  
Page=417 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.2.6.3.2 ST\_TFR (target frame router) state machine  
16th Paragraph, 1st Sentence  
"items"  
s/b  
"fields"

DELL comment number 180  
Page=429 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.4.1 SMP transport layer overview

In Table 128 - SMP FRAME TYPE field

Change  
"9.4.2"  
to  
"10.4.3.1"

as 9.4.2 is proposed for removal below.

DELL comment number 181  
Page=429 Subtype=Highlight Author=Kevin\_Marks  
Comment=  
9.4.1 SMP transport layer overview

In Table 128 - SMP FRAME TYPE field

Change  
"9.4.3"  
to  
"10.4.3.2"

as 9.4.3 is proposed for removal below.

DELL comment number 182  
Page=430 Subtype=StrikeOut Author=Kevin\_Marks  
Comment=  
Remove Section 9.4.2 - SMP\_REQUEST FRAME as it is redundant with 10.4.3.1

The removal of this section may cause a global change to SMP\_REQUEST to SMP REQUEST.

DELL comment number 183  
Page=430 Subtype=StrikeOut Author=Kevin\_Marks  
Comment=  
9.4.2 SMP\_REQUEST frame

Remove Table 129, as it is redundant to Table 167.

DELL comment number 184  
Page=430 Subtype=StrikeOut Author=Kevin\_Marks  
Comment=  
Remove Section 9.4.3 - SMP\_RESPONSE frame as it is redundant with 10.4.3.2 and seems to have a slightly different format than 10.4.3.2.

The removal of this section may cause a global change to SMP\_RESPONSE to SMP RESPONSE.

DELL comment number 185  
Page=432 Subtype=Highlight Author=Kevin\_Marks  
Comment=

## 9.4.5.2.2.1 State description

Add text

"This state is the initial state of the MT\_IP state machine."

DELL comment number 186

Page=432 Subtype=Highlight Author=Kevin\_Marks

Comment=

## 9.4.5.2.2.1 State description

1st Paragraph

change

"This state waits for a Send SMP Function Request request, which includes the following arguments:

- a) connection rate;
- b) destination SAS address; and
- c) request bytes."

to

"This state waits for a Send SMP Function Request request, which includes the following arguments:

- a) connection rate;
- b) destination SAS address;
- c) function; and
- d) additional request bytes."

per proposed removal of SMP\_REQUEST table 129.

DELL comment number 187

Page=432 Subtype=Highlight Author=Kevin\_Marks

Comment=

## 9.4.5.2.2.2 Transition MT\_IP1:Idle to MT\_IP2:Send

1st Paragraph

change

"This transition shall occur after a Send SMP Function Request request is received. This transition shall include the following arguments:

- a) connection rate;
- b) destination SAS address; and
- c) request bytes."

to

"This transition shall occur after a Send SMP Function Request request is received. This transition shall include the following arguments:

- a) connection rate;
- b) destination SAS address;
- c) function; and
- d) additional request bytes."

per proposed removal of SMP\_REQUEST table 129.

DELL comment number 188

Page=433 Subtype=Highlight Author=Kevin\_Marks

Comment=

## 9.4.5.2.3.1 State description

1st Paragraph

## Change

"This state constructs an SMP\_REQUEST frame using the following arguments received with the transition into this state:

a) request bytes;"

to

"This state constructs an SMP\_REQUEST frame using the following arguments received with the transition into this state:

a) function; and

b) additional request bytes;"

per proposed removal of SMP\_REQUEST table 129.

DELL comment number 189

Page=434 Subtype=Highlight Author=Kevin\_Marks

Comment=

9.4.5.3.2.1 State description

## Add text

"This state is the initial state of the MT\_TP state machine."

DELL comment number 190

Page=435 Subtype=Highlight Author=Kevin\_Marks

Comment=

9.4.5.3.3.1 State description

1st Paragraph

## Change

"This state waits for a Send SMP Response request, which includes the following arguments:

a) response bytes."

to

"This state waits for a Send SMP Response request, which includes the following arguments:

a) function;

b) function result; and

c) response bytes."

per proposed removal of SMP\_RESPONSE table 130.

DELL comment number 191

Page=437 Subtype=Highlight Author=Kevin\_Marks

Comment=

Table 132 - SCSI architecture mapping

Remove table note b and references..

"b SCSI initiator port Data Transfer transport protocol services are not specified by SAM-3."

SAM-3 does contain the Terminate Data Transfer protocol service and Data-In and Data-Out Delivery Service.

DELL comment number 192

Page=438 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.1.3 SCSI Command Received transport protocol service

"SCSI Command Received (IN (I\_T\_L\_Q Nexus, CDB, Task Attribute, [Task Priority], [Command Reference Number]))"

SCSI Command Received is missing First Burst Enabled argument.

DELL comment number 193

Page=442 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.1.7 Data-In Delivered transport protocol service

"Data-In Delivered (IN (I\_T\_L\_Q Nexus))"

Add Delivery Results argument as defined in Table 138.

DELL comment number 194

Page=443 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.1.9 Data-Out Received transport protocol service

Data-Out Received (IN (I\_T\_L\_Q Nexus))

Add Delivery Results argument as defined in Table 140..

DELL comment number 195

Page=443 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.1.10 Terminate Data Transfer transport protocol service

In Table 141 - Receive Data-Out transport protocol service arguments  
SAS SSP implementation of the Nexus

Change

"I\_T nexus, I\_T\_L nexus, or I\_T\_L\_Q nexus, specifying the scope of the data transfer(s) to terminate."

to

"I\_T\_L nexus, or I\_T\_L\_Q nexus, specifying the scope of the data transfer(s) to terminate."

The statement above the table says "The device server uses the Terminate Data Transfer ...."

The device server of one LU should not be able to affect/terminate data transfers to other LU.

DELL comment number 196

Page=444 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.1.11 Data Transfer Terminated transport protocol service

In Table 142 - Data-Out Received transport protocol service arguments  
SAS SSP implementation of the Nexus argument.

## Change

"I\_T nexus, I\_T\_L nexus, or I\_T\_L\_Q nexus indicated by the preceding Terminate Data Transfer () call."

to

"I\_T\_L nexus, or I\_T\_L\_Q nexus indicated by the preceding Terminate Data Transfer () call."

per previous comment, because I\_T nexus should not be allowed as a argument, I\_T Nexus should not be allowed as a returned indication.

DELL comment number 197

Page=447 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.2 Application client error handling

1st sentence

"delivers"

s/b

"returns"

DELL comment number 198

Page=448 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

10.2.3 Device server error handling

1st Paragraph, 1st Sentence

Remove

"management functions"

from

"...device server(s) shall abort all task management functions received on that I\_T nexus..."

DELL comment number 199

Page=448 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.3 Device server error handling

2nd Paragraph, 1st Sentence

Should Receive Data-Out () be Data-Out Received ()?

DELL comment number 200

Page=448 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.4 Task router and task manager error handling

1st Paragraph c) in second a,b,c list

Change

"c) call Task Management Function Executed () with the Service Response set to FUNCTION REJECTED - Overlapped Tag Attempted (i.e., requesting that the target port set the DATAPRES field to RESPONSE\_DATA and the RESPONSE CODE field to OVERLAPPED TAG ATTEMPTED)."

to

"

c) call Send Command Complete () with a with the Service Response set to SERVICE DELIVERY OR TARGET FAILURE (i.e., requesting that the target port set the DATAPRES field to RESPONSE\_DATA and the RESPONSE CODE field to OVERLAPPED TAG ATTEMPTED) if the SCSI command received caused the overlapped tag condition; or

call Task Management Function Executed () with the Service Response set to FUNCTION REJECTED - Overlapped Tag Attempted (i.e., requesting that the target port set the DATAPRES field to RESPONSE\_DATA and the RESPONSE CODE field to OVERLAPPED TAG ATTEMPTED) if the SCSI task management function received caused the overlapped tag condition"

Seems that if it was a command that was received last, that cause the overlapped tag condition, that the response would be for that command, and not the task management function that was already in the task set.

DELL comment number 201

Page=448 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.4 Task router and task manager error handling  
1st Paragraph, b) in first a,b list

Remove extra "calls" in sentence.

"b) an SSP target port calls calls Task Management Request Received () with a tag already in use by a SCSI command or SCSI task management function in any logical unit,"

DELL comment number 202

Page=450 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.7.1.1 Disconnect-Reconnect mode page overview  
3rd Paragraph, 1st Sentence

"ILLEGAL FIELD IN PARAMETER LIST."

Should this be "INVALID FIELD IN PARAMETER LIST", else it does not have a assigned ASC/ASCQ in SPC-3.

It is also incorrect in SPC-3 for Disconnect-Reconnect mode page.

DELL comment number 203

Page=453 Subtype=Text Author=Kevin\_Marks

Comment=

10.2.7.2.1 Protocol-Specific Port mode page overview

On I\_T NEXUS LOSS TIME

Add note or text that the SSP initiator port should also use the I\_T NEXUS LOSS TIME value in the Protocol-specific port mode page for reporting I\_T nexus loss for that SSP target port.

DELL comment number 204

Page=455 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.7.2.3 Protocol-Specific Port mode page - Phy Control And Discover

subpage

In Table 154 - SAS phy mode descriptor

Change Byte 2 to "Reserved" from "Restricted (for SMP PHY CONTROL function's PHY OPERATION field)"

DELL comment number 205

Page=460 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.9.1 Protocol-Specific diagnostic page

2nd Paragraph, 1st Sentence

"ILLEGAL FIELD IN PARAMETER LIST."

Should this be "INVALID FIELD IN PARAMETER LIST", else it does not have a assigned ASC/ASCQ in SPC-3.

DELL comment number 206

Page=467 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.11 SCSI vital product data (VPD)

In Table 165 - Device Identification VPD page required identification descriptors

Association row

Change

"ASSOCIATION 1h (i.e., SCSI target port) 1h (i.e., SCSI target port)"

to

"ASSOCIATION 01b (i.e., SCSI target port) 01b (i.e., SCSI target port)"

DELL comment number 207

Page=467 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.11 SCSI vital product data (VPD)

In Table 165 - Device Identification VPD page required identification descriptors

Code Set row

Change

"1b (i.e., binary)"

to

"1h (i.e., binary)"

DELL comment number 208

Page=468 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.2.11 SCSI vital product data (VPD)

2nd Paragraph after Table 165 - Device Identification VPD page required identification descriptors

"Logical units may include additional identification descriptors than those



required by this standard (e.g., SCSI target devices with SCSI target ports using other SCSI transport protocols may return additional target device names for those other SCSI transport protocols)."

Sentence seems to be an artifact from SAS-1, when the SCSI device name was required. Propose removing everything following with the e.g..

DELL comment number 209

Page=474 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

10.4.3.2 SMP function response frame format

In Table 170 - FUNCTION RESULT field (part 2 of 2) - Code value 16h (PHY VACANT) - Description

Remove

"The phy specified by the PHY IDENTIFIER field in the SMP request frame does not exist or"

This statement is the same as Code value 10h (PHY DOES NOT EXIST). Do not agree that return 10h and 16h are the same.

DELL comment number 210

Page=477 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.3 REPORT GENERAL function

9th Paragraph, 2nd Sentence after Table 172 - REPORT GENERAL response

Add sentence

"Devices other than expander devices shall not support this bit" before

"Changes in this bit from one to zero result in a BROADCAST (CHANGE) being originated."

DELL comment number 211

Page=477 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.3 REPORT GENERAL function

10th Paragraph, 2nd Sentence after Table 172 - REPORT GENERAL response

Add sentence

"Devices other than expander devices shall not support this bit" after

"An expander device without a configurable route table shall have the CONFIGURABLE ROUTE TABLE bit set to zero."

DELL comment number 212

Page=478 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.4 REPORT MANUFACTURER INFORMATION function

In Table 174 - REPORT MANUFACTURER INFORMATION response - Byte 8

Make 1.1 in SAS-1.1 FORMAT, SMALL CAPS, as it is part of the field name and

not the value of the field..

DELL comment number 213

Page=479 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.4 REPORT MANUFACTURER INFORMATION function

4th Paragraph, 1st and 2nd Sentences after In Table 174 - REPORT MANUFACTURER INFORMATION response

"A SAS-1.1 FORMAT bit set to..."

Make 1.1 in SAS-1.1 FORMAT, SMALL CAPS, as it is part of the field name.

DELL comment number 214

Page=483 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

10.4.3.5 DISCOVER function

In Table 178 - NEGOTIATED PHYSICAL LINK RATE field, 1st Sentence -Code Value 2h

Remove

"(either SAS or SATA)"

SATA does not do fall back test (final negotiation window.)

DELL comment number 215

Page=483 Subtype=StrikeOut Author=Kevin\_Marks

Comment=

10.4.3.5 DISCOVER function

In Table 178 - NEGOTIATED PHYSICAL LINK RATE field, 4st Sentence - Code Value 4h

Remove

"2h,"

Per comment above on 2h code value, SATA phy should not end up in code 2h, as it does not support fall back test or change i.e. in 2h description to e.g.

DELL comment number 216

Page=485 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.5 DISCOVER function

11th Paragraph after Table 179 - ATTACHED SATA PORT SELECTOR and ATTACHED SATA DEVICE bits

Change

"The ATTACHED SAS ADDRESS field shall be updated:

- a) after the identification sequence completes, if a SAS device or

expander device is attached; or

b) at SATA spinup hold time (see 6.10), if a SATA device is attached."

to

"The ATTACHED SAS ADDRESS field shall be updated:

a) after the identification sequence completes, if a SAS device or expander device is attached; or

b) at SATA spinup hold time (i.e. COMSAS detect timeout expires), if a SATA device is attached."

A phy (STP bridge) may not support SATA spinup hold, so the COMSAS detect timeout expires clarifies the time.

DELL comment number 217

Page=486 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.6 REPORT PHY ERROR LOG function

1st Paragraph, 1st Sentence

Change

"This SMP function may implemented by any SMP target port."

to

"This SMP function may be implemented by any SMP target port."

DELL comment number 218

Page=488 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.6 REPORT PHY ERROR LOG function

5th Paragraph after Table 184 - REPORT PHY ERROR LOG response

Change

"The INVALID DWORD COUNT field indicates the number of invalid dwords (see 3.1.98) that have been received outside of phy reset sequences (i.e., between when the SP\_DWS state machine (see 6.9) sends a Phy Layer Ready (SAS) confirmation and when it sends a Phy Layer Not Ready confirmation to the link layer). The count shall stop at the maximum value."

to

"The INVALID DWORD COUNT field indicates the number of invalid dwords (see 3.1.98) that have been received outside of phy reset sequences (i.e., between when the SP state machine (see 6.8) sends a Phy Layer Ready (SAS) confirmation and when it sends a Phy Layer Not Ready confirmation to the link layer). The count shall stop at the maximum value."

Do these counters not apply to SATA? If so, need to add or Phy Layer Ready (SATA) confirmation.

DELL comment number 219

Page=489 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.6 REPORT PHY ERROR LOG function

6th Paragraph after Table 184 - REPORT PHY ERROR LOG response

"The LOSS OF DWORD SYNCHRONIZATION COUNT field indicates the number of times the phy has lost dword synchronization and restarted the link reset

sequence (see 6.8) of phy reset sequences. The count shall stop at the maximum value."

Is the LOS SYNC COUNT only incremented if a the link reset sequence happens? Several SP states allow for a Start DWS message to prevent a link reset sequence, such as SP15:SAS\_PHY\_Ready. If this LOS is defined as DWS Loss, then remove "and restarted the link reset sequence (see 6.8) of phy reset sequences."

DELL comment number 220

Page=491 Subtype=Highlight Author=Kevin\_Marks

Comment=

8th Paragraph after Table 186 - REPORT PHY SATA response

Change

"...link reset sequence (see ATA/ATAPI-7 V3 and SATA2-EXT)."

to

"...link reset sequence (see ATA/ATAPI-7 V3 and SATAII-EXT)."

DELL comment number 221

Page=496 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.10 PHY CONTROL function

1st Paragraph, 2nd Sentence

Change

"This SMP function may implemented by any SMP target port."

to

"This SMP function may be implemented by any SMP target port."

DELL comment number 222

Page=498 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.10 PHY CONTROL function

In Table 192 - PHY OPERATION field (part 1 of 2)

Code value 01h (LINK RESET) Row

Change 2nd Paragraph, 2nd Sentence in description column

"The phy shall bypass the SATA spinup hold state."

to

"The phy shall bypass the SATA spinup hold state, if attached to a SATA device."

DELL comment number 223

Page=500 Subtype=Highlight Author=Kevin\_Marks

Comment=

10.4.3.11 PHY TEST FUNCTION function

1st Paragraph, 2nd Sentence

Change

"This SMP function may implemented by any SMP target port."

to

"This SMP function may be implemented by any SMP target port."

DELL comment number 224

Page=502 Subtype=Highlight Author=Kevin\_Marks

Comment=  
10.4.3.11 PHY TEST FUNCTION function

In Table 196 - PHY TEST FUNCTION field

Code value 01h - Description column- 1st Sentence  
Change

"MAXIMUM PHYSICAL LINK RATE"  
to  
"PHY TEST PATTERN PHYSICAL LINK RATE"

DELL comment number 225  
Page=504 Subtype=Highlight Author=Kevin\_Marks  
Comment=

A.1 Jitter tolerance pattern (JTPAT)

Change blue text to black in Table A.1 ,, JTPAT for RD+.

DELL comment number 226  
Page=505 Subtype=Highlight Author=Kevin\_Marks  
Comment=

A.1 Jitter tolerance pattern (JTPAT)

Change blue text to black in Table A.2 ,, JTPAT for RD

DELL comment number 227  
Page=541 Subtype=Highlight Author=Kevin\_Marks  
Comment=

G.1 STP differences from Serial ATA (SATA)

change  
"...device using an active/standby mode called affiliations..."  
to  
"...device using a reserve/release style mechanism called affiliations..."

Active/standby seems more like a Port selector or failover mechanism.

DELL comment number 228  
Page=541 Subtype=Highlight Author=Kevin\_Marks  
Comment=

G.2 STP differences from Serial ATA II

Remove  
"c) staggered device spinup;"

SATA Spinup Hold seems and phy reset are methods to control staggered spinup.

DELL comment number 229  
Page=542 Subtype=Highlight Author=Kevin\_Marks  
Comment=

G.4 SATA port selector considerations  
1st paragraph,1st sentence

change

"...SATA port selector (see SATA2-PS) in a SAS..."  
to  
"...SATA port selector (see SATAII-PS) in a SAS..."

DELL comment number 230  
Page=574 Subtype=Text Author=Kevin\_Marks  
Comment=  
L.1 Discover process example implementation overview

Through out comments in source code, "will" and "must" are used. Although an informative annex, recommend changing instances of "will" and "must" to "should"/"shall".

\*\*\*\*\*

Comments attached to No ballot from Robert H. Nixon of Emulex:

PDF page numbers are used  
(i.e., a single number sequence for the whole document)

Emulex concurs with the following issue identified by Intel:  
Page: 124; Author: rlsheffi;  
Comment: There is no place in the standard that specifies when (if ever) the ATTACHED SAS ADDRESS is set to zero.

Page 231, 6.8.3.3.2 para 2 line 3  
COMWAKE\_Recieved s/b COMWAKE\_Received

Emulex concurs with the following issue identified by Intel:  
Page: 296; Author: rlsheffi;  
Comment: 7.9.5.5.3 SL\_IR\_IRC2:Wait state 7.9.5.5.3.1 State description  
There is a problem that there is currently no definition for how a phy associated with an STP/SATA bridge becomes enabled.

\*\*\*\*\*

Comments attached to No ballot from Rob Elliott of Hewlett Packard Co.:

HPQ comment number 1  
Page=95 Subtype=Text Author=relliott  
Comment=  
4.2.6 Port identifiers

Comment received from Doug Gilbert (linux):  
Section 4.2.6 on Port identifiers says: "Each SAS initiator port, target port and target/initiator port shall include a SAS address (see 4.2.2) as its port identifier. The selected SAS address shall be used for no other name or identifier."

Current HBAs (4 or 8 phy) can have multiple initiator ports in different SAS domains each with the same SAS port identifier. IMO that doesn't sit well with the second sentence from draft shown above (namely the unqualified "... or identifier" part).

Or perhaps I am misunderstanding what a SAS HBA should publish as its port identifier for its second and subsequent ports?

My reply: Good point. The initiator device certainly is allowed to use that port identifier in another domain (causing another port to be created).

It's trying to ensure that the identifier is not used as (for targets or initiators) a device name or (for targets) a logical unit name.

HPQ comment number 2  
Page=108 Subtype=Text Author=relliott  
Comment=  
4.4.2 Hard reset

Clarify what "hard reset" means or does not mean in an expander. This still causes confusion.

HPQ comment number 3  
Page=154 Subtype=Text Author=relliott  
Comment=  
5.2.3.4.7 SAS internal compact wide connector pin assignments  
Table 29 - Backplane pinout

The A to Rx, B to Tx mapping does not match figure 76, which shows A's carrying the Rx lines and B's carrying the Tx lines. This table is probably incorrect.

HPQ comment number 4  
Page=161 Subtype=Text Author=relliott  
Comment=  
5.2.4.3.2 SAS internal wide symmetric cables  
Figure 76 - controller to backplane cable  
On the right side (backplane pinout), the A to Rx, B to Tx mapping does not match table 29, which has A's carrying the Tx lines and B's carrying the Rx lines. This figure is probably correct.

HPQ comment number 5  
Page=161 Subtype=Text Author=relliott  
Comment=  
5.2.4.3.2 SAS internal wide symmetric cables  
Figure 76 - controller to backplane cable

This figure is identical to the following figure 77 (controller to controller), except the "backplane" vs "connector" label on the right. If that is truly the case, then there should not be a special "backplane" pinout. (it's possible that the SIDEBAND signal names are different - if so, then they are indeed different)

HPQ comment number 6  
Page=161 Subtype=Text Author=relliott  
Comment=  
5.2.4.3.2 SAS internal wide symmetric cables  
Figure 76 - controller to backplane cable

The left side (controller) has SIDEBAND0 on A8, while table 29 has it on B8.

HPQ comment number 7  
Page=164 Subtype=Text Author=relliott  
Comment=  
5.2.3.4.2 SAS internal wide symmetric cables  
(general comment on all cable figures)

The depiction of the grounds is misleading in these cable figures.

Show grounds going into a cylinder with dotted lines. Show paddle boards for the crossovers of the signals where needed rather than just crossing the lines in space.

Alternatively, just show the grounds going into circles at each end (not full cylinders) labeled "twinaxial dual drain shield" and don't show them connected from one side to the other.

HPQ comment number 8  
Page=170 Subtype=Highlight Author=relliott  
Comment=  
5.2.6 Impedance and media specifications  
Table 31 external cables

The specification of:  
Maximum intra-pair skew (h, k): 20 ps

is barely achievable by commodity cables and may not be that important (it causes the corners of the eye diagram to become rounded off). See 05-098. Either raise the number or eliminate it.

HPQ comment number 9  
Page=171 Subtype=Highlight Author=relliott  
Comment=  
5.2.6 Impedance and media specifications  
Table 32 - internal wide cables

The number:  
Maximum intra-pair skew: 10 ps

may not be needed (see comment on table 31 for external cables).

If this row remains, then footnotes h and k from table 31 which describe the measurement techniques should be copied here.

HPQ comment number 10  
Page=190 Subtype=Text Author=relliott



Comment=

#### 5.3.6.4 Receiver device jitter tolerance eye mask

In January phy WG, was asked to add precalculated Z1tol values somewhere. Need specifics on what to do.

HPQ comment number 11

Page=193 Subtype=Text Author=relliott

Comment=

#### 5.3.7.5 Transmitter device signal output levels for OOB signals

The toggling algorithm is bogus and should not be used if SATA device attachment is supported. It leads to overdriving signals into the SATA device, which might have a 600 - 700 mV maximum expectation.

Instead, a SAS phy supporting SATA device attachment needs to always use SATA compatible levels for COMINIT, only switching to SAS levels if it receives a COMSAS. A SAS receiver (if a SAS drive is attached) should have no problem receiving the lower levels - no more of a problem than a SATA device in that same position. If it cannot work with lower levels, then a SATA device would not be able to work either and it's not really an attachment point that supports SATA device attachment.

SAS phys not concerned with SATA device attachment (e.g. phys attached to external cable connectors) need to use their normal SAS levels.

Proposals discussing this topic include 05-019 and 05-077.

HPQ comment number 12

Page=229 Subtype=Highlight Author=relliott

Comment=

#### 6.8.3.2.1 SP0:OOB\_COMINIT state description

"SMP Reset request" is not defined anywhere.

HPQ comment number 13

Page=237 Subtype=Text Author=relliott

Comment=

#### 6.8.4.9 SP15:SAS\_PHY\_Ready and

#### 6.8.5.8 SP22:SATA\_PHY\_Ready

need to clarify how COMINIT Detected works in SP15 and SP22 (and maybe other states). If the differential voltage level drops below 120 mV multiple times meeting COMINIT timing, is that enough? Or is the voltage drop ignored until dword sync is declared lost by SP\_DWS? DWS Reset Timeout is 1 ms; COMINIT idle time is 525 ns. So, COMINIT Detected will be seen before DWS is declared lost.

HPQ comment number 14

Page=239 Subtype=Highlight Author=relliott

Comment=

#### 6.8.5.4.2 Transition SP18 to SP0

"Transition SP187" s/b "Transition SP18"

HPQ comment number 15  
Page=243 Subtype=StrikeOut Author=relliott  
Comment=  
6.8.7.2 Transition SP26 to SP0

Delete "upon entry to SP0:OOB\_COMINIT."

HPQ comment number 16  
Page=243 Subtype=Text Author=relliott  
Comment=  
6.9.1 SP\_DWS state machine

When SP\_DWS declares DWS Lost but not DWS Reset, that could be interpreted as "loss of dword sync" which is a reason an expander would forward BREAK. The intent was that only happens if there is loss of dword sync resulting in the OOB sequence restarting. Clarify throughout.

HPQ comment number 17  
Page=270 Subtype=Text Author=relliott  
Comment=  
7.2.5.1 OPEN\_REJECT

For SAS phys (not expander phys), consider dropping the priority list in favor of the 1)2)3) list in the SL\_CC:Selected state, the only one that uses it.

For expander phys, the decision is not made by XL (in XL4:Open\_Reject), it's made by the ECM (choosing which Arb Reject to send). I don't know if there's a better place for the list than its current location since we don't define ECM state machines.

There are two candidates:

- a) 4.6.6.3 defines the Arb Rejects.
- b) 7.12.4.1 has the arbitration rules, but does not have an ordered list right now enforcing the priority.

HPQ comment number 18  
Page=299 Subtype=Text Author=relliott  
Comment=  
7.12.3 Arbitration fairness

should point to port layer section dealing with AWT stopping here.

don't want to imply that this "should not" rule overrides the port layer normal stopping of AWT when it has no more frames to send.

HPQ comment number 19  
Page=325 Subtype=Text Author=relliott  
Comment=  
7.15.3 XL0:Idle state

Comment from Expert I/O (in 05-141r0):

Expander - Backoff Reverse Path  
Problem

Expander Port 0 forwards an open to Expander Port 1, which causes Expander Port 0 to transition to XL3:Open\_Confirm\_Wait. Expander Port 1 receives an open address frame from the device it is connected. The received open address frame wins according to arbitration rules and thus causes Expander Port 1 to issue a Backoff Reverse Path message destined to Expander Port 0. The specification indicates that upon reception of the backoff reverse path message, Expander Port 0 should transition to XL5:Forward\_Open. The specification goes on to say upon entry into XL5:Forward\_Open, the expander port should transmit an open address frame based on the arguments of the oaf coincident with the state transition. However, in the case of the backoff reverse path message, there is no mechanism detailed to provide the Expander Port with the open address frame arguments along with the message.

#### Solution

This problem could be solved by having the expander port that received the backoff reverse path message transition to XL0:Idle rather than XL5:Forward\_Open. This will enable the expander port to be ready to accept the forward open message that will follow the backoff reverse path message and proceed as described in the specification.

Alternatively, the backoff reverse path message could include the arguments for the open address frame along with the message. However, this option seems more intrusive than the first option

HPQ comment number 20

Page=326 Subtype=Text Author=relliott

Comment=

7.15.4 XL1:Request\_Path state

Comment from Expert I/O in 05-141r0:

#### Expander - Request Path Handling Problem

The specification should clarify what should occur in the following condition: Expander Port 1 issues a request path message which will route to Expander Port 0 resources. Expander Port 1 wins arbitration and proceeds to issue a forward open message that will go to Expander Port 0. Coincidentally (or any time up to receiving the forward open message from Expander Port 1), an open address frame is received by Expander Port 0. This causes Expander Port 0 to transition to XL1:Request\_Path. While Expander Port 0 is in XL1:Request\_Path the forward open message is received. It is not clear what the expander link should do from this point forward. If the open address frame received by Expander Port 0 is greater, ultimately a backoff retry or backoff reverse path message should be issued to Expander Port 1. If the open address frame received by the forward open message is greater, the requestpath message to the ECM should be negated. Neither of these methods is explained.

#### Solution

A possible solution requires modification in both the XL1:Request\_Path section of the specification and the request path handling in the ECM. In the XL1:Request\_Path section, the contents of the received open address frame could be kept. Upon receiving a forward open message while in XL1:Request\_Path, the expander link uses arbitration rules to determine if a backoff retry message or backoff reverse path message should be issued while remaining in the same state. If either of these messages is issued, then no further modifications are necessary since the request path message

from Expander Port 0 will control the state operation of Expander Port 0. If the forward open message wins arbitration over the received open address frame by Expander Port 0, the state transition to XL5:Forward\_Open would take place as described. The only modification in this case would be that the ECM would ignore the request path message already issued by Expander Port 0.

As a note, the cases are covered if the open address frame is received while Expander Port 0 is in XL5:Forward\_Open and XL6:Open\_Confirm\_Wait. The only case missing in the specification is the case described

HPQ comment number 21

Page=337 Subtype=Text Author=relliott

Comment=

7.16.6 Closing an SSP connection

Point to 7.12.8 (Breaking a connection) somewhere in 7.16, since some SSP specific rules are hidden there

HPQ comment number 22

Page=340 Subtype=Text Author=relliott

Comment=

7.16.7.1 SSP state machines

Figure 151 - SSP part 1

Request Close and Request Break also go to all the other SSP state machines (in other figures), which is not mentioned in the figure.

In this figure, it is shown as an input on the right, but not shown coming from SSP\_D state which is also on this page.

HPQ comment number 23

Page=352 Subtype=Text Author=relliott

Comment=

7.17.4 Affiliations

What happens when clear affiliation attempted while a connection open?

vendor specific choice of:

reject, accept and do it at the end of the connection, accept but do nothing

HPQ comment number 24

Page=366 Subtype=Text Author=relliott

Comment=

8.2.2.2 PL\_OC1:Idle state

Should be clarified that the pools of requests exist even while OC is in OC1.

Going from OC2 to OC1 doesn't empty them. It's debatable whether new requests should be accepted while in OC1. The port might just be momentarily offline while its phy(s) are performing a link reset sequence.

HPQ comment number 25  
Page=366 Subtype=Text Author=relliott  
Comment=  
8.2.2.2 PL\_OC1:Idle

The I\_T Nexus Loss timer should continue to run after OC has moved into OC1 because all its phys become disabled. If they are disabled for too long while the OC has any useful work for them to do, it should be treated as an I\_T nexus loss. This makes it work the same as if a remote physical link went down and connections requiring that physical link start returning OPEN REJECT (NO DESTINATION).

HPQ comment number 26  
Page=378 Subtype=Text Author=relliott  
Comment=  
9.2.3.4 PL\_PM3 Connected state

Comment from Expert I/O in 05-141r0:

Port Layer - Frame Transmitted Handshake Problem

Due to the architectural freedom of having multiple SSP Transports running concurrently on top of a single Port Layer, multiple frames with different tags may be queued to the port layer. The port layer section of the specification does not describe any restriction for issuing multiple transmit frame messages to the link layer as long as the protocol, connection rate, and destination address match. However, the SSP Link Layer state machine is specified such that it can only accept one transmit frame message at a time. This creates an environment where a frame could be implicitly dropped if the transmit frame message is issued by the Port Layer while the SSP Link Layer is not in a state that recognizes the message.

Solution

The description of a handshake should be added to the Port Layer section of the specification. Specifically in the PL\_PM3:Connected state should specify that a new transmit frame message can only be issued if there are no outstanding frame transmitted confirmations from the SSP Link Layer.

HPQ comment number 27  
Page=395 Subtype=Text Author=relliott  
Comment=  
9.2.3 Sequences of SSP frames

Should explicitly state that, for the same command, the target port may send DATA frames for the read direction at the same time it is receiving DATA frames for the write direction. The ST\_I and ST\_T state machines might not be able to do that as written.

HPQ comment number 28  
Page=396 Subtype=Text Author=relliott  
Comment=  
9.2.4.2 COMMAND frame link layer errors

Missing "(see 9.4.3.x)" references in most of these paragraphs

HPQ comment number 29  
Page=396 Subtype=Text Author=relliott  
Comment=  
9.2.4.2 COMMAND frame link layer errors

May be missing a DATA paragraph (per 9.2.6.3.3.2.6)

HPQ comment number 30  
Page=396 Subtype=Highlight Author=relliott  
Comment=  
9.2.4.2 COMMAND frame link layer errors

After "ACK" add "or RESPONSE, XFER\_RDY, or DATA frame" to comprehend all the implicit ACK conditions just discussed. May be best to reword altogether.

The purpose of this kind of rule should be to guide the OS drivers not to give up after just one error.

10.2.2 has all the rules with more detail.

HPQ comment number 31  
Page=399 Subtype=Highlight Author=relliott  
Comment=  
9.2.5.2 SSP initiator port error handling summary

Change "error handling" to "transport layer error handling"

HPQ comment number 32  
Page=400 Subtype=Highlight Author=relliott  
Comment=  
9.2.5.2 SSP initiator port [transport layer] error handling summary

Explain "data offset that was not expected" in more detail.

DATA OFFSET field not sequential in the normal case, or not earlier than the current value if CHANGING DATA POINTERS is set to 1.

HPQ comment number 33  
Page=400 Subtype=Highlight Author=relliott  
Comment=  
9.2.5.3 SSP target port error handling summary

Change "error handling" to "transport layer error handling"

HPQ comment number 34  
Page=400 Subtype=Text Author=relliott  
Comment=  
9.2.5.2 SSP initiator port error handling summary

More reason that "data offset that was not expected" needs to be more specific.

Comment from Rich Deglin, Vitesse:

```
Initiator          Target

<=== DATA frame
<=== DATA frame w/CRC error
<=== DATA frame CHANGING DATA POINTERS=0
    ...
        ACK ==>
        NAK ==>
        ACK ==>
    ...
<=== DATA frame CHANGING DATA POINTERS=1
```

Due to the non-interlocked nature of data transfer, the target may have continued to transmit DATA frames for some time before it discovers that one of them was NAK'ed. Meanwhile the initiator has seen an "unexpected" data offset, but CHANGING DATA POINTERS=0. I believe the initiator is compelled to abort the command at this point.

HPQ comment number 35

Page=401 Subtype=Highlight Author=relliott

Comment=

9.2.5.3 SSP target port [transport layer] error handling summary

Explain "data offset that was not expected" in more detail.

DATA OFFSET field not sequential in the normal case, or not earlier if CHANGING DATA POINTERS is set to 1.

HPQ comment number 36

Page=402 Subtype=Text Author=relliott

Comment=

9.2.6.2.1 ST\_I state machines

Comment from ExpertIO in 05-141r0:

SSP Transport Layer - Ack Transmitted Confirmation Needs Tag Argument Problem

When an ack transmitted confirmation is received by the SSP Transport layer, it is not known for which frame the ack transmitted confirmation is associated. For instance, in the case of a wide link where a single transport layer is servicing commands for multiple tags simultaneously, the ST layer needs to know which ack transmitted confirmation is associated with which received frame.

Solution

The port layer has access to the information regarding which tag is associated with which confirmation. The specification should detail that the transmission status and the ack transmitted message should include an argument of the tag associated with the confirmation.

HPQ comment number 37

Page=410 Subtype=Highlight Author=relliott

Comment=

9.2.6.2.3.2.1 ST\_ITS2:Initiator\_Send\_Frame

Explain "requested offset is not expected"

HPQ comment number 38  
 Page=411 Subtype=Text Author=relliott  
 Comment=  
 9.2.6.2.3.3.6 ST\_ITS2 to ST\_ITS6

Note 53 is not reflected in 9.2.4.2 the error summary.

The note says that read DATA frames are honored even though the COMMAND has not been ACKed.

add para to 9.2.4.2 for read DATA frames that points here

HPQ comment number 39  
 Page=412 Subtype=Highlight Author=relliott  
 Comment=  
 9.2.6.2.3.7.1 ST\_ITS6:Receive\_Data\_In

Expand explanation of "not expected"

HPQ comment number 40  
 Page=412 Subtype=Text Author=relliott  
 Comment=  
 9.2.6.2.3.6 ST\_ITS5:Prepare\_Data\_Out

Comment from Expert I/O in 05-141r0:

SSP Transport Layer - Balance Counter  
 Problem

The specification is very detailed in the description of the ITS state transitions. A section particularly describes how the ITS cannot transition out of PREPARE\_DATA\_OUT until it has received as many ack received confirmations as data frames it has sent out. This wording implies a counter that is not explained.

Solution

The specification should describe a balance counter (similar to ones described in the Link Layer) that increments on every frame transmitted transmission status confirmation and decrements on every ack received transmission status confirmation

HPQ comment number 41  
 Page=426 Subtype=Highlight Author=relliott  
 Comment=  
 9.2.6.3.3.6.1 ST\_TTS5:Receive\_Data\_Out

Regarding:

"data offset was not expected (i.e., the CHANGING DATA POINTER bit is set to one and the value in the DATA OFFSET field is not set to the data offset associated with the XFER\_RDY frame, or the CHANGING DATA POINTER bit is set to zero and the value in the DATA OFFSET field is not set to the value in the DATA OFFSET FIELD in the previous write DATA information unit plus the number of bytes in that information unit)"



The i.e. list in 1) is incomplete. If an initiator violates the NUMBER OF FILL BYTES rules, it could send a DATA OFFSET that is  
a) not a multiple of 4 - violating the alignment rule; or  
b) is a multiple of 4 - leaving a gap and violating another rule.

Change to e.g. and discuss the alignment rule too.

HPQ comment number 42  
Page=477 Subtype=Highlight Author=relliott  
Comment=  
10.4.3.3 REPORT GENERAL function

After "virtual phys" add "and any vacant phys"

HPQ comment number 43  
Page=478 Subtype=Highlight Author=relliott  
Comment=  
10.4.3.4 REPORT MANUFACTURER INFORMATION Table 174  
10.4.3.5 DISCOVER Table 175 and 176  
10.4.3.6 REPORT PHY ERROR LOG Table 183 and 184  
10.4.3.7 REPORT PHY SATA Table 185 and 186  
10.4.3.8 REPORT ROUTE INFORMATION Table 187 and 188  
10.4.3.9 CONFIGURE ROUTE INFORMATION Table 189  
10.4.3.10 PHY CONTROL Table 191  
10.4.3.11 PHY TEST FUNCTION Table 195

Change Ignored to Reserved. There is no reason an expander cannot mask off these bits for reads and ignore them for writes.

HPQ comment number 44  
Page=482 Subtype=Text Author=relliott  
Comment=  
10.4.3.5 DISCOVER function  
Table 177 - ATTACHED DEVICE TYPE field

Add:  
111b Phy vacant (no device ever attached)

HPQ comment number 45  
Page=483 Subtype=Text Author=relliott  
Comment=  
10.4.3.5 DISCOVER function  
Table 178 - NEGOTIATED PHYSICAL LINK RATE field

Add 7h or Fh as "Phy vacant (phy is never going to be enabled)"

HPQ comment number 46  
Page=484 Subtype=Text Author=relliott  
Comment=  
10.4.3.5 DISCOVER function  
After table 179 - ATTACHED SATA PORT SELECTOR and ATTACHED SATA DEVICE bits

Add:  
If either the ATTACHED SATA PORT SELECTOR bit or the ATTACHED SATA DEVICE bit is

set to one, then all the ATTACHED SSP/STP/SMP INITIATOR/TARGET PORT bits shall be set to zero (and vice-versa).

HPQ comment number 47  
Page=488 Subtype=Highlight Author=RElliott  
Comment=  
10.4.3.6 REPORT PHY ERROR LOG function

The Phy Layer Ready confirmation really comes from SP not SP\_DWS

HPQ comment number 48  
Page=574 Subtype=Text Author=relliott  
Comment=  
L.3 Discover process C code

Update to detect when two table route phys are connected together and ignore the connection beyond the initiator. The current code loops continuously when a table to table connection is made.

\*\*\*\*\*

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

IBM comment number 1  
Page=32 Subtype=Text Author=George Penokie  
Comment=The revision information needs to be removed.

IBM comment number 2  
Page=43 Subtype=Highlight Author=George Penokie  
Comment=  
2.4 Other references  
This << OMG Unified Modeling Language (UML) Specification. Version 1.5, March 2003. >> should be << OMG Unified Modeling Language (UML) Specification. Version 2.0, October 2004. >>

IBM comment number 3  
Page=48 Subtype=Highlight Author=George Penokie  
Comment=  
3.1.52 duty cycle distortion (DCD):  
This << width of a '1' pulse or a '0' pulse and >> should be << width of a 1 pulse or a 0 pulse and >> or << width of a one pulse or a zero pulse and >>

IBM comment number 4  
Page=48 Subtype=Highlight Author=George Penokie  
Comment=  
3.1.58 enclosure:  
Add << An enclosure is not a SAS or SCSI class. >>

IBM comment number 5  
Page=50 Subtype=Text Author=George Penokie

Comment=

The glossary is not the place to define everything there is to know about jitter. It should only have a short definition of relevant terms. The details should be in a section of the standard that describes jitter. It is a bad sign when a term is only used in the glossary section and nowhere else.

IBM comment number 6

Page=50 Subtype=Text Author=George Penokie

Comment=

3.1.100 jitter, data dependent (DDJ):

This glossary entry has way too much information for a glossary entry. Also the only place where DDJ is used in other glossary entries. Everything after the first sentence should be in a section in the body of the standard.

IBM comment number 7

Page=50 Subtype=Highlight Author=George Penokie

Comment=

3.1.100 jitter, data dependent (DDJ):

This << (one ISI mechanism). >> should be << (i.e., one ISI mechanism). >>

IBM comment number 8

Page=50 Subtype=Highlight Author=George Penokie

Comment=

3.1.100 jitter, data dependent (DDJ):

This << mechanisms such as reflections, and transfer functions of coupling circuits and other mechanisms such as ground bounce. >> should be <<mechanisms (e.g., reflections,transfer functions of coupling circuits, and ground bounce). >>

IBM comment number 9

Page=50 Subtype=Highlight Author=George Penokie

Comment=

3.1.100 jitter, data dependent (DDJ):

This << For example, when using media that attenuates the peak amplitude of the bit sequence consisting of repeating 0101b patterns more than peak amplitude of the bit sequence consisting of repeating 00001111b patterns, the time required to reach the receiver threshold with the 0101b patterns is less than required from the 00001111b patterns. The run length of 4 produces a higher amplitude that takes more time to overcome when changing bit values and therefore produces a time difference compared to the run length of 1 bit sequence. >> should be << (e.g., when using media that attenuates the peak amplitude of the bit sequence consisting of repeating 0101b patterns more than peak amplitude of the bit sequence consisting of repeating 00001111b patterns, the time required to reach the receiver threshold with the 0101b patterns is less than required from the 00001111b patterns. The run length of four produces a higher amplitude that takes more time to overcome when changing bit values and therefore produces a time difference compared to the run length of one bit sequence). >>

IBM comment number 10

Page=50 Subtype=Highlight Author=George Penokie

Comment=

3.1.100 jitter, data dependent (DDJ):

This << pattern. For example, DDJ may be caused by the time differences required for the signal to arrive at the receiver threshold when starting from different places in bitsequences (symbols). >> should be << pattern (e.g., DDJ may be caused by the time differences required for the signal to arrive at the receiver threshold when starting from different places in bit sequences (i.e., symbols)). >>

IBM comment number 11

Page=50 Subtype=StrikeOut Author=George Penokie  
Comment=

3.1.96 intersymbol interference (ISI):

This << Important mechanisms that produce ISI are dispersion, reflections, and circuits that lead to baseline wander. >> should be deleted as it has no value to the standard.

IBM comment number 12

Page=50 Subtype=Highlight Author=George Penokie  
Comment=

3.1.96 intersymbol interference (ISI):

This << Neighboring means close enough to have significant >> should be << Neighboring pulses are pulses that are close enough to have significant >>

IBM comment number 13

Page=50 Subtype=Highlight Author=George Penokie  
Comment=

3.1.96 intersymbol interference (ISI):

This << pulses - many bit times may separate the pulses especially in the case of reflections. >> should be << pulses (i.e., many bit times may separate the pulses especially in the case of reflections). >>

IBM comment number 14

Page=50 Subtype=Highlight Author=George Penokie  
Comment=

3.1.94 insertion loss, differential (SDD21):

This << measured at port 2.>> should be << measured at port two.>>

IBM comment number 15

Page=50 Subtype=Highlight Author=George Penokie  
Comment=

3.1.94 insertion loss, differential (SDD21):

This << measured at port 1.>> should be << measured at port one.>>

IBM comment number 16

Page=50 Subtype=Highlight Author=George Penokie  
Comment=

3.1.93 insertion loss (S21):

This << The ratio (expressed in dB) of delivered power >> should be << The ratio, expressed in dB, of delivered power >>

IBM comment number 17

Page=51 Subtype=Highlight Author=George Penokie  
Comment=

3.1.110 jitter tolerance for receiver devices:

This << See also signal tolerance. >> is not a valid cross reference and

needs to be fixed.

IBM comment number 18

Page=51 Subtype=Text Author=George Penokie

Comment=

3.1.110 jitter tolerance for receiver devices:

Just about everything after the first sentence should not be in a glossary but should be included in a section on jitter.

IBM comment number 19

Page=51 Subtype=Text Author=George Penokie

Comment=

3.1.109 jitter tolerance at transmit device compliance points:

Just about everything after the first sentence should not be in a glossary but should be included in a section on jitter.

IBM comment number 20

Page=51 Subtype=Highlight Author=George Penokie

Comment=

3.1.109 jitter tolerance at transmit device compliance points:

This << See also signal tolerance. >> is not a valid cross reference and needs to be fixed.

IBM comment number 21

Page=51 Subtype=Highlight Author=George Penokie

Comment=

3.1.107 jitter, total (TJ):

It is not clear what this statement << (1 - jitter eye opening) >> relates to or what information it is trying to convey. This needs to be fixed.

IBM comment number 22

Page=51 Subtype=Highlight Author=George Penokie

Comment=

3.1.106 jitter, random, (RJ):

This << distribution and is unbounded. Examples of mechanisms that can cause RJ include PLL jitter in transmitter devices, electronic switching noise, and analog amplifiers. >> should be << distribution and is unbounded (e.g., may be caused by PLL jitter in transmitter devices, electronic switching noise, and analog amplifiers). >>

IBM comment number 23

Page=52 Subtype=StrikeOut Author=George Penokie

Comment=

3.1.127 object diagram:

This << ; a special case of a class diagram >> should be deleted as it is not really accurate. The remaining is good enough.

IBM comment number 24

Page=54 Subtype=Highlight Author=George Penokie

Comment=

3.1.156 retimer:

This << In the context of jitter methodology, a retimer resets the accumulation of jitter such that the output of a retimer has the jitter budget of a compliant transmitter device. All SAS receiver devices shall be retimers. >> should be moved to a section on jitter. Putting requirements

in a glossary enter is a very bad idea.

IBM comment number 25

Page=56 Subtype=Highlight Author=George Penokie

Comment=

3.1.202 signal tolerance:

None of this belongs in the glossary and should be placed in the main body of the standard possibly in a jitter section. << Signal tolerance is measured by the amount of jitter required to produce a specified bit error ratio at a specified signal amplitude and other signal properties. The signal tolerance performance depends on the frequency content of the jitter and on the amplitude of the signal. Since detection of bit errors is required to determine the signal tolerance, receiver circuits embedded in a SAS protocol chips require that the protocol chip be capable of reporting bit errors. For receiver circuits that are not embedded in a SAS protocol chip the bit error detection and reporting may be accomplished by instrumentation attached to the output of the receiver circuit. Signal tolerance is measured using the minimum allowed applied signal eye opening for both horizontal and vertical directions unless otherwise specified. >>

IBM comment number 26

Page=61 Subtype=Highlight Author=George Penokie

Comment=

3.2 Symbols and abbreviations

This should be deleted << SP\_DWS phy layer dword synchronization state machine (see 6.9) >> as it is the name of a state machine which we should not be adding into this list as it is not an abbreviation.

IBM comment number 27

Page=62 Subtype=Highlight Author=George Penokie

Comment=

3.3.6 need not:

This should not be a keyword. It should be deleted and all usages replaced with. << is not required to >>

IBM comment number 28

Page=63 Subtype=Highlight Author=George Penokie

Comment=

3.4 Editorial conventions

Global

This << Western-Arabic >> should be <<< Arabic >> per the ISO part 2 version 5 style guide.

IBM comment number 29

Page=63 Subtype=StrikeOut Author=George Penokie

Comment=

3.3.11 shall:

This << (equivalent to "is required to"). >> should be deleted as it adds nothing and is not used in other standards when defining the shall keyword.

IBM comment number 30

Page=74 Subtype=Highlight Author=George Penokie

Comment=

4.1.1 Architecture overview

Figure 10

This << 1..\* >> should be << 1.. 65 353>>

IBM comment number 31  
Page=74 Subtype=Highlight Author=George Penokie  
Comment=  
4.1.1 Architecture overview  
Figure 10  
This << 1..\* >> should be << 1.. 65 353>>

IBM comment number 32  
Page=78 Subtype=Text Author=George Penokie  
Comment=  
4.1.3 Ports (narrow ports and wide ports)  
Having all this space between the start of a sentence and the end of the sentence is not a good idea. Move the table anchor to it's own paragraph and this will not be a problem.

IBM comment number 33  
Page=78 Subtype=Highlight Author=George Penokie  
Comment=  
4.1.3 Ports (narrow ports and wide ports)  
This <<can>> should be <<are able to>>

IBM comment number 34  
Page=78 Subtype=Highlight Author=George Penokie  
Comment=  
4.1.3 Ports (narrow ports and wide ports)  
This << need not >> should be changed to << are not required to >>

IBM comment number 35  
Page=79 Subtype=Text Author=George Penokie  
Comment=  
4.1.3 Ports (narrow ports and wide ports)  
Having all this space between the start of a list and the end of the list is not a good idea. Move the table anchor to it's own paragraph and this will not be a problem.

IBM comment number 36  
Page=83 Subtype=Text Author=George Penokie  
Comment=  
4.1.5 Expander devices (edge expander devices and fanout expander devices)  
Having all this space between the start of a list and the end of the list is not a good idea. Move the table anchor to it's own paragraph and this will not be a problem.

IBM comment number 37  
Page=90 Subtype=Highlight Author=George Penokie  
Comment=  
4.1.8.3 Expander device topologies  
Figure 26  
Figure 26 is identical to figure 23. Delete figure 26 and change the references to figure 26 to reference figure 23.

IBM comment number 38  
Page=93 Subtype=Highlight Author=George Penokie

Comment=

#### 4.1.10 Connections

Figure 28

Change << Notes >> to << Note >>

IBM comment number 39

Page=94 Subtype=Highlight Author=George Penokie

Comment=

#### 4.2.2 SAS addresses

This << Information about IEEE company identifiers may be obtained from the <http://standards.ieee.org/regauth/oui> web site. >> should be made into a note.

IBM comment number 40

Page=108 Subtype=Highlight Author=George Penokie

Comment=

#### 4.5 I\_T nexus loss

This << An I\_T nexus loss based on the aforementioned conditions handled by the port layer state machine (see 8.2.2.3). >> does not make sense even after changing << aforementioned >> to << inthis subclause >>. Maybe << conditions handled by >> should be << conditions is handled by >>

IBM comment number 41

Page=108 Subtype=Highlight Author=George Penokie

Comment=

#### 4.4.2 Hard reset

This << SCSI application layer (see 10.2.5); the SCSI device shall perform the >> should be << SCSI application layer (see 10.2.5) and the SCSI device shall perform the >>

IBM comment number 42

Page=108 Subtype=Highlight Author=George Penokie

Comment=

#### 4.5 I\_T nexus loss

This << SCSI application layer (see 10.2.5); the SCSI device shall perform >> should be << SCSI application layer (see 10.2.5) and the SCSI device shall perform >>

IBM comment number 43

Page=119 Subtype=Highlight Author=George Penokie

Comment=

#### 4.6.7.2 Connection request routing

This << (i.e., the DISCOVER function reports a NEGOTIATED PHYSICAL LINK RATE field set to 8h or 9h) >> should change to an << (e.g., .. ) >> because in the future, when we go to higher speeds who is going to remember to add the new speed here?

IBM comment number 44

Page=121 Subtype=Text Author=George Penokie

Comment=

#### 4.7.1 Discover process overview

Figure 45

The note in this figure implies that all the phys are indicated by numbers.



However, there are several places where there appear to be multiple links but only one phy number. There also appears to be unconnected phys that are not numbered. This all needs to be fixed.

IBM comment number 45

Page=121 Subtype=Text Author=George Penokie

Comment=

4.7.1 Discover process overview

Figure 45

This figure needs to indicate where the expander device set boundaries are. Otherwise it this could be interpreted as allowing illegal topologies.

IBM comment number 46

Page=122 Subtype=Highlight Author=George Penokie

Comment=

4.7.1 Discover process overview

This << need not >> should be changed to << is not required to >>

IBM comment number 47

Page=124 Subtype=Highlight Author=George Penokie

Comment=

4.7.4 Expander route index order

This << If the phy is not attached to an edge expander device, every >> would be clearer stated as << If the edge expander device phy is not attached, every >>

IBM comment number 48

Page=124 Subtype=Highlight Author=George Penokie

Comment=

4.7.4 Expander route index order

This << phy (in either a fanout expander device or an edge expander device) that >> should be << phy, in either a fanout expander device or an edge expander device, that >>

IBM comment number 49

Page=131 Subtype=Highlight Author=George Penokie

Comment=

5.2.1 SATA cables and connectors

This << SAS initiator device; a SATA device is analogous to a SAS target device. >> should be << SAS initiator device and a SATA device is analogous to a SAS target device. >>

IBM comment number 50

Page=133 Subtype=Highlight Author=George Penokie

Comment=

5.2.2 SAS cables and connectors

Figure 53

This << (symmetric SAS internal wide cable connects the Tx signal pins to the Rx signal pins within each physical link) >> should be << NOTE: symmetric SAS internal wide cable connects the Tx signal pins to the Rx signal pins within each physical link. >>

IBM comment number 51

Page=133 Subtype=Highlight Author=George Penokie

Comment=

### 5.2.2 SAS cables and connectors

#### Figure 52

This << (SAS external cable connects the Tx signal pins to the Rx signal pins on each physical link) >> should be << NOTE: SAS external cable connects the Tx signal pins to the Rx signal pins on each physical link. >>

IBM comment number 52

Page=134 Subtype=Highlight Author=George Penokie

Comment=

### 5.2.2 SAS cables and connectors

#### Figure 55

This << (the cable connects the Tx signal pins to the Rx signal pins within each physical link) >> should be << NOTE: the cable connects the Tx signal pins to the Rx signal pins within each physical link. >>

IBM comment number 53

Page=134 Subtype=Highlight Author=George Penokie

Comment=

### 5.2.2 SAS cables and connectors

#### Figure 54

This << (SAS internal wide cable connects the Tx signal pins to the Rx signal pins within each physical link) >> should be << NOTE: SAS internal wide cable connects the Tx signal pins to the Rx signal pins within each physical link. >>

IBM comment number 54

Page=135 Subtype=Highlight Author=George Penokie

Comment=

### 5.2.2 SAS cables and connectors

#### Figure 55

This << (the cable connects the Tx signal pins to the Rx signal pins within each physical link) >> should be << NOTE: The cable connects the Tx signal pins to the Rx signal pins within each physical link. >>

IBM comment number 55

Page=137 Subtype=Highlight Author=George Penokie

Comment=

#### 5.2.3.2.2 SAS internal cable receptacle connector

This << receptacle connector on the SAS target device end. The SAS internal cable receptacle connectors are defined in SFF-8482. >> should be << receptacle connector (see SFF-8482) on the SAS target device end.>> to make the word consistent with other sections.

IBM comment number 56

Page=137 Subtype=Highlight Author=George Penokie

Comment=

#### 5.2.3.2.1 SAS plug connector

This << plug connector. The SAS plug connector is defined in SFF-8482. It >> should be << plug connector (see SFF-8482). It >> to make the word consistent with other sections.

IBM comment number 57

Page=140 Subtype=Highlight Author=George Penokie

Comment=

5.2.3.3.3 SAS external receptacle connector

This << The SAS external receptacle connector is defined in SFF-8470 as the four lane fixed (receptacle) connector with jack screws. >> should be << The SAS external receptacle connector (see SFF-8470) is a four lane fixed (receptacle)connector with jack screws. >>

IBM comment number 58

Page=140 Subtype=Highlight Author=George Penokie

Comment=

5.2.3.3.2 SAS external cable plug connector

This << The SAS external cable plug connector is defined in SFF-8470 as the four lane free (plug) connector with jack screws. >> should be << The SAS external cable plug connector (see SFF-8470) is a four lane free (plug) connector with jack screws. >>

IBM comment number 59

Page=141 Subtype=Text Author=George Penokie

Comment=

5.2.3.3.4 SAS external connector pin assignments

More of those needless broken up sentences that should be fixed.

IBM comment number 60

Page=142 Subtype=Highlight Author=George Penokie

Comment=

5.2.3.3.5 SAS external compact cable plug connector

This << Key slots are not defined by this standard. >> is not correct and should be deleted. The last paragraph states there are defined key slots.

IBM comment number 61

Page=142 Subtype=Highlight Author=George Penokie

Comment=

5.2.3.3.5 SAS external compact cable plug connector

This << The SAS external compact cable plug connector with latch is defined in SFF-8088 as the free (plug) cable connector. >> should be << The SAS external compact cable plug connector with latch (see SFF-8088) is a free (plug)cable connector. >>

IBM comment number 62

Page=143 Subtype=Highlight Author=George Penokie

Comment=

5.2.3.3.6 SAS external compact receptacle connector

This << Key slots are not defined by this standard. >> is not correct and should be deleted. The last paragraph states there are defined key slots.

IBM comment number 63

Page=143 Subtype=Highlight Author=George Penokie

Comment=

5.2.3.3.6 SAS external compact receptacle connector

This << SFF-8086 defines the receptacle mating interface (the receptacle body is common to both internal and external connectors). >> should be << SFF-8086 defines the receptacle mating interface in which the receptacle body is common to both internal and external connectors. >>

IBM comment number 64

Page=143 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.3.6 SAS external compact receptacle connector

This << The SAS external compact connector is defined in SFF-8088 as the fixed (receptacle) right angle connector. >> should be << The SAS external compact connector (see SFF-8088) is a fixed (receptacle) right angle connector.>>

IBM comment number 65

Page=144 Subtype=Text Author=George Penokie  
Comment=

5.2.3.3.7 SAS external compact connector pin assignments

More of those needless broken up sentences that should be fixed.

IBM comment number 66

Page=146 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.3.8 External compact connector keying

This should be deleted <<Editor's Note 2: keys may be incorrect >> as the figure is correct.

IBM comment number 67

Page=146 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.3.8 External compact connector keying

This should be deleted <<Editor's Note 1: keys may be incorrect >> as the figure is correct.

IBM comment number 68

Page=147 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.4.2 SAS internal wide cable receptacle connector

This << The SAS internal wide cable receptacle connector is defined in SFF-8484.

The SAS internal wide cable receptacle connector attaches to a SAS internal wide plug connector, >> should be << The SAS internal wide cable receptacle connector (see SFF-8484) attaches to a SAS internal wide plug connector, >>

IBM comment number 69

Page=147 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.3.8 External compact connector keying

This should be deleted <<Editor's Note 3: keys may be incorrect >> as the figure is correct.

IBM comment number 70

Page=148 Subtype=Text Author=George Penokie  
Comment=

5.2.3.4.4 SAS internal wide connector pin assignments

More of those needless broken up sentences that should be fixed.

IBM comment number 71

Page=148 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.4.3 SAS internal wide plug connector

This << The SAS internal wide plug connector is defined in SFF-8484. The SAS internal wide plug connector attaches to a SAS internal wide cable receptacle connector, >> should be << The SAS internal wide plug connector (see SFF-8484) attaches to a SAS internal wide cable receptacle connector, >>

IBM comment number 72

Page=150 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.4.5 SAS internal compact wide cable plug connector

This << The SAS internal compact wide cable plug connector assembly is defined in SFF-8087 as the fixed >> should be << The SAS internal compact wide cable plug connector assembly (see SFF-8087) is a fixed >>

IBM comment number 73

Page=151 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.4.6 SAS internal compact wide receptacle connector

This << The SAS internal compact wide receptacle connector is defined in SFF-8087 as the fixed (receptacle) right >> should be << The SAS internal compact wide receptacle connector (see SFF-8087) is a fixed (receptacle) right >>

IBM comment number 74

Page=152 Subtype=Text Author=George Penokie  
Comment=

5.2.3.4.7 SAS internal compact wide connector pin assignments

More of those needless broken up sentences that should be fixed.

IBM comment number 75

Page=153 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.4.7 SAS internal compact wide connector pin assignments

This << Editor's Note 4: signal assignments may be incorrect >> should be deleted as the information in the table is correct.

IBM comment number 76

Page=154 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.4.7 SAS internal compact wide connector pin assignments

Table 29

All the pin positions are incorrect in this table. Recommend adopting 05-139 as solution.

IBM comment number 77

Page=154 Subtype=Highlight Author=George Penokie  
Comment=

5.2.3.4.7 SAS internal compact wide connector pin assignments

This << Editor's Note 5: signal assignments may be incorrect >> should be deleted as the information in the table is correct.

IBM comment number 78

Page=155 Subtype=Text Author=George Penokie  
Comment=

5.2.4.1 SAS internal cables

The shall in this section relating to the internal connectors gives the impression that all internal cables are required to have SATA style cable receptacles. This is not the case as the wide internal cables do not have that requirement. This needs to be fixed but either clearly labeling this as a specific kind of internal cable or removing the shall altogether.

IBM comment number 79

Page=158 Subtype=Highlight Author=George Penokie

Comment=

5.2.4.3.1 SAS internal wide cables overview

This << other end (e.g., a Tx + of one connector shall connect to an Rx + of the other connector. The physical link number of the signal depends on the application - controller-to-controller and controller-to-backplane differ). >> should be << other end (e.g., a Tx + of one connector shall connect to an Rx + of the other connector). The physical link number of the signal depends on the application (e.g., controller-to-controller and controller-to-backplane differ). >>

IBM comment number 80

Page=160 Subtype=Square Author=George Penokie

Comment=

5.2.4.3.2 SAS internal wide symmetric cables

This << NOTE 9 - For controller to controller uses, all four physical links should be used, because one controller's physical link 0 is attached the other controller's physical link 3. If both controllers used only physical link 0, they would not communicate. >> should be << NOTE 9 - For controller to controller uses, all four physical links should be used, because one controller's physical link 0 is attached the other controller's physical link 3. If both controllers used only physical link 0, then communication is not possible. >>

IBM comment number 81

Page=161 Subtype=Highlight Author=George Penokie

Comment=

5.2.4.3.2 SAS internal wide symmetric cables

This << Editor's Note 6: signal assignments may be incorrect >> should be deleted as the information in the figure is correct.

IBM comment number 82

Page=162 Subtype=Highlight Author=George Penokie

Comment=

5.2.4.3.2 SAS internal wide symmetric cables

This << Editor's Note 7: signal assignments may be incorrect >> should be deleted as the information in the figure is correct.

IBM comment number 83

Page=165 Subtype=Highlight Author=George Penokie

Comment=

5.2.4.3.3 SAS internal wide controller-based fanout cables

This << Editor's Note 8: signal assignments may be incorrect >> should be deleted as the information in the figure is correct.

IBM comment number 84

Page=166 Subtype=Highlight Author=George Penokie

Comment=

## 5.2.4.3.4 SAS internal wide backplane-based fanout cables

This << Editor's Note 9: signal assignments may be incorrect >> should be deleted as the information in the figure is correct.

IBM comment number 85

Page=167 Subtype=Highlight Author=George Penokie  
Comment=

## 5.2.4.3.5 SAS internal compact wide cable keying

This <<Editor's Note 10: keys may be incorrect >> should be deleted as the figure is correct.

IBM comment number 86

Page=168 Subtype=Highlight Author=George Penokie  
Comment=

## 5.2.4.3.5 SAS internal compact wide cable keying

This <<Editor's Note 11: keys may be incorrect >> should be deleted as the figure is correct.

IBM comment number 87

Page=169 Subtype=Highlight Author=George Penokie  
Comment=

Global

Many of the footnote references overlay the table header line separators. This needs to be fixed as many of the b's and d's could be misinterpreted to be a's.

IBM comment number 88

Page=177 Subtype=Highlight Author=George Penokie  
Comment=

## 5.3.1 Compliance points

This << device is attached; SATA defines >> should be << device is attached because SATA defines >>

IBM comment number 89

Page=180 Subtype=Highlight Author=George Penokie  
Comment=

## 5.3.2.1 Test loads overview

There is no definition or description for the term << Gen2i >> this needs to be fixed.

IBM comment number 90

Page=186 Subtype=Highlight Author=George Penokie  
Comment=

## 5.3.3 General electrical characteristics

This << impedance dip (amplitude as  $\%961$ ;; the reflection coefficient, and duration in time) caused >> should be << impedance dip (i.e., amplitude as  $\%961$ ;; the reflection coefficient, and duration in time) caused >>

IBM comment number 91

Page=187 Subtype=Highlight Author=George Penokie  
Comment=

## 5.3.4 Transmitter and receiver device transients

This << GROUND on the test loads shown in figure 98 (for the transmitter device) and figure99 (for the receiver device) during all power state and

mode transitions. >> should be << GROUND on the test loads for the transmitter device (see figure 98) and for the receiver device (figure 99) during allpower state and mode transitions. >>

IBM comment number 92

Page=188 Subtype=Text Author=George Penokie

Comment=

5.3.6.3 Receiver device eye mask

Having all this space between the start of a sentence and the end of the sentence is not a good idea. Move the table anchor to it's own paragraph and this will not be a problem.

IBM comment number 93

Page=190 Subtype=Square Author=George Penokie

Comment=

5.3.6.4 Receiver device jitter tolerance eye mask

The << d) >> and << e) >> should be deleted. This is not an unordered list.

IBM comment number 94

Page=191 Subtype=Text Author=George Penokie

Comment=

5.3.7.3 Transmitter device signal output characteristics as measured with each test load

Having all this space between the start of a sentence and the end of the sentence is not a good idea. Move the table anchor to it's own paragraph and this will not be a problem.

IBM comment number 95

Page=192 Subtype=Highlight Author=George Penokie

Comment=

5.3.7.3 Transmitter device signal output characteristics as measured with each test load

Figure 38

This << Serial ATA >> should be <<SATA>>

IBM comment number 96

Page=192 Subtype=Highlight Author=George Penokie

Comment=

5.3.7.3 Transmitter device signal output characteristics as measured with each test load

Figure 38

This << Serial ATA >> should be <<SATA>>

IBM comment number 97

Page=192 Subtype=Highlight Author=George Penokie

Comment=

5.3.7.3 Transmitter device signal output characteristics as measured with each test load

Table 38

This <<cannot>> should be <<is not able to>>

IBM comment number 98

Page=192 Subtype=Highlight Author=George Penokie

Comment=

5.3.7.3 Transmitter device signal output characteristics as measured with



each test load

Table 38

This <<cannot>> should be <<is not able to>>

IBM comment number 99

Page=192 Subtype=Highlight Author=George Penokie

Comment=

5.3.7.3 Transmitter device signal output characteristics as measured with each test load

Table 38

This <<can>> should be <<is able to>>

IBM comment number 100

Page=192 Subtype=Highlight Author=George Penokie

Comment=

5.3.7.3 Transmitter device signal output characteristics as measured with each test load

Table 38

This <<can>> should be <<is able to>>

IBM comment number 101

Page=193 Subtype=Highlight Author=George Penokie

Comment=

5.3.7.4 Transmitter device maximum jitter

There is no definition or description for the term << Gen1i >> this needs to be fixed.

IBM comment number 102

Page=194 Subtype=Highlight Author=George Penokie

Comment=

5.3.8.1 Receiver device characteristics overview

This << The figure given assumes that any external >> should be << The value given assumes that any external >>

IBM comment number 103

Page=194 Subtype=Highlight Author=George Penokie

Comment=

5.3.8.1 Receiver device characteristics overview

This << The jitter tolerance figure is listed in figure 102 for all >> should be << The jitter tolerance value is listed in figure 102 for all >>

IBM comment number 104

Page=195 Subtype=Highlight Author=George Penokie

Comment=

5.3.8.2 Delivered signal characteristics

Figure 40

This << Serial ATA >> should be <<SATA>>

IBM comment number 105

Page=195 Subtype=Highlight Author=George Penokie

Comment=

5.3.8.2 Delivered signal characteristics

Figure 40

This << Serial ATA >> should be <<SATA>>

IBM comment number 106

Page=196 Subtype=Text Author=George Penokie

Comment=

5.3.8.4 Receiver device jitter tolerance

Having all this space between the start of a sentence and the end of the sentence is not a good idea. Move the table anchor to it's own paragraph and this will not be a problem.

IBM comment number 107

Page=197 Subtype=Highlight Author=George Penokie

Comment=

5.3.10 Non-tracking clock architecture

This << need not >> should be changed to << are not required to >>

IBM comment number 108

Page=197 Subtype=Highlight Author=George Penokie

Comment=

5.3.9 Spread spectrum clocking

This << need not >> should be changed to << are not required to >>

IBM comment number 109

Page=200 Subtype=Square Author=George Penokie

Comment=

6.2.3 8b10b coding notation conventions

The list after the << where >> should not be an a,b,c list. It should be indented and start with the named variable followed by a description with some space between See Style Guide (o5-085) for examples.

IBM comment number 110

Page=201 Subtype=StrikeOut Author=George Penokie

Comment=

6.3.3 Data and control characters

Move this << Otherwise >> to end of item b).

IBM comment number 111

Page=201 Subtype=Highlight Author=George Penokie

Comment=

6.3.3 Data and control characters

This << four-bit sub-block is 1100b. >> should be << four-bit sub-block is 1100b; otherwise >>

IBM comment number 112

Page=201 Subtype=Highlight Author=George Penokie

Comment=

6.3.3 Data and control characters

This << four-bit sub-block is 0011b. >> should be << four-bit sub-block is 0011b; >>

IBM comment number 113

Page=208 Subtype=Highlight Author=George Penokie

Comment=

6.4 Dwords, primitives, data dwords, and invalid dwords

This << which are used in SAS during STP connections >> should be << which are only used in SAS during STP connections >>

IBM comment number 114

Page=213 Subtype=Highlight Author=George Penokie

Comment=

#### 6.6.3 Receiving OOB signals

This << detected; another COMINIT may follow). >> should be << detected after which another COMINIT may follow).>>

IBM comment number 115

Page=217 Subtype=StrikeOut Author=George Penokie

Comment=

#### 6.7.2.2 SATA speed negotiation sequence

This <<Figure 110 shows the speed negotiation sequence between a SATA host and SATA device. >> along with figure 110, table 57, and the text between the figure and table should be deleted as it is information that is (or should be) defined in the referenced standards.

IBM comment number 116

Page=217 Subtype=Highlight Author=George Penokie

Comment=

#### 6.7.2.2 SATA speed negotiation sequence

This << defined by SATA; see ATA/ATAPI-7 V3 and SATA2-PHY for detailed requirements. >> should be << defined by SATA (see ATA/ATAPI-7 V3 and SATA2-PHY for detailed requirements). >>

IBM comment number 117

Page=226 Subtype=StrikeOut Author=George Penokie

Comment=

#### 6.8.1 SP state machine overview

This << A COMWAKE Detected message received in SP0:OOB\_COMINIT or SP1:OOB\_AwaitCOMX shall set the COMWAKE\_Received state machine variable to one. Any transition to SP0:OOB\_COMINIT shall set the COMWAKE\_Received state machine variable to zero. >> should be deleted and, if not already there, be placed in the relevant state transitions.

IBM comment number 118

Page=226 Subtype=Highlight Author=George Penokie

Comment=

#### 6.8.1 SP state machine overview

This << Any transition out of SP7:OOB\_AwaitCOMSAS shall set the MgmtReset state machine variable to zero. >> seems to contradict when is currently in SP0 and implies that the MgmtResedt is always set to zero when SP0 is exited. This seems to nullify it usefulness. I think the sentence should be deleted.

IBM comment number 119

Page=226 Subtype=Highlight Author=George Penokie

Comment=

#### 6.8.1 SP state machine overview

This is a mess << The SP state machine shall maintain a MgmtReset state machine variable to indicate whether SP0:OOB\_COMINIT was last entered due to a Management Reset, or a defined transition from another state (see 6.8.3.2.1). If SP0:OOB\_COMINIT was last entered due to a Management Reset, it shall set the MgmtReset statemachine variable to one. If SP0:OOB\_COMINIT was last entered by a defined transition from another state, it shall set the MgmtReset state machine variable to zero. >>. I think it should be

restated like this << TheSP state machine shall maintain a MgmtReset state machine variable to indicate whether when Management Reset request is received. Any SP state that receives a Management Reset request shall set the MgmtReset state machine variable to one before making the transition to the SP7:OOB\_AwaitCOMSAS state. Any SP state that receives a power on, or a hard reset shall set the MgmtReset state machine variable to one the transition to the SP7:OOB\_AwaitCOMSAS state. >> Note that the other cases that case theMgmtRest variable to be set to zero are not global and therefore have to be handled in the state were the action occurs in the description of the transition.

IBM comment number 120

Page=227 Subtype=Highlight Author=George Penokie

Comment=

6.8.2 SP transmitter and receiver

This << SP transmitter transmits idle time. >> should be << SP transmitter transmits idle dwords.>>

IBM comment number 121

Page=228 Subtype=Text Author=George Penokie

Comment=

6.8.3.1 OOB sequence states overview

Figure 117

The transition into SP0 from SP26 is missing. This needs to be fixed.

IBM comment number 122

Page=228 Subtype=Text Author=George Penokie

Comment=

6.8.3.1 OOB sequence states overview

Figure 117

All the comments on the state to state transitions within this figure should be deleted.

IBM comment number 123

Page=229 Subtype=Text Author=George Penokie

Comment=

6.8.3.2.4 Transition SP0:OOB\_COMINIT to SP4:OOB\_COMSAS

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 124

Page=229 Subtype=Text Author=George Penokie

Comment=

6.8.3.2.3 Transition SP0:OOB\_COMINIT to SP3:OOB\_AwaitCOMINIT\_Sent

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 125

Page=229 Subtype=Square Author=George Penokie

Comment=

6.8.3.2.1 State description

The behavior defined in this paragraph <<The state machine shall set the MgmtReset state machine variable to one if this state is entered due to a Management Reset request or SMP Reset request. The state machine shall set the MgmtReset state machine variable to zero if this state is entered due to

a power on, a hard reset, DWS Lost message received, or COMINIT received.  
 >> should be deleted as it is duplicate information. Part of the information that covers global SP behavior is in the SP state machine. The remaining part has to be placed into the state at which the event occurs before making the transition to SPO.

IBM comment number 126

Page=229 Subtype=StrikeOut Author=George Penokie  
 Comment=

6.8.3.2.1 State description

This << or SMP Reset request. >> should be deleted as there is not sure thing as an SMP Reset in SAS.

IBM comment number 127

Page=229 Subtype=Highlight Author=George Penokie  
 Comment=

6.8.3.3.1 State description

This << machine variable to one; and then if the value of the ATTACHED SATA PORT >> should be << machine variable to one, and if the value of the ATTACHED SATA PORT >>

IBM comment number 128

Page=230 Subtype=Highlight Author=George Penokie  
 Comment=

6.8.3.6.1 State description

This << DISCOVER response, it shall set the ATTACHED >> should be << DISCOVER response, this state shall set the ATTACHED >>

IBM comment number 129

Page=231 Subtype=Text Author=George Penokie  
 Comment=

6.8.3.8.2 Transition SP6:OOB\_AwaitNoCOMSAS to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 130

Page=231 Subtype=Highlight Author=George Penokie  
 Comment=

6.8.3.8.3 Transition SP6:OOB\_AwaitNoCOMSAS to SP8:SAS\_Start

So what is the point of this statement <<The COMSAS Completed message may be received before this state is entered. >>? There is an implication that the state is supposed to remember it this occurred which is impossible. So what is supposed to happen is the message is missed?

IBM comment number 131

Page=231 Subtype=Highlight Author=George Penokie  
 Comment=

6.8.3.6.3 Transition SP4:OOB\_COMSAS to SP6:OOB\_AwaitNoCOMSAS

This << send a SATA Port Selector Change confirmation to the link layer. >> should be << send a SATA Port Selector Change confirmation to the link layer before the transition. >>

IBM comment number 132

Page=231 Subtype=Highlight Author=George Penokie  
 Comment=

## 6.8.3.6.2 Transition SP4:00B\_COMSAS to SP5:00B\_AwaitCOMSAS\_Sent

This << response and send a SATA Port Selector Change confirmation to the linklayer. >> should be << response and send a SATA Port Selector Change confirmation to the link layer before the transition. >>

IBM comment number 133

Page=232 Subtype=Highlight Author=George Penokie

Comment=

## 6.8.3.9.5 Transition SP7:00B\_AwaitCOMSAS to SP26:SATA\_SpinupHold

This << This state shall send a SATA Spinup Hold confirmation to the link layer and perform this transition if. >> should be << This transition shall occur if: >> Also after the a.b.c list the following should be added << This state shall send a SATA Spinup Hold confirmation to the link layer before the transition. >>

IBM comment number 134

Page=232 Subtype=Highlight Author=George Penokie

Comment=

## 6.8.3.9.3 Transition SP7:00B\_AwaitCOMSAS to SP6:00B\_AwaitNoCOMSAS

This << shall send a SATA Port Selector Change confirmation to the link layer. >> should be << shall send a SATA Port Selector Change confirmation to the link layer before the transition. >>

IBM comment number 135

Page=232 Subtype=Highlight Author=George Penokie

Comment=

## 6.8.3.9.3 Transition SP7:00B\_AwaitCOMSAS to SP6:00B\_AwaitNoCOMSAS

This <<state machine variable to zero. >> should be << state machine variable to zero before the transition. >>

IBM comment number 136

Page=233 Subtype=Text Author=George Penokie

Comment=

## 6.8.4.1 SAS speed negotiation states overview

Figure 118

All the comments on the state to state transitions within this figure should be deleted.

IBM comment number 137

Page=234 Subtype=Text Author=George Penokie

Comment=

## 6.8.4.2.2 Transition SP8:SAS\_Start to SPO:00B\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 138

Page=234 Subtype=Text Author=George Penokie

Comment=

## 6.8.4.4.2 Transition SP10:SAS\_AwaitALIGN to SPO:00B\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 139

Page=234 Subtype=StrikeOut Author=George Penokie

Comment=

## 6.8.4.2.1 State description

This <<This allows time required for a transmitter to switch to either the next higher or next lower supported speed >> contains no useful information and should be deleted. Any information it does have has already been stated in the description of the speednegotiation sequence above.

IBM comment number 140

Page=235 Subtype=Text Author=George Penokie

Comment=

6.8.4.6.2 Transition SP12:SAS\_AwaitSNW to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 141

Page=235 Subtype=Text Author=George Penokie

Comment=

6.8.4.5.2 Transition SP11:SAS\_AwaitALIGN1 to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 142

Page=235 Subtype=StrikeOut Author=George Penokie

Comment=

6.8.4.5.4 Transition SP11:SAS\_AwaitALIGN1 to SP14:SAS\_Fail

This << This indicates that the other phy has not been able to lock at the current rate. >> should be deleted. Any information it does have has already been stated in the description of the speed negotiation sequence above

IBM comment number 143

Page=236 Subtype=Text Author=George Penokie

Comment=

6.8.4.7.2 Transition SP13:SAS\_Pass to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 144

Page=237 Subtype=Text Author=George Penokie

Comment=

6.8.4.9.2 Transition SP15:SAS\_PHY\_Ready to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 145

Page=238 Subtype=Text Author=George Penokie

Comment=

6.8.5.1 SATA host emulation states overview

Figure 119

All the comments on the state to state transitions within this figure should be deleted.

IBM comment number 146

Page=239 Subtype=Text Author=George Penokie

Comment=

6.8.5.4.2 Transition SP187:SATA\_AwaitNoCOMWAKE to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 147

Page=239 Subtype=Text Author=George Penokie

Comment=

6.8.5.3.2 Transition SP17:SATA\_AwaitCOMWAKE to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 148

Page=239 Subtype=Text Author=George Penokie

Comment=

6.8.5.5.2 Transition SP19:SATA\_AwaitALIGN to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 149

Page=240 Subtype=Text Author=George Penokie

Comment=

6.8.5.8.2 Transition SP22:SATA\_PHY\_Ready to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 150

Page=240 Subtype=Text Author=George Penokie

Comment=

6.8.5.7.2 Transition SP21:SATA\_TransmitALIGN to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 151

Page=240 Subtype=Text Author=George Penokie

Comment=

6.8.5.6.2 Transition SP20:SATA\_AdjustSpeed to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 152

Page=241 Subtype=Text Author=George Penokie

Comment=

6.8.5.10.2 Transition SP24:SATA\_PM\_Slumber to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 153

Page=241 Subtype=Text Author=George Penokie

Comment=

6.8.5.9.2 Transition SP23:SATA\_PM\_Partial to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 154

Page=242 Subtype=Highlight Author=George Penokie

Comment=



### 6.8.6.3 Transition SP25:SATA\_PortSelectionSignalPending to SP1:00B\_AwaitCOMX

This transition shall occur when the phy completes transmission of the SATA port selection signal (SATA Port Selection Signal Transmitted). >> should be << This transition shall occur after receiving a SATA Port Selection Signal Transmitted message. >>

IBM comment number 155

Page=242 Subtype=Highlight Author=George Penokie

Comment=

### 6.8.6.2 Transition SPx:<any state> to SP25:SATA\_PortSelectionSignalPending

This << The phy shall transmit the SATA port selection signal. This transition shall set the ATTACHED SATA PORT SELECTOR bit in the DISCOVER response to zero. >> should be placed in the states overview and changed to << Upon entry into this state, this state shall:  
a) send a SATA port selection signal to the SP transmitter; and  
b) set the ATTACHED SATA PORT SELECTOR bit in the DISCOVER response to zero. >>

IBM comment number 156

Page=242 Subtype=StrikeOut Author=George Penokie

Comment=

### 6.8.6.2 Transition SPx:<any state> to SP25:SATA\_PortSelectionSignalPending

This << If the phy supports attachment of a SATA device and attachment of a SATA Port Selector, a transition shall occur from any SP state to this state upon receipt of an SMP PHY CONTROL function for the phy specifying a phy operation of TRANSMIT SATA PORT SELECTION SIGNAL. >> will be redundant (see general comment on this section) and should be deleted.

IBM comment number 157

Page=242 Subtype=Text Author=George Penokie

Comment=

### 6.8.6.1 State description

This section is not properly formatted and as such is different than any other state description section in SAS. This has been fixed. For one thing there should only be one state shown. The SPx representation is not correct. The SMP Phy Control request should be handled like the Power on or hard reset or Management Reset request. And it should be placed in all the SP state machine figures not just this one.

There is no description of the transmitter and receiver signals.

The SPx to SP25 transition should not be here. It should be handled in the same fashion as the Power on or hard reset or Management Reset request.

There are other points that I have not described that also need fixing. In general make it look like it belongs in SAS.

IBM comment number 158

Page=242 Subtype=Text Author=George Penokie

Comment=

### 6.8.6.1 State description

Figure 120

All the comments on the state to state transitions within this figure should be deleted.

IBM comment number 159

Page=243 Subtype=Circle Author=George Penokie

Comment=

6.8.7.1 State description

Figure 121

There is no description as to under what conditions the << (in expander phys) SATA Spinup Hold >> confirmation is sent. This needs to be fixed.

IBM comment number 160

Page=243 Subtype=StrikeOut Author=George Penokie

Comment=

6.8.7.1 State description

Figure 121

This << Reset or >> on the transitions to SPO should be deleted as it is handled in the general description of the power on or hard reset or Management Reset description in the SP overview.

IBM comment number 161

Page=243 Subtype=Text Author=George Penokie

Comment=

6.8.7.2 Transition SP26:SATA\_SpinupHold to SPO:OOB\_COMINIT

Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

IBM comment number 162

Page=243 Subtype=StrikeOut Author=George Penokie

Comment=

6.8.7.2 Transition SP26:SATA\_SpinupHold to SPO:OOB\_COMINIT

This << a Management Reset request from the management layer, a hard reset, or a power on. If this transition is caused by a Management Reset Request from the management layer, the state machine shall set the MgmtReset state machine variable to one upon entry to SPO:OOB\_COMINIT. Otherwise, the state machine shall set the MgmtReset state machine variable to zero upon entry to SPO:OOB\_COMINIT. >> should be deleted as it is duplicate information that is stated in the general description of the Reset or Power on or hard reset or Management Reset request.

IBM comment number 163

Page=243 Subtype=Square Author=George Penokie

Comment=

6.8.7.1 State description

Figure 121

The << Reset or Power on or hard reset or Management Reset >> request should be handled in this figure the same way it is in all the other SP figures.

IBM comment number 164

Page=243 Subtype=StrikeOut Author=George Penokie

Comment=

6.8.7.1 State description

This << This state shall be entered from the SP7:OOB\_AwaitCOMSAS state upon detection of a COMSAS detect timeout if the phy supports SATA, the phy supports SATA spinup hold, and the MgmtReset state machine variable is set to zero. >> should be deleted as it is already defined in the SP7 to SP26 description. The convention is to only specify the transition rule on the out not on the in.

IBM comment number 165

Page=250 Subtype=Highlight Author=George Penokie  
Comment=

#### 7.2.1 Primitives overview

This << Primitives are not considered big-endian or little-endian; they are just >> should be << Primitives are not considered big-endian or little-endian, they are just >>

IBM comment number 166

Page=275 Subtype=Highlight Author=George Penokie  
Comment=

#### 7.5.1 CRC overview

note 27

This << one's complement of R(x); this equation is specifying that the R(x) is inverted before it is transmitted. >> should be << one's complement of R(x) resulting in this equation specifying that the R(x) is inverted before it is transmitted. >>.

IBM comment number 167

Page=277 Subtype=Highlight Author=George Penokie  
Comment=

#### 7.5.1 CRC overview

This << Thus, the first byte contains the least-significant bit. >> should be << As a result, the first byte contains the least-significant bit. >>

IBM comment number 168

Page=287 Subtype=Highlight Author=George Penokie  
Comment=

#### 7.8.3 OPEN address frame

This << connection rate; the SAS target port should not close the connection just to reopen the connection at the saved connection rate. >> should be << connection rate (i.e., the SAS target port should not close the connection just to reopen the connection at the saved connection rate). >>

IBM comment number 169

Page=299 Subtype=Highlight Author=George Penokie  
Comment=

#### 7.12.3 Arbitration fairness

This << NOTE 31 - NOTE 1 Connection responses that are conclusively from the destination >> should be << NOTE 31 -Connection responses that are conclusively from the destination >>

IBM comment number 170

Page=302 Subtype=Highlight Author=George Penokie  
Comment=

#### 7.12.5.2 Edge expander devices

This << OPEN\_REJECT (BAD DESTINATION); it should reply with OPEN\_REJECT (NO DESTINATION). >> should be <<OPEN\_REJECT (BAD DESTINATION). In this case the edge expander device should reply with OPEN\_REJECT (NO DESTINATION). >>

IBM comment number 171

Page=303 Subtype=Text Author=George Penokie

Comment=

#### 7.12.6 Aborting a connection request

Seemed to me there should be some wording here about the new BREAK stuff we just added in.

IBM comment number 172

Page=303 Subtype=Highlight Author=George Penokie

Comment=

#### 7.12.6 Aborting a connection request

This is not at all clear << Table 96 lists the responses to a BREAK being transmitted before a connectionresponse has been received.>> I believe it should be << Table 96 lists the responses to a BREAK being received before a connection response hasbeen received.>>

IBM comment number 173

Page=303 Subtype=Highlight Author=George Penokie

Comment=

#### 7.12.5.3 Fanout expander devices

This << OPEN\_REJECT (BAD DESTINATION); it should reply with OPEN\_REJECT (NO DESTINATION). >> should be <<OPEN\_REJECT (BAD DESTINATION). In this case the fanout expander device should reply with OPEN\_REJECT (NO DESTINATION). >>

IBM comment number 174

Page=305 Subtype=Highlight Author=George Penokie

Comment=

#### 7.12.7 Closing a connection

This in not clear << Table 97 lists the responses to a CLOSE being transmitted. >> I believe it should be << Table 97 lists the responses to a CLOSE being received.>>

IBM comment number 175

Page=306 Subtype=Highlight Author=George Penokie

Comment=

#### 7.12.8 Breaking a connection

This statement in not at all clear << Table 98 lists the responses to a BREAK being transmitted after a connection has been established. >> I believe it should be changed to << Table 98 lists the responses to a BREAK being received after a connection has been established. >>

IBM comment number 176

Page=306 Subtype=Highlight Author=George Penokie

Comment=

#### 7.12.8 Breaking a connection

This is no longer correct << After transmitting BREAK, the originating phy shall ignore all incoming dwords except for BREAKs. >> It should be << After transmitting BREAK, the originating phy shall ignore all incoming dwords except for BREAKs and OPENS. >>

IBM comment number 177

Page=315 Subtype=Highlight Author=George Penokie

Comment=

#### 7.14.4.3.3 Transition SL\_CC1:ArbSel to SL\_CC2:Selected

This << arbitration wait time argument to the Open Connection request for >> should be << arbitration wait time argument from the Open Connection

request for >>

IBM comment number 178

Page=318 Subtype=Highlight Author=George Penokie

Comment=

#### 7.14.4.6.1 State description

In the statement <<send a Transmit CLOSE (Normal) message or Transmit CLOSE (Clear Affiliation) message to theSL transmitter; >> there is no indication as to when which message is to be sent. This needs to be fixed.

IBM comment number 179

Page=319 Subtype=Highlight Author=George Penokie

Comment=

#### 7.15.1 XL state machine overview

This << facilitated by the expander function - specifically the ECM and ECR. >> should be << facilitated by the expander function (i.e., the ECM and ECR). >>

IBM comment number 180

Page=319 Subtype=Highlight Author=George Penokie

Comment=

#### 7.14.4.9.1 State description

In the statement <<send a Transmit CLOSE (Normal) message or Transmit CLOSE (Clear Affiliation) message to theSL transmitter; >> there is no indication as to when which message is to be sent. This needs to be fixed.

IBM comment number 181

Page=326 Subtype=Highlight Author=George Penokie

Comment=

#### 7.15.4.1 State description

This << If the Partial Pathway Timeout timer expires, timeout status is conveyed to the expander connection manager via the partial pathway timeout status argument in the Request Path request. >> should be <<

If the Partial Pathway Timeout timer expires a Request Path request shall be sent to the xxx with the partial pathway timeout status argument. >>

IBM comment number 182

Page=326 Subtype=Highlight Author=George Penokie

Comment=

#### 7.15.4.1 State description

This << set to IGNORE AWT; otherwise, the Retry Priority Status argument shall be set to NORMAL. >> should be << set to IGNORE AWT. If this state is entered from any other state then the Retry Priority Status argument shall be set to NORMAL. >>

IBM comment number 183

Page=329 Subtype=Highlight Author=George Penokie

Comment=

#### 7.15.7.2 Transition XL4:Open\_Reject to XL0:Idle

This << This transition shall occur after OPEN\_REJECT has been transmitted. >> should be << This transition shall occur after the OPEN\_REJECT message has been sent to the XL transmitter. >>. Note that there is no response from the XL transmitter in the XL state machine figure. So if you really want to wait until the OPEN\_REJECT is transmitted then that will have to be added into the figure and the XL transmitter section.

IBM comment number 184

Page=329 Subtype=Highlight Author=George Penokie

Comment=

7.15.6.6 Transition XL3:Open\_Confirm\_Wait to XL9:Break

This << This transition shall occur after sending a Forward Break request.  
>> should be << This transition shall occur after sending a Forward Break  
request to the ????. >>

IBM comment number 185

Page=330 Subtype=Highlight Author=George Penokie

Comment=

7.15.9.1 State description

This << ECR to a source phy, received by the source phy as confirmations:  
>> should be << ECR to a source phy that are received by the source phy as  
confirmations: >>

IBM comment number 186

Page=330 Subtype=Highlight Author=George Penokie

Comment=

7.15.9.1 State description

Several of the items in this a,b,c list contain long confusing lists of  
things written out in a single sentence. These should be made in A,B,C  
lists so the rules are clear.

IBM comment number 187

Page=330 Subtype=Highlight Author=George Penokie

Comment=

7.15.9.1 State description

This << ECR to a source phy, received by the source phy as confirmations:  
>> should be << ECR to a source phy that are received by the source phy as  
confirmations: >>

IBM comment number 188

Page=331 Subtype=Highlight Author=George Penokie

Comment=

7.15.9.6 Transition XL6:Open\_Response\_Wait to XL9:Break

This << This transition shall occur after sending a Forward Break response.  
>> should be << This transition shall occur after sending a Forward Break  
response to the ????. >>

IBM comment number 189

Page=331 Subtype=Highlight Author=George Penokie

Comment=

7.15.9.5 Transition XL6:Open\_Response\_Wait to XL7:Connected

This << This transition shall occur after sending an Open Accept response.  
>> should be << This transition shall occur after sending an Open Accept  
response to the ????. >>

IBM comment number 190

Page=331 Subtype=Highlight Author=George Penokie

Comment=

7.15.9.4 Transition XL6:Open\_Response\_Wait to XL2:Request\_Open

This << This transition shall occur after sending a Backoff Reverse Path  
response. >> should be << This transition shall occur after sending a

Backoff Reverse Path response to the ???. >>

IBM comment number 191

Page=331 Subtype=Highlight Author=George Penokie

Comment=

7.15.9.3 Transition XL6:Open\_Response\_Wait to XL1:Request\_Path

This << This transition shall occur after sending a Backoff Retry response, after releasing path resources. >> should be << This transition shall occur after:

- a) sending a Backoff Retry response to the ???; and
- b) after releasing path resources. >>

IBM comment number 192

Page=331 Subtype=Highlight Author=George Penokie

Comment=

7.15.9.2 Transition XL6:Open\_Response\_Wait to XL0:Idle

This << This transition shall occur after sending an Open Reject response. >> should be << This transition shall occur after sending an Open Reject response to the ?????. >>

IBM comment number 193

Page=331 Subtype=Highlight Author=George Penokie

Comment=

7.15.9.1 State description

This << This state shall repeatedly send a Phy Status (Partial Pathway) response to the ECM. >> should be << This state shall repeatedly send a Phy Status (Partial Pathway) response to the ECM until an AIP Received (Waiting On Partial) message is received. >>

IBM comment number 194

Page=332 Subtype=Highlight Author=George Penokie

Comment=

7.15.11.2 Transition XL8:Close\_Wait to XL0:Idle

This << This transition shall occur after sending a Forward Close request. >> should be << This transition shall occur after sending a Forward Close request to the ???.>>

IBM comment number 195

Page=332 Subtype=Highlight Author=George Penokie

Comment=

7.15.10.3 Transition XL7:Connected to XL9:Break

This << This transition shall occur after sending a Forward Break request. >> should be << This transition shall occur after sending a Forward Break request to the ?????. >>

IBM comment number 196

Page=333 Subtype=Highlight Author=George Penokie

Comment=

7.15.11.3 Transition XL8:Close\_Wait to XL9:Break

This << This transition shall occur after sending a Forward Break request. >> should be << This transition shall occur after sending a Forward Break request to the ?????. >>

IBM comment number 197

Page=333 Subtype=Highlight Author=George Penokie

Comment=

#### 7.15.13.1 State description

This << Upon entry into this state, this state shall send: >> should be << Upon entry into this state, this state shall: >>

IBM comment number 198

Page=344 Subtype=Highlight Author=George Penokie

Comment=

#### 7.16.7.5 SSP\_D (DONE control) state machine

This << the SSP transmitter is going to close the connection within 1 ms; other DONE Received confirmations >> should be << the SSP transmitter is going to close the connection within 1 ms. Other DONE Received confirmations >>

IBM comment number 199

Page=348 Subtype=Highlight Author=George Penokie

Comment=

#### 7.16.7.10 SSP\_TC (transmit credit control) state machine

This << (e.g., if the Available argument indicates 5 RRDYs are to be transmitted this state machine sends 5 Transmit RRDY (Normal) messages to the SSP transmitter). >> should be << (e.g., if the Available argument indicates five RRDYs are to be transmitted this state machine sends five Transmit RRDY (Normal) messages to the SSP transmitter). >>

IBM comment number 200

Page=348 Subtype=Highlight Author=George Penokie

Comment=

#### 7.16.7.8 SSP\_RCM (receive frame credit monitor) state machine

This <<(e.g., if this state machine has resources for 5 frames the maximum number of Rx Credit Control requests with the Available argument outstanding is 5). >> should be << (e.g., if this state machine has resources for five frames the maximum number of Rx Credit Control requests with the Available argument outstanding is five). >>

IBM comment number 201

Page=352 Subtype=StrikeOut Author=George Penokie

Comment=

#### 7.17.4 Affiliations

This << This avoids confusing the SATA device, which only knows about one SATA host. >> should be deleted as it has no value in a standard.

IBM comment number 202

Page=352 Subtype=Highlight Author=George Penokie

Comment=

#### 7.17.3 STP flow control

This<< within 21 dwords (for a SATA physical link)>> Should be << within 21 dwords for a SATA physical link>>

IBM comment number 203

Page=352 Subtype=Highlight Author=George Penokie

Comment=

#### 7.17.3 STP flow control

This << within 24 dwords (for a 1,5 Gbps physical link). >> should be << within 24 dwords for a 1,5 Gbps physical link. >>



IBM comment number 204

Page=352 Subtype=Highlight Author=George Penokie  
Comment=

7.17.3 STP flow control

This << within 24 dwords (for a 1,5 Gbps physical link). >> should be << within 24 dwords for a 1,5 Gbps physical link. >>

IBM comment number 205

Page=359 Subtype=Highlight Author=George Penokie  
Comment=

7.18.4.3.4 SMP\_IP3:Receive\_Frame state

This << this state receives fewer than 2 Data Dword Received messages after an SOF Received message and before an EOF Received message. >> should be << this state receives fewer than two Data Dword Received messages after an SOF Received message and before an EOF Received message. >>

IBM comment number 206

Page=361 Subtype=Highlight Author=George Penokie  
Comment=

7.18.4.4.3 SMP\_TP2:Transmit\_Frame state

This << If this state receives a Tx Frame request, this state shall send a Transmit Frame message to the SMP transmitter; then wait for a Frame Transmitted message. >> should be << If this state receives a Tx Frame request, this state shall send a Transmit Frame message to the SMP transmitter then wait for a Frame Transmitted message. >>

IBM comment number 207

Page=361 Subtype=Highlight Author=George Penokie  
Comment=

7.18.4.4.2.1 State description

This << this state receives fewer than 2 Data Dword Received messages after an SOF Received message and before an EOF Received message. >> should be << this state receives fewer than two Data Dword Received messages after an SOF Received message and before an EOF Received message. >>

IBM comment number 208

Page=369 Subtype=Highlight Author=George Penokie  
Comment=

8.2.2.3.3 PL\_OC2:Overall\_Control state connection established

This << stop the I\_T Nexus Loss timer for the SAS address (if the timer has been running); >> should be << if the timer has been running then stop the I\_T Nexus Loss timer for the SAS address ; >>

IBM comment number 209

Page=370 Subtype=Highlight Author=George Penokie  
Comment=

8.2.2.3.4 PL\_OC2:Overall\_Control state unable to establish a connection

This << stop the I\_T Nexus Loss timer (if the timer has been running); >> should be << if the timer has been running then stop the I\_T Nexus Loss timer ; >>

IBM comment number 210

Page=378 Subtype=Highlight Author=George Penokie  
Comment=

## 8.2.3.4.1 PL\_PM3:Connected state description

This << If this state receives a Tx Frame message, this state shall send a Tx Frame request to the link layer. >> should be << If this state receives a Tx Frame message, then this state shall send a Tx Frame request to the link layer. >>

IBM comment number 211

Page=378 Subtype=Highlight Author=George Penokie  
Comment=

## 8.2.3.4.1 PL\_PM3:Connected state description

This << stop the Bus Inactivity Time Limit timer, if it is running; >> should be << if it is running then stop the Bus Inactivity Time Limit timer; >>

IBM comment number 212

Page=379 Subtype=Highlight Author=George Penokie  
Comment=

## 8.2.3.4.1 PL\_PM3:Connected state description

This << or a Phy Disabled confirmation after sending a Transmission Status (Frame Transmitted) confirmation, but before this state receives an ACK Received or NAK Received confirmation, >> should be << or a Phy Disabled confirmation aftersending a Transmission Status (Frame Transmitted) confirmation, before this state receives an ACK Received or NAK Received confirmation, >>

IBM comment number 213

Page=384 Subtype=Highlight Author=George Penokie  
Comment=

## 9.2.1 SSP frame format

This << dataoffset >> should be in smallcaps.

IBM comment number 214

Page=385 Subtype=StrikeOut Author=George Penokie  
Comment=

## 9.2.1 SSP frame format

This << This may be useful when the SSP target port has more than one XFER\_RDY frame outstanding (i.e., the SSP targetport has transmitted an XFER\_RDY frame for each of two or more commandsand has not yet received all the write data for them). >> should be deleted as it has no value in a standard.

IBM comment number 215

Page=386 Subtype=Highlight Author=George Penokie  
Comment=

## 9.2.2.1 COMMAND information unit

This << target port comply with SAS-1.1 or later >> should be << target port comply with this standard >>

IBM comment number 216

Page=387 Subtype=Highlight Author=George Penokie  
Comment=

## 9.2.2.1 COMMAND information unit

This << (e.g., a six-byte CDB occupies the first six bytes of the CDB field; the remaining ten bytes are ignored; and the ADDITIONAL CDB BYTES field is not present).>> should be << (e.g., a six-byte CDB occupies the

first six bytes of the CDB field,the remaining ten bytes are ignored, and the ADDITIONAL CDB BYTES fieldis not present).>>

IBM comment number 217

Page=388 Subtype=Highlight Author=George Penokie  
Comment=

#### 9.2.2.2 TASK information unit

This << The TARGET RESET task management function defined in SAM-3 is not supported. >> is not correct as SAAM-3does not define target reset. SAM-2 does. I think this should be deleted rather than adding a reference to SAM-2.

IBM comment number 218

Page=389 Subtype=Text Author=George Penokie  
Comment=

#### 9.2.2.3 XFER\_RDY information unit

This statement << The information contained within a XFER\_RDY shall be maintained across connections. >> needs to be added into the 1st paragraph of this section.

IBM comment number 219

Page=390 Subtype=Text Author=George Penokie  
Comment=

#### 9.2.2.5.1 RESPONSE information unit overview

Having all this space between the start of a sentence and the end of the sentence is not a good idea. Move the table anchor to it's own paragraph and this will not be a problem.

IBM comment number 220

Page=392 Subtype=StrikeOut Author=George Penokie  
Comment=

#### 9.2.2.5.3 RESPONSE information unit RESPONSE\_DATA format

This << Other lengths are reserved for future standardization; >> should be deleted as it states nothing useful. All values that are reserved are reserved for future standardization.

IBM comment number 221

Page=393 Subtype=Highlight Author=George Penokie  
Comment=

#### 9.2.2.5.4 RESPONSE information unit SENSE\_DATA format

This << need not >> should be changed to << is not required to >>

IBM comment number 222

Page=399 Subtype=Highlight Author=George Penokie  
Comment=

#### 9.2.4.6 RESPONSE frame - handling of link layer errors

This << machine retransmits the RESPONSE frame at least one time with the RETRANSMIT bit set to zero >> should be << machine retransmits the RESPONSE frame atleast one time with the RETRANSMIT bit set to one >>

IBM comment number 223

Page=399 Subtype=Highlight Author=George Penokie  
Comment=

#### 9.2.4.6 RESPONSE frame - handling of link layer errors

This << same I\_T\_L\_Q nexus, the ST\_TFR state machine discards the extra RESPONSE frame (see 9.2.6.3.2). >> should be << same I\_T\_L\_Q nexus, the ST\_IFR state machine discards the extra RESPONSE frame (see x.x.x.x). >>

IBM comment number 224

Page=399 Subtype=Text Author=George Penokie

Comment=

9.2.5.2 SSP initiator port error handling summary

Add a then to all the if statements so they all read <<If ....then ... >>

IBM comment number 225

Page=399 Subtype=Highlight Author=George Penokie

Comment=

9.2.4.6 RESPONSE frame - handling of link layer errors

This << If the ST\_TFR state machine and the ST\_TTS state machine not previously received the RESPONSE frame, they considers the RESPONSE frame to be the valid RESPONSE frame. >> needs help how about << If the ST\_IFR state machine has not previously received the RESPONSE frame, the ST\_IFR should consider the RESPONSE frame to be the valid RESPONSE frame. >>

IBM comment number 226

Page=400 Subtype=Highlight Author=George Penokie

Comment=

9.2.5.3 SSP target port error handling summary

This << a TASK frame with a tag that is already in used for a command or another task management function, >> should be << a TASK frame with a tag that is already in use for a command or another task management function, >>

IBM comment number 227

Page=400 Subtype=Highlight Author=George Penokie

Comment=

9.2.5.2 SSP initiator port error handling summary

This << If an SSP initiator port receives a read DATA frame with a data offset that was not expected, the ST\_ITS state machine discards that frame and any subsequent read DATA frames received for that command >> would be clearer if changed to << If an SSP initiator port receives a read DATA frame with a data offset that was not expected (see 9.2.6.2.3.7.1), the ST\_ITS state machine discards that frame and any subsequent read DATA frames receivedfor that command >>

IBM comment number 228

Page=400 Subtype=Highlight Author=George Penokie

Comment=

9.2.5.2 SSP initiator port error handling summary

This << If an SSP initiator port receives an XFER\_RDY frame that is not 12 bytes long, he ST\_IFR state machine >> should be << If an SSP initiator port receives an XFER\_RDY frame that is not 12 bytes long, the ST\_IFR state machine >>

IBM comment number 229

Page=400 Subtype=Text Author=George Penokie

Comment=

9.2.5.3 SSP target port error handling summary

Add a then to all the if statements so they all read <<If ....then ... >>

IBM comment number 230

Page=400 Subtype=Highlight Author=George Penokie  
Comment=

9.2.5.3 SSP target port error handling summary

This << the ST\_TFR state machine may process this as an I\_T nexus >> should be << then, the ST\_TFR state machine may process this as an I\_T nexus >>

IBM comment number 231

Page=400 Subtype=Highlight Author=George Penokie  
Comment=

9.2.5.3 SSP target port error handling summary

This << the ST\_TTS state machine returns a RESPONSE frame with the DATAPRES>> should be << then, the ST\_TTS state machine returns a RESPONSE frame with the DATAPRES>>

IBM comment number 232

Page=401 Subtype=Text Author=George Penokie  
Comment=

9.2.6 ST (transport layer for SSP ports) state machines

During review of SAS 1.1 transport layer state machine descriptions it became apparent that the frame level retry description in the state machines was not complete and that the states in state machines that contained more than one state were not passing arguments. There appeared to be an assumption that a state would always have the information it wanted without regard as to where the information came from.

This proposal 05-143 addresses both those problems.

The comments included with these comments, for the most part, are not included in 05-143 and should be treated as independent of 05-143.

IBM comment number 233

Page=401 Subtype=Square Author=George Penokie  
Comment=

9.2.6.1 ST state machines overview

Remove the << the >> from all the items in the a.b.c list. The items should read as <<a) tag;

b) destination SAS address; and

c) source SAS address;

IBM comment number 234

Page=401 Subtype=Highlight Author=George Penokie  
Comment=

9.2.6.1 ST state machines overview

This << b) Frame Received;

include the following as arguments: >> should be << b) Frame Received.

The confirmations include the following as arguments: >>

IBM comment number 235

Page=403 Subtype=Text Author=George Penokie  
Comment=

9.2.6.2.1 ST\_I state machines overview

What happens if a cancel message is sent to the ST\_ITS6 state if the state machine is in the ST\_ITS7 state. Under the current description it would be missed. Is that OK?

IBM comment number 236

Page=403 Subtype=Text Author=George Penokie

Comment=

9.2.6.2.1 ST\_I state machines overview

What happens if a cancel message is sent to the ST\_ITS2 state if the state machine is in the ST\_ITS3, ST\_ITS4, or ST\_ITS5 states. Under the current description it would be missed. Is that OK?

IBM comment number 237

Page=403 Subtype=Square Author=George Penokie

Comment=

9.2.6.2.1 ST\_I state machines overview

Figure 168

The background around the << HARD\_RESET Received (to all state machines) >> confirmation should be changed from white to none.

IBM comment number 238

Page=405 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.2.2 ST\_IFR (initiator frame router) state machine

This << If the frame type is XFER\_RDY then this state machine shall check the length of the information unit. If the length of the information unit is not correct, then this state machine shall discard the frame >> needs to have a << Service Delivery or Target Failure - XFER\_RDY xxxxx to the SCSI application layer >> added as the description in section 9.2.5.2 states << If an SSP initiator port receives an XFER\_RDY frame that is not 12 bytes long, the ST\_IFR state machine discards the frame (see 8.2.6.2.2). The application client may then abort the command (see 10.2.2).>>. Without the added words there is no confirmation to the application layer that an abort should occur.

IBM comment number 239

Page=405 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.2.2 ST\_IFR (initiator frame router) state machine

This << a) the retry data frames bit;

b) the retransmit bit;

c) the target port transfer tag; and

d) the information unit. >> should be << a) retry data frames bit;

b) retransmit bit;

c) target port transfer tag; and

d) information unit. >>

IBM comment number 240

Page=407 Subtype=Text Author=George Penokie

Comment=

9.2.6.2.3.3.1 State description

The 2nd paragraph tells what to do if the number of retries for a COMMAND has not been reached but there is nothing that states what to do if the number of retries for a COMMAND has been reached. This needs to be fixed.

IBM comment number 241

Page=409 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.2.3.3.1 State description

## Table 121

This << (ACK Received >> should be << (ACK Received) >>

IBM comment number 242

Page=410 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.2.3.3.1 State description

This is in 05-143.

This << If this state machine receives an XFER\_RDY Arrived message and the requested offset is not expected, >> was carried over from SAS and looks like it needs more clarification now that retries are allowed. It should be changed to <<If this state machine receives an XFER\_RDY Arrived message, does not support transport layer retries of DATA frames, the RETRY DATA FRAMES bit is set to zero, and the requested offset is not expected, (e.g., the data offset is not set to a value in the DATA OFFSET field in the previous XFER\_RDY information unit plus the number of bytes transferred as a result of the previous XFER\_RDY information unit.) >>

IBM comment number 243

Page=410 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.2.3.3.1 State description

This << ST\_IPR state machine. >> should be << ST\_IFR state machine. >>

IBM comment number 244

Page=410 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.2.3.3.1 State description

This << ST\_IPR state machine. >> should be << ST\_IFR state machine. >>

IBM comment number 245

Page=410 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.2.3.3.5 Transition ST\_ITS2:Initiator\_Send\_Frame to ST\_ITS5:Prepare\_Data\_Out

This << NOTE 52 - This transition occurs even if this state has not received a Transmission Status (ACK Received) for the COMMAND frame for the write operation. >> should be moved to after item a)

IBM comment number 246

Page=410 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.2.3.3.1 State description

This << a) the destination SAS address; and  
b) the tag. >> should be << a) destination SAS address; and  
b) tag. >>

IBM comment number 247

Page=412 Subtype=Text Author=George Penokie

Comment=

9.2.6.2.3.7.1 State description

The 1,2,3 list does not look like it requires order. Change to an a,b,c list.

IBM comment number 248

Page=412 Subtype=Highlight Author=George Penokie  
Comment=

#### 9.2.6.2.3.6.1 State description

This << j) DATA OFFSET field set to the specified data offset, unless otherwise specified in this subclause; and  
k) in the information unit, DATA field set to the specified data.  
l) fill bytes, if any. >> should be << j) DATA OFFSET field set to the specified data offset, unless otherwise specified in this subclause;  
k) in the information unit, DATA field set to the specified data; and  
l) fill bytes, if any. >>. The << and >> is on the wrong item.

IBM comment number 249

Page=415 Subtype=Square Author=George Penokie  
Comment=

#### 9.2.6.3.1 ST\_T state machines overview

Figure 169

The background around the << HARD\_RESET Received (to all state machines) >> confirmation should be changed from white to none.

IBM comment number 250

Page=419 Subtype=Text Author=George Penokie  
Comment=

#### 9.2.6.3.2 ST\_TFR (target frame router) state machine

Having all this space between the start of a sentence and the end of the sentence is not a good idea. Move the table anchor to it's own paragraph and this willnot be a problem.

IBM comment number 251

Page=422 Subtype=Highlight Author=George Penokie  
Comment=

#### 9.2.6.3.3.3.1 State description

This << a) the tag; and  
b) the arguments received with the Transmission Status confirmation. >> should be << a) tag; and  
b) arguments received with the Transmission Status confirmation. >>

IBM comment number 252

Page=422 Subtype=Highlight Author=George Penokie  
Comment=

#### 9.2.6.3.3.3.1 State description

This note << NOTE 55 - The XFER\_RDY and RESPONSE frame rules ensure that wide ports do not send an XFER\_RDY orRESPONSE frame on a phy until all the ACKs have been transmitted for write DATA frames on a different phy. In a narrow port, the link layer ensures that ACK/NAKs are balanced before transmitting an interlocked frame. >> is the wrong font size. It should be 9 point.

IBM comment number 253

Page=423 Subtype=Square Author=George Penokie  
Comment=

#### 9.2.6.3.3.3.1 State description

Table 125 row three

This << a) the Transmit Frame request was for a RESPONSE frame; and  
b) the vendor-specific number of retries has been reached >> should be <<  
The Transmit Frame request was for a RESPONSE frame and the vendor-specific



number of retries has been reached. >>

IBM comment number 254

Page=423 Subtype=Square Author=George Penokie

Comment=

9.2.6.3.3.3.1 State description

Table 125 row three

This << a) the Transmit Frame request was for a read DATA frame;  
b) the number of databytes transmitted equal the request byte count; and  
c) this state has received a Transmission Status (ACK Received) confirmation  
for each read DATA frame transmitted for the request >> should be << The  
Transmit Frame request was for a read DATA frame and:

a) the number of data bytes transmitted equal the request byte count; and

b) this state has received a Transmission Status (ACK Received)  
confirmation for each read DATA frame transmitted for the request.

IBM comment number 255

Page=423 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.3.3.3.1 State description

Table 125

Delete all the <<the>> from the beginning of each entry in the middle  
column. It adds nothing and has the benefit of not having to argue about if  
the <<the>> should be capitalized or not.

IBM comment number 256

Page=424 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.3.3.3.1 State description

Again, this << a) the destination SAS address; and

b) the tag. >> should be << a) destination SAS address; and

b) tag. >>

IBM comment number 257

Page=424 Subtype=Highlight Author=George Penokie

Comment=

9.2.6.3.3.3.1 State description

This << a) the destination SAS address; and

b) the tag. >> should be << a) destination SAS address; and

b) tag. >>

IBM comment number 258

Page=425 Subtype=Text Author=kdbutt

Comment=

9.2.6.3.3.4.1 State description

In looking at the error recovery, I have noticed a few inconsistencies in  
the document. It appears that when sections 9.2.4 and 9.2.5 were added,  
the state diagrams were not updated to match. Proposal 05-143 contains the  
fixes for this problem.

9.2.6.3.3.5.1 states:

i) TARGET PORT TRANSFER TAG field set to a vendor-specific value,  
unless otherwise specified in this  
subclause;

and

If this state is entered after the ST\_TTS2:Target\_Send\_Frame state received a Transmission Status (Frame Transmitted) confirmation and a confirmation other than Transmission Status (ACK Received) for which a Transmission Complete message was not sent to the ST\_TFRstate machine (i.e., to retry transmitting a frame), then this state shall construct a new XFER\_RDY frame using the values from the previous

XFER\_RDY frame except:

a) the RETRANSMIT bit shall be set to one; and  
 b) the value in the TARGET PORT TRANSFER TAG field shall be set to a different value than the value in the previous XFER\_RDY frame. The new target port transfer tag value shall not conflict with any other target port transfer tag currently in use. If write data is received for a subsequent XFER\_RDY frame for a command, then all target port transfer tags used for previous XFER\_RDY frames for the command are no longer in use.

but the above does not match with 9.2.4.1 states:

If the TRANSPORT LAYER RETRIES bit is set to one, the logical unit:  
 d) selects a different value for the TARGET PORT TRANSFER TAG field in each XFER\_RDY frame than that used in the previous XFER\_RDY frame for that I\_T\_L\_Q nexus;

IBM comment number 259

Page=425 Subtype=Highlight Author=George Penokie  
 Comment=

9.2.6.3.3.4.1 State description

This << j) DATA OFFSET field set as specified in this subclause; and >> should be << j) DATA OFFSET field set as specified in this subclause; >>

IBM comment number 260

Page=426 Subtype=Text Author=kdbutt  
 Comment=

9.2.6.3.3.6.1 State description

In looking at the error recovery, I have noticed a few inconsistencies in the document. It appears that when sections 9.2.4 and 9.2.5 were added, the state diagrams were not updated to match. Proposal 05-143 contains the fixes for this problem.

9.2.6.3.3.6.1 states:

1) If the data offset was not expected (i.e., the CHANGING DATA POINTER bit is set to one and the value in the DATA OFFSET field is not set to the data offset associated with the XFER\_RDY frame, or the CHANGING DATA POINTER bit is set to zero and the value in the DATA OFFSET field is not set to the value in the DATA OFFSET FIELD in the previous write DATA information unit plus the number of bytes in that

information unit), then this state shall send a Reception Complete (Data Offset Error) message to the ST\_TFR state machine;

and then 9.2.6.3.2 table 124 states that Reception Complete (Data Offset Error) translates to a SCSI application layer:  
Data-Out Received with the Delivery Result argument set to DELIVERY FAILURE - DATA OFFSET ERROR

Which will prohibit any recovery.

So, if recovery is possible, then 9.2.6.3.3.6.1 cannot send the Reception Complete (Data Offset Error) message until recovery has been exhausted. However, 9.2.6.3.3.6.1 does not mention recovery at all.

IBM comment number 261

Page=426 Subtype=Square Author=George Penokie  
Comment=

9.2.6.3.3.6.1 State description

The 1,2,3 list does not appear to require ordering so it should be changed to an a,b,c list.

IBM comment number 262

Page=426 Subtype=Highlight Author=George Penokie  
Comment=

9.2.6.3.3.5.1 State description

This << j) DATA OFFSET field set to zero; and >> should be << j) DATA OFFSET field set to zero; >>

IBM comment number 263

Page=427 Subtype=Highlight Author=George Penokie  
Comment=

9.2.6.3.3.8.1 State description

This << h) TARGET PORT TRANSFER TAG field set to zero; >> should be << h) TARGET PORT TRANSFER TAG field set to zero; and>>

IBM comment number 264

Page=427 Subtype=Highlight Author=George Penokie  
Comment=

9.2.6.3.3.7.1 State description

This << This state shall process the data received in the Data-Out Arrived message using the Device Server Buffer (e.g., logical block address) to which the data is to be transferred. >> should be << This state shall process the SSP frame contents using the Device Server Buffer (e.g., logical block address) to which the data is to be transferred. >>

IBM comment number 265

Page=427 Subtype=Highlight Author=George Penokie  
Comment=

9.2.6.3.3.7.2 Transition ST\_TTS6:Process\_Data\_Out to ST\_TTS5:Receive\_Data\_Out

This << state has processed the data received in a Data-Out Arrived message.>> should be << has processed the SSP frame contents. >>

IBM comment number 266

Page=430 Subtype=Highlight Author=George Penokie

Comment=

#### 9.4.3 SMP\_RESPONSE frame

This << frame 1 032 bytes (1 024 bytes of data + 4 bytes of header + 4 bytes of CRC). >> should be << frame 1 032bytes (i.e., 1 024 bytes of data + 4 bytes of header + 4 bytes of CRC).

IBM comment number 267

Page=430 Subtype=Highlight Author=George Penokie

Comment=

#### 9.4.2 SMP\_REQUEST frame

This << frame 1 032 bytes (1 024 bytes of data + 4 bytes of header + 4 bytes of CRC). >> should be << frame 1 032 bytes (i.e., 1 024 bytes of data + 4 bytes of header + 4 bytes of CRC).

IBM comment number 268

Page=438 Subtype=Highlight Author=George Penokie

Comment=

#### 10.2.1.3 SCSI Command Received transport protocol service

This << SCSI Command Received (IN (I\_T\_L\_Q Nexus, CDB, Task Attribute, [Task Priority], [Command Reference Number])) >> should be << SCSI Command Received (IN (I\_T\_L\_Q Nexus, CDB, Task Attribute, [Task Priority], [Command Reference Number], [First Burst Enabled])) >>

IBM comment number 269

Page=447 Subtype=Highlight Author=George Penokie

Comment=

#### 10.2.2 Application client error handling

This << it shall abort the command (e.g., by sending an ABORT TASK task management function). >> should be << then the SSP initiator port shall abort the command (e.g., by sending an ABORT TASK task management function). >>

IBM comment number 270

Page=448 Subtype=Highlight Author=George Penokie

Comment=

#### 10.2.3 Device server error handling

This << If the SCSI target device performs tag checking and an SSP target port calls SCSI Command Received() with a tag already in use by another SCSI command (i.e., an overlapped command) in any logical unit, the task router and device server(s) shall abort all task management functions received on that I\_T nexus and shall respond to the overlapped command as defined in SAM-3. >> should be changed to << If the SCSI target device performs tag checking and an SSP target port calls SCSI Command Received () with a tag already in use by another SCSI command (i.e., an overlapped command) in any logical unit, the task router and device server(s) shall respond to the overlapped command as defined in SAM-3. >> as there are more specific rules on aborting below in the second a.b.c list in section 10.2.4.

IBM comment number 271

Page=449 Subtype=Text Author=George Penokie

Comment=

#### 10.2.7.1.1 Disconnect-Reconnect mode page overview

Having all this space between the start of a sentence and the end of the sentence is not a good idea. Move the table anchor to it's own paragraph and this will notbe a problem.

IBM comment number 272

Page=451 Subtype=Highlight Author=George Penokie

Comment=

10.2.7.1.4 MAXIMUM BURST SIZE field

This << the SSP target port shall prepare to close the connection after the amount of data specified by the MAXIMUM >> should be << then, the SSP target port shall prepare to close the connection after the amount of data specified by the MAXIMUM >>

IBM comment number 273

Page=453 Subtype=Highlight Author=George Penokie

Comment=

10.2.7.2.2 Protocol-Specific Port mode page - short format

This << SPF field shall >> should be << SPF bit shall >>

IBM comment number 274

Page=454 Subtype=Highlight Author=George Penokie

Comment=

10.2.7.2.3 Protocol-Specific Port mode page - Phy Control And Discover subpage

This << A SAS phy mode descriptor shall be included for each phy in the SAS target device (not just the SAS target port), starting with the lowest numbered phy and ending with the highest numbered phy. >> should be << A SAS phy mode descriptor shall be included for each phy inthe SAS target device, not just the SAS target port, starting with the lowest numbered phy and ending with the highest numbered phy. >>

IBM comment number 275

Page=454 Subtype=Highlight Author=George Penokie

Comment=

10.2.7.2.3 Protocol-Specific Port mode page - Phy Control And Discover subpage

This << SPF field shall >> should be << SPF bit shall >>

IBM comment number 276

Page=456 Subtype=Highlight Author=George Penokie

Comment=

10.2.7.3.2 Protocol-Specific Logical Unit mode page - short format

This << SPF field shall >> should be << SPF bit shall >>

IBM comment number 277

Page=458 Subtype=Highlight Author=George Penokie

Comment=

10.2.8.1 Protocol-Specific log page

This << control bits for >> should be << control bits and fields for >> as TMC is a field not a bit.

IBM comment number 278

Page=458 Subtype=Highlight Author=George Penokie

Comment=

10.2.8.1 Protocol-Specific log page

This << control bits for >> should be << control bits and fields for >> as TMC is a field not a bit.

IBM comment number 279

Page=460 Subtype=Text Author=George Penokie  
Comment=

10.2.9.1 Protocol-Specific diagnostic page

Having all this space between the start of a sentence and the end of the sentence is not a good idea. Move the table anchor to it's own paragraph and this will not be a problem.

IBM comment number 280

Page=462 Subtype=Highlight Author=George Penokie  
Comment=

10.2.10.2.1 SA\_PC state machine overview

This << This state machine shall start in the SA\_PC\_0:Powered\_On state after power on. >> should be << This state machine shall start in the SA\_PC\_0:Powered\_On state after power on. >>

IBM comment number 281

Page=462 Subtype=Highlight Author=George Penokie  
Comment=

10.2.10.1 SCSI power conditions overview

This << a) automatically spin-up after power on; and >> should be << a) initiate spin-up after power on; and >>

IBM comment number 282

Page=467 Subtype=Square Author=George Penokie  
Comment=

10.2.11 SCSI vital product data (VPD)  
table 165

This <<PIV (PROTOCOL IDENTIFIER VALID) >> should be << PIV (protocol identifier valid) >>

IBM comment number 283

Page=472 Subtype=Highlight Author=George Penokie  
Comment=

10.4.3.1 SMP function request frame format

This << size of the frame 1 032 bytes (1 024 bytes of data + 4 bytes of header + 4 bytes of CRC).>> should be << size of the frame 1 032 bytes (i.e., 1 024 bytes of data + 4 bytes of header + 4 bytes of CRC). >>

IBM comment number 284

Page=473 Subtype=Square Author=George Penokie  
Comment=

10.4.3.2 SMP function response frame format  
table 170

This << The SMP target port does not support the requested SMP function; the ADDITIONALRESPONSE BYTES field may be present but shall be ignored. >> should be << The SMP target port does not support the requested SMP function. The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored. >>

IBM comment number 285

Page=473 Subtype=Square Author=George Penokie

Comment=

10.4.3.2 SMP function response frame format  
table 170

This <<The SMP target port supports the SMP function; the ADDITIONAL RESPONSE BYTES field contains the requested information. >> should be <<The SMP target port supports the SMP function. The ADDITIONAL RESPONSE BYTES field contains the requested information. >>

IBM comment number 286

Page=474 Subtype=Highlight Author=George Penokie

Comment=

10.4.3.2 SMP function response frame format

This << size of the frame 1 032 bytes (1 024 bytes of data + 4 bytes of header + 4 bytes of CRC). >> should be << size of the frame 1 032 bytes (i.e., 1 024 bytes of data + 4 bytes of header + 4 bytes of CRC). >>

IBM comment number 287

Page=476 Subtype=Highlight Author=George Penokie

Comment=

10.4.3.3 REPORT GENERAL function

This << need not >> should be changed to << is not required to >>

IBM comment number 288

Page=482 Subtype=Text Author=George Penokie

Comment=

10.4.3.5 DISCOVER function

Having all this space between the start of a sentence and the end of the sentence is not a good idea. Move the table anchor to it's own paragraph and this will not be a problem.

IBM comment number 289

Page=484 Subtype=Highlight Author=George Penokie

Comment=

10.4.3.5 DISCOVER function

This << NOTE 62 - Supports for SATA hosts is outside the scope of this standard. >> should be << NOTE 62 - Support for SATA hosts is outside the scope of this standard. >>

IBM comment number 290

Page=485 Subtype=Highlight Author=George Penokie

Comment=

10.4.3.5 DISCOVER function

This makes no sense <<

c) the phy identifier provided for the attached port if the attached port is a SATA deviceport. >> It should be << c) the phy identifier provided for the attached phy if the attached phy is contained in a SATA device port. >>

IBM comment number 291

Page=485 Subtype=Highlight Author=George Penokie

Comment=

10.4.3.5 DISCOVER function

This makes no sense << b) the phy identifier of the attached expander device if the attached port is an expander port; >> It should be << b) the phy identifier of the attached phy if the attached phy is contained in an expander port; >>

IBM comment number 292

Page=485 Subtype=Highlight Author=George Penokie  
Comment=

10.4.3.5 DISCOVER function

This makes no sense << a) the phy identifier of the attached SAS port if the attached port is a SAS port; >>. It should be << a) the phy identifier of the attached phy if the attached phy is contained in a SAS port; >>

IBM comment number 293

Page=486 Subtype=Highlight Author=George Penokie  
Comment=

10.4.3.5 DISCOVER function

This << need not >> should be changed to << is not required to >>

IBM comment number 294

Page=488 Subtype=Text Author=George Penokie  
Comment=

10.4.3.6 REPORT PHY ERROR LOG function

It appears that the counters defined in the log function are never reset to zero. This does not seem like a good idea. At a minimum there should be a statement that the counters are all reset on a power on.

IBM comment number 295

Page=492 Subtype=Highlight Author=George Penokie  
Comment=

10.4.3.8 REPORT ROUTE INFORMATION function

This << The EXPANDER ROUTE INDEX field specifies the expander route index for the expander route entry being requested (see 4.6.7.3). >> should be << The EXPANDER ROUTE INDEX field specifies the expander route index for the expander route entry (see 4.6.7.3) of the phy indicated in the PHY IDENTIFIER field. >>

IBM comment number 296

Page=493 Subtype=Highlight Author=George Penokie  
Comment=

10.4.3.8 REPORT ROUTE INFORMATION function

This << The EXPANDER ROUTE INDEX field contains the expander route index for the expander route entry being returned (see 4.6.7.3). >> should be << The EXPANDER ROUTE INDEX field contains the expander route index for the expander route entry(see 4.6.7.3) of the phy indicated in the PHY IDENTIFIER field. >>

IBM comment number 297

Page=495 Subtype=Highlight Author=George Penokie  
Comment=

10.4.3.9 CONFIGURE ROUTE INFORMATION function

This << The EXPANDER ROUTE INDEX field specifies the expander route index for the expander routeentry being configured (see 4.6.7.3). >> should be << The EXPANDER ROUTE INDEX field specifies the expander route index for the expander route entry (see 4.6.7.3) of the phy indicated in the PHY IDENTIFIER field. >>

IBM comment number 298

Page=499 Subtype=Highlight Author=George Penokie



Comment=

10.4.3.10 PHY CONTROL function

This paragraph << If the PHY IDENTIFIER field specifies the phy which is being used for the SMP connection and a phy operation of LINK RESET, HARD RESET, or DISABLE is requested, the SMP target port shall not perform the requested operation and shall return a function result of SMP FUNCTION FAILED in the response frame. >> should be moved up to the PHY IDENTIFIER field description.

IBM comment number 299

Page=500 Subtype=Highlight Author=George Penokie

Comment=

10.4.3.10 PHY CONTROL function

This << in the response frame. If it does so, it shall not perform the requested phy operation. >> should be <<in the response frame. If the SMP target port returns an SMP FUNCTION FAILED then, it shall not perform the requested phy operation. >>

IBM comment number 300

Page=502 Subtype=Text Author=George Penokie

Comment=

10.4.3.11 PHY TEST FUNCTION function

The PHY TEST FUNCTION is description is a duplicate of the description in the protocol-specific diagnostic page. The description here should be replaced with a reference to thatdescription.

IBM comment number 301

Page=506 Subtype=Square Author=George Penokie

Comment=

A.2 Compliant jitter tolerance pattern (CJTPAT)

I believe the a,b,c list should be ordered. Change it to a 1,2,3 list.

IBM comment number 302

Page=520 Subtype=Highlight Author=George Penokie

Comment=

B.9.3 Use of single-ended instrumentation in differential applications

This << denoted by the \217A' subscript and reflected signals from the same port denoted by the \217B' subscript. >> should be << denoted by the A subscript and reflected signals from the same port denoted by the B subscript. >>

IBM comment number 303

Page=520 Subtype=Highlight Author=George Penokie

Comment=

B.9.3 Use of single-ended instrumentation in differential applications

This << d) SCCij.. common-mode stimulus, >> should be << d) SCCij: common-mode stimulus, >>

IBM comment number 304

Page=521 Subtype=Highlight Author=George Penokie

Comment=

B.9.3 Use of single-ended instrumentation in differential applications

This << VNA ports are all single-ended; the differential and common-mode properties for differential ports are >> should be << VNA ports are all

single-ended. The differential and common-mode properties for differential ports are >>

IBM comment number 305

Page=532 Subtype=Highlight Author=George Penokie  
Comment=

E.2 Hash collision probability

This << One randomly chosen SAS address (representing a replacement unit) with another unique >> should be <<One randomly chosen SAS address that represents a replacement unit withanother unique >>

IBM comment number 306

Page=532 Subtype=Highlight Author=George Penokie  
Comment=

E.2 Hash collision probability

This << One randomly chosen SAS address (representing a replacement unit) with another unique >> should be <<One randomly chosen SAS address that represents a replacement unit withanother unique >>

IBM comment number 307

Page=532 Subtype=Highlight Author=George Penokie  
Comment=

E.2 Hash collision probability

This << each lot were assigned by 10 SAS address-writers, randomly drawn from a pool of 4 096 possible >> should be << each lot were assigned by ten SAS address-writers, randomly drawn from a pool of 4 096 possible >>

IBM comment number 308

Page=532 Subtype=Highlight Author=George Penokie  
Comment=

E.2 Hash collision probability

This << within the lot were assigned by 10 SAS address-writers, randomly drawn from a pool of 4 096 >> should be << within the lot were assigned by ten SAS address-writers, randomly drawn from a pool of 4 096 >>

IBM comment number 309

Page=541 Subtype=Highlight Author=George Penokie  
Comment=

G.3.1 Affiliation policies overview

This << connection to send a command (perhaps a read), and >> should be << connection to send a command(e.g., a read), and >>

\*\*\*\*\*

Comments attached to No ballot from Robert Sheffield of Intel Corp.:

INTEL #1

PDF Page: 48

Author: Bob Sheffield

Comment: 3.1.35 cumulative distribution function (CDF):

This may not be the correct definition - even as it applies to jitter

measurements. It is not cumulative over time, but rather cumulative over a population of jitter measurement samples. Jitter samples are measured as intervals of time, but this definition sounds like it's based on absolute time, not sampled intervals. Suggest: "The integral of the PDF (see 3.1.143) with limits from negative infinity to a specified jitter value, or from a specified jitter value to positive infinity."

## INTEL #2

PDF Page: 54

Author: Bill Bissonette

Comment: 3.1 Definitions, symbols, abbreviations:

Add definition for 'probe point'. Could read something like, "Physical positions in the test load where the signal properties are measured. See Section 5.3.2.1."

## INTEL #3

PDF Page: 119

Author: Bob Sheffield

Comment: 4.6.6.5 BPP interface - Table 15 Third Row (Identification Sequence Complete):

"or because a virtual phy has been enabled (see 10.4.3.10)." s/b "because an STP/SATA bridge received the initial Register - Device to Host FIS (see 7.9.5.5.3 and 9.3.1), or because a virtual phy has been enabled (see 10.4.3.10)."

## INTEL #4

PDF Page: 123

Author: Bob Sheffield

Comment: 4.7.2 Allowed topologies Fifth paragraph:

This doesn't say what's intended. If the port of the expander device being configured is a subtractive decode port, and the expander device attached to that port has two or more ports with table-routing phys attached to other expanders, then the management application will find the SAS address of the port being configured in the ports of the other expander devices which connect to the same expander device, but it is not a routing loop.

## INTEL #5

PDF Page: 124

Author: Bob Sheffield

Comment: There is no place in the standard that specifies when (if ever) the ATTACHED SAS ADDRESS is set to zero. There probably should be (perhaps on any transition to SPO:OOB\_COMINIT?).

## INTEL #6

PDF Page: 132

Author: Mark Seidel

Comment: 5.1 Physical overview 4th line:

"reference" => "references"

## INTEL #7

PDF Page: 132

Author: Bill Bissonette

Comment: 5.2 Passive interconnect:

Figures 50 through 56 -- Arrows between plugs and receptacles imply conductor length. These should all be removed and plugs/receptacles show as mated.

## INTEL #8

PDF Page: 134

Author: Bill Bissonette

Comment: 5.2.2 SAS cables and connectors:

Figures 52 through 56 --

Title embedded in Figure is redundant to figure title. Recommend removing.

## INTEL #9

PDF Page: 141

Author: Schelto VanDoorn

Comment: 5.2.3.3.2 SAS external cable plug connector - Figure 61 ,, SAS external cable plug connector Need:

to define the location of pin 1 (S1). Draw picture showing pinning.

## INTEL #10

PDF Page: 142

Author: Schelto VanDoorn

Comment: 5.2.3.3.3 SAS external receptacle connector - Figure 62 - SAS external receptacle connector:

Need to define the location of pin 1 (S1). Draw picture showing pinning.

## INTEL #11

PDF Page: 142

Author: Bill Bissonette

Comment: 5.2.3.3.3 SAS external receptacle connector, text immediately below figure 62:

Grammar -- "are" should be "is".

## INTEL #12

PDF Page: 145

Author: Bob Sheffield

Comment: 5.2.3.3.6 SAS external compact receptacle connector Last paragraph (after Figure 64):

"are" s/b "is"

## INTEL #13

PDF Page: 154

Author: Bill Bissonette

Comment: 5.2.3.4.7 SAS internal compact wide connector pin assignments - Table 28 ,, Controller SAS ...:

Rows should be organized (ordered) like Table 25 -- External Wide Compact

## INTEL #14

PDF Page: 154

Author: Bill Bissonette

Comment: 5.2.3.4.7 SAS internal compact wide connector pin assignments - Table 28 ,, Controller SAS ...:

TX+, TX- are swapped (known issue). This will cause interconnect pinout definition to change (for the better).

## INTEL #15

PDF Page: 155

Author: Bill Bissonette

Comment: 5.2.3.4.7 SAS internal compact wide connector pin assignments - Table 29 „ Backplane SAS internal compact...:

Rows should be organized like Table 25.

## INTEL #16

PDF Page: 157

Author: Bill Bissonette

Comment: 5.2.4.1 SAS internal cables, figure 72, 73:

Should be "RX" and "TX" (vs. "RP" AND "TP") on host connector since there is no primary or secondary designations on host side. This may apply to target connector as well since only one port used.

## INTEL #17

PDF Page: 162

Author: Bill Bissonette

Comment: 5.2.4.3.2 SAS internal wide symmetric cables - Figure 76 „ SAS internal wide cable...:

Pin order on both connectors (A1, B1, A2, B2, . . . ) will be the same once the TX+/TX- pin assignments gets fixed. This figure must be updated to reflect that.

## INTEL #18

PDF Page: 163

Author: Bill Bissonette

Comment: 5.2.4.3.1 SAS internal wide cables overview, figure 77:

This figure is not correct: Signal/pin assignments on both connectors must be the same (controller version of pinout) and RX0 lane attaches to TX3 lane, etc. Pin sequence on right-hand connector should be changed to sequence used on left hand connector (only from top to bottom). Once TX signal polarities get fixed, the interconnect lines will straighten out. Should look like the wide 4x internal connector (controller to controller) Tx0<->Rx3, Tx1<->Rx2,....

## INTEL #19

PDF Page: 164

Author: Bill Bissonette

Comment: 5.2.4.3.1 SAS internal wide cables overview, figure 78:

"RP"s and "TP"s should be "RX"s and "TX"s since there is no primary/secondary designation here.

## INTEL #20

PDF Page: 165

Author: Bill Bissonette

Comment: 5.2.4.3.1 SAS internal wide cables overview, figure 79, 81:

This figure needs to be corrected once TX+/TX- signal/pin assignments get straightened out.

## INTEL #21

PDF Page: 167

Author: Bill Bissonette

Comment: 5.2.4.3.1 SAS internal wide cables overview, Figure 81:

Pin sequence should match physical layout (like in Figure 79). Will

have better symmetry when the [RT]+/[RT]- gets fixed.

INTEL #22

PDF Page: 170

Author: Bob Sheffield

Comment: 5.2.5 Backplanes Table 30: Column heading:

Delete the 1.5 Gbps column. The assumption is that all cables/connectors/backplanes are 3G capable, and so must pass the 3G spec. Applies to tables 31 & 32 as well

INTEL #23

PDF Page: 170

Author: Bill Bissonette

Comment: 5.2.6 Impedance and media specifications, table 30, 31, 32:

Table title says 'media requirements', but implication from note 'b' is that "Maximum TDR rise time" row is a requirement for measurement procedure. These specs should be reflected in notes and this row removed. Table footnotes a,b,c and d should all go with the "Requirement" column heading". Only table footnote 'e' doesn't apply to all rows.

INTEL #24

PDF Page: 172

Author: Bob Sheffield

Comment: 5.3.1 Compliance points First paragraph:

Delete, "that contain or comprise the candidate compliance point"

INTEL #25

PDF Page: 172

Author: Bob Sheffield

Comment: 5.3.1 Compliance points Second paragraph:

"Signal compliance is measured at physical positions denoted as probe points inside a test load (see 5.3.2)." s/b "Signal compliance is measured at physical positions in a test load that approximate compliance points defined in a functional configuration (see 5.3.2)."

Note: This paragraph should concisely define the relationship between a compliance point and a probe point (making it clear that a measurement made at a probe point constitutes an acceptable value to compare against the compliance values called out in the tables. Subsequently, probe points should be discussed in reference to figures to show measurements points, but not discussed in relation to the tables which specify the compliance values.

INTEL #26

PDF Page: 185

Author: Bob Sheffield

Comment: 5.3.3 General electrical characteristics - fourth paragraph:

"exceed" s/b "exhibit a BER less than"

INTEL #27

PDF Page: 188

Author: Bill Bissonette

Comment: 5.3.5 Electrical TxRx connections First paragraph:

"connection individual" s/b "connection, individual"

## INTEL #28

PDF Page: 188

Author: Bill Bissonette

Comment: 5.3.5 Electrical TxRx connections - first paragraph, second line:

"materials, including" s/b "materials including"

## INTEL #29

PDF Page: 192

Author: Bob Sheffield

Comment: 5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:  
delete "at probe point"

## INTEL #30

PDF Page: 193

Author: Bill Bissonette

Comment: 5.3.7.3, Table 38 Table footnote (g):

SATA does not allow 3,0 Gbps aligns in OOB. It DOES allow 1.5 Gbps OOB w/ 3,0 Gbps edge rates. Delete ", or 3.0 Gbps ALIGN (0) dwords"

## INTEL #31

PDF Page: 193

Author: Bob Sheffield

Comment: 5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:  
delete "at probe point"

## INTEL #32

PDF Page: 193

Author: Bob Sheffield

Comment: Table 38 ,, Transmitter device signal output characteristics...:

Delete "as measured with each test load". It should be made clear this applies to all measurements in subclause 5.3.1 and not reiterated here.

## INTEL #33

PDF Page: 194

Author: Bob Sheffield

Comment: Table 39 ,, Transmitter device maximum jitter...:

Delete "as measured with each test load". It should be made clear this applies to all measurements in subclause 5.3.1 and not reiterated here.

## INTEL #34

PDF Page: 194

Author: Bob Sheffield

Comment: 5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:  
delete "at probe point"

## INTEL #35

PDF Page: 195

Author: Bob Sheffield

Comment: Table 40 ,, Delivered signal characteristics...:

Delete "as measured with the zero-length test load". It should be made clear this applies to all measurements in subclause 5.3.1 and not

reiterated here.

INTEL #36

PDF Page: 195

Author: Bob Sheffield

Comment: 5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:  
delete "at probe point"

INTEL #37

PDF Page: 196

Author: Bob Sheffield

Comment: Table 40 „ Delivered signal characteristics...:  
Delete "as measured with the zero length test load".

INTEL #38

PDF Page: 196

Author: Bill Bissonette

Comment: 5.3.8.2 Delivered signal characteristics - Table 40 (part 2  
of 2) - table footnote (g):  
3 Gpbs OOB not allowed by SATA. Delete ", or 3.0 Gpbs ALIGN (0) dwords  
(see SATA2-PHY)"

INTEL #39

PDF Page: 196

Author: Bob Sheffield

Comment: 5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:  
delete "at probe point"

INTEL #40

PDF Page: 197

Author: Bob Sheffield

Comment: 5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:  
delete "at probe point"

INTEL #41

PDF Page: 198

Author: Bob Sheffield

Comment: 5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:  
delete "at probe point"

INTEL #42

PDF Page: 295

Author: Bob Sheffield

Comment: 7.9.5.4.3 SL\_IR\_RIF2:Receive\_Identify\_Frame state 7.9.5.4.3.1  
State description - fifth paragraph:

"After receiving an EoAF Received message, this state shall check if  
it the IDENTIFY address frame is valid."

s/b

"After receiving an EoAF Received message, this state shall check if  
the received frame is a valid IDENTIFY address frame."

INTEL #43

PDF Page: 296

Author: Bob Sheffield

Comment: 7.9.5.5.3 SL\_IR\_IRC2:Wait state 7.9.5.5.3.1 State description:



There is a problem that there is currently no definition for how a phy associated with an STP/SATA bridge becomes enabled. Add the following as the last paragraph: "If this state receives an Initial FIS Received message from the STP transport layer (see 9.3.1) it should send an Enable Disable SAS Link (Enable) message to the XL state machine (see 7.15) in an expander phy indicating that the rest of the link layer may start operation."

INTEL #44

PDF Page: 297

Author: Bob Sheffield

Comment: 7.11 SAS domain changes:

Add the following paragraph after the unordered list: "Expander devices should transmit a BROADCAST (CHANGE) when an STP/SATA bridge receives an initial Register - Device to host FIS (see 9.3.1)."

INTEL #45

PDF Page: 400

Author: Bob Sheffield

Comment: 9.2.5.2 SSP initiator port error handling summary:

Second paragraph Add the following text: An XFER\_RDY or RESPONSE frame received with a TAG corresponding to the TAG of a COMMAND or TASK frame which has still not received an ACK, but is otherwise a valid frame, shall be accepted as a valid frame.

INTEL #46

PDF Page: 429

Author: Bob Sheffield

Comment: 9.3.1 Initial FIS:

Add the following text as the second paragraph: "Upon receiving the initial Register - Device to Host FIS, the STP transport layer should send an Initial FIS Received message to the SL\_IR state machine (see 7.9.5.5.3). See 7.11 for BROADCAST (CHANGE) requirements related to the initial FIS."

INTEL #47

PDF Page: 486

Author: Bob Sheffield

Comment: 10.4.3.5 DISCOVER function:

In the description of the ATTACHED SAS ADDRESS field, "The ATTACHED SAS ADDRESS field shall be updated:"

Insert:

"a) when the SP state machine enters the SPO:OOB\_COMINIT state (set to zero\;")

INTEL #48

PDF Page: 512

Author: Bob Sheffield

Comment: Annex B:

"(normative)"

s/b

"(informative)"

There are many problems with this being a normative annex:

1) The terms are different. Nowhere is it evident the relationship between CT, CR, IT, and IR compliance points in clause 5 and the

Transmit and Receive interoperability points identified in the annex, and what the relationship might be to probe points described in clause-5.

2) Annex B describes a method for "de-embedding" a test fixture, presumably to mitigate the effects of the test load on the compliance measurement. But there is nothing to correlate the compliance values described in clause 5 with specific measurements described in Annex B.

The information in Annex B is quality information, but without appropriate changes to correlate the measurement techniques described in Annex B to the compliance values called out in clause 5. I.M.H.O., the bulk of LB comments that would be needed to reconcile the two would constitute a very substantive change, and might represent just cause to hold another LB to resolve. So I recommend making the annex informative for now, and fix it in SAS-2.

INTEL #49

PDF Page: 543

Author: Bob Sheffield

Comment: Annex G: Add annex G.5 as follows:

#### G.5 Discovery of a SATA device

An expander phy with STP/SATA bridge in the SATA Spinup Hold state is indicated in the DISCOVER response NEGOTIATED PHYSICAL LINK RATE field (a value of 3h indicates the phy is enabled and a SATA device has been detected, but it's in the spinup-hold state).

An expander device generates a BROADCAST (CHANGE) for the following conditions:

- a) the phy loses DWS sync and the SP state machine transitions to the SPO:OOB\_COMINIT state
- b) the phy detects the removal or insertion of a SATA port selector
- c) the phy sequences to the SATA Spinup Hold state
- d) the phy initialization sequence completes (completes SATA speed negotiation\
- e) the phy receives an initial Register - Device to Host FIS.

Anytime the SMP management client detects a BROADCAST (CHANGE) from a phy with a STP/SATA bridge, the SMP management client should issue a DISCOVER command to determine the ATTACHED DEVICE TYPE, ATTACHED SAS ADDRESS, and the NEGOTIATED PHYSICAL LINK RATE. If the NEGOTIATED PHYSICAL LINK RATE is 3h, the phy is in the SATA Spinup Hold state, and the SMP management client should issue an SMP PHY CONTROL command with a PHY CONTROL FUNCTION of HARD RESET or LINK RESET to cause link initialization to happen again  
- this time bypassing the SATA Spinup Hold state.

After finding the NEGOTIATED PHYSICAL LINK RATE field set to 8h or 9h (indicating that speed negotiation has completed at 1.5 Gbps or 3.0 Gbps, respectively), the SMP management client may issue the SMP REPORT PHY SATA command to see if there's a signature FIS there yet or not.

If the expander doesn't support the SATA SPINUP HOLD state, then the

NEGOTIATED PHYSICAL LINK rate field will sequence all the way to 8h or 9h - indicating speed negotiation has completed and the link is ready. The "ATTACHED SATA DEVICE" bit in the DISCOVER response byte 15 indicates if the attached device is a SATA device - determined by having transitioned to the SATA speed negotiation states rather than to the SAS speed negotiation states (which it did because it got a COMSAS timeout). If the initial FIS is not yet present, the SMP management client should wait for the next BROADCAST (CHANGE) from the STP/SATA bridge indicating receipt of the initial FIS, and then reissue the DISCOVER and SMP REPORT PHY SATA command.

In some hot-plug cases, a SATA device may not send an initial Register - Device to Host FIS (due to timing where the device does not see the initial COMINIT). In this case the STP/SATA bridge will complete speed negotiation, but will not receive an initial FIS. If this occurs, the SMP management client should time-out after a vendor-specific interval of time and then, after sending a SMP REPORT PHY SATA command that does not report a received initial FIS, the SMP management client should send an SMP PHY CONTROL command specifying a HARD RESET or LINK RESET. This will send a COMINIT to the SATA device, and will cause the SATA device to send the initial Register - Device to Host FIS following link initialization.

So - at anytime following the link initialization sequence, it is possible via DISCOVER and REPORT PHY SATA SMP commands to determine:

- a) If there is a device attached;
- b) Whether the device is SATA or SAS
- c) Whether the SP state machine is in the SPINUP HOLD state;
- d) Whether the SATA device has returned an initial REGISTER DEVICE TO HOST FIS.

Using this information, it should be possible for the SMP management client to force the device to transmit the initial FIS if need be through sending an SMP PHY CONTROL command with a function code specifying HARD RESET or LINK RESET.

\*\*\*\*\*

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

LSI comment number 1  
 Page=32 Subtype=Highlight Author=John Lohmeyer  
 Comment=  
 Revision Information

Remove this section prior to public review.

LSI comment number 2  
 Page=36 Subtype=Text Author=John Lohmeyer  
 Comment=  
 Add T10 List to Foreword (available at:  
<http://www.t10.org/ftp/pri/editors/t10-ansi.txt>)

LSI comment number 3

Page=52 Subtype=Highlight Author=Tim Hoglund

Comment=

definition does not strictly match 4.1.9 text. Also partial pathway should include case where an OPEN address frame has reached a SAS endpoint but no response has been given (yet).

LSI comment number 4

Page=54 Subtype=Highlight Author=Brian Day

Comment=This word is not used elsewhere in the spec. Should it be deleted?

LSI comment number 5

Page=54 Subtype=Highlight Author=Brian Day

Comment=This word is not used elsewhere in the spec. Should it be deleted?

LSI comment number 6

Page=78 Subtype=Highlight Author=Tim Hoglund

Comment=

"same" could imply that port is created when phys receive an identical address to what they transmitted during the identification sequence -- this is misleading.

7.9.1 text is better

LSI comment number 7

Page=87 Subtype=Highlight Author=Tim Hoglund

Comment=definition needed for "root edge expander device"

LSI comment number 8

Page=87 Subtype=Highlight Author=Tim Hoglund

Comment=

should this statement be an informative note rather than "shall"? clarify "sum of all SAS addresses addressable through the edge expander phymean"

LSI comment number 9

Page=90 Subtype=Highlight Author=Tim Hoglund

Comment=definition needed for "root edge expander device"

LSI comment number 10

Page=91 Subtype=Highlight Author=Tim Hoglund

Comment=

Text and reference for description of partial pathway not strictly consistent with definition 3.1.131. Also partial pathway should include case whereby OPEN address frame has reached the destination phy but no response has been given (yet).

LSI comment number 11

Page=108 Subtype=Highlight Author=Tim Hoglund

Comment=remove OPEN\_REJECT (WAITING FOR BREAK). see 05-145r0.

LSI comment number 12

Page=108 Subtype=Highlight Author=Brian Day

Comment=missing "is"

LSI comment number 13

Page=110 Subtype=Highlight Author=Tim Hoglund  
Comment=be more specific, i.e. routing attribute value

LSI comment number 14  
Page=121 Subtype=Highlight Author=Brian Day  
Comment=There are a few dangling lines in the diagram

LSI comment number 15  
Page=130 Subtype=Highlight Author=Tim Hoglund  
Comment=  
this section should also discuss Phy test functionality provided by the SMP  
PHY TEST FUNCTION

LSI comment number 16  
Page=146 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 2

Delete Editor's Note 2 (and fix keys if they are indeed incorrect)

LSI comment number 17  
Page=146 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 1

Delete Editor's Note 1 (and fix keys if they are indeed incorrect)

LSI comment number 18  
Page=147 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 3

Delete Editor's Note 3 (and fix keys if they are indeed incorrect)

LSI comment number 19  
Page=153 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 4

Delete Editor's Note 4 (and fix signal assignments if they are indeed incorrect)

LSI comment number 20  
Page=154 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 5

Delete Editor's Note 5 (and fix signal assignments if they are indeed incorrect)

LSI comment number 21  
Page=161 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 6

Delete Editor's Note 6 (and fix signal assignments if they are indeed incorrect)

LSI comment number 22  
Page=162 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 7

Delete Editor's Note 7 (and fix signal assignments if they are indeed incorrect)

LSI comment number 23  
Page=165 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 8

Delete Editor's Note 8 (and fix signal assignments if they are indeed incorrect)

LSI comment number 24  
Page=166 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 9

Delete Editor's Note 9 (and fix signal assignments if they are indeed incorrect)

LSI comment number 25  
Page=167 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 10

Delete Editor's Note 10 (and fix keys if they are indeed incorrect)

LSI comment number 26  
Page=168 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 11

Delete Editor's Note 11 (and fix keys if they are indeed incorrect)

LSI comment number 27  
Page=252 Subtype=Highlight Author=Tim Hoglund  
Comment=change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.

LSI comment number 28  
Page=256 Subtype=Highlight Author=Tim Hoglund  
Comment=change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.

LSI comment number 29  
Page=256 Subtype=Highlight Author=Tim Hoglund  
Comment=change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.

LSI comment number 30  
Page=269 Subtype=Highlight Author=Tim Hoglund

Comment=  
remove clause b)  
see 05-145r0

LSI comment number 31  
Page=269 Subtype=Highlight Author=Tim Hoglund  
Comment=change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.

LSI comment number 32  
Page=269 Subtype=Highlight Author=Tim Hoglund  
Comment=change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.

LSI comment number 33  
Page=270 Subtype=Highlight Author=Brian Day  
Comment=  
Should this be an item 4) instead of combined together with item 3)?

LSI comment number 34  
Page=315 Subtype=Highlight Author=Brian Day  
Comment=  
Need to pass up STP Resources Busy to match up with Table 107 in Port Layer.

LSI comment number 35  
Page=318 Subtype=Highlight Author=Tim Hoglund  
Comment=  
functional issue -- this behavior does not completely solve BREAK timing problems. see 05-145r0 for further details.

LSI comment number 36  
Page=327 Subtype=Highlight Author=Tim Hoglund  
Comment=  
...shall occur if:  
a) a Forward\_Open indication has not been received; and  
b) a BREAK Received message is received

LSI comment number 37  
Page=327 Subtype=Highlight Author=Tim Hoglund  
Comment=  
Remove dependency on BREAK Received message.

Honor the Forward Open indication and a pass both OPEN Address Frame Received argument and BREAK Received argument in the transition to XL5:Forward\_Open.

LSI comment number 38  
Page=333 Subtype=Highlight Author=Tim Hoglund  
Comment=  
functional issue -- this behavior does not completely solve BREAK timing problems. see 05-145r0 for further details.

LSI comment number 39  
Page=376 Subtype=Highlight Author=Brian Day  
Comment=  
Should be "Upon entry into this state,"

This state doesn't receive Tx Open messages. The Tx Open caused the PL\_PM1 to PL\_PM2 transition.

LSI comment number 40  
Page=377 Subtype=Highlight Author=Brian Day  
Comment=should be "Inbound"

LSI comment number 41  
Page=377 Subtype=Highlight Author=Brian Day  
Comment=should be "an"

LSI comment number 42  
Page=380 Subtype=Highlight Author=Brian Day  
Comment=  
It is not possible to be in this state during a connection, as the connection was never established.  
Suggest something like "as the result of an SMP connection request".

LSI comment number 43  
Page=380 Subtype=Highlight Author=Brian Day  
Comment=  
I think this needs to be Connection Closed(Transition to Idle) specifically. Otherwise, PL\_PM3 state will exit as soon as the first Connection Closed happens.

LSI comment number 44  
Page=396 Subtype=Highlight Author=Brian Day  
Comment=  
In addition to XFER\_RDY being received, I thought during conference call we were going to add DATA frame for a read command here as well.

LSI comment number 45  
Page=399 Subtype=Highlight Author=Brian Day  
Comment=  
Unless section 9.2.5 is removed entirely, there should be a sentence here that says transport layer retries are not included in the summary.

LSI comment number 46  
Page=399 Subtype=Highlight Author=Brian Day  
Comment=  
Replace this sentence with:  
If an SSP initiator port receives a RESPONSE frame with a RETRANSMIT bit set to one, and it has not previously received a RESPONSE frame for the same I\_T\_L\_Q nexus, then the RESPONSE frame is valid.

LSI comment number 47  
Page=400 Subtype=Highlight Author=Brian Day  
Comment=should be "the"

LSI comment number 48  
Page=406 Subtype=Highlight Author=Brian Day  
Comment=  
Relative to comment in section 9.2.6.2.3.7.1, this may need to be ACK/NAK Timeout instead of Command Failed, Connection Failed.



LSI comment number 49

Page=408 Subtype=Highlight Author=Brian Day

Comment=

I think this is supposed to be a generic Transmission Complete, not specifically a "Connection Failed", where the specific parameter is from item a) in the list following this paragraph.

LSI comment number 50

Page=408 Subtype=Highlight Author=Brian Day

Comment=

I think need to add "or a COMMAND frame" if supporting retrying the COMMAND frame at least once, per last sentence of 9.2.4.2

LSI comment number 51

Page=409 Subtype=Highlight Author=Brian Day

Comment=

I think this sentence conflicts with 9.2.4.2 and 10.2.2. After a command transmission gets an ACK/NAK timeout, application layer is running a QUERY TASK. At ACK/NAK Timeout, the ST\_ITS sent up the Transmission Complete(Command Failed, Connection Failed). IF XFER\_RDY now comes in before the response for the QUERY TASK, it is supposed to be valid.

LSI comment number 52

Page=409 Subtype=Highlight Author=Brian Day

Comment=

Need to add the retries case to not conflict with last sentence of 9.2.4.2.

"The Transmit Frame request was for a COMMAND frame, and the vendor-specific number of retries has been reached."

LSI comment number 53

Page=410 Subtype=Highlight Author=Brian Day

Comment=should be "ST\_IFR"

LSI comment number 54

Page=410 Subtype=Highlight Author=Brian Day

Comment=should be "ST\_IFR"

LSI comment number 55

Page=413 Subtype=Highlight Author=Brian Day

Comment=

Based on previous paragraph comment, this paragraph may not be accurate.

LSI comment number 56

Page=413 Subtype=Highlight Author=Brian Day

Comment=

I think this should be ACK/NAK Timeout instead of Command Failed, Connection Failed, to not conflict with 9.2.4.2 and 10.2.2 to allow command frame retries.

LSI comment number 57

Page=413 Subtype=Highlight Author=Brian Day

Comment=should be "Reception"

LSI comment number 58

Page=422 Subtype=Highlight Author=Brian Day  
Comment=

think this is supposed to be a generic Transmission Complete, not specifically a "Connection Failed", where the specific parameter is from item b) in the list following this paragraph.

LSI comment number 59

Page=450 Subtype=Highlight Author=Brian Day  
Comment=

I think values for anything 1 ms or greater may conflict with the port and link layer state machines.

For connections that the target establishes, in section 8.2.2.3.5, the PL\_OC will close the connection, essentially bypassing the bus inactivity timer. For connections, the initiator establishes:

1) the initiator may have sent DONE, and is running the DONE Timeout timer. Not closing within 1ms results in BREAK.

2) The timer may never be started in this connection in section 8.2.3.4 PL\_PM3, if the target doesn't have a frame to transmit.

LSI comment number 60

Page=477 Subtype=Highlight Author=Tim Hoglund  
Comment=

informative note vs normative shall?

this is stated as an expander requirement but really is a capacity/topology consideration for cascading multiple expanders...

LSI comment number 61

Page=565 Subtype=Highlight Author=Tim Hoglund  
Comment=change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.

LSI comment number 62

Page=613 Subtype=Highlight Author=John Lohmeyer  
Comment=

Editor's Note 13

Resolve this note.

LSI comment number 63

Page=613 Subtype=Highlight Author=John Lohmeyer  
Comment=

Editor's Note 12

Resolve this note.

LSI comment number 64

Page=614 Subtype=Highlight Author=John Lohmeyer  
Comment=

Editor's Note 16

Resolve this note.

LSI comment number 65

Page=614 Subtype=Highlight Author=John Lohmeyer  
Comment=

Editor's Note 15

Resolve this note.

LSI comment number 66  
Page=614 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 14

Resolve this note.

LSI comment number 67  
Page=615 Subtype=Highlight Author=John Lohmeyer  
Comment=  
Editor's Note 17

Resolve this note.

\*\*\*\*\*

Comments attached to No ballot from Mark Evans of  
Maxtor Corp.:

Summary of Comments on the Serial Attached SCSI 1.1 (SAS-1.1) Standard

Mark Evans  
Maxtor Corporation

Maxtor comment # 1

Page: 1  
Global: There are hundreds of occurrences of unclear pronoun references in  
this document. While reviewing the document for letter ballot, I only had  
time  
to comment on the ones that I thought were the most unclear. The general  
rule  
for pronoun usage is: there shall be no other noun forms (noun, pronoun,  
gerund, etc.) between a pronoun and the noun to which it is referring. The  
editor should correct any unclear pronoun references by replacing the  
unclear  
pronoun with the correct noun as he discovers the occurrences. Hint: one  
could  
start this process by searching on "it", then move on by searching on  
"they".

Maxtor comment # 2

Page: 4  
2.3: SES-2 is mentioned in many places and should be included here.

Maxtor comment # 3

Page: 6

3.1.11: Change to: an I/O subsystem that is made up of one host, one or more devices, and a service delivery subsystem. [as defined by the T13 Technical Committee.]

Maxtor comment # 4

Page: 7

3.1.28: Change to: Information passed from a lower layer state machine to a higher layer state machine, usually responding to a request (see 3.1.153) from that higher layer state machine. See 3.6.

Maxtor comment # 5

Page: 9

3.1.52, item (a): Change, "ideal bit time" to "average bit time". [this allows for frequency tolerances.]

Maxtor comment # 6

Page: 9

3.1.66: Change to: An object within an expander device that contains one or more phys and interfaces to the service delivery subsystem and to SAS ports in other devices (see x.x).

Maxtor comment # 7

Page: 10

3.1.67: Define "routed SAS address".

Maxtor comment # 8

Page: 10

3.1.71: Change "vs." to "versus".

Maxtor comment # 9

Page: 10

3.1.71, second sentence: Change to: Comparison of the measured eye contour to the jitter eye masks determines if a jitter eye mask violation has occurred (see 5.3.6).

Maxtor comment # 10

Page: 10

3.1.73: Add "(See x.x)" where x.x is the number of the clause where this device is described in detail.

Maxtor comment # 11

Page: 10

3.1.75: Change "e.g." to "i.e." in two places.

Maxtor comment # 12

Page: 10

3.1.84: Add "(See SAM-3)".

Maxtor comment # 13

Page: 10

3.1.86: Add "(See SAM-3)".

Maxtor comment # 14

Page: 11

3.1.87: Add "(See SAM-3)".

Maxtor comment # 15

Page: 11

3.1.91: Change to: Information passed from a lower layer state machine to a higher layer state machine, usually relaying a request (see 3.1.153) from a peer layer state machine. See 3.6.

Maxtor comment # 16

Page: 13

3.1.124: Change "after" to "as the result of".

Maxtor comment # 17

Page: 14

3.1.143: Change to: A mathematical representation of the likelihood of occurrence of various events. When applied to a jitter event population, it describes the histogram of measured jitter values.

Maxtor comment # 18

Page: 15

3.1.153: Change to: Information passed from a higher layer state machine to a lower layer state machine, usually to initiate some action. See 3.6.

Maxtor comment # 19

Page: 15

3.1.154: Change "from" to "in".

Maxtor comment # 20

Page: 15

3.1.155: Change to: Information passed from a higher layer state machine to a lower layer state machine, usually in response to an indication (see 3.1.91).

See 3.6.

Maxtor comment # 21

Page: 15

3.1.156: Delete the last sentence ("All SAS receiver devices shall be retimers.").

Maxtor comment # 22

Page: 19

3.1.240: Change "A physical entity..." to "A physical entity contained in a SAS port..."

Maxtor comment # 23

Page: 19

3.1.241: Change to: An electronic circuit that converts a logical signal to an analog serial output signal.

Maxtor comment # 24

Page: 26

3.5: Figure 3 is the first of many instances where it is difficult to determine what all is included in the figure. In these cases it would be helpful to put a box around all of the items in the figures, or somehow group them in some other way.

Maxtor comment # 25

Page: 32

3.6.3, third paragraph: Change, "...going to the top or bottom..." to, "...going toward the top or bottom..."

Maxtor comment # 26

Page: 32

3.6.4: Change, "They are created..." to, "Counters, timers and variables are created..."

Maxtor comment # 27

Page: 35

4.1.2, second paragraph: Change, "...which attaches to another physical phy." to, "which attaches to a physical phy in another device."

Maxtor comment # 28

Page: 47

4.1.8.1: Change, "Some of them..." to, "Expander devices..."

Maxtor comment # 29

Page: 48

4.1.8.2, paragraph 7: Change to:

An edge expander device set may be attached to one other edge expander device

set if:

- a) the expander device set is the only other edge expander device set in the SAS domain;
- b) the expander device set is attached using expander phys with subtractive routing attributes; and
- c) there are no fanout expander devices in the SAS domain.

Maxtor comment # 30

Page:48

4.1.8.3, second sentence: Change to: A fanout expander device may be attached

to up to 128 SAS ports.

Maxtor comment # 31

Page: 52

4.1.10, second paragraph: Change, "...when an OPEN\_ACCEPT is returned to the source phy." to, "...when an OPEN\_ACCEPT is received by the source phy."

Maxtor comment # 32

Page: 67

4.4.1, first paragraph: Change "describes" to "illustrates".

Maxtor comment # 33

Page: 72

4.6.2, fourth paragraph: Change, "...within an expander port requests and responds to connection requests..." to, "...within an expander port requests connections and responds to connection requests...".

Maxtor comment # 34

Page: 72

4.6.2, fifth paragraph: Change "SES" to "see SES-2".

Maxtor comment # 35

Page: 76

Table 12, second column, fifth row (Arbitrating (Waiting On Connection)): Change "block" to "blocked".

Maxtor comment # 36

Page: 77

Table 12, second column, eighth row (Arb Reject (Bad Destination)): Change to:

Confirmation that the ECM has determined that:

- a) the requested destination SAS address maps back to the requesting port;

- b) the requesting port is using the direct routing method; or
- c) the requesting port is using the table routing method, and the EM has not chosen to return Arb Reject (No Destination) (see 7.12.5.2 and 7.12.5.3).

Maxtor comment # 37

Page: 83

4.7.2, fourth paragraph: Change, "...it shall disable the expander route entry...", to, "...the management application client shall disable the expander route entry...".

Maxtor comment # 38

Page: 105

5.2.3.3.6, fifth paragraph: Change, "Based on what device are using the connector...", to, "Based on what device is using the connector...".

Maxtor comment # 39

Page: 107

Editor's Note 1: This is the first of many notes stating that something may be incorrect. Correct whatever is incorrect in each case and delete the note.

Maxtor comment # 40

Page: 119

5.2.4.2, lettered list: correct the lettering.

Maxtor comment # 41

Page: 119

5.2.4.3.1, second lettered list: correct the lettering.

Maxtor comment # 42

Page: 120

NOTE 8: Change "controller to backplane" to "controller-to-backplane".

Maxtor comment # 43

Page: 121

NOTE 9: Change "controller to controller" to "controller-to-controller".

Maxtor comment # 44

Page: 121

NOTE 10: Change "controller to controller" to "controller-to-controller".

Maxtor comment # 45

Page: 123

NOTE 13: Change "controller to controller" to "controller-to-controller".

Maxtor comment # 46



Page: 138

5.3.1, paragraph above figure 88: Change, "It also shows...", to, "Figure 88 also shows...".

Maxtor comment # 47

Page: 145

5.3.3, fourth paragraph: Change the first sentence to: The TxRx connection shall have a BER that is less than the objective of 10-12.

Maxtor comment # 48

Page: 146

Table 34, note b: Change "i.e." to "e.g.".

Maxtor comment # 49

Page: 148

5.3.4, list item e: Change, "enabling and disabling pre-emphasis (i.e., de-emphasis)" to, "enabling pre-emphasis or disabling preemphasis (i.e., de-emphasis)".

Maxtor comment # 50

Page: 151

5.3.7.1, third paragraph: Delete "(i.e., de-emphasis)".

Maxtor comment # 51

Page: 153

Table 38, note d: Change "i.e." to "e.g.".

Maxtor comment # 52

Page: 156

Table 40, note d: Change "i.e." to "e.g.".

Maxtor comment # 53

Page: 162

6.3.3, seventh paragraph: Change the first sentence to: All sub-blocks with equal numbers of zeros and ones have neutral disparity (i.e., the ending disparity is the same as the beginning disparity) with the exceptions noted above.

Maxtor comment # 54

Page: 171

6.6.1, first paragraph: In the first sentence, change "the phy" to "a phy".

Maxtor comment # 55

Page: 171

6.6.1, first paragraph: In the second sentence, change, "They consist

of...",  
to, "OOB signals consist of..."

Maxtor comment # 56

Page: 172

6.6.2, third paragraph: Change, "It shall then transmit...", to, "The transmitter device shall then transmit..."

Maxtor comment # 57

Page: 172

6.6.2, sixth paragraph: Change to: A SAS transmitter device:

a) should transmit ALIGNs at the G1 physical link rate to create the burst portion of the OOB signal;

b) may transmit ALIGNs at the lowest physical link rate supported by the SAS transmitter device if it is not able to transmit at the G1 physical link rate; and

c) shall not transmit ALIGNs at a physical link rate faster than the lowest physical link rate supported by the SAS transmitter device.

Maxtor comment # 58

Page: 174

6.6.5, fifth paragraph: Add the following sentence: A SAS receiver device is not required to identify the ALIGNs in the burst.

Maxtor comment # 59

Page: 187

6.8.1. fourth paragraph: Change to: The SP state machine shall maintain a MgmtReset state machine variable to determine whether SP0:OOB\_COMINIT was last

entered as the result of a Management Reset or a transition from another state

(see 6.8.3.2.1). If SP0:OOB\_COMINIT was last entered as the result of a Management Reset, then the SP state machine shall set the MgmtReset state machine variable to one. If SP0:OOB\_COMINIT was last entered as the result of

a transition from another state, then the SP state machine shall set the MgmtReset state machine variable to zero. Any transition from SP7:OOB\_AwaitCOMSAS shall cause the SP state machine to set the MgmtReset state machine variable to zero.

Maxtor comment # 60

Page: 187

6.8.1. fifth paragraph: Change to: If the phy supports attachment to a SATA device (i.e., the phy is contained in an STP/SATA bridge), and the phy supports attachment to a SATA port selector, then the SP state machine shall maintain a COMWAKE\_Received state machine variable to determine whether a COMWAKE detected message was received in SP0:OOB\_COMINIT or SP1:OOB\_AwaitCOMX

since the last time SP0:OOB\_COMINIT was entered. A COMWAKE Detected message received in SP0:OOB\_COMINIT or SP1:OOB\_AwaitCOMX shall cause the SP state

machine to set the COMWAKE\_Received state machine variable to one. Any transition to SP0:00B\_COMINIT shall cause the SP state machine to set the COMWAKE\_Received state machine variable to zero.

Maxtor comment # 61

Page: 188

6.8.2, third paragraph: Change "idle time" to "D.C. idle".

Maxtor comment # 62

Page: 190

6.8.3.2.1, fifth paragraph: Change to: If:

- a) the phy supports attachment to a SATA device (i.e., the phy is contained in an STP/SATA bridge);
  - b) the phy supports attachment to a SATA port selector; and
  - c) this state receives a COMWAKE Detected message;
- then this state shall set the COMWAKE\_Received state machine variable to one, and, if the value of the ATTACHED SATA PORT SELECTOR bit in the DISCOVER response is zero, this state shall:
- a) set the ATTACHED SATA PORT SELECTOR bit in the DISCOVER response to one; and
  - b) send a SATA Port Selector Change confirmation to the link layer.

Maxtor comment # 63

Page: 190

6.8.3.2.1, sixth paragraph: Change to: The state machine shall set the MgmtReset state machine variable to one if this state is entered as the result of receiving a Management Reset request or an SMP Reset request. The state machine shall set the MgmtReset state machine variable to zero if this state is entered as the result of receiving:

- a) a power on or hard reset request;
- b) a DWS Lost message; or
- c) a COMINIT Detected message.

Maxtor comment # 64

Page: 190

6.8.3.3.1, second paragraph: Change to: If:

- a) the phy supports attachment to a SATA device (i.e., the phy is contained in an STP/SATA bridge);
  - b) the phy supports attachment to a SATA port selector; and
  - c) this state receives a COMWAKE Detected message;
- then this state shall set the COMWAKE\_Received state machine variable to one, and, if the value of the ATTACHED SATA PORT SELECTOR bit in the DISCOVER response is zero, this state shall:
- a) set the ATTACHED SATA PORT SELECTOR bit in the DISCOVER response to one; and
  - b) send a SATA Port Selector Change confirmation to the link layer.

Maxtor comment # 65

Page: 191

6.8.3.3.2, second paragraph: Change to: If the phy supports attachment to a SATA device (i.e., the phy is contained in an STP/SATA bridge) and supports attachment to a SATA port selector, then the state machine shall check the value of the COMWAKE\_Recieved state machine variable prior to this transition.

If the COMWAKE\_Received state machine variable is set to zero and the ATTACHED

SATA PORT SELECTOR bit in the DISCOVER response is set to one, then the state

machine shall set the ATTACHED SATA PORT SELECTOR bit in the DISCOVER response

to zero and shall send a SATA Port Selector Change confirmation to the link layer.

Maxtor comment # 66

Page: 191

6.8.3.5.1, second paragraph: Change to: If:

a) this state receives COMWAKE Detected message;

b) the phy supports attachment to a SATA device (i.e., the phy is contained in

an STP/SATA bridge);

c) the phy supports attachment to a SATA port selector; and

d) the value of the ATTACHED SATA PORT SELECTOR bit is zero in the DISCOVER response;

then this state shall set the ATTACHED SATA PORT SELECTOR bit in the DISCOVER

response to one and send a SATA Port Selector Change confirmation to the link

layer.

Maxtor comment # 67

Page: 191

6.8.3.6.1, second paragraph: Change to: If:

a) this state receives COMWAKE Detected message;

b) the phy supports attachment to a SATA device (i.e., the phy is contained in

an STP/SATA bridge);

c) the phy supports attachment to a SATA port selector; and

d) the value of the ATTACHED SATA PORT SELECTOR bit is zero in the DISCOVER response;

then this state shall set the ATTACHED SATA PORT SELECTOR bit in the DISCOVER

response to one and send a SATA Port Selector Change confirmation to the link

layer.

Maxtor comment # 68

Page: 192

6.8.3.6.1, third paragraph: See the previous comment.

Maxtor comment # 69

Page: 192

6.8.3.6.2, second paragraph: Change "bit is one" to "bit is set to one" and "bit is zero" to "bit is set to zero".

Maxtor comment # 70

Page: 192

6.8.3.6.3, second paragraph: Change "bit is one" to "bit is set to one" and "bit is zero" to "bit is set to zero".

Maxtor comment # 71

Page: 195

6.8.4.2.1, second paragraph: Change item (a) to, 'initialize and start the RCDT timer (this provides the time required for a transmitter to switch to either the next higher or next lower supported speed negotiation window rate); and'

Maxtor comment # 72

Page: 195

6.8.4.2.1, third paragraph: Change to: The argument for the Set Rate message shall be:

- a) 1.5 Gbps (if the transition into this state was from the SP6:00B\_AwaitNoCOMSAS state); or
- b) the value of the SAS Speed Negotiation Window Rate argument.

Maxtor comment # 73

Page: 196

6.8.4.5.3: Change "lock" to "achieve dword synchronization".

Maxtor comment # 74

Page: 196

6.8.4.5.4: Change "lock" to "achieve dword synchronization".

Maxtor comment # 75

Page: 197

6.8.4.8.1, lettered list: Change "window" to "window rate" in three places.

Maxtor comment # 76

Page: 197

6.8.4.8.2, lettered list: Change "window" to "window rate" in two places. Change "haven't" to "have not".

Maxtor comment # 77

Page: 197

6.8.4.8.3, lettered lists: Change "window" to "window rate" in five places.

Maxtor comment # 78

Page: 198

See previous comment.

Maxtor comment # 79

Page: 228

7.2.5.9, eighth paragraph: Change to: When a SAS target devices with multiple SAS target ports receives a NOTIFY (ENABLE SPINUP) on any of its SAS target ports, the SAS target device transitions from the Active\_Wait or Idle\_Wait state (see 10.2.10). For example, if a SAS target device contains two SAS target ports (port A and port B), powers on in the Stopped state, and receives a START STOP UNIT command with the START bit set to one through SAS target port A, then a NOTIFY (ENABLE SPINUP) received on SAS target port B causes the SAS target device to spin up its rotating media.

Maxtor comment # 80

Page: 238

7.5.3, second paragraph: In the last sentence, change "Mathematically, the..." to "The...".

Maxtor comment # 81

Page: 243

7.8.1, first paragraph: Change the second sentence to: An address frame is delimited by a preceding SOAF and a following EOAF.

Maxtor comment # 82

Page: 250

7.9.3, first paragraph: Change the second sentence to be: The expander device may return OPEN\_REJECT (NO DESTINATION) in response to OPEN address frames until the expander device is ready to process connection requests.

Maxtor comment # 83

Page: 250

7.9.4, first paragraph: Change the second sentence to be: The expander device may return OPEN\_REJECT (NO DESTINATION) in response to OPEN address frames until the expander device is ready to process connection requests.

Maxtor comment # 84

Page: 257

7.11., lettered list, item b: Change to: 'after a virtual phy has been disabled with the SMP PHY CONTROL function DISABLE phy operation or has begun its internal reset as the result of receiving a LINK RESET or HARD RESET phy operation (see 10.4.3.10);'

Maxtor comment # 85

Page: 257

7.11., lettered list, item g: Change to: 'after a virtual phy has been enabled or completed an internal reset as the result of receiving an SMP PHY CONTROL function LINK RESET or HARD RESET phy operation (see 10.4.3.10);'

Maxtor comment # 86

Page: 258

7.12.1, first paragraph: Change "communication" to "SSP frame, SMP frame, or SATA FIS transmission".

Maxtor comment # 87

Page: 258

7.12.2.1, third paragraph: Change the last sentence to: If the Open Timeout timer expires before a connection response is received, the source phy shall transmit BREAK to abort the connection request (see 7.12.6).

Maxtor comment # 88

Page: 262

7.12.4.4, first paragraph: Change the second sentence to: Pathway recovery priority comparisons compare the values described in table 95 from the OPEN address frames of the blocked connection requests.

Maxtor comment # 89

Page: 269

7.13, first paragraph after figure 140: Change, "A phy shall start inserting ALIGNs and/or NOTIFYs for rate matching at the selected connection rate with the first dword...", to, "A phy shall start inserting ALIGNs and/or NOTIFYs for rate matching at the selected connection rate after the first dword..."

Maxtor comment # 90

Page: 291

7.15.9.1, fourth paragraph: Change the first sentence to: This state shall send the following responses received by one phy through the ECR to a source phy as confirmations:

Maxtor comment # 91

Page: 291

7.15.9.1, fifth paragraph: Change the first sentence to: This state shall send the following responses received by one phy through the ECR to a source phy

as  
confirmations:

Maxtor comment # 92

Page: 294

7.15.13.1, second paragraph: Change, "Upon entry into this state, this state shall send:", to, "Upon entry into this state, this state shall:".

Maxtor comment # 93

Page: 295

7.16.3, third paragraph: Change to: Receiving SSP phys shall acknowledge SSP frames within 1 ms (if the frame was not discarded as described in 7.16.7.7).

The receiving phy shall send an ACK to acknowledge that the SSP frame was received into a frame buffer without errors. The receiving phy shall send a NAK (CRC ERROR) to acknowledge that the SSP frame was received with a CRC error, an invalid dword, or an ERROR primitive.

Maxtor comment # 94

Page: 295

7.16.13, fourth paragraph: Change to: The transport layer (see 9.2.4) either retries sending SSP frames that encounter a link layer error (e.g., are NAKed

or create an ACK/NAK timeout), or the application layer aborts the SCSI command associated with the SSP frame that encountered a link layer error.

Maxtor comment # 95

Page: 303

7.16.7.3, fourth paragraph: Change to: When the number of Frame Transmitted messages received equals the number of ACK Received messages plus the number of NAK Received messages received, then the ACK/NAK count is balanced, and this state machine shall send a Tx Balance Status (Balanced) message to the SSP\_TF2:Tx\_Wait state. When the number of Frame Transmitted messages received

does not equal the number of ACK Received messages plus the number of NAK Received messages received, then this the ACK/NAK count is not balanced and this state machine shall send a Tx Balance Status (Not Balanced) message to the SSP\_TF2:Tx\_Wait state.

Maxtor comment # 96

Page: 303

7.16.7.3, first lettered list: Change item (a) to: decrement the ACK/NAK count by one.

Maxtor comment # 97

Page: 303

7.16.7.3, second lettered list: Change item (a) to: decrement the ACK/NAK count by one.



Maxtor comment # 98

Page: 309

7.16.7.9, third paragraph: Change, "...the number of the ACK Transmitted messages and the number of NAK Transmitted messages..." to, "...the number of the ACK Transmitted messages plus the number of NAK Transmitted messages..."

Maxtor comment # 99

Page: 309

7.16.7.9, fourth paragraph: Change, "...the number of the ACK Transmitted messages and the number of NAK Transmitted messages..." to, "...the number of the ACK Transmitted messages plus the number of NAK Transmitted messages..."

Maxtor comment # 100

Page: 333

8.2.2.3.6, last paragraph: Change to: If this state receives a Disable Tx Frames message from a PL\_PM state machine, then this state should send no more Tx Frame messages to that state machine until after a new connection is established.

Maxtor comment # 101

Page: 338

8.2.3.3.4, third paragraph: Change, "...Incoming Connection Rejected confirmation..." to, "...Inbound Connection Rejected confirmation..."

Maxtor comment # 102

Page: 340

8.2.3.4.1, twenty-fourth paragraph (the next to last paragraph on page 340): Change, "...Connection Closed (Transition to Idle Confirmation)..." to, "...Connection Closed (Transition to Idle) confirmation..."

Maxtor comment # 103

Page: 340

8.2.3.4.1, twenty-fifth paragraph (the last paragraph on page 340): Change, "...Connection Closed (Transition to Idle Confirmation)..." to, "...Connection Closed (Transition to Idle) confirmation..."

Maxtor comment # 104

Page: 349

9.2.2.2, fourth paragraph: Change, "If TASK MANAGEMENT FUNCTION contains..." to, "If the TASK MANAGEMENT FUNCTION field contains..."

Maxtor comment # 105

Page 349

9.2.2.2, fifth paragraph: Change, "If TASK MANAGEMENT FUNCTION is set..." to,  
"If the task management function is set..."

Maxtor comment # 106

Page: 350

9.2.2.3, fifth paragraph: Change "a XFER\_RDY" to "an XFER\_RDY".

Maxtor comment # 107

Page: 351

9.2.2.4, sixth paragraph: Change "a XFER\_RDY" to "an XFER\_RDY".

Maxtor comment # 108

Page: 351

9.2.2.4, tenth paragraph (the next to last paragraph in the clause): Change to: The DATA OFFSET field shall be set to zero in the initial read DATA frame for a given command. If any additional read DATA frames are required for the command and transport layer retries are not being used, then the DATA OFFSET field shall be set to the data offset plus the data length of the previous DATA frame for the command.

Maxtor comment # 109

Page: 351

9.2.2.4, eleventh paragraph (the last paragraph in the clause): Change to: The DATA OFFSET field shall be set to zero in the initial write DATA frame for a given command. If any additional write DATA frames are required for the command and transport layer retries are not being used, then the DATA OFFSET field shall be set to the data offset plus the data length of the previous DATA frame for the command.

Maxtor comment # 110

Page: 357

9.2.4.2, first paragraph: Change to: If an SSP initiator port transmits a COMMAND frame and does not receive an ACK or NAK for that frame (e.g., times out, or the connection is broken), then:

- 1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT)  
(see 7.16.7.6.5);
- 2) the application client sends a Send Task Management protocol service request for a QUERY TASK task management function to determine whether the command was received (see 10.2.2);
- 3) the transport layer constructs a TASK frame containing the task management function and the TAG OF TASK TO BE MANAGED field set to the tag of the COMMAND frame; and
- 4) the SSP initiator port transmits the TASK frame in a new connection with

the SSP target port.

Maxtor comment # 111

Page: 358

9.2.4.3, first paragraph: Change to: If an SSP initiator port transmits a TASK

frame and does not receive an ACK or NAK for that frame (e.g., times out, or the connection is broken), then:

1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT)

(see 7.16.7.6.5);

2) the application client sends a Send Task Management protocol service request for a the same task management function (see 10.2.2);

3) the transport layer constructs a TASK frame containing the task management

function and the TAG OF TASK TO BE MANAGED field set to the tag of the previous TASK frame; and

4) the SSP initiator port transmits the TASK frame in a new connection with the SSP target port.

Maxtor comment # 112

Page: 358

9.2.4.3, third paragraph: Change to: If an SSP initiator port does not receive

an ACK or a RESPONSE frame for a TASK frame, then the application client should send a Send Task Management protocol service request for a the same task management function and the SSP initiator port should transmit the TASK frame in a new connection to the SSP target port at least once.

Maxtor comment # 113

Page: 358

9.2.4.4.2, first paragraph: Change to: If an SSP target port transmits an XFER\_RDY frame and does not receive an ACK or NAK for that frame (e.g., times

out, or the connection is broken), then:

1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT)

(see 7.16.7.6.5);

2) the ST\_TTS state machine constructs a new XFER\_RDY frame setting the RETRANSMIT bit set to one and setting the value in the TARGET PORT TRANSFER TAG field to a value that is different than the value in the TARGET PORT TRANSFER TAG field in the previous XFER\_RDY frame (see 9.2.6.3.3.5); and

3) the SSP target port transmits the XFER\_RDY frame in a new connection with the SSP initiator port.

Maxtor comment # 114

Page: 358

9.2.4.4.2, second paragraph: Change to: If an SSP target port transmits an XFER\_RDY frame and receives a NAK for that frame, then:

1) the ST\_TTS state machine constructs a new XFER\_RDY frame setting the RETRANSMIT bit set to one and setting the value in the TARGET PORT TRANSFER

TAG field to a value that is different than the value in the TARGET PORT TRANSFER TAG field in the previous XFER\_RDY frame (see 9.2.6.3.3.5); and 2) the SSP target port transmits the XFER\_RDY frame to the SSP initiator port.

Maxtor comment # 115

Page: 358

9.2.4.4.2, third paragraph: Change the last sentence to: The ST\_ITS state machine does not send requests to transmit any additional write DATA frames for the previous XFER\_RDY frame after sending a request to transmit a write DATA frame for the new XFER\_RDY frame.

Maxtor comment # 116

Page:358

9.2.4.4.3, first paragraph: Change to: If an SSP target port transmits an XFER\_RDY frame and does not receive an ACK or NAK for that frame (e.g., times

out, or the connection is broken), then:

1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT)

(see 7.16.7.6.5);

2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED

COMMAND and the additional sense code set to ACK/NAK TIMEOUT (see 10.2.3);

3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and

4) the SSP target port transmits the RESPONSE frame in a new connection with the SSP initiator port.

Maxtor comment # 117

Page: 359

9.2.4.4.3, second paragraph: Change to: If an SSP target port transmits an XFER\_RDY frame and receives a NAK for that frame, then:

1) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED

COMMAND and the additional sense code set to ACK/NAK TIMEOUT (see 10.2.3);

2) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and

3) the SSP target port transmits the RESPONSE frame to the SSP initiator port.

Maxtor comment # 118

Page: 359

9.2.4.5.2, first paragraph: Change to: If an SSP target port transmits a read

DATA frame and does not receive an ACK or NAK for that frame (e.g., times out,

or the connection is broken), then:

1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK

TIMEOUT)  
(see 7.16.7.6.5); and  
3) the SSP target port retransmits, in a new connection with the SSP initiator port, all of the read DATA frames since a previous time when ACK/NAK balance occurred (see 9.2.6.3.3.4).

Maxtor comment # 119

Page: 359  
9.2.4.5.2, second paragraph: Change to: If an SSP target port transmits a read DATA frame and receives a NAK for that frame, then, in the same or in a new connection, the SSP target port retransmits all of the read DATA frames since a previous time when ACK/NAK balance occurred (see 9.2.6.3.3.4).

Maxtor comment # 120

Page: 359  
9.2.4.5.2, third paragraph: Change to: If an SSP initiator port transmits a write DATA frame and does not receive an ACK or NAK for that frame (e.g., times out, or the connection is broken), then:  
1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT)  
(see 7.16.7.6.5); and  
3) the SSP initiator port retransmits, in a new connection with the SSP target port, all of the write DATA frames since a previous time when ACK/NAK balance occurred (see 9.2.6.2.3).

Maxtor comment # 121

Page: 359  
9.2.4.5.2, fourth paragraph: Change to: If an SSP initiator port receives a new XFER\_RDY frame or a RESPONSE frame for a command while retransmitting or preparing to retransmit write DATA frames for that command, then the ST\_IFR state machine and ST\_ITS state machine stops sending requests to retransmit the write DATA frames and processes the XFER\_RDY frame or RESPONSE frame (see 9.2.6.2.2 and 9.2.6.2.3). The ST\_ITS state machine does not send a request to transmit a write DATA frame for the previous XFER\_RDY frame after sending a write DATA frame in response to the new XFER\_RDY frame.

Maxtor comment # 122

Page: 359  
9.2.4.5.2, fifth paragraph: Change to: If an SSP initiator port transmits a write DATA frame and receives a NAK for that frame, then, in the same or in a new connection, the SSP initiator port retransmits all of the write DATA frames since a previous time when ACK/NAK balance occurred (see

## 9.2.6.3.3.4).

Maxtor comment # 123

Page: 359

9.2.4.5.2, seventh paragraph: Change to: The ST\_ITS state machine and ST\_TTS state machine send requests to retransmit each DATA frame that does not receive an ACK at least one time (see 9.2.6.2.3 and 9.2.6.3.3). The number of times the state machines retransmit each DATA frame is vendor-specific.

Maxtor comment # 124

Page: 360

9.2.4.5.3, first paragraph: Change to: If an SSP target port transmits a read

DATA frame and does not receive an ACK or NAK for that frame (e.g., times out,

or the connection is broken), then:

1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT)

(see 7.16.7.6.5);

2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED

COMMAND and the additional sense code set to ACK/NAK TIMEOUT (see 10.2.3);

3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and

4) the SSP target port transmits the RESPONSE frame in a new connection with the SSP initiator port.

Maxtor comment # 125

Page: 360

9.2.4.5.3, second paragraph: Change to: If an SSP target port transmits a read

DATA frame and receives a NAK for that frame, then:

1) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED

COMMAND and the additional sense code set to ACK/NAK TIMEOUT (see 10.2.3);

2) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and

3) the SSP target port transmits the RESPONSE frame to the SSP initiator port.

Maxtor comment # 126

Page: 360

9.2.4.5.3, third paragraph: Change to: If an SSP initiator port transmits a write DATA frame and does not receive an ACK or NAK for that frame (e.g., times out, or the connection is broken), then:

1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT)

(see 7.16.7.6.5); and

2) the application client aborts the command (see 10.2.2).

Maxtor comment # 127

Page: 360

9.2.4.5.3, fourth paragraph: Change to: If an SSP initiator port transmits a write DATA frame and receives a NAK for that frame, the application client aborts the command (see 10.2.2).

Maxtor comment # 128

Page: 360

9.2.4.6, first paragraph: Change to: If an SSP target port transmits a RESPONSE frame and does not receive an ACK or NAK for that frame (e.g., times

out, or the connection is broken), then:

1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT)

(see 7.16.7.6.5);

2) the ST\_TTS state machine constructs a new RESPONSE frame using all of the values from the previous frame, except the RETRANSMIT bit is set to one (see 9.2.6.3.3); and

4) the SSP target port transmits the RESPONSE frame in a new connection with the SSP initiator port.

Maxtor comment # 129

Page: 360

9.2.4.6, second paragraph: Change to: If an SSP target port transmits a RESPONSE frame and receives a NAK for that frame, the SSP target port retransmits the RESPONSE frame at least one time with the RETRANSMIT bit set to zero (see 9.2.6.3.3).

Maxtor comment # 130

Page: 360

9.2.4.6, third paragraph: Change to: An SSP target port retransmits each RESPONSE frame that does not receive an ACK at least one time (see 9.2.6.3.3).

The number of times the SSP target port retransmits each RESPONSE frame is vendor-specific.

Maxtor comment # 131

Page: 360

9.2.4.6, fourth paragraph: Change to: If an SSP initiator port receives a new RESPONSE frame for an I\_T\_L\_Q nexus with the RETRANSMIT bit set to one, and that SSP initiator port has previously received a RESPONSE frame for the same I\_T\_L\_Q nexus, then the ST\_TFR state machine discards the new RESPONSE frame (see 9.2.6.3.2). If the ST\_TFR state machine had not previously received

a RESPONSE frame for the I\_T\_L\_Q nexus, then the state machine considers the new RESPONSE frame to be the valid RESPONSE frame for the I\_T\_L\_Q nexus.

Maxtor comment # 132

Page: 361

9.2.5.2, third paragraph: Change, "...he ST\_IFR state machine..." to, "...the ST\_IFR state machine...".

Maxtor comment # 133

Page: 361

9.2.5.3, second paragraph: Change "the ST\_TTS state machine" to "then the SSP target port".

Maxtor comment # 134

Page: 361

9.2.5.3, third paragraph: Change "the ST\_TTS state machine" to "then the SSP target port".

Maxtor comment # 135

Page: 361

9.2.5.3, fourth paragraph: Change "the device server" to "then the SSP target port".

Maxtor comment # 136

Page: 362

9.2.5.3, eighth paragraph: Change "the ST\_TFR state machine" to "then the SSP target port".

Maxtor comment # 137

Page: 362

9.2.5.3, ninth paragraph: Change "the ST\_TFR state machine" to "then the SSP target port".

Maxtor comment # 138

Page: 362

9.2.5.3, eleventh paragraph: Change to: If an SSP target port receives a write

DATA frame with a data offset that was not expected, then:

- 1) the ST\_TTS state machine discards the frame (see 9.2.6.3.3.6.1);
- 2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED

COMMAND and the additional sense code set to DATA OFFSET ERROR (see 10.2.3);

- 3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and

- 4) the SSP target port transmits the RESPONSE frame in the same or a new connection with the SSP initiator port.



Maxtor comment # 139

Page: 362

9.2.5.3, twelfth paragraph: Change to: If an SSP target port receives a write

DATA frame with more write data than expected (i.e., the write DATA frame contains data in excess of that requested by an XFER\_RDY frame or, for first burst data, indicated by the FIRST BURST LENGTH field in the Disconnect-Reconnect mode page), then:

1) the ST\_TTS state machine discards the frame (see 9.2.6.3.3.6.1);  
2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED

COMMAND and the additional sense code set to TOO MUCH WRITE DATA (see 10.2.3);

3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and

4) the SSP target port transmits the RESPONSE frame in the same or a new connection with the SSP initiator port.

Maxtor comment # 140

Page: 362

9.2.5.3, thirteenth paragraph: Change to: If an SSP target port receives a zero length write DATA frame, then:

1) the ST\_TTS state machine discards the frame (see 9.2.6.3.3.6.1);  
2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED

COMMAND and the additional sense code set to INFORMATION UNIT TOO SHORT (see 10.2.3);

3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and

4) the SSP target port transmits the RESPONSE frame in the same or a new connection with the SSP initiator port.

Maxtor comment # 141

Page: 362

9.2.5.3, add the following as a last paragraph: If an ST\_TFR state machine receives any subsequent write DATA frames for a command that has been aborted,

then the ST\_TFR state machine discards those frames (see 9.2.6.3.2).

Maxtor comment # 142

Page: 373

9.2.6.2.3.5.2: Change the clause heading to be bold.

Maxtor comment # 143

Page: 400

Table 134 through 146: Change "specifies" and "indicates", as required, to be

consistent with common practice.

Maxtor comment # 144

Page: 433

10.4.3.1, fourth paragraph: Change, "The ADDITIONAL REQUEST BYTES field definition and length is based..." to, "The ADDITIONAL REQUEST BYTES field definition and length are based...".

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Comments attached to No ballot from Jay Neer of Molex Inc.:

- 1. The information in the ballot was translated incorrectly from the original input for the tables and figures for the new Compact MultiLane connectors and needs to be corrected by the editor.
- 2. I agree with the 05-139r0 document that the duplicate technical information be removed for the new Compact MultiLane connector documentation; remove the tables and leave the figures.
- 3. I propose that the pin out proposed in 05-138r0 be used instead of the pin out proposed in the ballot. This proposed pin out will more closely follow the pin out requested by the committee at the last meeting and will facilitate having a cable assembly that is easier to manufacture.

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Comments attached to Yes ballot from Bill Lye of PMC-Sierra:

PMC #1  
 PDF Page 181  
 Section 5.3.2.2 Zero-length test load  
 Second Paragraph  
 "Figure 91" should be "Figure 92"

PMC #2  
 PDF Page 184  
 Section 5.3.2.4 Low-loss TCTF test load  
 Fourth Paragraph  
 The equation for this TCTF are specified differently than either of the other two TCTF's, in that it specifies a smooth line from 50MHz to 5,0GHz while the other two equations specify kinks at 3,0GHz (3Gbps operation) or 1,5GHz (1.5Gbps operation). Should the Low-loss TCTF be similarly specified with kinks at 1,5GHz and 3,0GHz? As it stands with the current definition, the Low Loss TCTF actually allows more loss above 2,7GHz than the 1.5Gbit/s Internal TCTF, and is allows slightly more loss at

5,0GHz than the 3.0Gbit/s Internal TCTF, which makes the term "Low Loss" somewhat inaccurate. Although probably not relevant to this discussion, this TCTF also allows more loss than that allowed by the corresponding SATA2 cable specification.

## PMC #3

PDF Page 193

Table 38 - Transmitter device signal output....

Last line

Note f has been applied to the entry (225mV) for 1,5Gbps IT Minimum OOB burst amplitude if attaching to a SATA device is supported. Note f allows 3,0Gbps ALIGN(0) dwords but does not allow 1,5 Gbps D24.3 characters. Suggestion is to apply note g instead.

## PMC #4

PDF Page 193

Table 38 - Transmitter device signal output....

Note g

The text "... or 3,0 Gbps ALIGN(0) dwords (see SATA2-PHY)." implies that SATA2 may transmit 3,0 Gbps ALIGN(0) OOB bursts, when in fact SATA2 may only transmit 1,5 Gbps D24.3 characters or 1,5 Gbps ALIGN(0) dwords. Suggestion is to move the "(see SATA2-PHY)" to after "1,5 Gbps D24.3 characters".

## PMC #5

PDF Page 196

Table 40 - Delivered signal characteristics as measured....

Last line

Note f has been applied to the entry (225mV) for 1,5Gbps IT Minimum OOB burst amplitude if attaching to a SATA device is supported. Note f allows 3,0Gbps ALIGN(0) dwords but does not allow 1,5 Gbps D24.3 characters. Suggestion is to apply note g instead.

## PMC #6

PDF Page 196

Table 40 - Delivered signal characteristics as measured....

Note g

The text "... or 3,0 Gbps ALIGN(0) dwords (see SATA2-PHY)." implies that SATA2 may transmit 3,0 Gbps ALIGN(0) OOB bursts, when in fact SATA2 may only transmit 1,5 Gbps D24.3 characters or 1,5 Gbps ALIGN(0) dwords. Suggestion is to move the "(see SATA2-PHY)" to after "1,5 Gbps D24.3 characters".

## PMC #7

PDF Pages 513-514

Section B.2.2 Assumptions for the structure of the...

Second enumerated list

This list enumerates the individual components that a transmitter device contains. It may be preferable if the order of the list were to better match what would normally be seen, i.e. a,b,e,f,g,c,d.

## PMC #8

PDF Page 513-514

Section B.2.2 Assumptions for the structure of the...

Second enumerated list, last line

The text "possibly ESD devices" should be "possibly ESD protection devices"

PMC #9

PDF Page 514

Section B.2.2 Assumptions for the structure of the...

Fourth enumerated list

This list enumerates the individual components that a receiver device contains. It may be preferable if the order of the list were to better match what would normally be seen, i.e. a,b,e,f,g,c,d.

PMC #10

PDF Page 514

Section B.2.2 Assumptions for the structure of the...

Fourth enumerated list, last line

The text "possibly ESD devices" should be "possibly ESD protection devices"

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Comments attached to Yes ballot from Craig W. Carlson of QLogic Corp.:

Qlogic Corp #001

PDF page 328

7.15.4.5 Transition XL1:Request\_Path to XL5:Forward\_Open

The following changes eliminate confusion regarding the arguments associated

with the OPEN Address Frame received message.

In the last sentence of this section,

"This transition shall include an OPEN Address Frame Received argument containing the arguments received in the Forward Open indication.", replace "transition" with "state" and replace the end of the sentence beginning

with "containing the arguments ..." with "with the transition."

Qlogic Corp #002

PDF page 328

7.15.4.5 Transition XL1:Request\_Path to XL5:Forward\_Open

7.15.4.6 Transition XL1:Request\_Path to XL9:Break

The following changes ensure that the Forward Open indication takes precedence

over a simultaneous BREAK Received message.

In the first sentence of 7.15.4.5, strike-through ", a BREAK Received message

has not been received,".

Add the following as the last sentence in this section.

"If a BREAK Received message is received, this state shall include a BREAK Received argument with the transition."

In 7.15.4.6, replace "after receiving a BREAK Received message" with "if a BREAK

Received message is received and a Forward Open indication has not been received".

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

Comments are in document 05-147r0.

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Comments attached to Yes ballot from William Martin of Sierra Logic, Inc.:

Sierra\_Logic-001 Page 303 clause 7.16.7.3 4th paragraph last sentence '. then this the ACK/NAK .' should be '. then the ACK/NAK .' Sierra\_Logic-002 Page 304 clause 7.16.7.3 last paragraph I believe that this was intended to set the number of frames transmitted to zero, and the number of ACKS and NAKS received to zero. At a minimum indicate that the number of

ACKs and NAKs received may be set to zero. Sierra\_Logic-004 Page 437 clause 10.4.3.3 Last sentence of paragraph on EXPANDER CHANGE COUNT and first sentence of following paragraph - The first sentence here requires incrementing under certain conditions specified in 7.11; however, the second sentence makes this requirement optional. While there is the possibility of minimizing the number of BROADCAST(CHANGE) transmissions, the process will require more than this qualified sentence to make it correct for a normative reference. I would suggest removing the second highlighted sentence.

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Comments attached to No ballot from Ashlie Fan of TycoElectronics:

1) Table 31 (for External Cables), page 131: Maximum Intra-pair skew: 20ps Comments: Compare to Table 32 (For Internal Wide Cables), 20ps is not practically possible. External cable is expected to be several times longer than internal cables, but the skew budget is not. Suggest: Need to propose a reasonable budget or leave it off the spec until a reasonable budget is determined

2) Table 31 and Table 32: Maximum Crosstalk Comments: the descriptions of the requirements are not clear Suggest: change description to match how the measurement should take place, such as how many aggressor at one time and how many victim lines should be considered and their position. If more than one victim line is measured, the

spec requirement is a total sum?

3) General comments: Cable, Media, Cable Assembly  
 Comments: Cable, Media and Cable Assembly have been used in this document.  
 They cause confusions  
 Suggest: Need more clarification about these terms: does 'cable' mean  
 'cable assembly'?does 'media' mean cable/backplane without connector and  
 termination? etc

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Comments attached to Abs ballot from Roger Cummings of Veritas Software:

Not with our organization's area of interest

\*\*\*\*\* End of Ballot Report \*\*\*\*\*