Summary of Comments on Serial Attached SCSI 1.1 (SAS-1.1) Standard

Page: i

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 1:42:36 PM

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".

Page: xxiii

Author: relliott
Subject: Note
Date: 4/28/2005 4:46:43 PM
 REFER PROTOCOL WG

Consider adding Table to each line since ISO requires it

Page: xxviii

Author: relliott
Subject: Note
Date: 4/28/2005 4:46:54 PM
 REFER PROTOCOL WG

Consider adding Figure to each line since ISO requires it

Page: xxix

Author: relliott
Subject: Note
Date: 4/23/2005 4:17:53 PM
ACCEPT - LAST
Watch the wrapping on these long figure titles

Page: xxxiii

Author: lohmeyer_lsi
Date: 4/23/2005 3:26:28 PM
ACCEPT - LAST

Revision Information

Remove this section prior to public review.

Author: gop_ibm
Date: 4/23/2005 4:26:31 PM
ACCEPT - DONE (track with LSI comment on this page 33)

The revision information needs to be removed.

Page: xxxvii

Author: lohmeyer_lsi
Date: 4/23/2005 3:26:49 PM
ACCEPT - LAST

Add T10 List to Foreword (available at: http://www.t10.org/ftp/pri/editors/t10-ansi.txt)

Page: 1

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 4:49:56 PM

TREFER PROTOCOL WG (the formal expansion of the SPC acronym is SCSI Primary Commands not Primary Command Set (PCS). This is worded to parallel "Device-type specific command sets" on the left.)

1 Scope

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

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 7:41:21 PM

TACCEPT - DONE

1 Scope
Figure 1 - SCSI document relationships

Change
"Protocols"
to
"SCSI Transport Protocols"

Page: 2

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 7:41:41 PM
REJECT (see response on figure 1)

1 Scope

In Figure 2 - ATA document relationships

Change
"Primary command set"
to
"Primary Command Set"

Author: relliott
Subject: Highlight
Date: 4/19/2005 7:47:29 PM
ACCEPT - DONE

1 Scope
Figure 2

In "Packet delivered" add -

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 7:46:05 PM
ACCEPT - DONE

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)"

Author: relliott
Subject: Highlight
Date: 4/19/2005 7:47:42 PM
ACCEPT - DONE

1 Scope
Figure 2

Similar to a Dell comment, change "Protocols" to "ATA transport protocols"

Author: relliott
Subject: Highlight
Date: 4/19/2005 7:47:39 PM

Comments from page 2 continued on next page

T ACCEPT - DONE

1 Scope
Figure 2

Similar to a Dell comment, change "Interconnects" to "ATA physical interconnects"

Page: 4

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:16:45 AM
REFER PROTOCOL WG (I don't think so. All 05-107r1 added to SAM-4 was "or task router" in a few places where the entity returning OVERLAPPED COMMANDS ATTEMPTED is described)

2.3 References under development

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

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 7:50:23 PM
ACCEPT - DONE (added "ISO/IEC 14776-372, *SCSI Enclosure Services-2 (SES-2)*(T10/1559-D)
")

2.3: SES-2 is mentioned in many places and should be included here.

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 8:54:38 AM
ACCEPT - DONE

2.4 Other References

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

There is already enough industry confusion between SATA2 and SATAII.

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 8:54:49 AM
ACCEPT - DONE

2.4 Other References

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

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 8:54:59 AM
ACCEPT - DONE

2.4 Other References

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

Comments from page 4 continued on next page

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 7:51:42 PM
ACCEPT - DONE

2.4 Other references
change
"http://www.serialata.org"
to
"http://www.sata-io.org"

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 7:59:37 PM
ACCEPT - DONE

2.4 Other references

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

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 7:59:20 PM
ACCEPT - DONE (with a - before Lane and s after Connector to literally match the current draft)

2.4 Other references

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

Author: gop_ibm
Date: 4/22/2005 9:21:17 AM
REJECT (UML 2.0 is splitting into 4 separate documents, none of which are officially released. The part that SAS would have to reference - the Superstructure document - is in the worst shape.)

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. >>

Page: 6

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 5:04:04 PM

TREFER (SAS points to ATA/ATAPI-7 not ATA/ATAPI-8, so we're not necessarily bound by T13's evolving architecture spec.

SAS needs to account for SATA port selectors (of various levels of complexity) and SATA port multipliers, even if T13 chooses to ignore them.

SAS needs to support advanced STP/SATA bridges and native STP targets which can recognize multiple STP initiators and provide separate task file register sets for each of them.

SAS does need a better way to say a phy "supports attachment to a SATA device" since it really means "attachment to a SATA port selector, SATA port multiplier, or SATA device." Maybe "supports being a SATA host phy" would help.
)

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.]

Page: 7

Author: relliott
Subject: Highlight
Date: 4/20/2005 12:06:13 PM
ACCEPT - DONE

3.1.18 burst time

"ALIGN primitives"

SATA2 also allows non-ALIGN primitives. This should be made more generic - change to "OOB burst"

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 8:12:06 PM
ACCEPT - DONE (as "The function provided by the receiver circuit responsible for producing a regular clock signal (i.e., the recovered clock) from the received signal ")

3.1.23 clock data recovery (CDR)
change
"The function is provided by the receiver circuit ..."
to
"A function provided by the receiver circuit ..."

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 10:12:26 AM
REJECT (the current word "message" is a defined term, no need to change it to the less precise "information". The part of the current sentence about "sometimes relaying a response from a peer higher layer state machine" is also useful and matches similar wording in the indication definition about its relationship to "request")

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.

Author: kmarks_dell
Subject: Cross-Out
Date: 4/28/2005 3:35:07 PM
REFER PHY WG

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..

Page: 8

Author: rlsheffi_intc
Subject: Highlight
Date: 4/28/2005 1:35:22 PM

REFER PHY WG

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."

Author: relliott
Subject: Note
Date: 4/20/2005 12:07:05 PM

ACCEPT - DONE

3.1.37 D.C. idle

Add mention that it is "used during the idle time (see 3.1.90) of an OOB signal (see 3.1.131)".

Page: 9

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 4:37:33 PM
REFER PHY WG

3.1.52, item (a): Change, "ideal bit time" to "average bit time". [this allows for frequency tolerances.]

Author: gop_ibm
Date: 4/28/2005 7:21:39 PM
REFER PHY WG

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 >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
3.1.58 enclosure:
Add << An enclosure is not a SAS or SCSI class. >>

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 8:14:14 PM
ACCEPT - DONE

Seagate #1
PDF page 49
3.1.61 expander connection manager (ECM)
The last sentence is “See 4.6.4”. It should reference 4.6.3 instead.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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).

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
3.1.67: Define "routed SAS address".

Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 4:18:52 PM
ACCEPT - DONE
3.1.71: Change "vs." to "versus".

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 4:41:08 PM
REFER PHY WG

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).

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 1:42:36 PM
3.1.73: Add "(See x.x)" where x.x is the number of the clause where this device is described in detail.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:15:31 PM
ACCEPT - DONE

3.1.75: Change "e.g." to "i.e." in two places.

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 8:16:04 PM
ACCEPT - DONE (as "See SAM-3.")

3.1.84: Add "(See SAM-3)".

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 8:16:15 PM
ACCEPT - DONE (as "See SAM-3.")

3.1.86: Add "(See SAM-3)".

Page: 11

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 8:16:10 PM
ACCEPT - DONE (as "See SAM-3.")

3.1.87: Add "(See SAM-3)".

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 8:19:45 PM
ACCEPT - DONE (7.9)

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.

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 8:19:53 PM
ACCEPT - DONE

Seagate #2
PDF page 51
3.1.88 identification sequence:
This definition refers to clause 4.4, but a better reference to understand what an identification sequence is would be clause 7.9.

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 7:22:52 PM
REJECT (in SAS-1.0 letter ballot comment resolution, adjective use was changed to "vendor-specific" and noun use was changed to "vendor specific". We could add both to the keywords list if that would help)

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 10:07:55 AM
REJECT (the current word "message" is a defined term, no need to change it to the less precise "information".)

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.

Comments from page 11 continued on next page

Author: gop_ibm
Date: 4/19/2005 8:21:51 PM
ACCEPT - DONE (as ", usually expressed in dB,")

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 >>

Author: gop_ibm
Date: 4/19/2005 8:22:13 PM
REJECT (1 matches the 1 in Sdd21)

3.1.94 insertion loss, differential (SDD21):
This << measured at port 1.>> should be << measured at port one.>>

Author: gop_ibm
Date: 4/19/2005 8:22:23 PM
REJECT (2 matches the 2 in Sdd21)

3.1.94 insertion loss, differential (SDD21):
This << measured at port 2.>> should be << measured at port two.>>

Author: gop_ibm
Date: 4/19/2005 8:23:09 PM
ACCEPT - DONE

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 >>

Author: gop_ibm
Date: 4/19/2005 8:23:50 PM
ACCEPT - DONE (with an extra ,)

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). >>

Author: gop_ibm
Date: 4/28/2005 7:22:59 PM
REFER PHY WG

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.

Author: gop_ibm
Date: 4/28/2005 7:23:15 PM
REFER PHY WG

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 bit sequences (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)). >>

Author: gop_ibm
Date: 4/28/2005 7:23:22 PM
REFER PHY WG

Comments from page 11 continued on next page

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.

Author: gop_ibm
Date: 4/28/2005 7:23:48 PM
REFER PHY WG

3.1.100 jitter, data dependent (DDJ):
This << (one ISI mechanism). >> should be << (i.e., one ISI mechanism). >>

Author: gop_ibm
Date: 4/28/2005 7:23:28 PM
REFER PHY WG

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). >>

Author: gop_ibm
Date: 4/28/2005 7:23:53 PM
REFER PHY WG

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.

Author: gop_ibm
Date: 4/28/2005 7:24:01 PM
REFER PHY WG

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). >>

Page: 12

Author: gop_ibm
Date: 4/28/2005 7:24:06 PM
REFER PHY WG

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). >>

Author: gop_ibm
Date: 4/28/2005 7:24:12 PM
REFER PHY WG

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.

Author: gop_ibm
Date: 4/28/2005 7:24:19 PM
REFER PHY WG

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.

Author: gop_ibm
Date: 4/28/2005 7:24:26 PM
REFER PHY WG

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.

Author: gop_ibm
Date: 4/28/2005 7:24:31 PM
REFER PHY WG

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.

Author: gop_ibm
Date: 4/28/2005 7:24:38 PM
REFER PHY WG

3.1.110 jitter tolerance for receiver devices:
This << See also signal tolerance. >> is not a valid cross reference and needs to be fixed.

Page: 13

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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)."

Author: afan_tyco
Subject: Note
Date: 4/28/2005 3:41:50 PM
REFER PHY WG
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

---

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:25:51 PM
ACCEPT - DONE

3.1.24: Change "after" to "as the result of".

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: relliott
Subject: Note
Date: 4/20/2005 12:07:52 PM
ACCEPT - DONE

Add "3.1.xx OOB burst: The transmission of signal transitions for a burst time (see 3.1.18). See 6.6.1."

Author: relliott
Subject: Highlight
Date: 4/19/2005 8:34:17 PM
ACCEPT - DONE
3.1.128 OOB sequence

To match two similar Seagate comments on identification sequence and speed negotiation sequence, change "See 4.4" to "see

Comments from page 13 continued on next page

6.7.2.1 and 6.7.2.4"

Author: relliott
Subject: Highlight
Date: 4/20/2005 9:13:48 AM
ACCEPT - DONE

3.1.129 OOB signal

"ALIGNs and idle time" s/b "idle time (see 3.1.90) and burst time (see 3.1.18)" since SATA2 allows non-ALIGNs to be used, and burst time and idle time are both defined times which provide that level of detail.

Author: relliott
Subject: Note
Date: 4/20/2005 12:09:02 PM
ACCEPT - DONE

Add "3.1.xx OOB interval: The time basis for burst times (see 3.1.18) and idle times (see 3.1.90) used to create OOB signals (see 3.1.131). See 6.6.1."

This supports the OOBI acronym added per a Seagate comment.

Author: thoglund_lsi
Subject: Highlight
Date: 4/19/2005 1:41:49 PM
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).

Page: 14

Author: mevans_mxo
Subject: Cross-Out
Date: 4/28/2005 7:24:59 PM
REFER PHY WG

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 histograph of measured jitter values.

Author: bbissone_intc
Subject: Note
Date: 4/28/2005 4:32:22 PM
REFER PHY WG

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."

Status
rlsheffi Accepted 4/14/2005 11:05:33 PM

Page: 15

Author: bday_lsi
Subject: Comment on Text
Date: 4/28/2005 7:25:13 PM
REFER PHY WG
The word "repeater" is not used elsewhere in the spec. Should it be deleted?

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 10:08:26 AM
REJECT (the current word "message" is a defined term, no need to change it to the less precise "information".)

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:27:06 PM
ACCEPT - DONE

3.1.154: Change "from" to "in".

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 10:09:45 AM
REJECT (the current word "message" is a defined term, no need to change it to the less precise "information".)

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.

Author: bday_lsi
Subject: Comment on Text
Date: 4/28/2005 3:39:34 PM
REFER PHY WG

This word is not used elsewhere in the spec. Should it be deleted?

Author: gop_ibm
Date: 4/28/2005 3:39:47 PM
REFER PHY WG

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.

Author: mevans_mxo
Subject: Cross-Out
Date: 4/28/2005 4:41:22 PM
REFER PHY WG

3.1.56: Delete the last sentence ("All SAS receiver devices shall be retimers.").

Author: relliott

Comments from page 15 continued on next page

Subject: Highlight
Date: 4/22/2005 3:41:07 PM
ACCEPT - DONE

3.1.163 running disparity

1. Add "(RD)" and

2. after "A binary value" add "with a negative (-) or positive (+) value"

Author: relliott
Subject: Highlight
Date: 4/22/2005 2:47:21 PM
ACCEPT - DONE

3.1.163 running disparity
"achieved (see 6.2)."

s/b
"achieved. See 6.2."

since 6.2 discusses running disparity, not dword synchronization

---

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
3.1.164 SAS Address

Change
"unique name assigned"
to"
"unique name or identifier assigned"

SAS Ports do not have names, only identifiers.

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 8:57:01 AM
ACCEPT - DONE

3.1.182 SATA port selector:
Change
"(see SATA2-PS)."
to
"(see SATAII-PS)."

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 10:17:37 AM
ACCEPT - DONE

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."

Page: 17

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
T3.1.196 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."

Author: gop_ibm
Date: 4/28/2005 7:25:31 PM
TREFER PHY WG

3.1.202 signal tolerance:
None of this belongs in the glossary and should in 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. >>

Page: 18

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 8:30:41 PM
ACCEPT - DONE (6.7.2.2 and 6.7.4.2, to also cover SATA speed negotiation)

Seagate #3
PDF page 58
3.1.211 speed negotiation sequence:
This definition refers to clause 4.4, but a better reference to understand the speed negotiation sequence would be 6.7.4.2.

Page: 19

Author: ghoulder_seg
Subject: Note
Date: 4/22/2005 10:18:25 AM
REJECT (that is the definition - it's the catch-all category for requests not handled by any other means)

Seagate #4
PDF page 59
3.1.231 subtractive routing attribute:
3.1.232 subtractive routing method:
These definitions define “subtractive routing” as “anything that is not direct routing or table routing”. This is too broad a definition. The definitions should say what subtractive routing is, not what it isn’t.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:35:37 PM
REJECT (it is within a phy, not a port, and could be in a SAS phy or expander phy, ... too complicated)

3.1.240: Change "A physical entity..." to "A physical entity contained in a SAS port..."

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:36:45 PM
ACCEPT - DONE

3.1.241: Change to: An electronic circuit that converts a logical signal to an analog serial output signal.

Page: 20

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 2:28:55 PM

Seagate #5
PDF page 60
3.1.253 virtual phy:
This definition is not really a definition, it doesn't include any characteristics that differentiate a virtual phy from a real phy. At the very least, it should contain the sentence "A virtual phy contains a vendor-specific interface to another virtual phy in lieu of the described transceiver/ physical link interface". A sentence similar to this is located in 4.1.2.

Page: 22

Author: relliott
Subject: Note
Date: 4/22/2005 2:43:55 PM
ACCEPT - DONE
3.2
Add RD = running disparity

Author: gop_ibm
Date: 4/19/2005 8:37:45 PM
REJECT (all the state machines are here)

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.

Page: 23

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
T3.3.6 need not:
This should not be a keyword. It should be deleted and all usages replaced with. << is not required to >>

Page: 24

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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.

Author: gop_ibm
Date: 4/19/2005 8:38:15 PM

ACCEPT - DONE

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

Page: 26

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 1:42:36 PM

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.

Page: 31

Author: kmarks_dell
Subject: Note
Date: 4/19/2005 1:42:54 PM

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."

Page: 32

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:39:06 PM
ACCEPT - DONE

3.6.3, third paragraph: Change, "...going to the top or bottom..." to, "...going toward the top or bottom...".

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 1:09:56 PM
ACCEPT - DONE (this paragraph is too wordy, repeating "counters, timers, and variables" in each sentence.

Rewriting all but the last sentence as:
State machines may contain counters, timers, and variables that affect the operation of the state machine. The following properties apply to counters, timers, and variables:
a) Their scope is the state machine itself;
b) They are created and deleted with the state machines with which they are associated;
c) Their initialization and modification is specified in the state descriptions and the transition descriptions; and
d) Their current values may be used to determine the behavior of a state and select the transition out of a state.
)
REVIEW

3.6.4: Change, "They are created..." to, "Counters, timers and variables are created...".

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 8:40:47 PM
REJECT ("numbers" is the verb of the sentence)

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.

Page: 34

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

T4.1 Architecture

Change
".... one SMP port."
to
"... one SMP target port."

Page: 35

Author: relliott
Subject: Highlight
Date: 4/19/2005 8:42:15 PM
ACCEPT - DONE

Port s/b port

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
4.1.1 Architecture overview
Figure 10
This << 1..* >> should be << 1.. 65 353>>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
4.1.1 Architecture overview
Figure 10
This << 1..* >> should be << 1.. 65 353>>

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:43:14 PM
REJECT (no, it might loop back to the same device (if the link layer doesn't mind). This is done for manufacturing testing.)

4.1.2, second paragraph: Change, "...which attaches to another
physical phy." to, "which attaches to a physical phy in another device.".

Page: 36

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 2:29:48 PM

Seagate #6
PDF page 76
First instance of list item a)
This states that a phy has a SAS address associated with it. I recall that the SAS address is associated with the port, which will associate the SAS address with a particular phy identifier. I'm not sure that a SAS address should be a required attribute of a phy. See also comment #7. Also figure 15 associates the SAS address attribute with the port.

Page: 37

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 2:30:16 PM

Seagate #7
PDF page 77 & 78
Figure 12 – phy class diagram
Figure 13 – phy object diagram
The class box for Phy at top of this figure includes a phy identifier attribute but doesn't include a SAS address attribute. This conflicts with statement on previous page (see comment #6) that requires a SAS address for the phy.

Page: 38

Author: kmarks_dell
Subject: Cross-Out
Date: 4/28/2005 3:22:40 PM
ACCEPT - DONE

4.1.2 Physical links and phys

Second paragraph, first sentence after Figure 12.

Remove

"(i.e., the transceiver)"
The phy consists of more that the transceiver.

Page: 39

Author: thoglund_lsi
Subject: Highlight
Date: 4/19/2005 1:41:49 PM
"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

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
4.1.3 Ports (narrow ports and wide ports)
This <<can>> should be <<are able to>>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
4.1.3 Ports (narrow ports and wide ports)
This << need not >> should be changed to << are not required to >>

Author: ghoulder_seg
Subject: Note
Date: 4/23/2005 4:25:52 PM
ACCEPT - DONE (track with IBM comment on this page 79)

Seagate #8
PDF page 79
4.1.3, last line on the page
The last line on the page ends in the middle of a sentence, then there is a half page of blank space, then the sentence completes at the top of the next page. The first two lines of the next page should be placed on this page, before the page break.

Author: gop_ibm
Date: 4/23/2005 4:25:35 PM
ACCEPT - LAST

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.

Page: 40

Author: gop_ibm
Date: 4/23/2005 4:24:53 PM
ACCEPT - LAST

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.

Page: 41

Author: ghoulder_seg
Subject: Note
Date: 4/23/2005 4:25:07 PM
ACCEPT - DONE (track with IBM comment on page 80)

Seagate #10
PDF page 81
First line on the page, item h)
This line should be on the previous page, since there is plenty of white space there for one more line.

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 2:31:23 PM
Seagate #9
PDF pages 81 & 82
Figure 15 – Port class diagram
Figure 16 – Port object diagram
These figures (and one earlier figure) use an attribute named “attached SAS address” but there is no definition of what this term is (i.e., how or why it is different than the “SAS address” attribute). There any many other occurrences of this term but most of them are associated with “attached SAS address” field and still don’t define it. A definition for this needs to be added.

Page: 43

Author: relliott
Subject: Highlight
Date: 4/23/2005 4:41:31 PM
ACCEPT - DONE
4.1.5

To match a later Dell comment, change "peripheral device type of SCSI enclosure services (SES))" to "peripheral device type set to 0Dh (i.e., enclosure services device) (see SPC-3 and SES-2))"

Page: 44

Author: gop_ibm
Date: 4/23/2005 4:24:23 PM
ACCEPT - LAST
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.

Page: 45

Author: ghoulder_seg
Subject: Note
Date: 4/23/2005 4:25:28 PM
ACCEPT - DONE (track with IBM comment on page 84)

Seagate #11
PDF page 85
First line on the page, item d)
This line should be on the previous page, since there is plenty of white space there for one more line.

Page: 47

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:45:06 PM
TACCEPT - DONE (deleted sentence instead)

4.1.8.1: Change, "Some of them..." to, "Expander devices...".

Page: 48

Author: thoglund_lsi
Subject: Highlight
Date: 4/19/2005 1:41:49 PM

should this statement be an informative note rather than "shall"? clarify "sum of all SAS addresses addressable through the edge expander phy mean"

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

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.

Author: thoglund_lsi
Subject: Highlight
Date: 4/19/2005 1:41:49 PM

definition needed for "root edge expander device"

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 2:32:52 PM

Seagate #12
PDF page 88 & 91
Figure 23 – Edge Expander Device Set
Figure 26 – Edge Expander device set … topology
These figures introduce the terms “upstream phy”, “downstream phy”, and “root edge expander” but there is no definition of these terms. I have also noted that these two figures appear to be identical – perhaps one can be eliminated by having the text that references figure 26 refer to figure 23 instead.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

4.1.8.3, second sentence: Change to: A fanout expander device may be attached to up to 128 SAS ports.

Page: 51

Author: thoglund_lsi
Subject: Highlight
Date: 4/19/2005 1:41:49 PM
definition needed for "root edge expander device"

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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"

Page: 52

Author: thoglund_lsi
Subject: Highlight
Date: 4/19/2005 1:41:49 PM
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).

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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)."

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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."

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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."

Page: 54

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
4.1.10 Connections
Figure 28
Change << Notes >> to << Note >>

Author: kmarks_dell
Subject: Cross-Out
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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)."

Page: 55

Author: gop_ibm
Date: 4/19/2005 8:48:38 PM
TACCEPT - DONE (and added "IEEE Registration Authority" to the sentence)

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.

Page: 56

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 8:49:04 PM
ACCEPT - DONE (as SAM-3)

4.2.5 Port names
1st Sentence

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

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 8:49:25 PM
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.

Page: 60

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
Figure 32
Change
"SSP_TF (transmit frame) state machine"
to
"SSP_TF (transmit frame control) state machine"

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
Figure 32

Change
"SSP_TC (transmit credit) state machine"
to
"SSP_TC (transmit credit control) state machine"

Page: 67

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:50:15 PM
ACCEPT - DONE

4.4.1, first paragraph: Change "describes" to "illustrates".

Page: 69

Author: gop_ibm
Date: 4/19/2005 8:50:54 PM
ACCEPT - DONE

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 >>

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
4.4.2 Hard reset

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

Author: thoglund_lsi
Subject: Highlight
Date: 4/28/2005 1:34:29 PM
REFER PROTOCOL WG (05-145)

remove OPEN_REJECT (WAITING FOR BREAK). see 05-145r0.

Author: gop_ibm
Date: 4/19/2005 8:51:20 PM
ACCEPT - DONE

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 >>

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 8:51:54 PM
ACCEPT - DONE

missing "is"

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 << in this subclause >>. Maybe << conditions handled by >> should be << conditions is handled by >>

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 8:52:10 PM
ACCEPT - DONE

Seagate #13
PDF page 109
4.5 I_T Nexus Loss, last sentence on page.
Change “…loss based on the aforementioned conditions handled by the port layer…” to
“…loss based on the aforementioned conditions is handled by the port layer…”

Comments from page 69 continued on next page

Page: 71

Author: thoglund_lsi
Subject: Highlight
Date: 4/28/2005 11:33:51 AM
TACCEPT - DONE ("value in the routing attribute field")

be more specific, i.e. routing attribute value

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 4:39:23 PM
ACCEPT - DONE (changed to "handles")
REVIEW

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...".

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 4:42:45 PM
ACCEPT - DONE as ("peripheral device type set to 0Dh (i.e., enclosure services device) (see SPC-3 and SES-2))")

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 4:40:03 PM
ACCEPT - DONE (part of other changes)

4.6.2, fifth paragraph: Change "SES" to "see SES-2".

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
4.6.2 Expander ports
6th Paragraph, 1st Sentence
Change
"... internal SMP port using ..."
to
"... internal SMP target port using ..."

Author: kmarks_dell
Subject: Cross-Out
Date: 4/28/2005 7:29:37 PM
ACCEPT - DONE (also changed "routed" to "routing")

4.6.3 Expander connection manager (EMC)
b) list

Remove
"addressing"

Page: 76

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 8:53:22 PM
ACCEPT - DONE

Table 12, second column, fifth row (Arbitrating (Waiting On Connection)): Change "block" to "blocked".

Page: 77

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

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).

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 3:24:08 PM

ACCEPT - DONE

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..."

Page: 79

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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 SP0: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.

Author: rlsheffi_intc
Subject: Highlight
Date: 4/19/2005 1:37:51 PM

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)."

Status
rlsheffi Accepted 4/14/2005 11:05:11 PM

Page: 80

Author: gop_ibm
Date: 4/19/2005 8:54:10 PM
TACCEPT - DONE

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?

Page: 82

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
There are a few dangling lines in the diagram

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 were 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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 2:34:11 PM
Seagate #14
PDF page 122
Figure 45 – Level order traversal example
Most of the “end device” boxes are labeled as end devices, but two are labeled “SAS device”. For purposes of this figure, all should be labeled as “end device”. I do see wording in following paragraphs that talk about a “SAS device”, but the wording seems to treat all end devices as a SAS device that could have SSP, STP bridge, or SMP characteristics. I believe this use of SAS device should change to end device also.

Page: 83

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
4.7.1 Discover process overview
This << need not >> should be changed to << is not required to >>

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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))."

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
4.7.2, fourth paragraph: Change, "...it shall disable the expander route entry...", to, "...the management application client shall disable the expander route entry...".

Author: rlsheffi_intc
Subject: Highlight
Date: 4/19/2005 1:37:51 PM
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.

Author: rlsheffi_intc
Subject: File Attachment
Date: 4/28/2005 1:36:18 PM
Example expander device configuration (file attached)

Status
rlsheffi Accepted 4/16/2005 11:40:30 AM

Page: 84

Author: bnixon_elx
Subject: Highlight
Date: 4/26/2005 5:59:51 PM
TEmulex 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.

Author: rlsheffi_intc
Subject: Highlight
Date: 4/19/2005 1:37:51 PM
TThere 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 SP0:OOB_COMINIT?).

Status
rlsheffi Accepted 4/14/2005 11:04:55 PM

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
T4.7.3 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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
T4.7.3 discover process optimization
6th Paragraph, 1st Sentence

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

What is defined as an inconsistency, add example?

Page: 85

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

T4.7.4 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 >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

T4.7.4 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 >>

Page: 91

Author: thoglund_lsi
Subject: Highlight
Date: 4/28/2005 1:32:48 PM

ACCEPT - DONE (incorporated throughout the section. Includes new rule on when the test function begins on SMP - after the connection is closed - which is not currently defined.

New wording:
"The optional Protocol-Specific diagnostic page for SAS (see 10.2.9.1) provide methods for an application client to enable and disable a phy test function (e.g., transmission of the CJTPAT) for a selected phy in a SAS target device with an SSP target port. The optional SMP PHY TEST FUNCTION function (see 10.4.3.11) provides similar methods for SAS target devices with SMP target ports.

The application client sends a SEND DIAGNOSTIC command with the Protocol-Specific diagnostic page or an SMP PHY TEST FUNCTION function specifying the phy in the SAS target device that is to perform the phy test function and the phy test function to be performed. If the phy test function requires a specific phy test pattern and/or phy test pattern physical link rate, then it also specfies the phy test pattern and phy test pattern physical link rate.

The SEND DIAGNOSTIC command may be sent through any SSP target port to any logical unit in the SAS target device that contains the phy that is to perform the phy test function.

For the SEND DIAGNOSTIC command, the phy shall begin the specified phy test function after the SSP target port receives an ACK for the RESPONSE frame transmitted in response to the SEND DIAGNOSTIC command that requested the phy test function. For the SMP PHY TEST FUNCTION function, the phy shall begin the specified phy test function after the SMP target port transmits the SMP response frame.

Once a SAS phy has begun performing a phy test function, it shall ignore its receiver. To stop a SAS phy from performing a phy test function, an application client sends a SEND DIAGNOSTIC command or an SMP PHY TEST FUNCTION function to a SAS phy in the SAS target device that is not performing a phy test function requesting a phy test function of 00h (i.e., STOP). If no such phy is available, the phy test function only stops on power loss.")
REVIEW

this section should also discuss Phy test functionality provided by the SMP PHY TEST FUNCTION

Author: relliott
Subject: Highlight
Date: 4/28/2005 1:32:31 PM

ACCEPT - DONE
REVIEW

4.8 Phy test functions

"The phy shall begin... after receiving an ACK" implies the phy running the function is the one receiving the ACK. Really, it's the phy receiving the SEND DIAGNOSTIC command.

Change to:
The phy shall begin the specified phy test function after the SSP target port receives an ACK for the RESPONSE frame transmitted in response to the SEND DIAGNOSTIC command that requested the phy test function.
"

Page: 92

Author: relliott
Subject: Highlight
Date: 4/25/2005 6:02:03 PM
REFER PHY WG

5.1 Physical layer overview

"Within this standard, reference to connector gender use the terms plug and receptacle as equivalent to the terms free and fixed, respectively, that may be used in the references that define the connectors."

This makes no sense. Free should mean cable, fixed should backplane. With SFF-8484, the cable has a receptacle on it; for the others, the cable has a plug. All of the the cable connectors should be called the "free" connectors.

Author: mseidel_intc
Subject: Inserted Text
Date: 4/24/2005 10:30:15 AM
ACCEPT - DONE

5.1 Physical overview
4th line: "reference" => "references"

Author: gop_ibm
Date: 4/19/2005 8:56:14 PM
ACCEPT - DONE

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. >>

Author: bbissone_intc
Subject: Note
Date: 4/28/2005 4:32:13 PM
REFER PHY WG (I am inclined to agree)

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.

Status
rlsheffi Accepted 4/7/2005 2:33:45 PM

Page: 93

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 6:04:37 PM
ACCEPT - DONE

Figure 50 - SAS internal cabled environments
Top figure

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

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 6:04:28 PM
ACCEPT - DONE

Figure 50 - SAS internal cabled environments
Bottom figure

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

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 6:04:45 PM
ACCEPT - DONE

Figure 50 - SAS internal cabled environments

Bottom figure

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

Author: relliott
Subject: Cross-Out
Date: 4/25/2005 6:07:45 PM
ACCEPT - DONE

Figure 51
Delete "Internal backplane environment" which is also the figure title (matching Intel comments on subsequent figures)

Page: 94

Author: bbissone_intc
Subject: Cross-Out
Date: 4/25/2005 6:08:00 PM
ACCEPT - DONE

5.2.2 SAS cables and connectors:
Figures 52 through 56 -- Title embedded in Figure is redundant to figure title. Recommend removing.

Status
rlsheffi Accepted 4/7/2005 2:39:00 PM

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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. >>

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 3:32:31 PM
ACCEPT - DONE

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)"

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 7:30:20 PM
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)"

Comments from page 94 continued on next page

This removes reference to whether it is compact or not.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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. >>

Page: 95

Author: relliott
Subject: Cross-Out
Date: 4/28/2005 4:25:54 PM
ACCEPT - DONE
Above figure 54

Delete "with each controller using using an internal wide plug connector." to match text above figure 53

Author: ghoulder_seg
Subject: Note
Date: 4/28/2005 4:26:37 PM
ACCEPT - DONE (without "controller", which is not necessary)

Seagate #23
PDF page 135
Figure 54 — Internal wide cabled environment - controller to controller - symmetric cable

Change “SAS controller internal wide plug connector (4 physical links)”

to “SAS controller internal wide plug or internal compact wide receptacle connector (4 physical links)” in two places in this figure.

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 4:27:21 PM
ACCEPT - DONE (dropping "controller" which is not necessary)

5.2.2 SAS cables and connectors

Figure 54 - Internal wide cabled environment - controller to controller - symmetric cable

Change:
SAS controller internal wide plug connector (4 physical links)
To:
SAS controller internal wide plug or internal compact wide receptacle connector (4 physical links)

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 4:27:06 PM
ACCEPT - DONE (dropping "controller" which is not necessary)

5.2.2 SAS cables and connectors

Figure 54 - Internal wide cabled environment - controller to controller - symmetric cable

Change:
SAS controller internal wide plug connector (4 physical links)
To:
SAS controller internal wide plug or internal compact wide receptacle connector (4 physical links)

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
5.2.2 SAS cables and connectors
Figure 54

Comments from page 95 continued on next page

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. >>

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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.

Author: relliott
Subject: Cross-Out
Date: 4/28/2005 4:28:26 PM

ACCEPT - DONE

Figure 55
Delete "controller" which is not necessary in the name of the connector

---

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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. >>

Page: 96

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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. >>

Page: 98

Author: gop_ibm
Date: 4/28/2005 5:00:15 PM
ACCEPT - DONE (changed to use the exact name used in the SFF document:

The SAS plug connector is the SAS Device Free (Plug) connector defined in SFF-8482.)

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.

Author: relliott
Subject: Underline
Date: 4/28/2005 5:59:48 PM
ACCEPT - DONE
Change "It attaches" to "The SAS plug connector attaches" and put it in a new paragraph

---

Author: gop_ibm
Date: 4/28/2005 5:02:30 PM
ACCEPT - DONE (changed to use the exact name used in the SFF document:

The SAS internal cable receptacle connector is the SAS Internal Cable Fixed (Receptacle) connector defined in SFF-8482.)

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.

Author: relliott
Subject: Cross-Out
Date: 4/28/2005 5:10:00 PM
ACCEPT - DONE
delete "either"

Page: 99

Author: relliott
Subject: Cross-Out
Date: 4/28/2005 5:10:13 PM
ACCEPT - DONE

Delete either

Author: relliott
Subject: Highlight
Date: 4/28/2005 5:09:40 PM
ACCEPT - DONE
"The SAS backplane receptacle connector (see SFF-8482)"

To match resolution to other IBM comments, change to "The SAS backplane receptacle connector is the SAS Backplane Fixed (Receptacle) connector defined in SFF-8482." and "The SAS bacplane receptacle connector [attaches to:"

Page: 100

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 8:57:20 AM
TACCEPT - DONE

Table 23 - SAS internal connector pin assignments

Note c

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

Page: 101

Author: gop_ibm
Date: 4/28/2005 5:17:16 PM
ACCEPT - DONE (changed to use the exact name used in the SFF document:
The SAS external cable plug connector is the 4X free (plug) connector with jack screws defined in SFF-8470.)

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. >>

Author: sjvandoo_intc
Subject: Note
Date: 4/28/2005 1:34:57 PM
REFER PHY WG

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.

Author: gop_ibm
Date: 4/28/2005 5:17:47 PM
ACCEPT - DONE (changed to use the exact name used in the SFF document:
The SAS external receptacle connector is the 4X fixed (receptacle) connector with jack screws defined in SFF-8470.)

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. >>

Page: 102

Author: sjvandoo_intc
Subject: Note
Date: 4/28/2005 1:34:51 PM
REFER PHY WG

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.

Author: bbissone_intc
Subject: Comment on Text
Date: 4/19/2005 8:58:26 PM
ACCEPT - DONE

5.2.3.3.3 SAS external receptacle connector, text immediately below figure 62:
Grammar -- "are" should be "is".

Author: acox_seg
Subject: Highlight
Date: 4/19/2005 8:58:13 PM
ACCEPT - DONE ("device is")

5.2.3.3.3 SAS external receptacle connector

Text below figure 62
Change:
device
to:
devices

Author: gop_ibm
Date: 4/25/2005 6:20:30 PM
ACCEPT - LAST

5.2.3.3.4 SAS external connector pin assignments
More of those needless broken up sentences that should be fixed.

Page: 103

Author: jneer_molex
Subject: Note
Date: 4/28/2005 5:26:37 PM
REFER PHY WG (pinout)

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.

Author: kmarks_dell
Subject: Cross-Out
Date: 4/28/2005 5:23:22 PM
ACCEPT - DONE

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.

Author: gop_ibm
Date: 4/28/2005 5:22:31 PM
ACCEPT - DONE (changed to use the exact name used in the SFF document:
The SAS external compact cable plug connector is the free (plug) cable connector defined in SFF-8088.)

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. >>

Author: jneer_molex
Subject: Note
Date: 4/28/2005 3:19:28 PM
REFER PHY WG (pinout)

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.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 5:39:03 PM
ACCEPT - DONE (as "The SAS external compact cable plug connector is the free (plug) cable connector defined in SFF-8088 with the 26 circuit size defined in SFF-8086.)
REVIEW

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.

Author: kmarks_dell
Subject: Highlight

Comments from page 103 continued on next page

Date: 4/28/2005 5:39:41 PM
REJECT (deleted sentence altogether)

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 ...."

Author: kmarks_dell
Subject: Cross-Out
Date: 4/28/2005 3:34:53 PM
REFER PHY WG (choose terms for keys and key slots the apply)

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.

Author: gop_ibm
Date: 4/28/2005 5:27:13 PM
REFER PHY WG (keys)

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.

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 4:30:06 PM
REFER PHY WG (keys)

5.2.3.3.5 SAS external compact cable plug connector

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

to:
The SAS external compact cable plug connector shall include key slots.

Page: 104

Author: acox_seg
Subject: Note
Date: 4/28/2005 3:42:38 PM
REFER PHY WG (pinout)

5.2.3.3.5 SAS external compact cable plug connector

Figure 63 - SAS external compact cable plug connector

Update figure to show location of B1 in addition to A1.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 7:30:48 PM
REFER PHY WG (pinout0

Figure 63 - SAS external compact cable plug connector

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

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 5:38:57 PM
ACCEPT - DONE (as:
The SAS external compact receptacle connector is the fixed (receptacle) right angle connector defined in SFF-8088 with the 26 circuit size defined in SFF-8086.)

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.

Author: gop_ibm
Date: 4/28/2005 5:38:33 PM
ACCEPT - DONE (changed to use the exact name used in the SFF document:
The SAS external compact receptacle connector is the fixed (receptacle) right angle connector defined in SFF-8088 with the 26 circuit size defined in SFF-8086.)

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. >>

Author: gop_ibm
Date: 4/28/2005 5:36:37 PM
REJECT (but sentence deleted in favor of Dell 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. >>

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 7:31:15 PM

Comments from page 104 continued on next page

REJECT (deleted instead)

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)"

Author: kmarks_dell
Subject: Cross-Out
Date: 4/28/2005 6:05:21 PM
REFER PHY WG (keys)

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.

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 4:29:47 PM
REFER PHY WG (keys)

5.2.3.3.6 SAS external compact receptacle connector

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

to:
The SAS external compact receptacle connector shall include keys.

Author: gop_ibm
Date: 4/28/2005 6:05:09 PM
REFER PHY WG (keys)

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 6:05:02 PM
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

Comments from page 104 continued on next page

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))."

Page: 105

Author: acox_seg
Subject: Note
Date: 4/28/2005 6:05:27 PM
REFER PHY WG (pinout)

5.2.3.3.6 SAS external compact receptacle connector

Figure 64 - SAS external compact receptacle connector

Update figure to show A1 and B1 contact locations.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 6:05:32 PM
REFER PHY WG (pinout)

Figure 64 - SAS external compact receptacle connector

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

Author: rlsheffi_intc
Subject: Highlight
Date: 4/20/2005 7:40:13 PM
ACCEPT - DONE

5.2.3.3.6 SAS external compact receptacle connector
Last paragraph (after Figure 64)
"are"
s/b "is"

Status
rlsheffi Accepted 4/12/2005 12:13:50 PM

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 6:03:43 PM
ACCEPT - DONE

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...".

Author: gop_ibm
Date: 4/26/2005 6:01:29 PM
ACCEPT - LAST

5.2.3.3.7 SAS external compact connector pin assignments
More of those needless broken up sentences that should be fixed.

Page: 106

Author: acox_seg
Subject: Highlight
Date: 4/29/2005 9:35:09 AM
TREFER PHY WG (pinout - this table does match 05-084r2. It would be nice if the internal compact and external compact matched. The 8470 and 8484 pinouts prefer a +--+ ordering rather than +-+- ordering. Variations will require ASICs to offer +/- swapping capability.)

5.2.3.3.7 SAS external compact connector pin assignments

Table 25 - SAS external compact connector pin assignments and physical link usage

All Tx polarities are reversed.

Author: jneer_molex
Subject: Note
Date: 4/29/2005 9:34:33 AM
REFER PHY WG (pinout - 05-138 provides better matching with the internal compact connector. However, it makes BOTH of them inconsistent with 8470, 8484, SATA-style host plug, and SAS plug.)

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.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 6:05:56 PM
REFER PHY WG (pinout)

Update per T10/05-138r0.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 6:06:01 PM
REFER PHY WG (keys)

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

---

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 4:29:56 PM
TREFER PHY WG (keys - not sure every system needs to be required to use receptacles that use the keys.)

5.2.3.3.8 External compact connector keying

change: may
to: shall

Comments from page 106 continued on next page

Page: 107

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 6:06:09 PM
REFER PHY WG (keys - not sure "shall" is right for the receptacle. For the plug, the default needs to be to at least provide all 3 slots.)

5.2.3.3.8 External compact connector keying

Change:
Figure 65 shows the keys that may be used for an external compact receptacle connector
to:
Figure 65 shows the keys that shall be used for an external compact receptacle connector

---

Author: acox_seg
Subject: Note
Date: 4/28/2005 3:42:18 PM
REFER PHY WG (keys)

5.2.3.3.8 External compact connector keying

Figure 65 - SAS external compact connector keys for end devices

Update figure to correct key slots in cable plug.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 6:06:21 PM
REFER PHY WG (keys)

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.

Author: gop_ibm
Date: 4/28/2005 6:06:29 PM
REFER PHY WG (keys)

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:20:04 PM
REFER PHY WG (keys)

Editor's Note 1

Delete Editor's Note 1 (and fix keys if they are indeed incorrect)

Comments from page 107 continued on next page

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 6:06:39 PM
REFER PHY WG (pinout)

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.

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 4:29:38 PM
REFER PHY WG (keys)

5.2.3.3.8 External compact connector keying

Change:
Figure 66 shows the keys that may be used for an external compact receptacle connector

to:
Figure 66 shows the keys that shall be used for an external compact receptacle connector

---

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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..."

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 6:06:52 PM
REFER PHY WG (keys)

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

Receptacle only needs key in position 1.

Author: gop_ibm
Date: 4/28/2005 6:07:00 PM
REFER PHY WG (keys)

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:20:39 PM
REFER PHY WG (keys)

Editor's Note 2

Delete Editor's Note 2 (and fix keys if they are indeed incorrect)

Page: 108

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 6:07:09 PM
REFER PHY WG (keys)

5.2.3.3.8 External compact connector keying

Change:
Figure 67 shows the keys that may be used for an external compact receptacle connector

to:
Figure 67 shows the keys that shall be used for an external compact receptacle connector

---

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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..."

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 6:07:14 PM
REFER PHY WG (keys)

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

Receptacle only needs key in position 5.

Author: gop_ibm
Date: 4/28/2005 6:07:22 PM
REFER PHY WG (keys)

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:19:58 PM
REFER PHY WG (keys)

Editor's Note 3

Delete Editor's Note 3 (and fix keys if they are indeed incorrect)

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 6:07:25 PM

Comments from page 108 continued on next page

REFER PHY WG (pinout)

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 6:36:40 PM
ACCEPT - DONE

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..."

Author: gop_ibm
Date: 4/28/2005 5:54:31 PM
ACCEPT - DONE (to match others and use SFF terminology, as:
The SAS internal wide cable receptacle connector is the 4 Lane Cable Receptacle (fixed) with Backshell connector defined in SFF-8484.
)

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, >>

Page: 109

Author: gop_ibm
Date: 4/28/2005 5:55:18 PM
ACCEPT - DONE (to match others and SFF terminology, as
The SAS internal wide plug connector is the 4 Lane Vertical Plug (free) or 4 Lane R/A Plug (free) connector defined in SFF-8484.
)

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, >>

Author: gop_ibm
Date: 4/25/2005 6:36:59 PM
ACCEPT - LAST

5.2.3.4.4 SAS internal wide connector pin assignments
More of those needless broken up sentences that should be fixed.

Page: 110

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 6:07:35 PM
TREFER PHY WG (doesn't vendor-specific include not using them?)

5.2.3.4.4 SAS internal wide connector pin assignments

Change:
The use of the sideband signals by a controller is vendor-specific.

to:
The use of the sideband signals by a controller is optional and vendor-specific.

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 4:30:10 PM
TACCEPT - DONE

5.2.3.4.4 SAS internal wide connector pin assignments

Change:
Table 27 defines how the signal assignments

to:
Table 27 defines the signal assignments

Page: 111

Author: acox_seg
Subject: Highlight
Date: 4/25/2005 6:38:02 PM
REFER PHY WG (doesn't vendor-specific include not using them?)

5.2.3.4.4 SAS internal wide connector pin assignments

Change:
The use of the sideband signals by a backplane is vendor-specific.

to:
The use of the sideband signals by a backplane is optional and vendor-specific.

Author: acox_seg
Subject: Highlight
Date: 4/28/2005 5:52:05 PM
ACCEPT - DONE (although other comments rewrite this)

5.2.3.4.5 SAS internal compact wide cable plug connector

Change:
The SAS internal compact wide cable plug connector assembly is defined in SFF-8087 as the fixed (receptacle) right angle connector.

to:
The SAS internal compact wide cable plug connector assembly is defined in SFF-8087 as the free (plug) cable connector.

Author: gop_ibm
Date: 4/28/2005 5:51:49 PM
ACCEPT - DONE (matching others, as: The SAS internal compact wide receptacle connector is the fixed (receptacle) right angle connector defined in SFF-8087 with the 36 circuit size defined in SFF-8086.)

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 >>

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 5:52:12 PM
ACCEPT - DONE (as The SAS internal compact wide receptacle connector is the fixed (receptacle) right angle connector defined in SFF-8087 with the 36 circuit size defined in SFF-8086.)
REVIEW

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 5:51:29 PM

Comments from page 111 continued on next page

TREJECT (deleted instead)

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...."

Page: 112

Author: acox_seg
Subject: Note
Date: 4/28/2005 3:42:25 PM
REFER PHY WG (pinout)

5.2.3.4.5 SAS internal compact wide cable plug connector

Figure 70 - SAS internal compact wide cable plug connector

Update figure to include both A1 and B1 pin indications.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 3:24:24 PM
REFER PHY WG (pinout)

Figure 70 - SAS internal compact wide cable plug connector

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

Author: gop_ibm
Date: 4/28/2005 5:56:06 PM
ACCEPT - DONE (to match others and SFF terminology, as:
The SAS internal compact wide receptacle connector is the fixed (receptacle) right angle connector defined in SFF-8087 with the 36 circuit size defined in SFF-8086.
)

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 >>

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 5:56:33 PM
ACCEPT - DONE (as:
The SAS internal compact wide receptacle connector is the fixed (receptacle) right angle connector defined in SFF-8087 with the 36 circuit size defined in SFF-8086.)
REVIEW

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 5:56:19 PM
REJECT (deleted instead)

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...."

Comments from page 112 continued on next page

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

Author: relliott
Subject: Highlight
Date: 4/28/2005 5:57:44 PM
TACCEPT - DONE

Change "SAS internal compact wide cable plug connector attaches to a SAS internal compact wide receptacle connector," to "SAS internal compact wide receptacle connector attaches to a SAS internal compact wide cable plug receptacle connector" to match the order in the other sections (this connector name attaches to others)

Page: 113

Author: acox_seg
Subject: Note
Date: 4/28/2005 3:42:30 PM
REFER PHY WG (pinout)

5.2.3.4.6 SAS internal compact wide receptacle connector
Figure 71 - SAS internal compact wide receptacle connector

Update figure to include A1 and B1 pin indicators.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 3:24:43 PM
REFER PHY WG (pinout)

Figure 71 - SAS internal compact wide receptacle connector

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

Author: gop_ibm
Date: 4/25/2005 6:41:15 PM
ACCEPT - LAST

5.2.3.4.7 SAS internal compact wide connector pin assignments
More of those needless broken up sentences that should be fixed.

Page: 114

Author: ghoulder_seg
Subject: Note
Date: 4/28/2005 6:07:49 PM
REFER PHY WG (pinout)

Seagate #15
PDF page 154 - 167
Tables 28, 29 & Figures 76, 77, 79, 81
Editor's notes 4 through 8 indicate that pin assignments may be wrong. This must be resolved so the notes can be removed.

Author: bbissone_intc
Subject: Note
Date: 4/29/2005 9:36:56 AM
REFER PHY WG (pinout - we should consider making the left side be the pin names and the right side be the signal assignments. This will make the table match the physical connector)

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

Status
rlsheffi Accepted 4/7/2005 2:57:01 PM

Author: bbissone_intc
Subject: Highlight
Date: 4/29/2005 9:38:08 AM
REFER PHY WG (pinout - I don't think this table differs from the original proposal. It is different than the external compact connector, though.)

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).

Status
rlsheffi Accepted 4/7/2005 2:57:57 PM

Author: gop_ibm
Date: 4/28/2005 6:07:58 PM
REFER PHY WG (pinout)

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:20:50 PM
REFER PHY WG (pinout)

Editor's Note 4

Delete Editor's Note 4 (and fix signal assignments if they are indeed incorrect)

Author: acox_seg
Subject: Highlight
Date: 4/25/2005 6:42:21 PM
REFER PHY WG (doesn't vendor-specific include not using?)

5.2.3.4.7 SAS internal compact wide connector pin assignments

Change:

Comments from page 114 continued on next page

The use of the sideband signals by a controller is vendor-specific.

to:
The use of the sideband signals by a controller is optional and vendor-specific.

Page: 115

Author: relliott
Subject: Cross-Out
Date: 4/19/2005 8:59:58 PM
ACCEPT - DONE

Delete "how"

Author: gop_ibm
Date: 4/28/2005 6:08:05 PM
REFER PHY WG (pinout - another IBM comment says the signal assignments are correct. I assume this one overrides that other 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.

Author: bbissone_intc
Subject: Note
Date: 4/28/2005 4:31:13 PM
REFER PHY WG (pinout)

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.

Status
rlsheffi Accepted 4/7/2005 2:58:38 PM

Author: relliott_hpq
Subject: Note
Date: 4/29/2005 9:38:51 AM
REFER PHY WG (pinout - agree, fixed in sas1r09a to match the table. The only difference from the controller side is the SIDEBAND numbering.)

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.

Author: gop_ibm
Date: 4/24/2005 11:36:00 AM
REJECT (the IBM comment at the top of the table says the table is broken, not "correct." I think the other IBM comment is right.)

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:21:03 PM
REFER PHY WG (pinout)

Editor’s Note 5

Delete Editor's Note 5 (and fix signal assignments if they are indeed incorrect)

Page: 116

Author: acox_seg
Subject: Highlight
Date: 4/25/2005 6:43:35 PM

TREFER PHY WG (doesn't vendor-specific include not using?)

5.2.3.4.7 SAS internal compact wide connector pin assignments

Change:
The use of the sideband signals by a backplane is vendor-specific.

to:
The use of the sideband signals by a backplane is optional and vendor-specific.

Author: gop_ibm
Date: 4/25/2005 6:44:35 PM

REFER PHY WG ("internal" has grown to mean "internal narrow" as opposed to the 4-wide variants. Is a name change necessary?)

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.

Page: 117

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 11:07:53 AM
ACCEPT - DONE (changed both figures 72 and 73 to use:
GROUND
RX+ (B+)
RX- (B-)
GROUND
TX- (A-)
TX+ (A+)
GROUND
since ATA/ATAPI-7 V3 and Serial ATA 1.0a both use A/B terminology in their connector definition.)
REVIEW

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"

Author: bbissone_intc
Subject: Comment on Text
Date: 4/24/2005 11:07:29 AM
ACCEPT - DONE (changed both figures 72 and 73 to use:
GROUND
RX+ (B+)
RX- (B-)
GROUND
TX- (A-)
TX+ (A+)
GROUND
since ATA/ATAPI-7 V3 and Serial ATA 1.0a both use A/B terminology in their connector definition.)
REVIEW

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.

Status
rlsheffi Accepted 4/7/2005 3:02:19 PM

Page: 118

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 11:08:08 AM
TACCEPT - DONE (changed both figures 72 and 73 to use:
GROUND
RX+ (B+)
RX- (B-)
GROUND
TX- (A-)
TX+ (A+)
GROUND
since ATA/ATAPI-7 V3 and Serial ATA 1.0a both use A/B terminology in their connector definition.)
REVIEW

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"

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Author: relliott
Subject: Highlight
Date: 4/24/2005 11:24:11 AM
ACCEPT - DONE

5.2.4.2
Change "external" to "SAS external" 3 times in the a)b)c) list

---

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 9:00:55 PM
ACCEPT - DONE

5.2.4.2, lettered list: correct the lettering.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 3:23:08 PM
REFER PHY WG (pinout)

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.

Author: kmarks_dell
Subject: Note
Date: 4/28/2005 6:08:29 PM
REFER PHY WG (pinout)

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.

Author: gop_ibm
Date: 4/25/2005 6:45:34 PM
ACCEPT - DONE

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). >>

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 9:01:25 PM
ACCEPT - DONE

5.2.4.3.1, second lettered list: correct the lettering.

Page: 120

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 7:34:06 PM
TACCEPT - DONE

NOTE 8: Change "controller to backplane" to "controller-to-backplane".

Page: 121

Author: gop_ibm
Date: 4/24/2005 10:50:37 AM
ACCEPT - DONE (as "For controller to controller uses, all four physical links should be used, because one controller's physical links 0 and 1 are attached the other controller's physical links 3 and 2, respectively. If both controllers use one or two physical links starting with physical links 0, communication is not possible. If both controllers use physical links 0, 1, and 2, then only communication over physical links 1 and 2 is possible.") REVIEW

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 controllers physical link 0 is attached the other controllers 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 controllers 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. >>

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 7:35:15 PM
ACCEPT - DONE (and changed "uses" to "applications")

NOTE 9: Change "controller to controller" to "controller-to-controller".

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 7:35:09 PM
ACCEPT - DONE (and changed "uses" to "applications")

NOTE 10: Change "controller to controller" to "controller-to-controller".

Page: 122

Author: relliott_hpq
Subject: Note
Date: 4/29/2005 8:50:12 AM
REFER PHY WG (pinout)

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.

Author: relliott_hpq
Subject: Note
Date: 4/28/2005 6:08:38 PM
REFER PHY WG (pinout)

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)

Author: relliott_hpq
Subject: Note
Date: 4/29/2005 9:39:56 AM
REFER PHY WG (pinout - I think that table 29 was wrong)

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.

Author: bbissone_intc
Subject: Note
Date: 4/29/2005 8:50:06 AM
REFER PHY WG (pinout)

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.

Status
rlsheffi Accepted 4/7/2005 3:03:14 PM

Author: gop_ibm
Date: 4/28/2005 6:08:51 PM
REFER PHY WG (pinout)

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:20:58 PM
REFER PHY WG (pinout)

Editor's Note 6

Comments from page 122 continued on next page

Delete Editor's Note 6 (and fix signal assignments if they are indeed incorrect)

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 6:09:50 PM
ACCEPT - DONE

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.

Author: bbissone_intc
Subject: Note
Date: 4/28/2005 4:32:30 PM
REFER PHY WG (pinout - sidebands won't work quite right, though)

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,....

Status
rlsheffi Accepted 4/7/2005 3:05:31 PM

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 7:36:13 PM
ACCEPT - DONE

NOTE 13: Change "controller to controller" to "controller-to-controller".

Author: gop_ibm
Date: 4/28/2005 6:10:01 PM
REFER PHY WG (pinout)

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:21:14 PM
REFER PHY WG (pinout)
Editor's Note 7

Delete Editor's Note 7 (and fix signal assignments if they are indeed incorrect)

Page: 124

Author: bbissone_intc
Subject: Note
Date: 4/28/2005 4:34:17 PM

REJECT (these are SAS internal cable receptacle connectors, not SATA-style host plug connectors, so RP/TP are the correct names to point to the primary not the secondary pins)

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.

Status
rlsheffi Accepted 4/7/2005 3:05:55 PM

Page: 125

Author: relliott_hpq
Subject: Note
Date: 4/25/2005 6:48:00 PM
REFER PHY WG

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.

Author: bbissone_intc
Subject: Note
Date: 4/28/2005 4:32:40 PM
REFER PHY WG (pinout)

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.

Status
rlsheffi Accepted 4/7/2005 3:06:12 PM

Page: 126

Author: gop_ibm
Date: 4/28/2005 6:10:22 PM
REFER PHY WG (pinout)

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:19:49 PM
REFER PHY WG (pinout)

Editor’s Note 8

Delete Editor's Note 8 (and fix signal assignments if they are indeed incorrect)

Author: relliott
Subject: Note
Date: 4/24/2005 11:14:58 AM
ACCEPT - DONE
REVIEW

Figure 80
To match Dell/Intel comments on figures 72 and 73:
Use:
GROUND
RX+ (B+)
RX- (B-)
GROUND
TX- (A-)
TX+ (A+)
GROUND
since ATA/ATAPI-7 V3 and Serial ATA 1.0a both use A/B terminology in their connector definition.)

Page: 127

Author: relliott
Subject: Note
Date: 4/24/2005 11:14:27 AM
ACCEPT - DONE
REVIEW

Figure 81
To match Dell/Intel comments on figures 72 and 73:
Use:
GROUND
RX+ (B+)
RX- (B-)
GROUND
TX- (A-)
TX+ (A+)
GROUND
since ATA/ATAPI-7 V3 and Serial ATA 1.0a both use A/B terminology in their connector definition.)

Author: bbissone_intc
Subject: Note
Date: 4/28/2005 4:32:46 PM
REFER PHY WG (pinout)

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.

Author: gop_ibm
Date: 4/28/2005 6:10:28 PM
REFER PHY WG (pinout)

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:20:54 PM
REFER PHY WG (pinout)

Editor's Note 9

Delete Editor's Note 9 (and fix signal assignments if they are indeed incorrect)

Page: 128

Author: kmarks_dell
Subject: Cross-Out
Date: 4/24/2005 11:26:57 AM
ACCEPT - DONE (this was supposed to be external, not internal. Moved to the "SAS external cable" subclause and corrected terms)
REVIEW

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 additionaly plugs are the external versions

---

Author: acox_seg
Subject: Highlight
Date: 4/24/2005 11:27:36 AM
REJECT (section is really for external cables, not internal compact wide. Moving and fixing terms instead)

5.2.4.3.5 SAS internal compact wide cable keying

Delete entire section as internal compact wide does not require keying.

Author: kmarks_dell
Subject: Note
Date: 4/24/2005 11:28:06 AM
ACCEPT - DONE (moving and fixing terms)

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.

Author: ghoulder_seg
Subject: Note
Date: 4/28/2005 6:10:45 PM
REFER PHY WG (keys)
Seagate #16
PDF page 168 – 169
Figures 82 & 83
Editor's notes 9 and 10 indicate keys may be wrong. This must be resolved so notes can be removed.

Author: gop_ibm
Date: 4/24/2005 11:32:25 AM
REJECT (in sas1r09, there is no definition of which key positions are used. SFF-8088 r0.9 later defines 5 choices; which of them SAS chooses to use has to be defined. Plus this figure is labeled internal when it should be labeled external - it is far from "correct.")

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:20:43 PM
REFER PHY WG (keys)

Comments from page 128 continued on next page

Editor’s Note 10

Delete Editor's Note 10 (and fix keys if they are indeed incorrect)

Page: 129

Author: kmarks_dell
Subject: Cross-Out
Date: 4/24/2005 11:33:02 AM
ACCEPT - DONE (moving and fixing terms rather than deleting, per Dell comment on previous page 168)

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

Author: gop_ibm
Date: 4/24/2005 11:32:15 AM
REJECT (in sas1r09, there is no definition of which key positions are used. SFF-8088 r0.9 later defines 5 choices; which of them SAS chooses to use has to be defined. Plus this figure is labeled internal when it should be labeled external - it is far from "correct.")

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.

Author: lohmeyer_lsi
Date: 4/28/2005 3:20:26 PM
REFER PHY WG (keys)

Editor’s Note 11

Delete Editor's Note 11 (and fix keys if they are indeed incorrect)

Page: 130

Author: rlsheffi_intc
Subject: Highlight
Date: 4/25/2005 6:49:25 PM

REFER PHY WG

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

Status
rlsheffi Accepted 4/7/2005 3:33:32 PM

Author: gop_ibm
Date: 4/24/2005 11:34:50 AM

ACCEPT - LAST (suggestions for how to automate this in FrameMaker?)

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.

Author: bbissone_intc
Subject: Comment on Text
Date: 4/25/2005 6:49:55 PM

REFER PHY WG

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.

Status
rlsheffi Accepted 4/7/2005 3:30:52 PM

Page: 131

Author: relliott
Subject: Highlight
Date: 4/25/2005 7:33:20 PM
REFER PHY WG

Table 31/32 Impedance media requirements

Table 31 uses "aggressor pair" to mean a signal pair like Tx0+/Tx0- affecting an unnamed signal pair

Table 32 uses "signal pair" to mean signal pair Tx0+/Tx0- to signal pair Rx0+/Rx0-

Should table 31 says "aggressor signal pair" rather than "aggressor pair"?

Should table 32 mention that each signal pair takes turns being the aggressor?

Author: afan_tyco
Subject: Note
Date: 4/25/2005 7:29:57 PM
ACCEPT - DONE (In table 31, changed to "from any single aggressor pair". In table 32, changed to "on any of the following signal pairs")
REVIEW

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?

Author: relliott
Subject: Note
Date: 4/25/2005 7:35:48 PM
REFER PHY WG

Table 31 Media requirements for external cables
Maximum near-end crosstalk rows

These pair choices are not appropriate for the external using external compact (SFF-8088) connectors. They are based on the odd SFF-8470 signal assignments with all the RX on one end and TX on the other end.

Also, there are two dimensions to consider (e.g. A0 to B0 as well as A0 to A1)

Author: relliott_hpq
Subject: Highlight
Date: 4/25/2005 6:52:29 PM
REFER PHY WG
5.2.6 Impedance and media specifications
Table 31 external cables

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

Comments from page 131 continued on next page

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.

Author: afan_tyco
Subject: Note
Date: 4/28/2005 3:42:03 PM
REFER PHY WG (cable skew)

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.

Page: 132

Author: relliott
Subject: Note
Date: 4/28/2005 6:17:03 PM
REFER PHY WG

Table 32 Media requirements for internal wide cables

Maximum near-end crosstalk rows

These pair choices are not appropriate for the internal wide cable using internal compact wide (SFF-8087) connectors. There are now two dimensions to consider (e.g. A0 to B0, A0 to A1).

Author: relliott_hpq
Subject: Highlight
Date: 4/25/2005 6:51:55 PM
REFER PHY WG

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.

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/25/2005 6:53:43 PM
REFER PHY WG (cannot just remove, or "the parts" is too vague.)

5.3.1 Compliance points
First paragraph,
Delete, "that contain or comprise the candidate compliance point"

Status
rlsheffi Accepted 4/12/2005 12:16:37 PM

Author: rlsheffi_intc
Subject: Highlight
Date: 4/25/2005 6:54:04 PM
REFER PHY WG

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.

Status

Comments from page 132 continued on next page

Page: 138

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 6:54:46 PM
ACCEPT - DONE (joined sentences with ", and" instead)

5.3.1, paragraph above figure 88: Change, "It also shows...", to, "Figure 88 also shows...".

Author: gop_ibm
Date: 4/25/2005 6:55:30 PM
REJECT (makes an awfully long sentence)

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

Page: 141

Author: gop_ibm
Date: 4/24/2005 12:33:27 PM
ACCEPT - DONE (added "(see SATAII-PHY)")

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

Author: relliott
Subject: Note
Date: 4/25/2005 6:55:56 PM
REFER PHY WG
5.3.2.1 Test loads overview

This paragraph is identical to a paragraph in 5.3.1.

There are letter ballot comments there but not here, which is always the risk when material is duplicated.

Delete one or the other so it is stated only one place.

Author: blye_pmcs
Subject: Highlight
Date: 4/19/2005 9:07:07 PM
ACCEPT - DONE

PMC #1 PDF Page 181 Section 5.3.2.2 Zero-length test load Second Paragraph "Figure 91" should be "Figure 92"

Page: 144

Author: blye_pmcs
Subject: Note
Date: 4/28/2005 3:38:18 PM
REFER PHY WG (TECHNICAL ISSUE)

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 it 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.

Page: 145

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 6:58:00 PM
TREFER PHY WG (also see Intel comment)

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}.

Author: rlsheffi_intc
Subject: Highlight
Date: 4/25/2005 6:57:52 PM
TREFER PHY WG (also see maxtor comment)

5.3.3 General electrical characteristics - fourth paragraph
"exceed"
s/b
"exhibit a BER less than"

Status
rlsheffi Accepted 4/14/2005 1:37:41 PM

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 8:57:38 AM
TACCEPT - DONE

5.3.3 General electrical characteristics
5th Paragraph, b) list
change
"...levels (see SATA2-PHY) but..."
to
"...levels (see SATAII-PHY) but..."

Page: 146

Author: relliott
Subject: Highlight
Date: 4/23/2005 2:33:06 PM
ACCEPT - DONE
REVIEW

Table 34 General electrical characteristics

Since this is the main table defining bit rates, mention the acronyms G1 and G2.

In the table header, change "1,5 Gbps" and "3,0 Gbps" to "1,5 Gbps (i.e, G1)" and "3,0 Gbps (i.e., G2)"

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 7:00:07 PM
REFER PHY WG (i.e.=in other words, e.g.=for example. Is the bandwidth 4.5 GHz for 1.5 Gbps-only phys too? i.e. implies it's 4.5 GHz for SAS-1.1 regardless of speed. e.g. would imply it is 2.25 GHz for 1.5 Gbps-only phys)

Table 34, note b: Change "i.e." to "e.g.".

Page: 147

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 8:57:52 AM
ACCEPT - DONE

Table 36 - Receiver device general electrical characteristics

In note a
change
"...V3 and SATA2-PHY)."
to
"...V3 and SATAII-PHY)."

Author: gop_ibm
Date: 4/25/2005 7:00:39 PM
REFER PHY WG

5.3.3 General electrical characteristics
This << impedance dip (amplitude as ρ, the reflection coefficient, and duration in time) caused >> should be << impedance dip (i.e., amplitude as ρ, the reflection coefficient, and duration in time) caused >>

Page: 148

Author: relliott
Subject: Highlight
Date: 4/22/2005 2:33:11 PM
ACCEPT - DONE

Change and to or

Author: relliott
Subject: Highlight
Date: 4/22/2005 2:33:16 PM
ACCEPT - DONE

Change and to or

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 7:36:51 PM
REJECT (will change "and" to "or" in this and 3 other rows in the list, though)

5.3.4, list item e: Change, "enabling and disabling pre-emphasis (i.e., de-emphasis)" to, "enabling pre-emphasis or disabling pre-emphasis (i.e., de-emphasis)".

Author: relliott
Subject: Highlight
Date: 4/22/2005 2:33:20 PM
ACCEPT - DONE

Change and to or

Author: gop_ibm
Date: 4/25/2005 7:02:45 PM
REFER PHY WG

5.3.4 Transmitter and receiver device transients
This << GROUND on the test loads shown in figure 98 (for the transmitter device) and figure 99 (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 all power state and mode transitions. >>

Author: bbissone_intc
Subject: Inserted Text
Date: 4/24/2005 10:30:48 AM
ACCEPT - DONE

5.3.5 Electrical TxRx connections
First paragraph
"connection individual"
s/b "connection, individual"

Status
rlsheffi Accepted 4/7/2005 3:49:15 PM

Author: bbissone_intc
Subject: Cross-Out

Comments from page 148 continued on next page

Date: 4/28/2005 4:34:13 PM

TREFER PHY WG ("differing" is not the right adjective either - rewrite sentence somehow)

5.3.5 Electrical TxRx connections - first paragraph, second line:
"materials, including" s/b "materials including"

Status

rlsheffi Accepted 4/14/2005 11:05:45 PM

Page: 149

Author: gop_ibm
Date: 4/23/2005 4:24:08 PM
ACCEPT - LAST

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.

Page: 151

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
5.3.6.4 Receiver device jitter tolerance eye mask
The << d) >> and << e) >> should be deleted. This is not an unordered list.

Author: relliott
Subject: Highlight
Date: 4/22/2005 2:31:14 PM
ACCEPT - DONE

d) s/b a)

Author: relliott
Subject: Highlight
Date: 4/22/2005 2:49:26 PM
ACCEPT - DONE

add xrefs in "scrambling and running disparity"

Author: relliott_hpq
Subject: Note
Date: 4/28/2005 6:14:36 PM
REFER PHY WG

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 2:35:58 PM
REJECT (Although the terms were introduced in 5.4.3 mode transitions, that enough of a different topic that I think it bears repeating here.)

5.3.7.1, third paragraph: Delete "(i.e., de-emphasis)".

Page: 152

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42: delete "at probe point"

Status
rlsheffi Accepted 4/14/2005 11:04:39 PM

Author: gop_ibm
Date: 4/22/2005 2:37:52 PM
ACCEPT - LAST

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.

Page: 153

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
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.

Status
rlsheffi Accepted 4/14/2005 11:04:10 PM

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:
delete "at probe point"

Status
rlsheffi Accepted 4/14/2005 11:04:30 PM

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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>>

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 8:58:47 AM
ACCEPT - DONE

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 x Z2) if a SATA device can be attached
2. Minimum eye opening (i.e., 2 x Z1), if a SATA device can be attached

change

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

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
5.3.7.3 Transmitter device signal output characteristics as measured with each test load
Table 38
This <<can>> should be <<is able to>>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
5.3.7.3 Transmitter device signal output characteristics as measured with each test load
Table 38

Comments from page 153 continued on next page

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

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
5.3.7.3 Transmitter device signal output characteristics as measured with each test load
Table 38
This <<can>> should be <<is able to>>

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 7:44:51 PM
ACCEPT - DONE (but footnote g remains, modified per other comments)

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"

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 7:39:01 PM
REFER PHY WG (see similar comment from Maxtor in table 34, General electrical characteristics)

Table 38, note d: Change "i.e." to "e.g.".

Author: gop_ibm
Date: 4/25/2005 7:37:38 PM
ACCEPT - DONE

5.3.7.3 Transmitter device signal output characteristics as measured with each test load
Figure 38
This << Serial ATA >> should be <<SATA>>

Author: gop_ibm
Date: 4/25/2005 7:38:12 PM
ACCEPT - DONE (wider than requested; changed "the Serial ATA standard" to "SATA")

5.3.7.3 Transmitter device signal output characteristics as measured with each test load
Figure 38
This << Serial ATA >> should be <<SATA>>

Author: blye_pmcs
Subject: Note
Date: 4/25/2005 7:41:48 PM
REJECT (note g still allows 3 Gbps ALIGNs, which the SATA device won't support. Other comments clean up the footnotes and the SATA rows.)

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 attacing to a SATA device is supported.

Comments from page 153 continued on next page

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.

Author: relliott
Subject: Highlight
Date: 4/24/2005 12:27:31 PM
ACCEPT - DONE

Table 38

Change "burst portion of the OOB signal" to "OOB burst" twice.

Author: relliott
Subject: Highlight
Date: 4/24/2005 11:45:27 AM
ACCEPT - DONE

Table 38
Fix (see 6.6) which is not an active crossreference in FrameMaker

---

Author: blye_pmcs
Subject: Note
Date: 4/25/2005 7:43:38 PM
REJECT (this is the transmitter signal output characteristic table, so is providing the rules for a SAS phy transmitter device. It would never send 1.5 Gbps D24.3s either. Other comments clean up the footnotes and SATA rows)

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".

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 12:23:59 PM
ACCEPT - DONE

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)."

Author: bbissone_intc
Subject: Comment on Text
Date: 4/24/2005 12:26:12 PM
ACCEPT - DONE (Agree that since SATA II doesn't allow 3 Gbps ALIGNs, then a SAS phy supporting attachment to SATA devices must not be allowed to transmit them. This rule needs to also be stated in 6.6 (comment added there).

Comments from page 153 continued on next page

Also, a SAS phy would never transmit D24.3 characters since that breaks its SAS rule (we assume that SAS never discusses phys that ONLY attach to SATA). So, D24.3 also needs to be removed.

Result: Footnote g) is 1.5 Gbps ALIGN (0)s only.)
REVIEW

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"

Status
rlsheffi Accepted 4/7/2005 3:52:04 PM

Page: 154

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
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.

Status
rlsheffi Accepted 4/14/2005 11:04:19 PM

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:
delete "at probe point"

Status
rlsheffi Accepted 4/14/2005 11:04:49 PM

Author: gop_ibm
Date: 4/25/2005 8:01:25 PM
REJECT (that's what "(see SATA2-PHY)" is for, right after the Gen2i reference that follows.)

5.3.7.4 Transmitter device maximum jitter
There is no definition or description for the term << Gen1i >> this needs to be fixed.

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:00:11 AM
ACCEPT - DONE

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..."

Author: relliott_hpq
Subject: Note
Date: 4/25/2005 8:03:54 PM
REFER PHY WG

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.

Comments from page 154 continued on next page

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

Author: relliott
Subject: Underline
Date: 4/25/2005 8:07:03 PM
ACCEPT - DONE
"voltage levels" s/b "signal levels"

Author: relliott
Subject: Underline
Date: 4/25/2005 8:06:44 PM
ACCEPT - DONE
"voltage levels" s/b "signal levels"

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 8:12:50 PM
ACCEPT - DONE (also changed "SATA signal levels" to "SATA Gen1i or Gen2i signal levels" throughout the section)

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..."

Author: relliott
Subject: Underline
Date: 4/25/2005 8:07:38 PM
ACCEPT - DONE
"voltage levels" s/b "signal levels"

Author: relliott
Subject: Highlight
Date: 4/25/2005 8:09:42 PM
ACCEPT - DONE
After "transient" add "(see 5.3.4)"

Author: relliott
Subject: Underline
Date: 4/25/2005 8:05:03 PM
ACCEPT - DONE
"SAS voltage level" s/b "SAS signal level"

Author: relliott
Subject: Underline
Date: 4/25/2005 8:04:48 PM
ACCEPT - DONE
"SATA voltage levels" s/b "SATA Gen1i or Gen2i signal levels"

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 8:04:28 PM
ACCEPT - DONE

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

Comments from page 154 continued on next page

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

Author: relliott
Subject: Highlight
Date: 4/25/2005 8:21:00 PM
REFER PHY WG

"SAS signal" s/b "signal"

Author: relliott
Subject: Highlight
Date: 4/25/2005 8:19:32 PM
ACCEPT - DONE

"compliance point" s/b "receiver device compliance point"

Page: 155

Author: relliott
Subject: Highlight
Date: 4/25/2005 8:20:41 PM
TREFER PHY WG

Change "the signal at a receiving phy"
to either:
"the delivered signal at the receiver device compliance point"

or nothing - just delete it altogether (since the sentence begins with Additionally and the previous sentence has that phrase already)

Author: relliott
Subject: Highlight
Date: 4/25/2005 8:24:54 PM
TREFER PHY WG

"and" is the wrong conjunction here, leading to a sentence with bad grammar.

"when the signal...has the jitter present that is specified in ... and the common mode signal Vcm over... Fcm as specified in"

Options include:
"and" s/b "and has"
"and" s/b "with"
"as" s/b "is as"

Author: relliott
Subject: Highlight
Date: 4/25/2005 8:25:26 PM
TREFER PHY WG

Delete "that is"?

Author: relliott
Subject: Highlight
Date: 4/25/2005 8:25:11 PM
TREFER PHY WG

Delete "the"?

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
T5.3.8.1 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 >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
T5.3.8.1 Receiver device characteristics overview
This << The figure given assumes that any external >> should be << The value given assumes that any external >>

Author: relliott
Subject: Highlight
Date: 4/28/2005 6:18:04 PM

Comments from page 155 continued on next page

REFER PHY WG

Is "receiving phy" the right term?

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
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.

Status
rlsheffi Accepted 4/14/2005 11:05:03 PM

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:
delete "at probe point"

Status
rlsheffi Accepted 4/14/2005 11:05:23 PM

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:00:33 AM
ACCEPT - DONE

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"

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 12:29:48 PM
REFER PHY WG (will be rejected, but "SATA device attached" is intended to encompass port selectors/port multipliers too. Need global wording for that concept.)

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.

Comments from page 155 continued on next page

REFER PHY WG (will be rejected, but "SATA device attached" is intended to encompass port selectors/port multipliers too. Need global wording for that concept.)

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.

Author: kmarks_dell
Subject: Cross-Out
Date: 4/24/2005 12:29:38 PM

REFER PHY WG (will be rejected, but "SATA device attached" is intended to encompass port selectors/port multipliers too. Need global wording for that concept.)

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.

Page: 156

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
Table 40 — Delivered signal characteristics...
Delete "as measured with the zero length test load".

Status
rlsheffi Accepted 4/14/2005 11:03:41 PM

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:
delete "at probe point"

Status
rlsheffi Accepted 4/14/2005 11:04:14 PM

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 8:26:51 PM
REFER PHY WG (see comment on table 34 general characteristics)

Table 40, note d: Change "i.e." to "e.g.".

Author: gop_ibm
Date: 4/25/2005 8:27:34 PM
ACCEPT - DONE

5.3.8.2 Delivered signal characteristics
Figure 40
This << Serial ATA >> should be <<SATA>>

Author: gop_ibm
Date: 4/25/2005 8:27:47 PM
ACCEPT - DONE ("the Serial ATA standard" changed to "SATA")

5.3.8.2 Delivered signal characteristics
Figure 40
This << Serial ATA >> should be <<SATA>>

Author: blye_pmcs
Subject: Note
Date: 4/25/2005 8:30:34 PM
ACCEPT - DONE
REVIEW

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 attacing 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.

Author: relliott

Comments from page 156 continued on next page

Subject: Highlight
Date: 4/24/2005 12:27:50 PM
ACCEPT - DONE

Table 40

Change "burst portion of the OOB signal" to "OOB burst" twice.

Author: relliott
Subject: Highlight
Date: 4/24/2005 11:45:40 AM
ACCEPT - DONE

Table 40
Fix (see 6.6) which is not an active crossreference in FrameMaker

---

Author: blye_pmcs
Subject: Note
Date: 4/25/2005 8:33:05 PM
ACCEPT - DONE (a phy that supports being attached to SATA also supports being attached to SAS, so 3 Gbps ALIGNs is necessary. Changing "(see SATA2-PHY)" to "(see 6.6 and SATA2-PHY)" so it won't imply this is SATA2-PHY's fault.)
REVIEW

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".

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 12:23:33 PM
ACCEPT - DONE

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)."

Author: bbissone_intc
Subject: Highlight
Date: 4/24/2005 12:23:07 PM
REJECT (if the phy supports being attached to either a SATA device or a SAS phy, it has to tolerate the 3 Gbps ALIGNs allowed by SAS as well. Will change the reference to "see 6.6 and SATA2-PHY" so it doesn't imply that this footnote only applies to SATA devices)

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

Status
rlsheffi Accepted 4/7/2005 3:59:48 PM

Comments from page 156 continued on next page

Page: 157

Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM

5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42:
delete "at probe point"

Status
rlsheffi Accepted 4/14/2005 11:04:35 PM

Author: gop_ibm
Date: 4/23/2005 4:21:00 PM

ACCEPT - LAST
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.

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Author: rlsheffi_intc
Subject: Cross-Out
Date: 4/19/2005 1:37:51 PM
5.3.7.2, Table 37, 38, 39, 40 (parts 1 and 2), 41, 42: delete "at probe point"

Status
rlsheffi Accepted 4/14/2005 11:04:24 PM

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:01:29 AM
ACCEPT - DONE

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)."

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
5.3.9 Spread spectrum clocking
This << need not >> should be changed to << are not required to >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
5.3.10 Non-tracking clock architecture
This << need not >> should be changed to << are not required to >>

Page: 159

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:01:43 AM
TACCEPT - DONE

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..."

Page: 160

Author: relliott
Subject: Highlight
Date: 4/22/2005 2:50:39 PM
ACCEPT - DONE
After "on each physical link" add "in each direction."

Author: relliott
Subject: Highlight
Date: 4/22/2005 2:50:08 PM
ACCEPT - DONE

After "Running disparity" add "(RD)"

Page: 161

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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.

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Author: relliott
Subject: Highlight
Date: 4/22/2005 3:42:20 PM
ACCEPT - DONE

6.3.3
Here and many times afterwards, change "running disparity" to "RD" since the acronym was introduced.

Author: gop_ibm
Date: 4/19/2005 9:10:59 PM
ACCEPT - DONE

6.3.3 Data and control characters
This << four-bit sub-block is 0011b. >> should be << four-bit sub-block is 0011b; >>

Author: gop_ibm
Date: 4/28/2005 7:37:21 PM
REFER PROTOCOL WG (maybe this needs to be a 1)2)3) list if that is the desired change, since otherwise implies the other conditions were checked first)

6.3.3 Data and control characters
This << four-bit sub-block is 1100b. >> should be << four-bit sub-block is 1100b; otherwise >>

Author: gop_ibm
Date: 4/28/2005 7:37:35 PM
REFER PROTOCOL WG (see previous IBM comment)

6.3.3 Data and control characters
Move this << Otherwise >> to end of item b).

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 2:43:15 PM
REJECT (the subblock _having_ neutral disparity is a different concept than the running disparity being positive or negative. The running disparity is never "neutral")

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.

Page: 168

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 3:43:27 PM
REJECT (they're also underlined, highlighting the command patterns)

Table 47 — Control characters

Make blue text black in table.

Author: ghoulder_seg
Subject: Note
Date: 4/22/2005 3:59:28 PM
REJECT (technically, SATA_ERROR is not a primitive. That was mentioned in table 48 and section 7.2.71. Added comment to also mention it in table 47. Added comments to change "SATA_ERROR primitive" to just "SATA_ERROR" two times the phrase is used in the XL state machine.)

Seagate #18
Printed page 168
Table 48 – Control character usage
In K28.3 row, Usage in SATAcolumn, it says “All primitives except ALIGN”. It should be “All primitives except ALIGN and SATA_ERROR”.

Page: 169

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 9:14:58 AM
TREJECT (it's highlighting the bit that is in error)

Table 49 — Delayed code violation example

Make blue text black in table and not underlined.

Author: gop_ibm
Date: 4/20/2005 9:04:15 AM
TREJECT (SATA defines ALIGN, which is used for outside STP as well)

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 >>

Page: 171

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 9:10:15 AM
ACCEPT - DONE (deleted "detected by the phy" altogether. That's not core to the definition of an OOB signal.)

6.6.1, first paragraph: In the first sentence, change "the phy" to "a phy".

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 9:15:33 AM
ACCEPT - DONE

6.6.1, first paragraph: In the second sentence, change, "They consist of...", to, "OOB signals consist of..."

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Author: ghoulder_seg
Subject: Note
Date: 4/20/2005 9:18:06 AM
ACCEPT - DONE (added acronym and definition in chapter 3 - "The time basis for burst times and idle times used to create OOB signals (see 3.1.129). See 6.6.1.")

Seagate #19
PDF page 212
Tables 50 & 51
An abbreviation called “OOBI” is defined in table 50. OOBI should be added to the abbreviation list in 3.2 and should reference table 50 for the precise definition.

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 4:00:52 PM
ACCEPT - DONE

6.6.2, third paragraph: Change, "It shall then transmit...", to, "The transmitter device shall then transmit..."

Author: relliott
Subject: Highlight
Date: 4/23/2005 2:25:30 PM
ACCEPT - DONE

"at generation 1 (G1) physical link rates" should be singular:
"at the generation 1 (G1) physical link rate"

Author: mevans_mxo
Subject: Highlight
Date: 4/24/2005 12:14:16 PM
ACCEPT - DONE (as "When transmitting an OOB burst, A SAS transmitter device:
a) should transmit ALIGNs at the G1 physical link rate;
b) may transmit ALIGNs at its lowest supported physical link rate 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 its lowest supported physical link rate.
")

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.

Author: relliott
Subject: Note
Date: 4/24/2005 12:17:17 PM
ACCEPT - DONE
REVIEW

A SAS phy supporting being attached to SATA devices must not send OOB bursts with G2 or later ALIGNs - SATAII-PHY only allows G1 ALIGNs (or D24.3s, which a SAS phy won't send because a SAS phy receiver device doesn't necessarily accept it).

After also applying Maxtor's comment on this paragraph, results in:
"When transmitting an OOB burst, if the phy supports being attached to SATA devices, the transmitter device shall transmit ALIGN (0) primitives at G1. If thea phy does not support being attached to SATA devices, the transmitter device:
should transmit ALIGN (0) primitives at G1;
may transmit ALIGN (0) primitives at its lowest supported physical link rate if it is not able to transmit at G1; and

Comments from page 172 continued on next page

shall not transmit ALIGN (0) primitives at a physical link rate faster than its lowest supported physical link rate."

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Author: relliott
Subject: Highlight
Date: 4/22/2005 4:02:03 PM
ACCEPT - DONE

i.e., s/b e.g.

Author: gop_ibm
Date: 4/22/2005 4:06:29 PM
ACCEPT - DONE (rewrote entire e.g. as " (e.g., if a receiver device previously detected COMINIT, then receives four sets of COMWAKE idle times followed by burst times, the receiver device detects COMWAKE. The receiver device may then detect COMINIT again)
")

6.6.3 Receiving OOB signals
This << detected; another COMINIT may follow). >> should be << detected after which another COMINIT may follow). >>

Author: relliott
Subject: Highlight
Date: 4/22/2005 4:10:54 PM
ACCEPT - DONE

Change "OOB signals" to "OOB bursts"

Author: relliott
Subject: Highlight
Date: 4/24/2005 12:21:34 PM
ACCEPT - DONE

6.6.3 Receiving OOB

Change "ALIGNs" to "ALIGN (0) primitives" to match similar change in the transmitting OOB section on previous page 213

Author: relliott
Subject: Highlight
Date: 4/22/2005 4:11:02 PM
ACCEPT - DONE

Change "OOB signals" to "OOB bursts"

Author: mevans_mxo
Subject: Note
Date: 4/22/2005 4:10:41 PM
ACCEPT - DONE (added "A SAS receiver device shall not check the characters used to form the OOB burst; only the frequency content of the burst matters.")

REVIEW PHY WG

6.6.5, fifth paragraph: Add the following sentence: A SAS receiver device is not required to identify the ALIGNs in the burst.

Author: relliott
Subject: Note
Date: 4/22/2005 4:11:25 PM

Comments from page 174 continued on next page

ACCEPT - DONE

Move the D24.3 sentence to its own paragraph after note 18.

Page: 176

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:01:56 AM
ACCEPT - DONE

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)."

Author: relliott
Subject: Highlight
Date: 4/25/2005 4:53:50 PM
ACCEPT - DONE
REVIEW
6.7.1
In the list of "shall originate a phy reset sequence after" reasons:
"losing dword synchronization (see 6.8.4.9);"

has two problems:
1. It does not mention that SP may choose to re-acquire rather than jump right back to phy reset sequence.
2. The cross reference only points to SAS_PHY_Ready, but the rule is also true in SATA_PHY_Ready.

Change to:
"losing dword synchronization and not attempting to re-acquire dword synchronization (see 6.8.4.9 and 6.8.5.8)"

Author: relliott
Subject: Highlight
Date: 4/22/2005 4:21:31 PM
ACCEPT - DONE
6.7.1

"Receive Identify Timeout"
s/b
"Receive Identify Timeout timer expires"

Page: 177

Author: relliott
Subject: Highlight
Date: 4/22/2005 4:19:42 PM
ACCEPT - DONE
6.7.1
Table 56 Phy reset sequence timing specifications

Expand:
"The maximum time after which an expander phy shall retry an unsuccessful phy reset sequence (see 6.7.5)."

to include the initiator should recommendation too:
"The maximum time after which an expander phy shall retry an unsuccessful phy reset sequence, and after which a SAS initiator phy should retry an unsuccessful phy reset sequence (see 6.7.5)."

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:02:08 AM
ACCEPT - DONE

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."

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 12:10:56 PM
REJECT (that's part of the speed negotiation sequence stage [as viewed by SAS]. See the next figure.)

Figure 109 — SATAOOB sequence

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

Page: 178

Author: gop_ibm
Date: 4/20/2005 12:11:26 PM
REJECT (the SAS SP state machine generates this sequence)

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:02:32 AM
ACCEPT - DONE

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."

Author: gop_ibm
Date: 4/20/2005 12:12:01 PM
ACCEPT - DONE

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). >>

Author: kmarks_dell
Subject: Cross-Out
Date: 4/28/2005 3:35:46 PM
ACCEPT - DONE

6.7.3 SAS to SATA phy reset sequence

5th Paragraph, 2nd Sentence

Remove "initiate" from sentence.

Page: 179

Author: relliott
Subject: Highlight
Date: 4/20/2005 7:39:07 PM
TACCEPT - DONE

Power-on remove the -

Page: 182

Author: relliott
Subject: Note
Date: 4/23/2005 1:46:17 PM
ACCEPT - DONE
REVIEW6.7.4.2 SAS speed negotiation sequence

This section mixes up the definition of the speed negotiation window with the definition of the speed negotiation sequence (a set of windows).

Split into subclauses:
.1 overview
.2 speed negotiation window
.3 speed negotiation sequence

Author: relliott
Subject: Highlight
Date: 4/23/2005 1:25:37 PM
ACCEPT - DONE
6.7.4.2 SAS speed neg
rate s/b physical link rate

Author: relliott
Subject: Highlight
Date: 4/23/2005 1:26:35 PM
ACCEPT - DONE

6.7.4.2 SAS speed neg
After "length of the speed
negotiation sequence" add "(i.e., the number of speed negotiation windows)"

Author: relliott
Subject: Note
Date: 4/23/2005 1:25:45 PM
ACCEPT - DONE
REVIEW

6.7.4.2 SAS speed neg
Add "speed negotiation window rate" to figure 113.

Author: relliott
Subject: Note
Date: 4/23/2005 1:25:53 PM
ACCEPT - DONE
REVIEW
6.7.4.2 SAS speed neg
Figure 113 - SNW
Make this figure more to scale. The RCD really consumes 82% of the SNW, and SNLT consumes 94% of the SNTT.

Author: relliott
Subject: Highlight
Date: 4/23/2005 11:24:29 AM

Comments from page 182 continued on next page

ACCEPT - DONE
6.7.4.2
Figure 113
"Speed negotiation window" s/b "Speed negotiation window time"

Page: 183

Author: relliott
Subject: Cross-Out
Date: 4/23/2005 11:23:10 AM
ACCEPT - DONE

Delete "for each speed negotiation window" which is redundant with the preceding part of the sentence "The SNW shall consist of the following transmission sequence"

Author: relliott
Subject: Cross-Out
Date: 4/24/2005 12:35:55 PM
ACCEPT - DONE

6.7.4.2

Delete "a" in 1)

Author: relliott
Subject: Cross-Out
Date: 4/24/2005 12:36:11 PM
ACCEPT - DONE

6.7.4.2

Delete "a" in 2)

Author: relliott
Subject: Highlight
Date: 4/23/2005 1:46:54 PM
ACCEPT - DONE

6.7.4.2 SAS speed neg

Insert new paragraph between "valid. The". It's currently merging discussion of the results of a speed negotiation window with the speed negotiation SEQUENCE.

(another comment makes this a new subclause break)

Author: relliott
Subject: Highlight
Date: 4/23/2005 1:38:30 PM
ACCEPT - DONE

After "highest supported physical link rate plus one" add " (e.g., a phy supporting G2 participates in G1, G2, and G3 speed negotiation windows)"

Author: relliott
Subject: Highlight
Date: 4/23/2005 1:47:50 PM
ACCEPT - DONE
Change:
"If the phy has detected a valid physical link rate in the previous speed negotiation window, it shall enter the final speed negotiation

Comments from page 183 continued on next page

window using the highest previously successful link rate."

to
"Once a phy reaches its limit, if the phy detected a valid physical link rate in the previous speed negotiation window, it shall participate in a final speed negotiation window using the highest previously successful physical link rate."

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Author: relliott
Subject: Highlight
Date: 4/24/2005 12:35:26 PM
ACCEPT - DONE
REVIEW

Expand:
"Both phys then select G2 for the final speed negotiation window to establish the negotiated physical link rate."

to:
"Phy A reaches its limit because it has run a speed negotiation window that does not detect a valid physical link rate (i.e., G3) after having detected a valid physical link rate in a previous speed negotiation window (i.e., G2). Phy B reaches its limit because it has reached its highest support physical link rate plus one (i.e., G3). Both phys select G2 for the final speed negotiation window to establish the negotiated physical link rate."

Author: relliott
Subject: Note
Date: 4/23/2005 1:51:22 PM
ACCEPT - DONE
REVIEW

Figure 114 - redraw so RCD looks a bit more to scale. Also show the link layer dwords starting at the end of the sequence - current picture is sometimes misinterpreted as meaning "go back to D.C. idle"

Author: relliott
Subject: Highlight
Date: 4/23/2005 11:31:09 AM
ACCEPT - DONE

obtain s/b achieve

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 12:13:02 PM
ACCEPT - DONE

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..."

Author: relliott
Subject: Highlight
Date: 4/23/2005 1:48:40 PM
ACCEPT - DONE
Change "This may be counted" to
"This is called a phy reset problem and may be counted"

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Author: relliott
Subject: Highlight
Date: 4/23/2005 11:30:37 AM
ACCEPT - DONE

obtain s/b achieve

Author: relliott
Subject: Highlight
Date: 4/23/2005 12:54:26 PM
ACCEPT - DONE

"the same speed negotiation sequence as in figure 114 when" is wrong. Figure 115 shows phy B support G1 while figure 114 does not. Change to "a speed negotiation sequence where"

Author: relliott
Subject: Highlight
Date: 4/23/2005 12:55:58 PM
ACCEPT - DONE

Change "OOB sequence shall be retried starting with COMINIT, forcing the phy to retry the whole reset sequence."
to
"the phy reset sequence is retried."

Author: relliott
Subject: Note
Date: 4/24/2005 12:34:11 PM
ACCEPT - DONE

Figure 115
Redraw with better RCD relative scale and more informative labeling

---

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 4:29:01 PM
REJECT (it's optional but implementing is a "should". Also, this says "hot-plug timeout" which is just the name of the 500 ms time, not the "Hot-Plug Timeout timer" which is the name of the optional timer that enforces that time.)

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.

Page: 187

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 state machine 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 << The SP 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 the MgmtRest 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 MgntResedt is always set to zero when SP0 is exited. This seems to nullify it usefulness. I think the sentence should be deleted.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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:OOB_COMINIT shall cause the SP state machine to set the COMWAKE_Received state machine variable to zero.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

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Author: relliott
Subject: Note
Date: 4/22/2005 4:26:39 PM
ACCEPT - DONE

add section number cross references to the table references here, e.g.
(see table 58 in 6.7.4.2)

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 7:44:15 PM
ACCEPT - DONE

6.8.2, third paragraph: Change "idle time" to "D.C. idle".

Author: gop_ibm
Date: 4/22/2005 4:29:57 PM
ACCEPT - DONE (but as "transmits D.C. idle" rather than idle dwords. It does not transmit idle dwords - that's a link layer concept.)
REVIEW

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

Page: 189

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.3.1 OOB sequence states overview
Figure 117
The transition into SP0 from SP26 is missing. This needs to be fixed.

Author: kmarks_dell
Subject: Note
Date: 4/19/2005 1:42:54 PM
Figure 117 - SP (phy layer) state machine - OOB sequence states

The SP7:OOB_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.

Page: 190

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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 place into the state at which the event occurs before making the transition to SP0.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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.

Author: relliott_hpq
Subject: Highlight
Date: 4/19/2005 1:40:54 PM

6.8.3.2.1 SP0:OOB_COMINIT state description

"SMP Reset request" is not defined anywhere.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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. >>

Comments from page 190 continued on next page

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T6.8.3.3.1, 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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

T6.8.3.3.1 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 >>

Page: 191

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

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.

Author: bnixon_elx
Subject: Highlight
Date: 4/20/2005 7:42:44 PM

ACCEPT - DONE

Page 191
6.8.3.3.2
para 2 line 3

COMWAKE_Recieved

s/b

COMWAKE_Received

Author: relliott
Subject: Highlight
Date: 4/22/2005 4:31:44 PM

ACCEPT - DONE

6.8.3.3.3
"bit is one" s/b "bit is set to one"

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

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.

Comments from page 191 continued on next page

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

T6.8.3.6.1 State description

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

Page: 192

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
6.8.3.6.1, third paragraph: See the previous comment.

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 4:31:03 PM
ACCEPT - DONE

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".

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.3.6.2 Transition SP4:OOB_COMSAS to SP5:OOB_AwaitCOMSAS_Sent
This << response and send a SATA Port Selector Change confirmation to the link layer. >> should be << response and send a SATA Port Selector Change confirmation to the link layer before the transition. >>

Author: mevans_mxo
Subject: Highlight
Date: 4/22/2005 4:32:41 PM
ACCEPT - DONE

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".

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.3.8.2 Transition SP6:OOB_AwaitNoCOMSAS to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 a 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?

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
6.8.3.9.2 Transition SP7:OOB_AwaitCOMSAS to SP2:OOB_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."

Page: 193

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.3.9.3 Transition SP7:OOB_AwaitCOMSAS to SP6:OOB_AwaitNoCOMSAS
This <<state machine variable to zero. >> should be << state machine variable to zero before the transition. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.3.9.3 Transition SP7:OOB_AwaitCOMSAS to SP6:OOB_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. >>

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 4:34:13 PM
ACCEPT - DONE

6.8.3.9.4 Transition SP7:OOB_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;"

Author: gop_ibm
Date: 4/22/2005 5:05:16 PM
REJECT (it's perfectly clear now. Why move the confirmation to a "by the way" sentence after the transition sentence?)

6.8.3.9.5 Transition SP7:OOB_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. >>

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
6.8.3.9.5 Transition SP7:OOB_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.

Page: 194

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Page: 195

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 speed negotiation sequence above.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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

---

Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 11:16:33 AM
ACCEPT - DONE (as "shall be set to: a) 1,5 Gbps, if the...; or b) the value...")

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:OOB_AwaitNoCOMSAS state); or
b) the value of the SAS Speed Negotiation Window Rate argument.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.4.2.2 Transition SP8:SAS_Start to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 11:14:16 AM
REJECT (grammar does not make sense)

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."

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 11:14:30 AM
REJECT (grammar does not make sense)

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."

Author: gop_ibm

Comments from page 195 continued on next page

Date: 4/19/2005 1:38:20 PM

6.8.4.4.2 Transition SP10:SAS_AwaitALIGN to SP0:OOB_COMINIT

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

Page: 196

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.4.5.2 Transition SP11:SAS_AwaitALIGN1 to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 11:21:17 AM
ACCEPT - DONE

6.8.4.5.3: Change "lock" to "achieve dword synchronization".

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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

---

Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 11:21:01 AM
ACCEPT - DONE

6.8.4.5.4: Change "lock" to "achieve dword synchronization".

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.4.6.2 Transition SP12:SAS_AwaitSNW to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Page: 197

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.4.7.2 Transition SP13:SAS_Pass to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
6.8.4.8.1, lettered list: Change "window" to "window rate" in three places.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
6.8.4.8.2, lettered list: Change "window" to "window rate" in two places. Change "haven't" to "have not".

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
6.8.4.8.3, lettered lists: Change "window" to "window rate" in five places.

Page: 198

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
See previous comment.

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.4.9.2 Transition SP15:SAS_PHY_Ready to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Page: 199

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Page: 200

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.5.3.2 Transition SP17:SATA_AwaitCOMWAKE to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: relliott_hpq
Subject: Highlight
Date: 4/20/2005 7:41:52 PM
ACCEPT - DONE

6.8.5.4.2 Transition SP18 to SP0

"Transition SP187" s/b "Transition SP18"

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.5.4.2 Transition SP187:SATA_AwaitNoCOMWAKE to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.5.5.2 Transition SP19:SATA_AwaitALIGN to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Page: 201

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.5.6.2 Transition SP20:SATA_AdjustSpeed to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.5.7.2 Transition SP21:SATA_TransmitALIGN to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.5.8.2 Transition SP22:SATA_PHY_Ready to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Page: 202

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.5.9.2 Transition SP23:SATA_PM_Partial to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.5.10.2 Transition SP24:SATA_PM_Slumber to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Page: 203

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.6.1 State description
This section is not properly formatted and as such is different that any other state description section is SAS. This has be 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 lke 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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.6.1 State description
Figure 120
All the comments on the state to state transitions within this figure should be deleted.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.6.3 Transition SP25:SATA_PortSelectionSignalPending to SP1:OOB_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. >>

Page: 204

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: kmarks_dell
Subject: Cross-Out
Date: 4/19/2005 1:42:54 PM
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."

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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..."

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: kmarks_dell

Comments from page 204 continued on next page

Subject: Note
Date: 4/19/2005 1:42:54 PM
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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.7.1 State description
Figure 121
This << Reset or >> on the transitions to SP0 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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.7.2 Transition SP26:SATA_SpinupHold to SP0: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 SP0:OOB_COMINIT. Otherwise, the state machine shall set the MgmtReset state machine variable to zero upon entry to SP0: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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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..."

Author: relliott_hpq
Subject: Cross-Out
Date: 4/19/2005 1:40:54 PM
6.8.7.2 Transition SP26 to SP0

Delete "upon entry to SP0:OOB_COMINIT."

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
6.8.7.2 Transition SP26:SATA_SpinupHold to SP0:OOB_COMINIT
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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.

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Author: ghoulder_seg
Subject: Note
Date: 4/28/2005 4:36:50 PM
ACCEPT - DONE

Seagate #20
PDF page 246
Figure 122 – SP_DWS state machine
The transition from state SP_DWS5 to SP_DWS6, Invalid dword, has a strange bend by the words “Invalid dword”. This should be fixed.

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 4:31:26 PM

ACCEPT - DONE (That was from when people were considering drives that might speak both SATA and SAS protocol, always transmitting COMSAS and going into SAS mode if COMSAS is detected and going into SATA mode if it is not. It just says that SATA rules apply if the drive takes the SATA path. I think it is appropriate to delete the sentence now.)
REVIEW

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:03:17 AM

ACCEPT - DONE

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)."

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 4:28:35 PM

ACCEPT - DONE

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)."

Page: 211

Author: gop_ibm
Date: 4/23/2005 4:32:12 PM
TREJECT (comma makes it a run-on sentence)

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 >>

Page: 213

Author: thoglund_lsi
Subject: Highlight
Date: 4/28/2005 11:32:05 AM
TREFER PROTOCOL WG (05-145)

change back to OPEN_REJECT (RESERVED STOP 0). see 05-145r0.

Page: 215

Author: relliott
Subject: Highlight
Date: 4/22/2005 3:50:01 PM
TACCEPT - DONE

Table 64
SATA_ERROR

Add footnote similar to one in table 65:
Although included in this table, SATA_ERROR is not a primitive (see 3.1.141) since it starts with K28.6. It does not appear inside STP connections. It is an invalid dword, used by expander devices forwarding an error onto a SATA physical link (see 7.2.7.1).

Page: 217

Author: thoglund_lsi
Subject: Highlight
Date: 4/28/2005 1:34:20 PM
TREFER PROTOCOL WG (05-145)

change back to OPEN_REJECT (RESERVED STOP 0). see 05-145r0.

Author: thoglund_lsi
Subject: Highlight
Date: 4/19/2005 1:41:49 PM

Page: 219

Author: relliott
Subject: Highlight
Date: 4/22/2005 3:50:25 PM
TACCEPT - DONE

Table 67
Change "the list of primitive encodings" to "this table"

Page: 226

Author: relliott
Subject: Highlight
Date: 4/23/2005 4:39:37 PM
ACCEPT - DONE
Table 71 - BROADCAST

To match a Dell comment below,

Change "SCSI enclosure
services (SES) logical unit" to "logical unit with a peripheral device type set to 0Dh (i.e., enclosure services device) (see SPC-3 and SES-2)"

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 4:38:26 PM
ACCEPT - DONE (as "peripheral device types set to 0Dh (i.e., enclosure services devices)(see SPC-3 and SES-2)")

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.

Page: 228

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 12:18:19 PM
TACCEPT - DONE ("an NVRAM programmed" and added NVRAM to acronym list)

7.2.5.9 NOTIFY
Note 22 after 2nd Paragraph after Table 73
change
"...configured by a NVROM programming..."
to
"...configured by a NVRAM programming..."

Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 4:46:42 PM
TREJECT (Section 10.2.10 is SCSI specific. This paragraph is trying to be generic and also cover native STP targets, only mentioning SCSI-specific material inside the e.g.)

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.

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Author: thoglund_lsi
Subject: Highlight
Date: 4/28/2005 1:34:13 PM
TREFER PROTOCOL WG (05-145)

change back to OPEN_REJECT (RESERVED STOP 0). see 05-145r0.

Author: thoglund_lsi
Subject: Highlight
Date: 4/19/2005 1:41:49 PM
T

Author: thoglund_lsi
Subject: Highlight
Date: 4/28/2005 11:32:26 AM
TREFER PROTOCOL WG(04-145)

remove clause b)
see 05-145r0

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Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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.

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
Should this be an item 4) instead of combined together with item 3)?

Page: 232

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 2:56:08 PM
PDF page 272
Table 76 – Done primitives
Done(credit-timeout) description is unclear. It should be reworded.
It currently says “The SSP state machine (see 7.16.7) timed out waiting for an RRDY or received a CREDIT BLOCKED and the transmitter is going to transmit BREAK if credit is extended for 1 ms without receiving a frame or a DONE.”
Perhaps the last part of the sentence should read “…transmit BREAK in 1 ms unless credit is extended, a frame is received, or DONE is received within 1 ms of transmitting the DONE(CREDIT_TIMEOUT).”
I also don’t understand how “credit is extended” because a later paragraph (under table 78) prohibits sending RRDY after a CREDIT_BLOCKED has been sent. Perhaps this phrase should be stricken.

Page: 233

Author: relliott
Subject: Highlight
Date: 4/22/2005 3:51:37 PM

ACCEPT - DONE
Change "SATA_ERROR is an invalid dword, not a primitive."
to:
"Although included in this subclause, SATA_ERROR is not a primitive (see 3.1.141) since it starts with K28.6. It does not appear inside STP connections. It is an invalid dword."

and place it as the last paragraph in 7.2.7.1.

Page: 236

Author: gop_ibm
Date: 4/23/2005 4:48:41 PM
TACCEPT - DONE (as "complement of R(x). This means that R(x)")

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. >>.

Page: 238

Author: gop_ibm
Date: 4/28/2005 6:23:50 PM
REJECT

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. >>

Author: mevans_mxo
Subject: Cross-Out
Date: 4/23/2005 4:51:14 PM
ACCEPT - DONE

7.5.3, second paragraph: In the last sentence, change "Mathematically, the..." to "The...".

Author: relliott
Subject: Highlight
Date: 4/23/2005 4:51:00 PM
ACCEPT - DONE

7.5.3
"received checking" s/b "received sequence checking"

Page: 243

Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 4:56:50 PM

TACCEPT - DONE (added a figure like that in SSP and SMP showing SOAF, frame contents, CRC, EOAF, and used the same language to introduce the figure: "Address frames are preceded by SOAF and followed by EOAF as shows in figure 136." In this figure, the last dword is named dword 7 since address frames are a fixed size.)

7.8.1, first paragraph: Change the second sentence to: An address frame is delimited by a preceding SOAF and a following EOAF.

Page: 248

Author: gop_ibm
Date: 4/23/2005 4:57:54 PM
TREJECT (the should and should not rules are not mirror images of each other, so calling it an i.e. is incorrect)

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). >>

Page: 249

Author: ghoulder_seg
Subject: Note
Date: 4/19/2005 2:59:23 PM

Seagate #22
PDF page 289
7.9.1 Identification and hard reset sequence overview
last sentence on page states “If a device detects the same SAS address incoming on different phys, it shall consider those phys part of the same wide port.” Add a sentence “If the device is capable of supporting a wide port on its phys, it may configure the phys as a wide port.”

Page: 250

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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."

Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 4:59:16 PM

ACCEPT - DONE (accepted adding "to process" but did not accept changing "it" to the wordier "expander device". There is no other noun "it" could be confused with.)

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 4:59:54 PM

ACCEPT - DONE (accepted adding "to process" but did not accept changing "it" to the wordier "expander device". There is no other noun "it" could be confused with.)

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.

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Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 5:02:06 PM
ACCEPT - DONE

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 5:03:33 PM
ACCEPT - DONE

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.

Page: 255

Author: rlsheffi_intc
Subject: Highlight
Date: 4/23/2005 5:05:27 PM
TACCEPT - DONE

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."

Status
rlsheffi Accepted 4/14/2005 11:05:28 PM

Page: 256

Author: relliott
Subject: Highlight
Date: 4/23/2005 5:04:38 PM
ACCEPT - DONE

7.9.5.5.2.1 SL_IR_IRC1

"SL_CC state machines" s/b "SL state machines"

Author: bnixon_elx
Subject: Note
Date: 4/23/2005 5:06:07 PM
7.9.5.5.3 SL_IR_IRC2:Wait state 7.9.5.5.3.1 State description

Emulex concurs with the following issue identified by Intel:

There is a problem that there is currently no definition for how a phy associated with an STP/SATA bridge becomes enabled.

Author: rlsheffi_intc
Subject: Inserted Text
Date: 4/19/2005 1:37:51 PM
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."

Status
rlsheffi Accepted 4/14/2005 11:05:36 PM

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Page: 257

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 5:07:16 PM
ACCEPT - DONE

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..."

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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 SP0: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..

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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);"

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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);

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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);

Author: rlsheffi_intc
Subject: Inserted Text

Comments from page 257 continued on next page

Date: 4/19/2005 1:37:51 PM

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)."

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Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 5:08:35 PM
REJECT (we don't necessarily know what is inside an STP connection, and in SSP there is credit exchange that begins before frame transmission. Better to leave the generic term.)

7.12.1, first paragraph: Change "communication" to "SSP frame, SMP frame, or SATA FIS transmission".

Author: mevans_mxo
Subject: Cross-Out
Date: 4/23/2005 5:10:03 PM
ACCEPT - DONE (agree; the source phy should applies an I_T nexus loss timer and not immediately assume the destination is lost)
REVIEW

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).

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Author: kmarks_dell
Subject: Cross-Out
Date: 4/19/2005 1:42:54 PM
7.12.3 Arbitration fairness
Remove "NOTE 1" from NOTE 31.

Author: gop_ibm
Date: 4/20/2005 12:21:24 PM
ACCEPT - DONE

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 >>

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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.

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Author: mevans_mxo
Subject: Highlight
Date: 4/23/2005 5:12:37 PM
TREJECT (the table is not just a list of fields, it shows the MSB/LSB order of how they are related for the comparison. Will change "compares" to "comparisions compare" though.)

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.

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Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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). >>

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Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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). >>

Author: gop_ibm
Date: 4/25/2005 5:05:51 PM
REJECT (it has nothing to do with receiving a BREAK. It's from the source phy perspective, not the destination phy perspective.

The order is: 1) transmit OPEN, 2) transmit BREAK before receiving a connection response.

This table lists the possible things that the source phy can expect after 2). It only lists the things that matter; a connection request could arrive because it crossed on the wire with the BREAK, but it's ignored at this point because this phy has already sent a BREAK.

Will add (see 7.12.2.2) after "connection response" to highlight that it's a special term.)

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 connection response has been received.>>

I believe it should be
<< Table 96 lists the responses to a BREAK being received before a connection response has been received.>>

Author: gop_ibm
Date: 4/25/2005 5:02:51 PM
REFER PROTOCOL WG (that BREAK stuff might not survive...)

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.

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Author: gop_ibm
Date: 4/25/2005 5:03:49 PM
TREJECT (this is from the source phy's perspective, not the destination phy's perspective)

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.>>

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Author: gop_ibm
Date: 4/25/2005 5:04:21 PM
TREFER PROTOCOL WG (it might be true again...)

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. >>

Author: gop_ibm
Date: 4/25/2005 5:04:40 PM
TREJECT (this is from the source phy perspective, not the destination phy)

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. >>

Author: relliott
Subject: Highlight
Date: 4/25/2005 4:36:35 PM
TACCEPT - DONE
REVIEW

7.12.8 Breaking a connection

"a connection is considered broken due to loss of dword synchronization (see 6.9)."

This is only intended to be true for loss of dword sync resulting in a phy reset sequence. If an expander phy detects several invalid dwords but then reacquires sync, it neither forwards BREAK to tear down the connection through the ECR, nor transmits BREAK itself. The phy just gets a bunch of receive errors (the other direction might be fine). If it fails to reacquire and redoes the phy reset sequence, then BREAK is forwarded through the ECR (and the local physical link is in OOB, so BREAK is not needed).

Change to: "a connection is considered broken due to loss of dword synchronization (see 6.9) that results in a new link reset sequence (i.e., the SP state machine transitioned from SP15:SAS_PHY_Ready or SP22:SATA_PHY_Ready to SP0: OOB_COMINIT (see 6.8))"

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Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 5:08:00 PM
TREJECT (we aren't trying to dictate whether an "ALIGN dword" or a "dword ALIGN" pattern is used. Thus, the vague "starting with". "after" would imply the second option is mandatory)

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..."

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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.

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Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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..

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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.

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Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
Need to pass up STP Resources Busy to match up with Table 107 in Port Layer.

Author: gop_ibm
Date: 4/25/2005 5:15:30 PM
ACCEPT - DONE (split into an a)b) list and changed "to" to "in":
"The arbitration fairness comparison shall compare:
a) the value of the arbitration wait time argument in the Open Connection request for the outgoing OPEN address frame; and
b) the value of the arbitration wait time field received in the incoming OPEN address frame.")

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 >>

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Author: relliott
Subject: Highlight
Date: 4/20/2005 7:45:56 PM
TACCEPT - DONE

"a Inbound" s/b "an Inbound"

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Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

7.14.4.6.1 State description

In the statement <<send a Transmit CLOSE (Normal) message or Transmit CLOSE (Clear Affiliation) message to the SL transmitter; >> there is no indication as to when which message is to be sent. This needs to be fixed.

Author: thoglund_lsi
Subject: Highlight
Date: 4/28/2005 11:32:33 AM

REFER PROTOCOL WG (04-145)

functional issue -- this behavior does not completely solve BREAK timing problems. see 05-145r0 for further details.

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Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

T7.14.4.9.1 State description
In the statement <<send a Transmit CLOSE (Normal) message or Transmit CLOSE (Clear Affiliation) message to the SL transmitter; >> there is no indication as to when which message is to be sent. This needs to be fixed.

Author: gop_ibm
Date: 4/25/2005 5:17:51 PM

TACCEPT - DONE (as e.g. rather than i.e., since "ECM and ECR" are not 100% equivalent to "expander function", they're just the main parts)

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). >>

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Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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

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Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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 request path 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

---

Author: gop_ibm
Date: 4/25/2005 5:19:19 PM
TACCEPT - DONE

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. >>

Author: gop_ibm
Date: 4/25/2005 5:21:20 PM
TREFER PROTOCOL WG (it doesn't general a new Request Path request, it just modifies the current value of the timeout status line. This really wants to be a level-based not event-based interface)

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. >>

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Author: relliott
Subject: Note
Date: 4/25/2005 5:21:53 PM
REFER PROTOCOL WG
7.15.4.5 Transition XL1:Request_Path to XL5:Forward_Open
Comment by ExpertIO in 05-141r1:

Problem:
The specification indicates that if a forward open message is received after an arbitrating (NORMAL) message has been received, the forward open message is ignored. We believe there is a flaw in the statement or perhaps overall in the expander function handling. It is illustrated in the following case.

Expander Port 2 wins arbitration to open Expander Port 0. Expander Port 1 receives an Open Address Frame (OAF) to Open Expander Port 2 but has to hold off as it waits for the connection to try to open between 2 and 0. The expander function sends an arbitrating (NORMAL) message to expander Port 1 to acknowledge the receipt of the request path message. Expander Port 0 transmits an OAF at the same time an OAF
resolving to port 1 is received from the device connected to Expander Port 0. The OAF received by expander Port 0 wins over the outgoing OAF by arbitration rules. Expander Port 0 sends a backoff retry message to Expander Port 2 and also a request path message
to the expander function requesting a connection to port 1. The request path message from Expander Port 0 wins by arbitration rules, that is, it is more significant than the outstanding request message by Expander Port 1. As a result, Expander Port 0 issues a forward open message to Expander Port 1. However, since Expander Port 1 had already received an arbitrating (NORMAL) message while in the XL1:Request_Path state, the forward open message is ignored and a stall occurs.

Solution
Removing the restriction of transitioning to XL5:Forward_Open if an Arbitrating (Normal) message has been seen alleviates the problem. There are two cases to consider in determining that this is a valid solution. Following the example described above:

The first case is that the OAF that is forwarded to Expander Port 1 wins via arbitration rules over the OAF received by Expander Port 1. The second case being the OAF that is forwarded to Expander Port 1 loses via arbitration rules over the OAF received by Expander Port 1.
In the case that the forwarded OAF wins, with the restriction removed, the OAF will be received by the port connected and will discard the OAF it sent. This mechanism is already described in both the expander and link layer specification.

The second case can not occur because a forward open message will not be generated by Expander Port 0 destined for Expander Port 1 since Expander Port 0 did not win arbitration in the Expander Function.

Author: thoglund_lsi
Subject: Highlight
Date: 4/25/2005 5:21:46 PM
REFER PROTOCOL WG
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.

Author: ccarlson_qlgc
Subject: Note
Date: 4/25/2005 5:22:26 PM
REFER PROTOCOL WG

Qlogic Corp #001 PDF page 328 7.15.4.5 Transition XL1:Request_Path to XL5:Forward_Open

Comments from page 288 continued on next page

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.".

Author: ccarlson_qlgc
Subject: Note
Date: 4/25/2005 5:22:45 PM
REFER PROTOCOL WG

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".

Author: thoglund_lsi
Subject: Highlight
Date: 4/19/2005 1:41:49 PM
T...shall occur if:
a) a Forward_Open indication has not been received; and
b) a BREAK Received message is received

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Author: gop_ibm
Date: 4/25/2005 5:23:26 PM

TREJECT (the state description gives all the details about where it is sent)

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 ????. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

T7.15.7.2 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 want until the OPEN_REJECT is transmitted then that will have to be added into the figure and the XL transmitter section.

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Author: gop_ibm
Date: 4/25/2005 5:30:44 PM
TREJECT ("that are" would mean there are a subset of responses which are received as confirmations. Really, all of them are. Will add "which are" instead)

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: >>

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 5:31:33 PM
TREJECT ("This state" is only in a single phy by definition - the suggested "one phy" wording makes no sense.

Will reword as:
"This state shall send the following responses through the ECR to the source phy, which are received by the source phy as confirmations"

If IBM would allow parenthetical expressions, that'd be perfect for "(received by the source phy as confirmations)". As a standalone sentence it would be in the way of the list that follows. So, the comma-based phrase is the only option.)

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:

Author: gop_ibm
Date: 4/25/2005 5:38:34 PM
TACCEPT - DONE (as
"c) a Backoff Retry response, after releasing path resources, when:
A) an AIP Received message has not been received;
B) an OPEN Address Frame Received message is received or an OPEN Address Frame Received argument is included in the transition into this state containing a higher priority OPEN address frame according to the arbitration fairness comparison (see 7.12.3); and
C) the destination SAS address and connection rate of the received OPEN address frame are not equal to the source SAS address and connection rate of the transmitted OPEN address frame;
d) a Backoff Retry response, after releasing path resources, when:
A) an AIP Received message has been received;
B) an OPEN Address Frame Received message is received or an OPEN Address Frame Received argument is included in the transition into this state; and
C) the destination SAS address and connection rate of the received OPEN address frame are not equal to the source SAS address and connection rate of the transmitted OPEN address frame;
e) a Backoff Reverse Path response when:
A) an AIP Received message has not been received,
B) an OPEN Address Frame Received message is received or an OPEN Address Frame Received argument is included in the transition into this state containing a higher priority OPEN address frame according to the arbitration fairness comparison (see 7.12.3); and
C) the destination SAS address and connection rate of the received OPEN address frame are equal to the source SAS address and connection rate of the transmitted OPEN address frame;
and
f) a Backoff Reverse Path response when:
A) an AIP Received message has been received;
B) an OPEN Address Frame Received message is received or an OPEN Address Frame Received argument is included in the transition into this state; and
C) the destination SAS address and connection rate of the received OPEN address frame are equal to the source SAS address and connection rate of the transmitted OPEN address frame.
")
REVIEW

Comments from page 291 continued on next page

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.

Author: relliott
Subject: Note
Date: 4/25/2005 5:39:35 PM
REFER PROTOCOL WG

7.15.9.1
The last two a)b) lists on the page have the same preliminary sentences. Should they be joined into one huge list?

Author: gop_ibm
Date: 4/25/2005 5:30:54 PM
REJECT ("that are" would mean there are a subset of responses which are received as confirmations. Really, all of them are. Will add "which are" instead)

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: >>

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 5:32:14 PM
REJECT ("This state" is only in a single phy by definition - the suggested "one phy" wording makes no sense.

Will reword as:
"This state shall send the following responses through the ECR to the source phy, which are received by the source phy as confirmations"

If IBM would allow parenthetical expressions, that'd be perfect for "(received by the source phy as confirmations)". As a standalone sentence it would be in the way of the list that follows. So, the comma-based phrase is the only option.)

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:

Page: 292

Author: gop_ibm
Date: 4/25/2005 5:40:24 PM
ACCEPT - DONE

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. >>

Author: gop_ibm
Date: 4/25/2005 5:40:40 PM
REJECT (state description has the details)

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 ????. >>

Author: gop_ibm
Date: 4/25/2005 5:40:49 PM
REJECT (state description has the details)

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 it the ???: and
b) after releasing path resources. >>

Author: gop_ibm
Date: 4/25/2005 5:40:54 PM
REJECT (state description has the details)

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 ???. >>

Author: gop_ibm
Date: 4/25/2005 5:41:00 PM
REJECT (state description has the details)

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 ????. >>

Author: gop_ibm
Date: 4/25/2005 5:41:05 PM
REJECT (state description has the details)

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 ????. >>

Author: relliott
Subject: Highlight
Date: 4/22/2005 3:53:58 PM
ACCEPT - DONE
7.15.10.1 XL7

Comments from page 292 continued on next page

Change
"SATA_ERROR primitive" to just "SATA_ERROR" since it is not really a primitive

---

Author: gop_ibm
Date: 4/25/2005 5:41:16 PM
TREJECT (state description has the details)

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 ????. >>

Author: relliott
Subject: Highlight
Date: 4/22/2005 3:54:12 PM
TACCEPT - DONE
7.15.11.1 XL8

Change
"SATA_ERROR primitive" to just "SATA_ERROR" since it is not really a primitive

---

Author: gop_ibm
Date: 4/25/2005 5:41:23 PM
TREJECT (state description has the details)

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 ???.>>

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Author: gop_ibm
Date: 4/25/2005 5:41:28 PM
REJECT (state description has the details)

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 ????. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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: >>

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 5:41:55 PM
ACCEPT - DONE

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:".

Author: thoglund_lsi
Subject: Highlight
Date: 4/25/2005 5:42:04 PM
REFER PROTOCOL WG

functional issue -- this behavior does not completely solve BREAK timing problems. see 05-145r0 for further details.

Page: 295

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 5:44:54 PM
TACCEPT - DONE (split into a)b) list:
"Receiving SSP phys shall acknowledge SSP frames within 1 ms, if not discarded as described in 7.16.7.7, with either:
a) ACK (i.e., positive acknowledgement) if the SSP frame was received into a frame buffer without errors; or
b) NAK (CRC ERROR) (i.e., negative acknowledgement) if the SSP frame was received with a CRC error, an invalid dword, or an ERROR primitive. ")
REVIEW

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/28/2005 4:43:47 PM
TACCEPT - DONE (moving "Either" to the beginning of the sentence too)

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.

Page: 296

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 5:48:09 PM

TREJECT (interlocking does mix the layers. ACK/NAK vs. credit timing is link layer material, while frame types (e.g. COMMAND, DATA references) and tags are transport layer material. Since it will have out-of-place material no matter where it is located, the link layer seems as good a home as any.)
REVIEW

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.

Page: 298

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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

Page: 301

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Note
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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.

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Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Note
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
Figure 152 - SSP (link layer for SSP phys) state machines (part 2 - frame reception)

Comments from page 302 continued on next page

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.

Page: 303

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 5:52:12 PM
ACCEPT - DONE (also fixing "then this the ACK/NAK count" at the end and dropping the "then"s which don't go with the "when"s)

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.

Author: bmartin_sierra
Subject: Note
Date: 4/25/2005 5:51:40 PM
ACCEPT - DONE

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 .'

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
7.16.7.3, first lettered list: Change item (a) to: decrement the ACK/NAK count by one.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
7.16.7.3, second lettered list: Change item (a) to: decrement the ACK/NAK count by one.

Page: 304

Author: bmartin_sierra
Subject: Note
Date: 4/19/2005 6:57:52 PM

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.

Page: 305

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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 >>

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

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Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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). >>

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

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..."

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

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..."

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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). >>

Page: 313

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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>>

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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

---

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Page: 319

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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"

Page: 320

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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. >>

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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"

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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"

Author: kmarks_dell
Subject: Cross-Out
Date: 4/19/2005 1:42:54 PM

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.

Page: 322

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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. >>

Page: 327

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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.

Author: relliott_hpq
Subject: Note
Date: 4/20/2005 12:04:31 PM
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).

Page: 330

Author: gop_ibm
Date: 4/25/2005 9:45:59 AM

TACCEPT - DONE (just changed the parenthesis to ,)

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 ; >>

Page: 331

Author: gop_ibm
Date: 4/25/2005 9:44:16 AM
TACCEPT - DONE (just changed the parenthesis to ,)

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 ; >>

Page: 333

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 9:43:39 AM
TACCEPT - DONE (but without "after")

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.

Page: 334

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 9:41:12 AM
ACCEPT - DONE

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"

Author: kmarks_dell
Subject: Note
Date: 4/25/2005 9:40:29 AM
ACCEPT - DONE (with an initial value of "The arbitration wait time argument from a Retry Open message (see 8.2.2.3.1).")

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.

Author: bday_lsi
Subject: Comment on Text
Date: 4/25/2005 9:46:53 AM
TACCEPT - DONE

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.

Page: 338

Author: bday_lsi
Subject: Comment on Text
Date: 4/24/2005 12:38:08 PM
ACCEPT - DONE
should be "Inbound"

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 7:45:11 PM
ACCEPT - DONE

8.2.3.3.4, third paragraph: Change, "...Incoming Connection Rejected confirmation..." to, "...Inbound Connection Rejected confirmation...".

Author: bday_lsi
Subject: Comment on Text
Date: 4/20/2005 7:45:18 PM
ACCEPT - DONE

should be "an"

Page: 339

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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.

Author: gop_ibm
Date: 4/25/2005 9:47:23 AM
REJECT

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; >>

Author: gop_ibm
Date: 4/25/2005 9:49:00 AM
REJECT

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. >>

Page: 340

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 10:02:09 AM
ACCEPT - DONE

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..."

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 after sending a Transmission Status (Frame Transmitted) confirmation, before this state receives an ACK Received or NAK Received confirmation, >>

Author: mevans_mxo
Subject: Highlight
Date: 4/25/2005 10:01:35 AM
ACCEPT - DONE

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..."

Page: 341

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
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.

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
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".

Page: 345

Author: gop_ibm
Date: 4/20/2005 12:24:11 PM
ACCEPT - DONE (and added space between words)

9.2.1 SSP frame format
This << dataoffset >> should be in smallcaps.

Page: 346

Author: gop_ibm
Date: 4/24/2005 8:56:44 AM
REJECT (but I will downgrade it to a note)

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 target port has transmitted an XFER_RDY frame for each of two or more commands and has not yet received all the write data for them). >> should be deleted as it has no value in a standard.

Page: 347

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 8:58:37 AM
TACCEPT - DONE (but as "target port shall expect..." This is the COMMAND frame, so the contents of this aren't telling the initiator what to do, they are reporting what it is going to do and telling the target what to expect)

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..."

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 8:58:49 AM
TACCEPT - DONE (but as "target port shall expect..." This is the COMMAND frame, so the contents of this aren't telling the initiator what to do, they are reporting what it is going to do and telling the target what to expect)

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..."

Author: gop_ibm
Date: 4/24/2005 8:59:19 AM
TREJECT (that will cause this sentence to be incorrect in SAS-2 and it would easily be overlooked)

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 >>

Page: 348

Author: gop_ibm
Date: 4/24/2005 9:00:33 AM
ACCEPT - DONE

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 field is not present).>>

Page: 349

Author: kmarks_dell
Subject: Note
Date: 4/20/2005 3:23:41 PM
REJECT (in SAS-2, I_T NEXUS RESET will have a "no" entry)

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.

Author: gop_ibm
Date: 4/24/2005 9:01:23 AM
REFER PROTOCOL WG (agree some change is needed. This statement heads off inevitable questions, so it is helpful to include. Could change it to a SAM-2 reference, or say something like "defined in previous versions of SCSI")

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-3 does not define target reset. SAM-2 does. I think this should be deleted rather than adding a reference to SAM-2.

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 3:26:15 PM
ACCEPT - DONE

9.2.2.2, fourth paragraph: Change, "If TASK MANAGEMENT FUNCTION contains..." to, "If the TASK MANAGEMENT FUNCTION field contains..."

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 3:26:28 PM
ACCEPT - DONE

9.2.2.2, fifth paragraph: Change, "If TASK MANAGEMENT FUNCTION is set..." to, "If the task management function is set..."

Page: 350

Author: gop_ibm
Date: 4/24/2005 9:02:17 AM
REJECT (that's true of all transport layer frames, and is already discussed in 9.2.3)

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.

Author: relliott
Subject: Note
Date: 4/24/2005 9:11:25 AM
ACCEPT - DONE

New paragraph for "The requested offset field shall be zero for the first..." since it has a peer paragraph for enable first burst.

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 9:09:35 AM
ACCEPT - DONE (I assume the confusion is that the units here are bytes but the units in the mode page are 512-bytes. I will change "to the value indicated by" to "to the application client buffer offset of the segment of write data following the first burst data defined by")
REVIEW

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)."

Author: relliott
Subject: Highlight
Date: 4/24/2005 9:32:30 AM
ACCEPT - DONE
REVIEW

To match a Maxtor comment on the DATAframe on the next page 391, Change "If any additional XFER_RDY frames are required, the REQUESTED OFFSET field shall be set to the value of the previous XFER_RDY frame's REQUESTED OFFSET field plus the value of the previous XFER_RDY frame's WRITE DATALENGTH field."

to:
"If any additional XFER_RDY frames are required for the command and transport-layer retries are not being used, the requested offset field shall be set to the sum of the requested offset and write data length of the previous XFER_RDY frame."

Author: relliott
Subject: Note
Date: 4/24/2005 9:10:14 AM
ACCEPT - DONE

new paragraph before "If any" so it doesn't seem related to enable first burst.

Comments from page 350 continued on next page

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 4:11:29 PM
ACCEPT - DONE

9.2.2.3, fifth paragraph: Change "a XFER_RDY" to "an XFER_RDY".

Author: relliott
Subject: Highlight
Date: 4/24/2005 9:24:41 AM
ACCEPT - DONE

9.2.2.4
Table 115
Change "n-1" to "n". No reason to have a - 1 here.

Page: 351

Author: relliott
Subject: Note
Date: 4/24/2005 9:22:32 AM
ACCEPT - DONE
REVIEW

Add "The size of the data field (i.e., the data length) is determined by the number of fill bytes field in the frame header (see 9.2.1) and the link layer detection of EOF.

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 4:11:36 PM
ACCEPT - DONE

9.2.2.4, sixth paragraph: Change "a XFER_RDY" to "an XFER_RDY".

Author: mevans_mxo
Subject: Highlight
Date: 4/24/2005 9:32:38 AM
ACCEPT - DONE (as "The data offset field shall be set to zero in the initial read DATA frame for a command. If any additional read DATA frames are required for the command and transport-layer retries are not being used, the data offset field shall be set to the sum of the data offset and data length of the previous read DATA frame.")
REVIEW

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/24/2005 9:33:04 AM
ACCEPT - DONE (as "The data offset field shall be set to zero in the initial write DATA frame for a command. If any additional write DATA frames are required for the command and transport-layer retries are not being used, the data offset field shall be set to the sum of the data offset and data length of the previous write DATA frame.")
REVIEW

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.

Author: gop_ibm
Date: 4/23/2005 4:23:36 PM
ACCEPT - LAST

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.

Page: 353

Author: gop_ibm
Date: 4/20/2005 4:12:22 PM
ACCEPT - DONE

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 9:35:48 AM
ACCEPT - DONE (will just delete the entire ", which..." clause, which is basically restated in the next sentence.)
REVIEW

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.
"

Page: 354

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
9.2.2.5.4 RESPONSE information unit SENSE_DATA format
This << need not >> should be changed to << is not required to >>

Page: 356

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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.

Page: 357

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 4:13:39 PM
ACCEPT - DONE

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..."

Author: mevans_mxo
Subject: Highlight
Date: 4/24/2005 9:48:39 AM
ACCEPT - DONE (but the suggested step 3 makes it seem like the transport layer is managing the tag to be managed; really the application client passes that down in the Nexus argument to the protocol service. Changed to:
1) the SSP_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT) (see 7.16.7.6.5);
2) to determine whether the command was received, the application client calls Send Task Management Function Request () (see 10.2.2) with:
A) Nexus set to the same I_T_L_Q nexus of the COMMAND frame task management function; and
B) Function Identifier set to QUERY TASK;
and
3) the SSP initiator port transmits the TASK frame in a new connection to the SSP target port.)
REVIEW

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.

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
9.2.4.2 COMMAND frame link layer errors

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

---

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
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.

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
9.2.4.2 COMMAND frame link layer errors

Comments from page 357 continued on next page

May be missing a DATA paragraph (per 9.2.6.3.3.2.6)

Author: relliott_hpq
Subject: Highlight
Date: 4/19/2005 1:40:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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."

Page: 358

Author: mevans_mxo
Subject: Highlight
Date: 4/24/2005 9:52:31 AM

TREJECT (loses the RETRANSMIT bit=1 requirement)

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.3, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.4.2, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.4.2, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.4.2, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.4.3, 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);

Comments from page 358 continued on next page

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.

Page: 359

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.4.3, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.5.2, 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).

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.5.2, 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).

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.5.2, 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).

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.5.2, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.5.2, 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).

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

Comments from page 359 continued on next page

T9.2.4.5.2, 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.

Page: 360

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.5.3, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM

T9.2.4.5.3, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 4:15:54 PM

TACCEPT - DONE

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).

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

T9.2.4.5.3 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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

T9.2.4.5.3 DATA frame without transport layer retries

Last sentence

Change

Comments from page 360 continued on next page

"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.

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 4:14:58 PM
ACCEPT - DONE

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).

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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).

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 at least one time with the RETRANSMIT bit set to one >>

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
9.2.5.6, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

Comments from page 360 continued on next page

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). >>

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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. >>

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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."

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
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.

Author: relliott_hpq
Subject: Highlight
Date: 4/24/2005 9:54:31 AM
ACCEPT - DONE

9.2.5.2 SSP initiator port error handling summary

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

Author: rlsheffi_intc
Date: 4/19/2005 1:37:51 PM
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.

Status
rlsheffi Accepted 4/12/2005 12:25:45 PM

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
9.2.5.2 SSP initiator port error handling summary
Add a then to all the if statements so they all read <<If ....then ... >>

Comments from page 360 continued on next page

Page: 361

Author: bday_lsi
Subject: Comment on Text
Date: 4/28/2005 3:39:08 PM
ACCEPT - DONE

should be "the"

Author: mevans_mxo
Subject: Highlight
Date: 4/24/2005 9:55:00 AM
ACCEPT - DONE

9.2.5.2, third paragraph: Change, "...he ST_IFR state machine..." to, "...the ST_IFR state machine...".

Author: gop_ibm
Date: 4/24/2005 9:55:08 AM
ACCEPT - DONE

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 >>

Author: relliott_hpq
Subject: Highlight
Date: 4/19/2005 1:40:54 PM
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 that the current value if CHANGING DATA POINTERS is set to 1.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 received for that command >>

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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 ===>

Comments from page 361 continued on next page

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.

Author: relliott_hpq
Subject: Highlight
Date: 4/24/2005 9:54:22 AM
ACCEPT - DONE

9.2.5.3 SSP target port error handling summary

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

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
9.2.5.3 SSP target port error handling summary
Add a then to all the if statements so they all read <<If ....then ... >>

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
9.2.5.3, second paragraph: Change "the ST_TTS state machine" to "then the SSP target port".

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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>>

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
9.2.5.3, third paragraph: Change "the ST_TTS state machine" to "then the SSP target port".

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
9.2.5.3, fourth paragraph: Change "the device server" to "then the SSP target port".

Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 9:58:18 AM
ACCEPT - DONE (changed to "(see 10.2.3)" - Device server error handling)

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.

Comments from page 361 continued on next page

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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, >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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 >>

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Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
T9.2.5.3, eighth paragraph: Change "the ST_TFR state machine" to "then the SSP target port".

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
T9.2.5.3, ninth paragraph: Change "the ST_TFR state machine" to "then the SSP target port".

Author: relliott_hpq
Subject: Highlight
Date: 4/19/2005 1:40:54 PM
T9.2.5.3 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
T9.2.5.3, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
T9.2.5.3, 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.

Author: mevans_mxo
Subject: Highlight
Date: 4/19/2005 1:42:36 PM
T9.2.5.3, 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.

Comments from page 362 continued on next page

Author: mevans_mxo
Subject: Note
Date: 4/19/2005 1:42:36 PM

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).

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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: >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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;

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Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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.

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Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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?

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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?

Author: gop_ibm
Date: 4/24/2005 10:39:38 AM

ACCEPT - DONE

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.

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Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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, he 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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
9.2.6.2.2 ST_IFR (initiator frame router) state machine
14th Paragraph, 1st Sentence
"items"
s/b
"fields"

Author: kmarks_dell
Subject: Cross-Out
Date: 4/19/2005 1:42:54 PM
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).

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
9.2.6.2.2 ST_IFR (initiator frame router) state machine
15th Paragraph, 1st Sentence
"items"
s/b
"fields"

Author: gop_ibm
Date: 4/24/2005 10:00:41 AM
ACCEPT - DONE

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. >>

Author: kmarks_dell

Comments from page 366 continued on next page

Subject: Highlight
Date: 4/19/2005 1:42:54 PM

9.2.6.2.2 ST_IFR (initiator frame router) state machine
17th Paragraph, 1st Sentence
"items"
s/b
"fields"

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Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM

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.**

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Author: relliott
Subject: Highlight
Date: 4/24/2005 10:19:56 AM
ACCEPT - DONE

an s/b the

Author: kmarks_dell
Subject: Note
Date: 4/19/2005 1:42:54 PM
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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
9.2.6.2.3.3.1 State description
The 2nd paragraph tells what to do it the number of retrys for a COMMAND has not been reached but there is nothing that states what to do if the number of retrys for a COMMAND has been reached. This needs to be fixed.

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Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
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.

Author: relliott
Subject: Cross-Out
Date: 4/24/2005 10:01:45 AM
ACCEPT - DONE

Change "b) the tag." to "b) tag" to match other IBM comments

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
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

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Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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)"

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

9.2.6.2.3.3.1 State description
Table 121
This << (ACK Received >> should be << (ACK Received) >>

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM

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 retires has been reached."

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM

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.

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Author: gop_ibm
Date: 4/24/2005 10:00:56 AM
ACCEPT - DONE

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. >>

Author: bday_lsi
Subject: Comment on Text
Date: 4/28/2005 3:40:36 PM
ACCEPT - DONE

should be "ST_IFR"

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
9.2.6.2.3.3.1 State description
This << ST_IPR state machine. >> should be << ST_IFR state machine. >>

Author: relliott_hpq
Subject: Highlight
Date: 4/19/2005 1:40:54 PM
9.2.6.2.3.2.1 ST_ITS2:Initiator_Send_Frame

Explain "requested offset is not expected"

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 clerification 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 transfered as a result of the previous XFER_RDY infomration unit.) >>

Author: bday_lsi
Subject: Comment on Text
Date: 4/28/2005 3:40:43 PM
ACCEPT - DONE

should be "ST_IFR"

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
9.2.6.2.3.3.1 State description
This << ST_IPR state machine. >> should be << ST_IFR state machine. >>

Author: gop_ibm
Date: 4/24/2005 10:05:02 AM
REJECT (it is true for both a) and b). It doesn't really matter for c) and d). Since it applies to the whole list, not just any particular item, will move it after d))

Comments from page 371 continued on next page

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)

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Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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

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Author: kmarks_dell
Subject: Highlight
Date: 4/24/2005 10:05:35 AM
ACCEPT - DONE

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.

Author: mevans_mxo
Subject: Highlight
Date: 4/24/2005 10:06:11 AM
ACCEPT - DONE

9.2.6.2.3.5.2: Change the clause heading to be bold.

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM
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

---

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: relliott_hpq
Subject: Highlight
Date: 4/19/2005 1:40:54 PM
9.2.6.2.3.7.1 ST_ITS6:Receive_Data_In

Expand explanation of "not expected"

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
9.2.6.2.3.7.1 State description
The 1,2,3 list does not look like is requires order. Change to an a,b,c list.

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Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
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 retires.

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
Based on previous paragraph comment, this paragraph may not be accurate.

Author: bday_lsi
Subject: Comment on Text
Date: 4/24/2005 10:06:56 AM
ACCEPT - DONE

should be "Reception"

Page: 376

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM

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.

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Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
9.2.6.3.2 ST_TFR (target frame router) state machine
14th Paragraph, 1st Sentence
"items"
s/b
"fields"

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
9.2.6.3.2 ST_TFR (target frame router) state machine
15th Paragraph, 1st Sentence
"items"
s/b
"fields"

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
9.2.6.3.2 ST_TFR (target frame router) state machine
16th Paragraph, 1st Sentence
"items"
s/b
"fields"

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
9.2.6.3.2 ST_TFR (target frame router) state machine
20th Paragraph, 1st Sentence
"items"
s/b
"fields"

Page: 380

Author: gop_ibm
Date: 4/23/2005 4:22:44 PM
ACCEPT - LAST
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 will not be a problem.

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Author: relliott
Subject: Highlight
Date: 4/24/2005 10:20:12 AM
TACCEPT - DONE

an s/b the

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Author: gop_ibm
Date: 4/24/2005 10:07:37 AM
TACCEPT - DONE

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 or RESPONSE 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.

Author: bday_lsi
Subject: Comment on Text
Date: 4/19/2005 1:41:37 PM
T 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.

Author: gop_ibm
Date: 4/24/2005 10:08:07 AM
TACCEPT - DONE

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. >>

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Author: gop_ibm
Date: 4/24/2005 10:15:06 AM
REJECT (added The to the sole missing case instead. As paragraphs rather than a)b) lists per other IBM comment on this page 424, they read better that way)

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.

Author: gop_ibm
Date: 4/24/2005 10:14:52 AM
REJECT (got rid of list entirely; see other IBM comment on this page 424)

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 data bytes 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.

Author: gop_ibm
Date: 4/24/2005 10:13:03 AM
ACCEPT - DONE (change from a)b) lists to paragraphs for all entries in this table)

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. >>

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Author: gop_ibm
Date: 4/24/2005 10:16:22 AM
ACCEPT - DONE

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. >>

Author: gop_ibm
Date: 4/24/2005 10:16:29 AM
ACCEPT - DONE
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. >>

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Author: gop_ibm
Date: 4/20/2005 4:19:18 PM
ACCEPT - DONE

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; >>

Author: kdbutt_ibm
Subject: Note
Date: 4/20/2005 7:48:24 PM
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_TFR state 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;

Page: 387

Author: gop_ibm
Date: 4/20/2005 4:19:28 PM
ACCEPT - DONE

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; >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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.

Author: relliott_hpq
Subject: Highlight
Date: 4/19/2005 1:40:54 PM
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.

Author: kdbutt_ibm
Subject: Note
Date: 4/20/2005 7:47:40 PM
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.

Comments from page 387 continued on next page

Page: 388

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
T9.2.6.3.3.7.1 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. >>

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
T9.2.6.3.3.7.2 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. >>

Author: gop_ibm
Date: 4/24/2005 10:18:22 AM
TACCEPT - DONE

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>>

Page: 389

Author: rlsheffi_intc
Subject: Inserted Text
Date: 4/19/2005 1:37:51 PM

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."

Status

rlsheffi Accepted 4/14/2005 11:05:54 PM

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

T9.4.1 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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

T9.4.1 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.

Page: 391

Author: kmarks_dell
Subject: Cross-Out
Date: 4/19/2005 1:42:54 PM
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 golbal change to SMP_REQUEST to SMP REQUEST.

Author: kmarks_dell
Subject: Cross-Out
Date: 4/19/2005 1:42:54 PM
9.4.2 SMP_REQUEST frame

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

Author: kmarks_dell
Subject: Cross-Out
Date: 4/19/2005 1:42:54 PM
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 golbal change to SMP_RESPONSE to SMP RESPONSE.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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).

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
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 1 032 bytes (i.e., 1 024 bytes of data + 4 bytes of header + 4 bytes of CRC).

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
9.4.5.2.2.1 State description

Add text

"This state is the initial state of the MT_IP state machine."

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
9.4.5.2.2.2 Transition MT_IP1:Idle to MT_IP2:Send
1st Paragaph
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.

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

T9.4.5.2.3.1 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.

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Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
T9.4.5.3.2.1 State description

Add text

"This state is the initial state of the MT_TP state machine."

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM

T9.4.5.3.3.1 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.

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Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 1:50:58 PM

TREJECT (the key phrase here is "SCSI initiator port" - these protocol services are only on the target side, not the initiator side. Will rephrase to "Data transfer transport protocol services for SCSI initiator ports are not specified")

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.

Page: 399

Author: relliott
Subject: Note
Date: 4/20/2005 4:33:27 PM
Consider a non-indended List paragraph tag to use inside table cells. The indenting hurts readability especially as the cells get narrow.

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 7:04:35 PM
ACCEPT - DONE

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.

Author: gop_ibm
Date: 4/20/2005 4:28:50 PM
ACCEPT - DONE

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])) >>

Page: 400

Author: mevans_mxo
Subject: Note
Date: 4/25/2005 1:51:51 PM

REJECT (they are all consistent. request and response calls, which ask that an action be done, use "specifies," while indication and confirmation calls, which report that an action has happened, use "indicates." The only problem I see is that 3 entries in various tables still say "used to set" where they should say "specifies" - added separate letter ballot comments to correct them.)

Table 134 through 146: Change "specifies" and "indicates", as required, to be consistent with common practice.

Page: 403

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 4:30:47 PM
TACCEPT - DONE

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.

Page: 404

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 4:34:13 PM
ACCEPT - DONE

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.

Author: relliott
Subject: Highlight
Date: 4/20/2005 4:50:39 PM
ACCEPT - DONE

10.2.1.10
"Receive Data-Out" s/b "Terminate Data Transfer"

Author: relliott
Subject: Highlight
Date: 4/20/2005 4:51:43 PM
ACCEPT - DONE
10.2.1.10
"Table 139 shows" s/b "Table 141 shows"

Author: relliott
Subject: Highlight
Date: 4/20/2005 4:50:47 PM
ACCEPT - DONE

10.2.1.10
"Receive Data-Out" s/b "Terminate Data Transfer"

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 1:53:02 PM
REJECT (the comment is currently true, because TARGET RESET is not defined. Conceptually, though, it (or some other task management function that does affect other logical units) could be defined, and the protocol service descriptions in SAS-1.1 don't seem like an appropriate place to try to prohibit this. It would be too easy to forget to change this text if such a function was added.)

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.

Comments from page 404 continued on next page

Page: 405

Author: relliott
Subject: Highlight
Date: 4/20/2005 4:52:01 PM
ACCEPT - DONE
10.2.1.11
"Table 140 shows" s/b "Table 142 shows"

Author: relliott
Subject: Highlight
Date: 4/20/2005 4:50:54 PM
ACCEPT - DONE

10.2.1.11
"Data-Out Received" s/b "Data Transfer Terminated"

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 1:53:21 PM
REJECT (see response to Dell comment on previous page 443)

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.

Author: relliott
Subject: Highlight
Date: 4/20/2005 4:26:37 PM
ACCEPT - DONE
10.2.1.12
Change "used to set" to "specifies"

Author: relliott
Subject: Highlight
Date: 4/20/2005 5:06:15 PM
ACCEPT - DONE

10.2.1.12
"used to set" s/b "specifies"

Author: relliott
Subject: Highlight
Date: 4/20/2005 4:26:20 PM
ACCEPT - DONE

Comments from page 405 continued on next page

10.2.1.12
"Used to set" s/b "Specifies"

Page: 408

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 1:53:43 PM
ACCEPT - DONE (changed "and delivers" to "with")

10.2.2 Application client error handling
1st sentence

"delivers"
s/b
"returns"

Author: gop_ibm
Date: 4/20/2005 4:40:51 PM
ACCEPT - DONE (as "then the application client shall abort the command...")
REVIEW

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). >>

Page: 409

Author: gop_ibm
Date: 4/20/2005 4:46:56 PM

REJECT (10.2.4 covers SCSI Command Received () with a tag already in use by a task management function, not already in use by a command. So, it doesn't apply. SAM-3 covers commands conflicting with other commands (and has commands be aborted), but does not worry about commands colliding with task management functions, so does not say that task management functions also need to be aborted. Thus, this rule is unique to SAS and must remain in this section.)

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.

Author: kmarks_dell
Subject: Cross-Out
Date: 4/28/2005 7:05:27 PM

REJECT (this is indeed the intent. SAS describes aborting task management functions, which SAM doesn't contemplate. SAM-3 only discusses aborting commands.)

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..."

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 4:49:06 PM

ACCEPT - DONE ("If an SSP target port calls Data-Out Received () with a Delivery Result set to a value in table 147, the device server shall...")

10.2.3 Device server error handling
2nd Paragraph, 1st Sentence

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

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 5:09:35 PM

ACCEPT - DONE

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

Comments from page 409 continued on next page

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,"

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 5:13:13 PM
TREJECT (When the proposal changing this was added, the committee decided that if a command conflicts with a task management function, the task management function is the one that the RESPONSE frame is for, no matter which one arrived first. This simplifies the interaction with the SAM-3 rules (which handle command/command problems).)

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.

Page: 410

Author: gop_ibm
Date: 4/23/2005 4:22:14 PM
ACCEPT - LAST
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 not be a problem.

Page: 411

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 5:32:49 PM
TACCEPT - DONE

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.

Author: bday_lsi
Subject: Comment on Text
Date: 4/28/2005 7:05:55 PM
TREFER PROTOCOL WG (PL_OC should be modeled as not being required to close connections when it has no more frames. It should only be recommended to close them at that time. The same for SSP sending DONE - it's advisable but not absolutely required)

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 that 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.

Page: 412

Author: gop_ibm
Date: 4/20/2005 5:33:26 PM
ACCEPT - DONE

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 >>

Page: 414

Author: gop_ibm
Date: 4/20/2005 5:35:05 PM
ACCEPT - DONE

10.2.7.2.2 Protocol-Specific Port mode page - short format
This << SPF field shall >> should be << SPF bit shall >>

Author: kmarks_dell
Subject: Note
Date: 4/25/2005 2:00:59 PM
ACCEPT - DONE (copied the sentence with that rule from 4.5 as a NOTE: "An SSP initiator port should retry connection requests for the time indicated by the i_t nexus loss field in the Protocol-Specific Port mode page for the SSP target port to which it is trying to establish a connection (see 4.5).")
REVIEW

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.

Page: 415

Author: relliott
Subject: Highlight
Date: 4/28/2005 7:13:19 PM
ACCEPT - DONE

Table 153
Change "First" to "(first)" at end of phrase and "Last" to "(last)"

Author: gop_ibm
Date: 4/20/2005 5:34:13 PM
ACCEPT - DONE

10.2.7.2.3 Protocol-Specific Port mode page - Phy Control And Discover subpage
This << SPF field shall >> should be << SPF bit shall >>

Author: gop_ibm
Date: 4/25/2005 2:01:41 PM
ACCEPT - DONE

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 in the SAS target device, not just the SAS target port, starting with the lowest numbered phy and ending with the highest numbered phy. >>

Page: 416

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 2:02:34 PM
ACCEPT - DONE
REVIEW

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)"

Page: 417

Author: gop_ibm
Date: 4/20/2005 5:34:26 PM
TACCEPT - DONE

10.2.7.3.2 Protocol-Specific Logical Unit mode page - short format
This << SPF field shall >> should be << SPF bit shall >>

Page: 418

Author: relliott
Subject: Highlight
Date: 4/20/2005 5:49:59 PM
ACCEPT - DONE

10.2.8.1
Table 157

"log parameters" s/b "log parameter list"

Author: relliott
Subject: Highlight
Date: 4/28/2005 7:12:01 PM
ACCEPT - DONE

Table 158
Change "First" to "(first)" at end of phrase and "nth" to "(last)"

Page: 419

Author: relliott
Subject: Note
Date: 4/20/2005 5:48:41 PM
ACCEPT - DONE

10.2.8.1
Table 158
Add a yellow row labeling byte 2 as the "Parameter control byte"

Author: relliott
Subject: Highlight
Date: 4/28/2005 7:11:50 PM
ACCEPT - DONE

Table 158
Change "First" to "(first)" at end of phrase and "Last" to "(last)"

Author: gop_ibm
Date: 4/25/2005 2:04:42 PM
ACCEPT - DONE (changed to "fields" rather than "bits." Bits are a subset of fields, so I think that term suffices.)

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.

Author: gop_ibm
Date: 4/20/2005 7:36:12 PM
ACCEPT - DONE (changed "Bit" to "Field" in the header row. Changed title to "Parameter control byte in the Protocol-Specific log parameter for SAS". Changed intro to "values of the fields in the parameter control byte for the Protocol-Specific log parameter for SAS.")

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.

Page: 421

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 5:32:36 PM
ACCEPT - DONE

10.2.9.1 Protocol-Specific diagnostic page
2rd 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.

Author: gop_ibm
Date: 4/23/2005 4:21:52 PM
ACCEPT - LAST
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.

Page: 423

Author: gop_ibm
Date: 4/25/2005 2:05:23 PM
ACCEPT - DONE

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 >>

Author: gop_ibm
Date: 4/20/2005 5:54:50 PM
REJECT (no change requested)

10.2.10.2.1 SA_PC state machine overview
This
<< This state machine stall 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. >>

Page: 428

Author: relliott
Subject: Cross-Out
Date: 4/20/2005 6:31:03 PM
ACCEPT - DONE

10.2.11 SCSI VPD

Delete "that is a SCSI target device"

Logical units are by definition only in SCSI target devices, so there is no need to mention that subset here.

Author: relliott
Subject: Note
Date: 4/25/2005 2:07:07 PM
REFER PROTOCOL WG (proposed table of the two device name possibilities - columns for NAA format and string format names)

10.2.11 SCSI VPD

"Each logical unit in a SAS target device that is a SCSI target device shall include the identification descriptors listed in table 165 in the Device Identification VPD page (83h) returned by the INQUIRY command (see SPC-3)."

Describe the target device name that is required by 4.2.4. The target device name format could be either binary NAA format (64-bit SAS address) or SCSI name string format ("naa." string), so present both of those possibilities in a table.

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 5:56:25 PM
ACCEPT - DONE

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)"

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 5:57:00 PM
ACCEPT - DONE

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)"

Comments from page 428 continued on next page

ACCEPT - DONE

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)"

Author: gop_ibm
Date: 4/20/2005 5:59:07 PM
 ACCEPT - DONE

10.2.11 SCSI vital product data (VPD)
table 165
This <<PIV (PROTOCOL IDENTIFIER VALID) >> should be << PIV (protocol identifier valid) >>

Author: relliott
Subject: Note
Date: 4/20/2005 6:27:36 PM
 ACCEPT - DONE

10.2.11 SCSI VPD
Table 165

Add double-line before footnote cell

Page: 429

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:08:01 PM
TREFER PROTOCOL WG (should this paragraph be deleted?)

10.2.11 SCSI VPD

"The SAS target device shall use different identifiers for each logical unit name, each target port identifier, and the target device name."

Section 4.2.4 device names says "The selected SAS address shall be used by no other name or identifier".

Section 4.2.6 port identifiers says "The selected SAS address shall be used for no other name or identifier".

So, this rule is already stated. Section 4.2 doesn't explicitly mention logical unit names as a possible conflicting use, though. And, 4.2 and this rule ignore the fact that a port identifier might be appear in more than one domain - is that considered "used for another identifier"? (see Dell comments)

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 7:01:54 PM
TREJECT (Target device names are still required per 4.2.4 but discussion of that was lost in this section. Additional letter comment has been added to cover the underlying issue.)

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..

Page: 433

Author: mevans_mxo
Subject: Highlight
Date: 4/20/2005 7:05:36 PM
ACCEPT - DONE

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...".

Author: gop_ibm
Date: 4/20/2005 7:06:01 PM
ACCEPT - DONE

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). >>

Page: 434

Author: gop_ibm
Date: 4/23/2005 3:06:15 PM
ACCEPT - DONE

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. >>

Author: gop_ibm
Date: 4/23/2005 3:06:24 PM
ACCEPT - DONE

10.4.3.2 SMP function response frame format
table 170
This << The SMP target port does not support the requested SMP function; the ADDITIONAL RESPONSE 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. >>

Page: 435

Author: kmarks_dell
Subject: Cross-Out
Date: 4/23/2005 3:07:05 PM
ACCEPT - DONE

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.

Author: gop_ibm
Date: 4/20/2005 7:07:08 PM
ACCEPT - DONE

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). >>

Page: 437

Author: relliott
Subject: Note
Date: 4/23/2005 3:11:52 PM
ACCEPT - DONE

10.4.3.3 REPORT GENERAL
Join the EXPANDER CHANGE COUNT paragraphs, since the second paragraph continues to use "this field"

Author: bmartin_sierra
Subject: Note
Date: 4/23/2005 3:12:35 PM
REJECT (the first sentence just says it counts certain things; that's just an overview of what it does, and does not have a "shall" in it. The later sentences have the shall/need not rules. The "need not" sentence doesn't conflict with the "shall", because the "shall" says "at least once")

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.

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
10.4.3.3 REPORT GENERAL function
This << need not >> should be changed to << is not required to >>

Page: 438

Author: thoglund_lsi
Subject: Highlight
Date: 4/25/2005 2:09:39 PM
REFER PROTOCOL WG (if a requirement of a SAS topology, doesn't seem like it belongs buried in the SMP function definitions)

informative note vs normative shall?
this is stated as an expander requirement but really is a capacity/topology consideration for cascading multiple expanders...

Author: relliott_hpq
Subject: Highlight
Date: 4/23/2005 3:13:03 PM
ACCEPT - DONE

10.4.3.3 REPORT GENERAL function

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

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 3:16:16 PM
ACCEPT - DONE

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."

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 3:16:03 PM
ACCEPT - DONE

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."

Author: relliott
Subject: Cross-Out
Date: 4/23/2005 3:15:40 PM
ACCEPT - DONE

10.4.3.3 REPORT GENERAL
ENCLOSURE LOGICAL IDENTIFIER field

Delete "expander" since this could also return the enclosure ID for a non-expander

Comments from page 438 continued on next page

Page: 439

Author: relliott_hpq
Subject: Highlight
Date: 4/25/2005 2:09:58 PM
TREFER PROTOCOL WG

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 2:10:52 PM
TREJECT (In FrameMaker, it is indeed smallcaps, but numbers do not have distinct glyphs. Only other option would be to change the name to something functional like "COMPONENT IDS PRESENT")

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.

Page: 440

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 2:11:12 PM
TREJECT (In FrameMaker, it is indeed smallcaps, but numbers do not have distinct glyphs. See Dell comment on previous page 478)

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.

Page: 442

Author: relliott
Subject: Note
Date: 4/25/2005 2:30:53 PM
ACCEPT - DONE
Table 176
byte 14
Add the missing "Reserved" label in bits 7-4

Page: 443

Author: relliott_hpq
Subject: Note
Date: 4/25/2005 2:11:59 PM
REFER PROTOCOL WG

10.4.3.5 DISCOVER function
Table 177 - ATTACHED DEVICE TYPE field

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

Discovery software would like a placeholder value in this field.

Author: gop_ibm
Date: 4/23/2005 4:21:25 PM
ACCEPT - LAST
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.

Page: 444

Author: kmarks_dell
Subject: Cross-Out
Date: 4/20/2005 7:13:28 PM
ACCEPT - DONE (changed to "during the SAS speed negotiation sequence, but the SAS speed negotiation sequence failed.")

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.)

Author: kmarks_dell
Subject: Cross-Out
Date: 4/28/2005 7:14:43 PM
ACCEPT - DONE
REVIEW

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.

Author: relliott_hpq
Subject: Note
Date: 4/25/2005 2:12:21 PM
REFER PROTOCOL WG

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)"

Software would like a placeholder value in this field.

Page: 445

Author: relliott_hpq
Subject: Note
Date: 4/25/2005 2:35:58 PM
ACCEPT - DONE (
with this after the SATA bits:
"If a SAS phy reset sequence occurs (i.e., one or more of the attached ssp initiator port bit, attached stp initiator port bit, attached smp initiator port bit, attached ssp target port bit, attached stp target port bit, and/or attached smp target port bit is set to zero), then the attached sata port selector bit, the attached sata device bit, and the attached sata host bit shall each be set to one."

and this after the SAS bits:
"If a SATA phy reset sequence occurs (i.e., the attached sata port selector bit is set to one, the attached sata device bit is set to one, or the attached sata host bit is set to one), then the attached ssp initiator port bit, attached stp initiator port bit, attached smp initiator port bit, attached ssp target port bit, attached stp target port bit, and attached smp target port bit shall each be set to zero.")
REVIEW

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).

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:15:01 PM
ACCEPT - DONE
"the SSP INITIATOR value" s/b "the value of the SSP INITIATOR PORT field"

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:22:23 PM
ACCEPT - DONE
"link reset sequence" s/b "identification sequence"

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:15:14 PM
ACCEPT - DONE
"the STP INITIATOR value" s/b "the value of the STP INITIATOR PORT field"

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:22:29 PM
ACCEPT - DONE
"link reset sequence" s/b "identification sequence"

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:15:23 PM
ACCEPT - DONE
"the SMP INITIATOR value" s/b "the value of the SMP INITIATOR PORT field"

Comments from page 445 continued on next page

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:22:43 PM
ACCEPT - DONE
"link reset sequence" s/b "identification sequence"

Author: relliott
Subject: Note
Date: 4/25/2005 2:36:06 PM
ACCEPT - DONE
REVIEW

Move the ATTACHED SATA HOST bit next to table 179 ATTACHED SATA PORT SELECTOR and ATTACHED SATA DEVICE. Since the ASPS and ASD bits are not adjacent, they're bound to be out of order wherever they are placed. Keeping the SATA bits together is clearer.

Author: gop_ibm
Date: 4/20/2005 7:13:45 PM
ACCEPT - DONE

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. >>

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:15:39 PM
ACCEPT - DONE
"the SSP TARGET value" s/b "the value of the SSP TARGET PORT field"

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:22:48 PM
ACCEPT - DONE
"link reset sequence" s/b "identification sequence"

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:15:50 PM
ACCEPT - DONE
"the STP TARGET value" s/b "the value of the STP TARGET PORT field"

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:22:54 PM
ACCEPT - DONE
"link reset sequence" s/b "identification sequence"

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:15:59 PM
ACCEPT - DONE
"the SMP TARGET value" s/b "the value of the SMP TARGET PORT field"

Comments from page 445 continued on next page

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:22:59 PM
ACCEPT - DONE
"link reset sequence" s/b "identification sequence"

Author: relliott
Subject: Cross-Out
Date: 4/25/2005 2:25:09 PM
ACCEPT - DONE

Delete "ATTACHED SMP TARGET PORT bit" which is the list twice

---

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:53:59 PM
ACCEPT - DONE
REVIEW

This paragraph is confusing. It should be symmetrical with the ATTACHED SAS ADDRESS paragraph. It should refer to the IDENTIFY address frame and its field name.

Change:
"The SAS ADDRESS field contains the SAS address (see 4.2.2) transmitted by this phy during an identification sequence. If the phy is an expander phy, the SAS ADDRESS field contains the SAS address of the expander device. If the phy is a SAS phy, the SAS ADDRESS field contains the SAS address of the SAS port."

to:
"The sas address field contains the value of the sas address field transmitted in the IDENTIFY address frame during the identification sequence. If the phy is an expander phy, the sas address field contains the SAS address of the expander device (see 4.2.4). If the phy is a SAS phy, the sas address field contains the SAS address of the SAS port (see 4.2.6)."

Page: 446

Author: relliott
Subject: Highlight
Date: 4/25/2005 2:54:08 PM
ACCEPT - DONE
REVIEW

This paragraph is confusing. Refer to IDENTIFY address frame and its field name, and add cross references to where SAS address usage by expander devices, SAS ports, and STP/SATA bridges are defined.

Change:
"The ATTACHED SAS ADDRESS field contains the SAS address (see 4.2.2) received by this phy during the identification sequence, which is either:
a) the SAS address of the attached SAS port if the attached port is a SAS port;
b) the SAS address of the attached expander device if the attached port is an expander port; or
c) the SAS address provided for the attached port if the attached port is a SATA device port."

to:
"The attached sas address field contains the value of the the sas address field received in the IDENTIFY address frame during the identification sequence. If the attached port is an expander port, the attached sas address field contains the SAS address of the attached expander device (see 4.2.4). If the attached port is a SAS port, the attached sas address field contains SAS address of the attached SAS port (see 4.2.6). If the attached port is a SATA device port, the attached sas address field contains the SAS address of the STP/ SATA bridge (see 4.6.2)."

Author: kmarks_dell
Subject: Highlight
Date: 4/19/2005 1:42:54 PM
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.

Author: rlsheffi_intc
Subject: Inserted Text
Date: 4/19/2005 1:37:51 PM
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 SP0:OOB_COMINIT state (set to zero);"

Status
rlsheffi Accepted 4/14/2005 11:04:44 PM

Author: relliott
Subject: Highlight
Date: 4/25/2005 4:16:32 PM
ACCEPT - DONE

Comments from page 446 continued on next page

This is confusing, and should refer to the field name in the IDENTIFY address frame.

Change
"The ATTACHED PHY IDENTIFIER field contains the phy identifier received by this phy during the identification sequence, which is either:"

to:
"The attached phy identifier field contains the value of the phy identifier field received in the IDENTIFY address frame during the identification sequence. If the attached phy is an expander phy, the attached phy identifier field contains the phy identifier (see 4.2.7) of the attached expander phy in the attached expander device. If the attached phy is a SAS phy, the attached phy identifier field contains the phy identifier of the attached SAS phy in the attached SAS device. If the attached phy is a SATA device phy, the attached phy identifier field contains the phy identifier of the expander phy in the expander device containing the STP/ SATA bridge. "

Author: gop_ibm
Date: 4/25/2005 4:15:14 PM
ACCEPT - DONE (whole paragraph rewritten; see new comment)
REVIEW

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; >>

Author: gop_ibm
Date: 4/25/2005 4:14:54 PM
ACCEPT - DONE (whole paragraph rewritten; see new comment)
REVIEW

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; >>

Author: gop_ibm
Date: 4/25/2005 4:14:47 PM
ACCEPT - DONE (whole paragraph rewritten; see new comment)
REVIEW

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 device port. >> If should be << c) the phy identifier provided for the attached phy if the attached phy is contained in a SATA device port. >>

Author: relliott
Subject: Rectangle
Date: 4/25/2005 4:18:15 PM
ACCEPT - DONE

Move "An STP initiator port should not make a connection request to the attached SAS address until the ATTACHED DEVICE TYPE field is not 000b." up after the ATTACHED SAS ADDRESS paragraph. Currently, the ATTACHED PHY IDENTIFIER paragraph is in between.

Page: 447

Author: gop_ibm
Date: 4/19/2005 1:38:20 PM
10.4.3.5 DISCOVER function
This << need not >> should be changed to << is not required to >>

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 7:14:43 PM
ACCEPT - DONE

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.

Page: 449

Author: kmarks_dell
Subject: Highlight
Date: 4/23/2005 2:51:30 PM
ACCEPT - DONE (corrected SP_DWS to SP and added Phy Layer Ready (SATA) too. The latter is not applicable to the SAS log page use of this definition, but I don't think it will cause any problem to mention it here and still have the log page refer to this definition.)
REVIEW

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.

Author: relliott_hpq
Subject: Highlight
Date: 4/28/2005 7:16:48 PM
ACCEPT - DONE (fixed as part of Dell comment resolution)

10.4.3.6 REPORT PHY ERROR LOG function

The Phy Layer Ready confirmation really comes from SP not SP_DWS

Author: gop_ibm
Date: 4/28/2005 6:27:01 PM
REFER PHY WG
REFER PROTOCOL WG (I don't think there should be a requirement that they be cleared on power on either in the log page or in SMP. It is always incumbent on software to read the starting values.)

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.

Page: 450

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 4:38:25 PM
REJECT (the intention is that only loss of dword sync resulting in a new phy reset sequence is counted. Otherwise, this counter increments many times during unplugs. Will expand the wording to make this clearer with SP state references, though - see new comment)
REVIEW

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."

Author: relliott
Subject: Note
Date: 4/28/2005 6:26:42 PM
ACCEPT - DONE
REVIEW

Rewrite "has lost dword synchronization and restarted the link reset sequence (see 6.8) of phy reset sequences."

First of all, "of phy reset sequences" is bogus.

Second, it should refer to specific SP state transitions to emphasize that just plain dword sync does not increment the count.

Third, "and" could be constructed as incrementing on loss of dword sync and also incrementing on link reset sequence; really, a "because" relationship is intended.

New wording:
"has restarted the link reset sequence because it lost dword synchronization (see 6.9) (i.e., the SP state machine transitioned from SP15:SAS_PHY_Ready or SP22:SATA_PHY_Ready to SP0:OOB_COMINIT (see 6.8))"

Author: relliott
Subject: Highlight
Date: 4/23/2005 2:45:59 PM
ACCEPT - DONE

Change "during the final speed negotiation window during a phy reset sequence"
to "during the final SAS speed negotiation window"

to emphasize that it is only counting SAS, not SATA, events, and to better describe exactly what is being counted

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Page: 452

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:03:43 AM
TACCEPT - DONE

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)."

Author: relliott
Subject: Highlight
Date: 4/25/2005 4:47:54 PM
TACCEPT - DONE
REVIEW
Change:
"lost dword synchronization and restarted the link reset sequence (see 6.8)"

to:
restarted the link reset sequence after losing dword synchronization (see 6.9) (i.e., the SP state machine transitioned from SP15: SAS_PHY_Ready or SP22:SATA_PHY_Ready to SP0:OOB_COMINIT (see 6.8))"

to match new comment on LOSS OF DWORD SYNCHRONIZATION field on page 450 and on Break in chapter 7.

Page: 453

Author: gop_ibm
Date: 4/23/2005 2:55:56 PM
TREJECT (phy identifier and expander route index are equal indices into the table. The suggested wording sounds like there is one entry for the specified phy and this field is supplying an index for it, which is not correct)

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. >>

Page: 454

Author: gop_ibm
Date: 4/23/2005 2:56:21 PM
TREJECT (phy identifier and expander route index are equal indices into the table. The suggested wording sounds like there is one entry for the indicated phy and this field is supplying an index for it, which is not correct)

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. >>

Page: 456

Author: gop_ibm
Date: 4/23/2005 2:56:31 PM
TREJECT (phy identifier and expander route index are equal indices into the table. The suggested wording sounds like there is one entry for the specified phy and this field is supplying an index for it, which is not correct)

10.4.3.9 CONFIGURE ROUTE INFORMATION function
This << The EXPANDER ROUTE INDEX field specifies the expander route index for the expander route entry 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. >>

Page: 457

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 7:15:08 PM
TACCEPT - DONE

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."

Page: 459

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 7:16:08 PM

TREFER PROTOCOL WG (it bypasses it if needed... might be some more precise way to say this)

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."

Page: 460

Author: gop_ibm
Date: 4/28/2005 6:28:12 PM
TREJECT (the paragraph is based on both PHY IDENTIFIER and the selected phy operation, the latter of which was just introduced)

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.

Page: 461

Author: gop_ibm
Date: 4/23/2005 2:58:00 PM
ACCEPT - DONE

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. >>

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 7:15:23 PM
ACCEPT - DONE

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."

Page: 463

Author: gop_ibm
Date: 4/23/2005 3:04:54 PM
REJECT (unfortunately, the SCSI diagnostic page table discusses CHECK CONDITION status, which this SMP table has to discuss an SMP function result instead. So they cannot be merged (PHY TEST FUNCTION PATTERN is merged because it doesn't have any SCSI specific content))

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 that description.

Author: relliott
Subject: Note
Date: 4/23/2005 3:02:58 PM
ACCEPT - DONE

Table 196 - PHY TEST FUNCTION for SMP
Add Name column like in the diagnostic page containing STOP and TRANSMIT_PATTERN

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 7:17:45 PM
ACCEPT - DONE

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"

Page: 465

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 7:18:58 PM
TREJECT (it's blue and underlined, and the underline shows up when printed black-and-white, and the underlines highlight "critical pattern sections")

A.1 Jitter tolerance pattern (JTPAT)

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

Page: 466

Author: kmarks_dell
Subject: Highlight
Date: 4/20/2005 7:19:24 PM
TREJECT (it's blue and underlined, and the underline shows up when printed black-and-white, and the underlines highlight "critical pattern sections")

A.1 Jitter tolerance pattern (JTPAT)

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

Page: 467

Author: relliott
Subject: Highlight
Date: 4/24/2005 10:37:53 AM
ACCEPT - DONE

Change "JTPAT" to "JTPAT for RD+ and RD- (see table A.3 in A.1)"

Author: gop_ibm
Date: 4/24/2005 10:32:32 AM
ACCEPT - DONE

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.

Author: relliott
Subject: Highlight
Date: 4/24/2005 10:35:57 AM
ACCEPT - DONE

Combine:
"b) JTPAT for RD+;
c) JTPAT for RD-;"

into:
"b) JTPAT for RD+ and RD-;"

Page: 472

Author: rlsheffi_intc
Subject: Highlight
Date: 4/25/2005 11:03:32 AM
TREFER PHY WG
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.

Status
rlsheffi Accepted 4/14/2005 11:04:03 PM

Page: 473

Author: blye_pmcs
Subject: Note
Date: 4/28/2005 3:38:23 PM
REFER PHY WG

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.

Page: 474

Author: blye_pmcs
Subject: Highlight
Date: 4/25/2005 10:13:57 AM
ACCEPT - DONE

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"

Author: relliott
Subject: Note
Date: 4/25/2005 10:15:34 AM
ACCEPT - DONE

Add "ESD electrostatic discharge" to acronym list in chapter 3

Author: blye_pmcs
Subject: Note
Date: 4/28/2005 3:38:26 PM
REFER PHY WG

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.

Author: blye_pmcs
Subject: Highlight
Date: 4/25/2005 10:14:04 AM
ACCEPT - DONE

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"

Page: 481

Author: gop_ibm
Date: 4/20/2005 7:20:32 PM
TACCEPT - DONE

B.9.3 Use of single-ended instrumentation in differential applications
This << d) SCCij.. common-mode stimulus, >> should be << d) SCCij: common-mode stimulus, >>

Author: gop_ibm
Date: 4/25/2005 11:19:53 AM
TACCEPT - DONE (deleted the sentence altogether, and added "
VA1, VA2, VA3, and VA4 are incident signals
VB1, VB2, VB3, and VB4 are reflected signals"
to figure B.13)
REVIEW

B.9.3 Use of single-ended instrumentation in differential applications
This << denoted by the ‘A’
subscript and reflected signals from the same port denoted by the ‘B’ subscript. >> should be << denoted by the A
subscript and reflected signals from the same port denoted by the B subscript. >>

Page: 482

Author: gop_ibm
Date: 4/25/2005 11:28:15 AM
REJECT (these sentences are independent but are closely related, so a semicolon is the preferred punctuation)

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 >>

Author: relliott
Subject: Note
Date: 4/25/2005 11:19:43 AM
ACCEPT - DONE

Figure B.13
Add equations for V2, V3, and V4

Page: 487

Author: relliott
Subject: Note
Date: 4/23/2005 2:16:01 PM
ACCEPT - DONE
REVIEW

C - Phy reset sequence examples
Figure C.1 G1/G1
Redraw with better RCD scaling

Author: relliott
Subject: Note
Date: 4/23/2005 2:16:48 PM
ACCEPT - DONE
REVIEW

C - Phy reset sequence examples
Add a figure showing G1, G2 vs. G1, G2 (the most common implementation in the market)

Page: 488

Author: relliott
Subject: Note
Date: 4/23/2005 2:16:17 PM
ACCEPT - DONE
REVIEW

C - Phy reset sequence examples
Figure C.2 G1, G2, G3/G1, G2
Redraw with better RCD scaling

Author: relliott
Subject: Note
Date: 4/23/2005 2:17:12 PM
ACCEPT - DONE
REVIEW

C - Phy reset sequence examples
Add a figure showing G2, G3 vs. G1, G2 (showing that they agree on G2)

Author: relliott
Subject: Note
Date: 4/23/2005 2:17:50 PM
ACCEPT - DONE
REVIEW

C - Phy reset sequence examples
Add a figure showing G1 only vs. G2 only,showing they do not agree on a rate and go back to the phy reset sequence

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Page: 493

Author: gop_ibm
Date: 4/20/2005 7:21:53 PM
TREJECT (10 and 4096 use the same units, so better they both use digits)

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 >>

Author: gop_ibm
Date: 4/20/2005 7:24:29 PM
TACCEPT - DONE (with ", representing a replacement unit" moved to the end of the sentence)

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 with another unique >>

Author: gop_ibm
Date: 4/20/2005 7:22:04 PM
TREJECT (10 and 4096 use the same units, so better they both use digits)

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 >>

Author: gop_ibm
Date: 4/20/2005 7:24:34 PM
TACCEPT - DONE (with ", representing a replacement unit" moved to the end of the sentence)

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 with another unique >>

Page: 502

Author: kmarks_dell
Subject: Highlight
Date: 4/25/2005 11:31:09 AM

ACCEPT - DONE (just deleted "using an active/standby mode called" altogether. It's unfortunately not as functional as SCSI reservations, so the analogy is best left unstated)

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.

Author: kmarks_dell
Subject: Highlight
Date: 4/28/2005 6:34:47 PM

REJECT (since SATA doesn't require the feature, some drives are still "handled differently". Will delete "device" and add "(see 6.10)"

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.

Author: relliott
Subject: Highlight
Date: 4/28/2005 6:36:54 PM

ACCEPT - DONE

"drive activity indication" s/b "device activity indication"

Author: relliott
Subject: Highlight
Date: 4/28/2005 6:40:15 PM

ACCEPT - DONE
REVIEW
Change "drive hot-plug improvements;" to "presence detect"

Don't want to imply that SATA device hot plugging is not supported by SAS. The SATA II definition of presence detect is not necessarily followed by a SAS system, so that seems like the part that belongs in this list.

Author: gop_ibm
Date: 4/20/2005 7:26:12 PM

ACCEPT - DONE

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 from page 502 continued on next page

Page: 503

Author: kmarks_dell
Subject: Highlight
Date: 4/22/2005 9:04:02 AM
ACCEPT - DONE

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..."

Author: rlsheffi_intc
Subject: Note
Date: 4/28/2005 1:35:54 PM
REFER PROTOCOL WG (this uses many terms like "will" which will draw complaints from IBM. Editors notes in [])

Annex G:
Add annex G.5 as follows:
G.5 Discovery of a SATA device

An expander phy with [an] STP/SATA bridge in the SATA Spinup Hold [no caps, or a full SP state name] state is indicated in the DISCOVER response NEGOTIATED PHYSICAL LINK RATE field ([needs e.g. or i.e.] a value of 3h indicates the phy is enabled and a SATA device has been detected, but it's [it's won't be accepted] 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 SP0: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.
[seems like this list will easily lose sync with the main text]

Anytime [not a word] 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. [cannot refer to them with caps that way. CAPITAL field or lowercase for what the field pertains to]

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 [no caps] 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. [too conversational]

If the expander doesn't [generally avoid conjunctions] support the SATA SPINUP HOLD state, then the NEGOTIATED PHYSICAL LINK rate field will [no will] sequence all the way [too informal] to 8h or 9h [this will break in SAS-2] - indicating speed negotiation has completed and the link is ready.

The "ATTACHED SATA DEVICE" [no quotes] bit in the DISCOVER response byte 15 [usually don't refer to byte numbers; field name suffices] 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

Comments from page 503 continued on next page

command [functions not command singular].

In some hot-plug cases, a SATA device may not send an initial Register - Device to Host FIS ([needs e.g.] due to timing where the device does not see the initial COMINIT). [I know there are some devices that misbehave in this manner. I don't think they are following the SATA spec in doing so.] 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 - [too conversational, and dash is unusual] at anytime [not a word] following the link initialization sequence, it is possible via DISCOVER and REPORT PHY SATA SMP commands to determine:

If there is a device attached
Whether the device is SATA or SAS
Whether the SP state machine is in the SPINUP HOLD state
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.

Status
rlsheffi Accepted 4/14/2005 11:05:40 PM

Page: 526

Author: thoglund_lsi
Subject: Highlight
Date: 4/28/2005 11:32:17 AM
TREFER PROTOCOL WG (04-145)

change back to OPEN_REJECT (RESERVED STOP 0). see 05-145r0.

Page: 535

Author: kmarks_dell
Subject: Note
Date: 4/19/2005 1:42:54 PM

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".

Author: relliott_hpq
Subject: Note
Date: 4/19/2005 1:40:54 PM

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.

Page: 574

Author: ghoulder_seg
Subject: Note
Date: 4/28/2005 7:20:05 PM
REFER PROTOCOL WG (icons)

Seagate #17
PDF page 614 – 616
Figures M.2, M.3, M.4, M.5, M.6, M.7
Editor's notes 11 through 17 indicates these icons might be changed. Let's freeze the icons and get rid of the notes.

Author: lohmeyer_lsi
Date: 4/28/2005 7:20:09 PM
REFER PROTOCOL WG (icons)

Editor's Note 12

Resolve this note.

Author: lohmeyer_lsi
Date: 4/28/2005 7:20:12 PM
REFER PROTOCOL WG (icons)

Editor's Note 13

Resolve this note.

Page: 575

Author: lohmeyer_lsi
Date: 4/28/2005 7:20:15 PM
TREFER PROTOCOL WG (icons)

Editor’s Note 14

Resolve this note.

Author: lohmeyer_lsi
Date: 4/28/2005 7:20:19 PM
TREFER PROTOCOL WG (icons)

Editor’s Note 15

Resolve this note.

Author: lohmeyer_lsi
Date: 4/28/2005 7:20:22 PM
TREFER PROTOCOL WG (icons)

Editor’s Note 16

Resolve this note.

Page: 576

Author: lohmeyer_lsi
Date: 4/28/2005 7:20:25 PM
TREFER PROTOCOL WG (icons)

Editor’s Note 17

Resolve this note.