

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

---


Page: i

---

Author: mevens\_mxo

Subject: Note

Date: 6/18/2005 2:45:42 PM

 REJECT (Extra nouns are fine if the meaning is clear, and that can be implied by subject/verb agreement and other hints.)


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".

---

Author: relliott

Subject: Note

Date: 5/5/2005 1:13:00 PM

 REJECT (reduces the amount of wrapping; defer wrapping problems to the ISO editor if they happen)


Consider adding Table to each line since ISO requires it

---

Author: relliott

Subject: Note

Date: 5/5/2005 1:13:06 PM

 REJECT (reduces the amount of wrapping; defer wrapping problems to the ISO editor if they happen)


Consider adding Figure to each line since ISO requires it

---

Author: relliott


Subject: Note

Date: 4/23/2005 4:17:53 PM

 ACCEPT - LAST

Watch the wrapping on these long figure titles


---

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.

---

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>)

---

Author: relliott  
Subject: Highlight  
Date: 9/21/2005 7:51:28 PM  
ACCEPT - DONE

change 2004 to 2005

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 5:40:20 PM  
ACCEPT - DONE

On page 1:

Serial Attached SCSI (SAS) s/b Serial Attached SCSI - 1.1 (SAS-1.1)

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/5/2005 1:15:12 PM  
REJECT (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  
ACCEPT - DONE

1 Scope

Figure 1 - SCSI document relationships

Change  
"Protocols"  
to  
"SCSI Transport Protocols"

---

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  
ACCEPT - DONE

1 Scope

Figure 2

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


---



Author: RElliott


Subject: Note

Date: 5/7/2005 2:48:36 PM

 ACCEPT - DONE (per 5/5 WG)


When MJSQ is referenced from this standard, the FC Port terminology used within MJSQ should be substituted with SAS phy terminology.

---

Author: RElliott  
Subject: Highlight  
Date: 7/14/2005 1:04:16 PM  
 ACCEPT - DONE


Change T13/1532-D to ANSI INCITS 397-2005

---

Author: RElliott  
Subject: Highlight  
Date: 7/14/2005 1:04:36 PM  
 ACCEPT - DONE


Change INCITS xxx to ISO/IEC 14776-971

---

Author: RElliott  
Subject: Highlight  
Date: 7/14/2005 1:04:26 PM  
 ACCEPT - DONE

Change T13/1532-D to ANSI INCITS 397-2005


---

Author: RElliott  
Subject: Highlight  
Date: 7/14/2005 1:04:43 PM  
 ACCEPT - DONE

Change INCITS xxx to ISO/IEC 14776-971

---


Author: kmarks\_dell  
Subject: Highlight  
Date: 5/5/2005 1:17:21 PM

 REJECT (All 05-107r1 added to SAM-4 was "or task router" in a few places where the entity returning OVERLAPPED COMMANDS ATTEMPTED is described. Other things were kept out of SAS-1.1 to keep the reference as SAM-3 (retry delay and I\_T NEXUS RESET task management function)

2.3 References under development


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

---

Author: RElliott  
Subject: Note  
Date: 7/14/2005 1:03:48 PM  
 ACCEPT - DONE


Change T10/1561-D to ANSI INCITS 402-2005

---

Author: RElliott  
Subject: Highlight  
Date: 7/14/2005 1:03:57 PM  
 ACCEPT - DONE


Change to T10/1416-D to ANSI INCITS 408-2005

---

Author: RElliott  
Subject: Highlight  
Date: 7/14/2005 1:04:05 PM  
 ACCEPT - DONE


Change T10/1417-D to ANSI INCITS 405-2005

---

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)"


---

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: relliott  
Subject: Note  
Date: 5/10/2005 12:11:23 PM  
 ACCEPT - DONE

new names per May SFF meeting:  
SFF-8086 Compact Multilane Series: Common Elements  
SFF-8087 Compact Multilane Series: Unshielded  
SFF-8088 Compact Multilane Series: Shielded


---

Author: RElliott  
Subject: Note  
Date: 5/29/2005 3:37:47 PM  
 REJECT (The EIA process is moving slowly if at all. Leave these as-is.)

In SAS-1, France complained in ISO ballot about the SFF references.

Are their EIA document names and numbers available for each of these?


---

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"

Comments from page 4 continued on next page

---

Author: gop\_ibm


Date: 4/22/2005 9:21:17 AM

**1** 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. >>

---


Author: relliott  
Subject: Note  
Date: 5/20/2005 5:14:58 PM  
 ACCEPT - DONE

To help alleviate some Seagate comments, add:

attached SAS address: The SAS address (see 3.1.165) of the attached phy (e.g., received by a physical phy in the incoming IDENTIFY address frame during the initialization sequence (see 4.1.2)), or the SAS address of the STP target port in an STP/SATA bridge (see 4.6.2).

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/22/2005 10:40:46 AM

 ACCEPT - DONE (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 should account for 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. The limited access model supported by affiliations is not required.

The May WG recommended using "ATA domain" only in the limited sense suggested by Maxtor, and add "STP domain" as the name for the set of STP initiators and STP targets. However, there seems to be no need for the latter term, so it is omitted. STP/SATA bridges simply bridge between a SAS domain and an ATA domain. STP initiators and STP targets, although similar to ATA hosts and ATA devices, are outside the scope of the ATA architecture, and are only defined by SAS.)

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.]


---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 5:42:40 PM  
 ACCEPT - DONE

Delete "3.1.15 bit clock: Clock used in a jitter measurement that generates a single rising and a single falling..."


which is unused after deleting the unused "repeater" and "retimer" terms

---

Author: relliott  
Subject: Note  
Date: 5/11/2005 5:47:45 PM  
 ACCEPT - DONE

Add "See MJSQ." to BER.

---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 6:22:48 PM  
 ACCEPT - DONE

Change "would be" to "is expressed as"


---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 9:39:36 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: relliott  
Subject: Note  
Date: 5/20/2005 9:55:57 AM  
 ACCEPT - DONE (as "Bulk cable plus a separable connector at each end plus any retention, backshell, or shielding features.  
". It really has two TxRx connection segments, one in each direction. And it's really x\*2 not 2, because wide cables are still called one cable assembly. So, dropped discussion of TxRx connection segments altogether.)  
REVIEW)


Add 3.1.xx definition: cable assembly = the TxRx connection segment, including a separable connector at each end, any retention, backshell, or shielding features, and the bulk cable.

---

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: relliott  
Subject: Note  
Date: 5/11/2005 5:49:09 PM  
 ACCEPT - DONE


Add "See MJSQ." to CDR

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/7/2005 2:49:18 PM  
 ACCEPT - DONE (change message to information only)


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: relliott  
Subject: Cross-Out  
Date: 5/11/2005 11:50:41 AM  
 ACCEPT - DONE

Delete media

---

Author: kmarks\_dell  
Subject: Cross-Out  
Date: 5/7/2005 2:49:37 PM  
 ACCEPT - DONE

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..

---

Author: risheffi\_intc

Subject: Highlight

Date: 5/20/2005 9:56:11 AM

 ACCEPT - DONE ("The probability that jitter is less than a given value. See MJSQ.")

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: relliott  
Subject: Cross-Out  
Date: 5/11/2005 5:53:39 PM  
 ACCEPT - DONE


Delete "3.1.52 duty cycle distortion (DCD):" which is not used after other terms are deleted.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/11/2005 5:52:23 PM  
 REJECT (would have changed "ideal to "nominal", but whole definition deleted since the term is not used after other terms are deleted)

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

---

Author: gop\_ibm  
Date: 5/11/2005 5:53:00 PM  
 REJECT (would have used "...average time of a one bit or a zero bit and the nominal time of a bit in a clock-like ..." but whole term deleted instead since it is not used after other terms are deleted)


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: RElliott  
Subject: Highlight  
Date: 5/11/2005 5:53:16 PM  
 REJECT (would have matched an IBM comment on part a, but whole term deleted instead)


average width of a one and the average width of a zero  
s/b  
average time of a one bit and the average time of a zero bit

---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 5:54:50 PM  
 ACCEPT - DONE


Delete "3.1.57 effective deterministic jitter:" which is not used.

---

Author: gop\_ibm  
Date: 5/7/2005 2:53:02 PM  
 ACCEPT - DONE (as "An enclosure is not a class in this standard.")


3.1.58 enclosure:  
Add << An enclosure is not a SAS or SCSI class. >>

---

Author: relliott  
Subject: Note  
Date: 5/11/2005 5:55:30 PM  
 ACCEPT - DONE


Add:  
enclosure in port: A set of expander phys with subtractive routing attributes using the same external connector (see 5.2.3.3). See 4.6.2.  
  
enclosure out port: A set of expander phys with table routing attributes using the same external connector (see 5.2.3.3). See 4.6.2.

---

Author: RElliott  
Subject: Highlight  
Date: 5/7/2005 2:53:27 PM  
 ACCEPT - DONE


message s/b information  
  
to match Maxtor comments on request, confirmation, etc.

---

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: 5/20/2005 9:59:44 AM  
 REJECT (loses symmetry with definitions of SMP initiator port, SSP target port, etc.)

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: mevens\_mxo  
Subject: Highlight  
Date: 5/20/2005 10:01:23 AM  
 REJECT (deleted "routed" instead)


3.1.67: Define "routed SAS address".

---

Author: mevens\_mxo  
Subject: Highlight  
Date: 4/23/2005 4:18:52 PM  
 ACCEPT - DONE


3.1.71: Change "vs." to "versus".

---

Author: relliott  
Subject: Note  
Date: 5/11/2005 6:00:36 PM  
 ACCEPT - DONE


Add "See MJSQ" to eye contour

---

Author: mevens\_mxo  
Subject: Highlight  
Date: 5/7/2005 2:55:19 PM  
 ACCEPT - DONE


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: mevens\_mxo  
Subject: Note  
Date: 5/20/2005 10:29:03 AM  
 ACCEPT - DONE (also added to "edge expander device" for symmetry)


3.1.73: Add "(See x.x)" where x.x is the number of the clause where this device is described in detail.

---

Author: mevens\_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: relliott  
Subject: Note  
Date: 5/11/2005 6:23:07 PM  
 ACCEPT - DONE


Add "See MJSQ." to Golden PLL

---

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


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

---

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: goulder\_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: 5/7/2005 2:55:38 PM  
 ACCEPT - DONE (change message to information only)


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.

---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 6:55:18 PM  
 ACCEPT - DONE


Delete "where a differential component or assembly is introduced into a link or system. May refer to electrical power in a specified frequency range." from insertion loss

---

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: RElliott  
Subject: Note  
Date: 5/11/2005 6:25:10 PM  
 ACCEPT - DONE


Add "See MJSQ" to ISI. Keep the entire definition, though.

---

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: 5/11/2005 6:24:41 PM  
 ACCEPT - DONE (changed to "Several mechanisms produce ISI (e.g., dispersion, reflections, and circuits that lead to baseline wander.")


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: RElliott  
Subject: Note  
Date: 5/11/2005 5:33:25 PM  
 ACCEPT - DONE

Add "See MJSQ." to jitter

---


Author: relliott  
Subject: Highlight  
Date: 5/11/2005 6:27:42 PM  
 ACCEPT - DONE  
jitter

Change "The reference time is the jitter-timing-reference specified in MJSQ that occurs under a specific set of conditions." to

"(e.g., as defined by the jitter timing reference)" added after "reference times"


and add "See MJSQ"

---

Author: gop\_ibm  
Date: 5/11/2005 5:25:55 PM  
 REJECT (deleted text instead per other IBM comment)


3.1.100 jitter, data dependent (DDJ):  
This << pattern. For example, DDJ may be caused by the time differences required for the signal to arrive at the receiver threshold when starting from different places in 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: 5/28/2005 4:15:57 PM  
 ACCEPT - DONE (reduced most of the jitter-related definitions to one sentence plus "See MJSQ.")


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: 5/11/2005 5:26:10 PM  
 REJECT (deleted text instead per other IBM comment)

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

---


Author: gop\_ibm  
Date: 5/11/2005 5:25:50 PM  
 REJECT (deleted text instead per other IBM comment)

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

---

Author: gop\_ibm

Date: 5/11/2005 5:26:33 PM

 ACCEPT - DONE (refer to MJSQ instead)


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: 5/11/2005 5:26:00 PM

 REJECT (deleted text instead per other IBM comment)

3.1.100 jitter, data dependent (DDJ):


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

---


Author: RElliott  
Subject: Highlight  
Date: 5/11/2005 5:28:40 PM  
 ACCEPT - DONE

Change "non-Gaussian PDF (see 3.1.143)" to "non-Gaussian distribution."


---

Author: RElliott  
Subject: Note  
Date: 5/11/2005 5:28:54 PM  
 ACCEPT - DONE  
Add "See MJSQ." to DJ

---

Author: RElliott  
Subject: Note  
Date: 5/11/2005 5:27:48 PM  
 ACCEPT - DONE  
Add "See MJSQ." to SJ


---

Author: relliott  
Subject: Note  
Date: 5/22/2005 2:20:38 PM  
 ACCEPT - DONE (deleted)

"jitter eye opening" is not used anywhere.

B.2 does use "horizontal eye opening"


---

Author: RElliott  
Subject: Highlight  
Date: 5/7/2005 2:56:22 PM  
 ACCEPT - DONE

add superscript


10-12

---

Author: relliott  
Subject: Note  
Date: 5/22/2005 2:21:15 PM  
 ACCEPT - DONE (deleted)


"jitter frequency" is not used anywhere

---

Author: relliott  
Subject: Note  
Date: 5/22/2005 2:29:35 PM  
 ACCEPT - DONE  
REVIEW

"jitter output" is only used in one place - footnote a of the transmitter device signal output characteristics at IT/CT table as "jitter output requirements". Change that to "jitter requirements" and remove this definition.


---

Author: gop\_ibm  
Date: 5/11/2005 5:30:22 PM  
 REJECT (deleted instead in favor of an MJSQ reference. Unfortunately this loses "Examples of mechanisms that can cause RJ include PLL jitter in transmitter devices, electronic switching noise, and analog amplifiers." which is not currently in MJSQ)

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: RElliott  
Subject: Note  
Date: 5/11/2005 5:30:33 PM  
 ACCEPT - DONE

Add "See MJSQ" to RJ

---

Author: gop\_ibm  
Date: 5/11/2005 5:31:41 PM  
 ACCEPT - DONE (Changed to "Jitter from all sources. See MJSQ.")

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: RElliott  
Subject: Note

Date: 5/11/2005 5:31:54 PM  
ACCEPT - DONE

Add "See MJSQ." to TJ

---

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 6:38:47 PM  
ACCEPT - DONE

Change "The jitter timing reference has specific requirements on its ability to track and respond to changes in the signal under test. The jitter timing reference may be different from other timing references available in the system." to "See MJSQ."

---

Author: gop\_ibm  
Date: 5/22/2005 11:47:04 AM  
ACCEPT - DONE (deleted the entire definition. SAS does not seem to have any jitter tolerance numbers at transmitter device compliance points; it has signal output characteristics)

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: 5/22/2005 11:47:24 AM  
REJECT (definition entirely deleted instead)

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: 5/22/2005 11:47:53 AM  
ACCEPT - DONE (Changed to:  
"jitter tolerance: The ability of the receiver device to recover transmitted bits in an incoming data stream in the presence of specified jitter in the signal applied to the receiver device compliance point. See MJSQ.")

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: 5/22/2005 11:47:37 AM  
REJECT (definition rewritten instead)

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: 5/22/2005 2:35:12 PM

 ACCEPT - DONE (got rid of all cable/connector related uses of the term "media" and defined as simply "The plural of medium." Added definition of medium as requested.)

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: 5/20/2005 6:42:03 PM

 ACCEPT - DONE (Phy WG reviewed terminology and got rid of "media" everywhere (in the chapter 5 context). Cable was changed to "cable assembly" or "bulk cable" depending on meaning. "cable assembly" added to chapter 3.)

#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: 5/1/2005 9:45:03 PM

 ACCEPT - DONE

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 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\_jsi

Subject: Highlight

Date: 5/20/2005 11:07:26 AM

 ACCEPT - DONE (changed to "The set of physical links participating in a connection request that have not yet conveyed a connection response.")


---

Comments from page 13 continued on next page




Partial pathway 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).

---

Author: relliott  
Subject: Note  
Date: 5/20/2005 5:06:24 PM  
 ACCEPT - DONE

Add "phy identifier: A identifier for a phy that is unique within the device containing it. See 4.2.7.

---

Author: mevans\_mxo  
Subject: Cross-Out  
Date: 5/21/2005 9:23:16 PM  
 ACCEPT - DONE (delete instead)

3.1.143: Change to: A mathematical representation of the likelihood of occurrence of various events. When applied to a jitter event population, it describes the histogram of measured jitter values.

---


Author: bbissonne\_intc  
Subject: Note  
Date: 5/20/2005 11:07:36 AM  
 ACCEPT - DONE (as "Physical position in a test load where signal characteristics for compliance points are measured See 5.3.2.

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  
risheffi Accepted 4/14/2005 11:05:33 PM

---

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 6:57:06 PM  
 ACCEPT - DONE

Change "The reflection coefficient of the transmission media (i.e., the ratio of the reflected voltage divided by the voltage applied to the transmission media)." to "The ratio of reflected voltage to incident voltage."

---

Author: bday\_lsi  
Subject: Comment on Text  
Date: 5/7/2005 2:57:15 PM  
ACCEPT - DONE (Deleted it)

The word "repeater" is not used elsewhere in the spec. Should it be deleted?

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/7/2005 3:00:32 PM  
ACCEPT - DONE (change message to information only)

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: 5/7/2005 2:58:49 PM  
ACCEPT - DONE (change message to information only)

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: 5/7/2005 2:57:33 PM  
ACCEPT - DONE (deleted it, and repeater, which was the only place it was used)

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

---

Author: gop\_ibm  
Date: 5/11/2005 6:41:59 PM  
REJECT (whole definition deleted instead)

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 entry is a very bad idea.

---

Author: mevans\_mxo  
Subject: Cross-Out  
Date: 5/11/2005 6:42:11 PM  
REJECT (whole definition deleted instead)

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

---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 6:54:08 PM  
ACCEPT - DONE

Delete "when a component or assembly is introduced into a link or system." from return loss.

---

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 6:52:04 PM  
ACCEPT - DONE

insertion loss s/b return loss

---

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 6:52:09 PM  
ACCEPT - DONE

insertion loss s/b return loss

---

Author: relliott  
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: 5/20/2005 11:10:08 AM

ACCEPT - DONE ( as "A worldwide unique value assigned to..." The distinction being made is that the value itself is worldwide unique, but the usage of it might not be.)

3.1.164 SAS Address

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

SAS Ports do not have names, only identifiers.

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 10:00:24 AM  
ACCEPT - DONE

As part of changing ATA domain everywhere...  
Change "A storage device" to "An ATA device"

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 10:00:48 AM  
ACCEPT - DONE

As part of changing ATA domain everywhere...  
Change: "A storage device object in an ATA domain" to "An ATA device object"

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 10:01:06 AM  
ACCEPT - DONE

As part of changing ATA domain everywhere...  
Change "A host device" to "An ATA host"

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 10:01:24 AM  
ACCEPT - DONE

As part of changing ATA domain everywhere...  
Change "A host device object in an ATA domain" to "An ATA host object"

---

Author: RElliott  
Subject: Highlight  
Date: 5/22/2005 4:31:48 PM  
ACCEPT - DONE (as "A phy in a SATA device or SATA port selector...")

Expand to include port selectors/multipliers  
  
also look for "level translator" in PHYii spec for GenM

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 10:03:37 AM  
ACCEPT - DONE

As part of rewording ATA domain...  
  
A device that attaches to two SATA hosts and one SATA device," to  
"A device that attaches to two SATA host ports (i.e., two ATA domains) and one SATA device port"

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/1/2005 9:47:51 PM  
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."

---

Author: relliott  
Subject: Note  
Date: 5/1/2005 9:55:26 PM  
 ACCEPT - DONE

In the definitions for STP, SMP, and SSP, add "See 7.xx and 9.xx." pointing to their link layer and transport layer subclauses.

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/1/2005 9:49:49 PM  
 ACCEPT - DONE (but without "for the purpose of communicating management information")

3.1.196 Serial Management Protocol (SMP)


Change

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

to


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

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 9:54:43 PM  
 ACCEPT - DONE

To match Dell comment on SMP, change "SCSI initiator ports to communicate with SCSI target ports" to "SSP initiator ports to communication with SSP target ports"

---

Author: gop\_ibm  
Date: 5/22/2005 11:53:01 AM  
 ACCEPT - DONE (Changed to "The ability of the receiver device to recover transmitted bits in an incoming data stream with maximum jitter and minimum amplitude. See MJSQ")

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. >>

---

Author: ghouder\_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.

---

Author: goulder\_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.


---

Author: RElliott  
Subject: Highlight  
Date: 5/7/2005 2:59:40 PM  
 ACCEPT - DONE

message s/b information


to match Maxtor comments on request, confirmation, etc.

---

Author: RElliott  
Subject: Highlight  
Date: 5/7/2005 2:59:46 PM  
 ACCEPT - DONE  
message s/b information

to match Maxtor comments on request, confirmation, etc.

---


Author: RElliott  
Subject: Highlight  
Date: 5/7/2005 2:59:52 PM  
 ACCEPT - DONE  
message s/b information

to match Maxtor comments on request, confirmation, etc.

---




Author: RElliott  
Subject: Highlight  
Date: 5/7/2005 3:00:01 PM

 ACCEPT - DONE  
message s/b information

to match Maxtor comments on request, confirmation, etc.

---


Author: relliott  
Subject: Cross-Out  
Date: 5/10/2005 6:24:06 PM

 ACCEPT - DONE

Delete "over which a bit error ratio (BER) of < 10-12 is achieved." since the definition section is not the place to define the BER of SAS.

---


Author: relliott  
Subject: Highlight  
Date: 5/11/2005 6:50:28 PM

 ACCEPT - DONE

media s/b "the conductive material"

---

Author: ghoulder\_seg  
Subject: Note  
Date: 5/22/2005 2:39:26 PM

 ACCEPT - DONE (added "with a vendor-specific interface" resulting in "A phy (see 3.1.136) that interfaces with a vendor-specific interface to another virtual phy inside the same device. See 4.1.2.")

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.

---


Author: RElliott  
Subject: Note  
Date: 5/7/2005 3:02:31 PM

 ACCEPT - LAST (looked correct in FrameMaker - check after final build)

The 3.1.26 reference isn't working

---

Author: RElliott  
Subject: Note  
Date: 5/7/2005 3:07:16 PM

 ACCEPT - DONE

Add:

Gen1i SATA generation 1 physical link rate, internal (see SATAII-PHY)


Gen2i

Gen1x


Gen2x

etc.


---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 6:43:50 PM  
 ACCEPT - DONE  
Delete "PDF probability density function (see 3.1.143)"

---

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.

---

Author: relliott  
Subject: Cross-Out  
Date: 5/10/2005 12:22:12 PM  
 ACCEPT - DONE

Per comment on page 479 (SMP REPORT MANUFACTURER INFORMATION), delete this keyword and change all "Ignored" fields to "Reserved":  
"3.3.1 ignored: A keyword used to describe an unused bit, byte, word, field or code value. The contents or value of an ignored bit, byte, word, field or code value shall not be examined by the receiving SCSI device and may be set to any value by the transmitting SCSI device."

---


Author: gop\_ibm  
Date: 5/7/2005 3:09:19 PM  
 ACCEPT - DONE (based on 5/5 vote 9-1)

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

---

Author: gop\_ibm

Date: 5/7/2005 3:11:39 PM

 REJECT (but will get rid of the "to")

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: RElliott

Subject: Highlight

Date: 5/7/2005 3:11:45 PM


 ACCEPT - DONE

Delete "to"

---

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.

---

Author: mevens\_mxo

Subject: Note

Date: 5/21/2005 9:43:36 PM

 ACCEPT - DONE (I will add horizontal bars across each section of these UML figures, which helps readability. I will not change every Visio file in the standard to add a box.)

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.

---

Author: relliott

Subject: Cross-Out

Date: 5/21/2005 9:35:01 PM

~~ACCEPT - DONE~~

Figure 5 - UML Aggregation

Delete "Note: The role name is optional" because there is no Role Name in this figure

---

Author: kmarks\_dell

Subject: Note

Date: 5/20/2005 6:52:17 PM


 ACCEPT - DONE

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."

---



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."

---

Author: relliott  
Subject: Rectangle  
Date: 5/21/2005 2:46:34 PM  
 ACCEPT - DONE

Format this "where:" list per other IBM comments

"

Result: A single...  
Procedure Name: A descriptive...  
IN (Input-1, Input-2, ...): A comma-...  
OUT (Output-1, Output-2, ...): A...  
[...]: Brackets enclosing optional..."

---

Author: relliott  
Subject: Cross-Out  
Date: 5/21/2005 2:45:31 PM  
 ACCEPT - DONE  
 REVIEW

Delete the procedure call example, which doesn't follow the format used in this standard (all the input arguments to protocol services are listed in tables in chapter 10)

"The following is an example of a procedure specification:

Found = Search (IN (Pattern, Item List), OUT ([Item Found]))

where:

Found = Flag

If set, indicates that a matching item was located.

Input Arguments:

Pattern = ... /\* Definition of Pattern object \*/

Object containing the search pattern.

Item List = Item<NN> /\* Definition of Item List as an array of NN Item objects\*/

This list contains the items to be searched for a match.

Output Arguments:

Item Found = Item ... /\* Item located by the search procedure \*/

This object is only returned if the search succeeds."

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/5/2005 2:47:03 PM

**1** REJECT (SMP port is the name of the class. SMP target port is the name of an object instantiated from the SMP port class (or the SAS target port class. Since this text is summarizing the following UML class diagram, it should continue to refer to only classes, not objects.)

#### 4.1 Architecture


Change

"... one SMP port."

to


"... one SMP target port."

---

Author: relliott  
Subject: Cross-Out  
Date: 5/22/2005 9:50:26 AM  
 ACCEPT - DONE


To match the Maxtor definition of ATA domain, delete "Relationships to ATA classes (e.g., ATA domain) are not shown in figure 10." since it is not at all related to a SAS domain.

---

Author: relliott  
Subject: Note  
Date: 5/20/2005 4:57:21 PM  
 ACCEPT - DONE


Add "Not all attributes are shown." since figure 10 doesn't mention attached phy identifier, device type, attached device type, etc. which are all arguably attributes of various classes.

---

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


Port s/b port

---

Author: gop\_ibm  
Date: 5/20/2005 3:34:31 PM  
 ACCEPT - DONE (but as 65535, not 65353)

4.1.1 Architecture overview  
Figure 10  
This << 1..\* >> should be << 1.. 65 353>>

---


Author: gop\_ibm  
Date: 5/20/2005 3:39:01 PM  
 REJECT (SAS devices are really limited by the limit on the number of phys in a SAS device - 128. There could be one port per phy worst case.

Also, the SAS limit is not necessary constrained by the SCSI limit. An STP/SMP only SAS device is not affected by the SCSI relative target port limit.

So, changing this to 128 instead).  
REVIEW

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."

---

Author: gshoulder\_seg

Subject: Note

Date: 5/20/2005 5:01:40 PM

ACCEPT - DONE (added ", inherited from the SAS port (see 4.1.3) or expander device (see 4.1.5)".

In the SAS port case, the phy is actually the real owner of it, but the port is the logical owner of it. The phy uses its outgoing SAS address before it determines which port it needs to join based on the incoming SAS address. Nevertheless, from the class diagram view, it just inherits the SAS address from the port to which it is eventually assigned.

Since these attributes are inherited, they don't show up in the class diagram for phy derivatives, although they are really present.)

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.

---

Author: relliott

Subject: Highlight

Date: 5/20/2005 5:03:22 PM

ACCEPT - DONE

Need to define the phrase "attached SAS address" because it is widely used.

Replace the paragraph containing "... Each phy also receives an IDENTIFY address frame containing those values from its attached phy during the identification sequence."

with lengthier text that introduces all the terms:

"During the identification sequence (see 7.9), a phy:

a) transmits an IDENTIFY address frame including the device type (i.e., end device, edge expander device, or fanout expander device) of the device containing the phy, the SAS address of the SAS port or expander device containing the phy, phy identifier, SSP initiator phy capability, STP initiator phy capability, SMP initiator phy capability, SSP target phy capability, STP target phy capability, and SMP target phy capability.


b) receives an IDENTIFY address frame containing the same set of information from the attached phy, including the attached device type, attached SAS address, attached phy identifier, attached SSP initiator phy capability, attached STP initiator phy capability, attached SMP initiator phy capability, attached SSP target phy capability, attached STP target phy capability, and attached SMP target phy capability.

---

Author: ghoulder\_seg

Subject: Note

Date: 5/20/2005 4:57:59 PM

 REJECT (SAS address is an inherited attribute, and there isn't room to show all the attributes. See response to comment on previous page 76)

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.

---

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 than the transceiver.

---

Author: thoglund\_isi  
Subject: Highlight  
Date: 5/20/2005 5:16:56 PM

 ACCEPT - DONE (reworded to include some that subclauses which might help lessen the confusion. 7.9.1 as strictly interpreted has some errors - see new comment there)

"A port is created from one or more physical phys if, during the identification sequence (see 7.9), they:


- a) transmitted the same SAS address (see 4.2) that the other physical phys in that port also transmitted in their outgoing IDENTIFY address frames (i.e., the SAS address is the same); and
- b) received the same SAS address that the other physical phys in that port also received in their incoming IDENTIFY address frames (i.e., the attached SAS address is the same).

")

"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: relliott  
Subject: Highlight  
Date: 5/20/2005 4:10:59 PM

 ACCEPT - DONE

Change "A wide port is created if there is more than one phy in the port. A narrow port is created if there is only one phy in the port."


to:

"A port is a wide port if there are more than one phy in the port. A port is a narrow port if there is only one phy in the port."

to get rid of the confusing "is created" wording. The previous paragraph already defined a port being created - this could be read as an additional set of creations, which is not the case.

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 4:12:32 PM

 ACCEPT - DONE


In "Attaching phys within a wide port to other phys in the same wide port is outside the scope of this standard."

add an i.e. explaining how this happens:

"Attaching phys within a wide port to other phys in the same wide port (i.e., the SAS address transmitted in the outgoing IDENTIFY address frame is the same as the SAS address received in the incoming IDENTIFY address frame) is outside the scope of this standard."

---

Author: gop\_ibm  
Date: 5/7/2005 3:13:02 PM


 ACCEPT - DONE (based on 5/5 WG vote 10-1-1)

4.1.3 Ports (narrow ports and wide ports)

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

---

Author: gop\_ibm  
Date: 5/7/2005 3:09:38 PM

 ACCEPT - DONE (based on 5/5 vote 7-1-3)

4.1.3 Ports (narrow ports and wide ports)

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

---

Author: goulder\_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.

---



Author: gop\_ibm  
Date: 5/20/2005 4:47:21 PM  
 ACCEPT - DONE

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.

---

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: 5/20/2005 5:15:51 PM

 ACCEPT - DONE (added definition in chapter 3.)

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 are 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.

---


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))"

---

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: ghouder\_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.

---

Author: relliott  
Subject: Cross-Out  
Date: 5/22/2005 10:42:42 AM  
 ACCEPT - DONE


As part of ATA domain changes, delete "(defined by SATA)."

---

Author: relliott  
Subject: Cross-Out  
Date: 5/22/2005 10:42:26 AM  
 ACCEPT - DONE

As part of ATA domain changes, delete "(defined by this standard)"


---

Author: relliott  
Subject: Note  
Date: 5/22/2005 10:41:56 AM  
 ACCEPT - DONE  
REVIEW

Add a picture of ATA domains with a SATA port selector.


Remove "(informative)" since "ATA domain" is not defined by ATA/ATAPI-7.

---

Author: relliott  
Subject: Cross-Out  
Date: 5/22/2005 10:43:04 AM  
 ACCEPT - DONE

As part of ATA domain changes, delete "(informative)"

---

Author: relliott  
Subject: Note  
Date: 5/22/2005 10:43:32 AM  
 ACCEPT - DONE  
REVIEW

Add another figure showing a SAS domain with STP/SATA bridge(s) bridging to ATA domains with SATA port selectors.

---

Author: mevens\_mxo

Subject: Highlight

Date: 4/19/2005 8:45:06 PM

ACCEPT - DONE (deleted sentence instead)

1

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

---

Author: thoglund\_isi  
Subject: Highlight  
Date: 5/20/2005 1:02:01 PM

**T** ACCEPT - DONE (key as a shall, but reworded to clarify "sum":  
"4.7), an edge expander device set shall be constructed such that the number of edge expander route indexes available for each edge expander phy is greater than or equal to the number of SAS addresses addressable through that edge expander phy.")

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

---

Author: relliott  
Subject: Note  
Date: 5/20/2005 1:25:31 PM

**T** ACCEPT - DONE

Move the "An edge expander device set shall not be attached to..."  
and "...may be attached to..." paragraphs to the next section on expander device topologies.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/20/2005 12:59:09 PM

**T** ACCEPT - DONE (as "An edge expander device set may be attached to one other edge expander device set if:

- a) there are only two edge expander device sets in the SAS domain;
  - b) the edge expander device sets are attached using expander phys with subtractive routing attributes; and
  - c) there are no fanout expander devices in the SAS domain.
- ")

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\_isi  
Subject: Highlight  
Date: 5/20/2005 3:29:19 PM

**T** REJECT (this figure completely replaced, getting rid of that phrase from this figure. Also got rid of it from figure 26; see comments there)

definition needed for "root edge expander device"

---

Author: relliott  
Subject: Note  
Date: 5/20/2005 1:24:32 PM

**T** ACCEPT - DONE  
REVIEW

Figure 23 Edge expander device set

This is the wrong figure. It's the same as figure 26 (as noted by Seagate and IBM comments). It is supposed to be different.

This was broken going from sas-r05f to sas-r05g when some of the Visio filenames were changed.

Restore the original figure.

---

Author: ghoulder\_seg  
Subject: Note  
Date: 5/20/2005 3:27:36 PM

**T** ACCEPT - DONE (Figure 23 is actually the wrong figure - restored the correct one from sas-r03f (see new comment).

Removed the root, upstream, and downstream terms from the figures in favor of labeling each port with S, T, and D indicating the routing methods used.)

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: 5/20/2005 1:03:04 PM

**T** REJECT (that would be wrong - "SAS ports" doesn't include expander ports)

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


---



Author: relliott  
Subject: Note  
Date: 5/20/2005 3:28:07 PM  
 ACCEPT - DONE

Add S, T, D routing method labels to match response to Seagate comment on Figure 23

---

Author: relliott  
Subject: Note  
Date: 5/20/2005 3:28:13 PM  
 ACCEPT - DONE


Add S, T, D routing method labels to match response to Seagate comment on Figure 23

---

Author: thoglund\_isi

Subject: Highlight

Date: 5/20/2005 3:28:55 PM

 REJECT (eliminated usage of that term instead)

definition needed for "root edge expander device"

---

Author: relliott

Subject: Note

Date: 5/20/2005 3:28:41 PM


 ACCEPT - DONE

Add S, T, D routing method labels to match response to Seagate comment on Figure 23 (which is actually incorrectly the same as this figure)

---

Author: gop\_ibm

Date: 5/20/2005 1:13:32 PM

 REJECT (figure 23 is the wrong figure. It was broken going from sas-r05f to sas-r05g. Restored the correct figure 23 instead.)

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: 5/20/2005 5:20:34 PM

 ACCEPT - DONE (as "it is possible that there is more than one potential pathway, each" since "may" means permission, but this is not a statement granting permission.)

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"

---

Author: thoglund\_isi  
Subject: Highlight  
Date: 5/20/2005 12:56:26 PM

ACCEPT - DONE (changed to "A partial pathway is the set of physical links participating in a connection request that have not yet conveyed a connection response (see 7.12).")

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: 5/20/2005 10:53:53 AM

REJECT (no, a partial pathway is considered "blocked" only if it is waiting on other partial pathways, not connected pathways.)

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: 5/20/2005 5:21:06 PM

ACCEPT - DONE

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: 5/20/2005 5:22:29 PM

ACCEPT - DONE ("No more than one connection is". "may" implies permission, but the "only one" concept is just a statement of fact.)

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."

---

Author: gop\_ibm  
Date: 5/7/2005 3:14:19 PM  
ACCEPT - DONE

4.1.10 Connections  
Figure 28  
Change << Notes >> to << Note >>

---

Author: kmarks\_dell  
Subject: Cross-Out  
Date: 5/1/2005 10:23:52 PM  
REJECT (since SAS does not technically provide them, although it seems like it does at first because the NAA format is used.)

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: 5/1/2005 10:27:18 PM  
REJECT (we're trying to genericize the SAM-3 concepts here. will delete (see SAM-3)."

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)."

---

Author: relliott  
Subject: Cross-Out  
Date: 5/20/2005 11:15:45 AM  
ACCEPT - DONE

Delete "and are used as SAS addresses." which doesn't make sense here. It probably meant "port identifiers are used for addressing within a domain" and/or "SAS addresses serve as port identifiers in a SAS domain" but that is all defined later.

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 10:28:52 PM  
ACCEPT - DONE

Table 7  
Change "Device name" to "SCSI device name" to match the exact wording in SAM-3

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 10:48:15 AM  
ACCEPT - DONE

SAS addresses s/b SAS address

---

Author: gop\_ibm  
Date: 4/19/2005 8:48:38 PM  
ACCEPT - 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.


---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 11:11:55 AM  
ACCEPT - DONE

contains s/b field contains

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 11:12:42 AM


 ACCEPT - DONE

Change "The SAS address shall be worldwide unique." to

"The VENDOR-SPECIFIC IDENTIFIER field shall be assigned so the SAS address is worldwide unique." and move into the previous paragraph defining the VENDOR-SPECIFIC IDENTIFIER field.

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/1/2005 10:31:13 PM

 REJECT (deleted "as defined by SCSI" instead. This just refers to the generic port name term.)

4.2.5 Port names  
1st Sentence

Change

"SCSI"

to

"the SCSI Architectural Model"

or

"SAM-3"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 10:33:48 PM

 ACCEPT - DONE

Change "SSP target ports" to "SAS ports" to make this generic, not SCSI specific.

Also change "address" to "addresses" and "it" to "the SAS address".

Also add "(see 4.2.6)" after "port identifier"

---

Author: relliott\_hpq  
Subject: Note  
Date: 5/20/2005 11:40:40 AM

 ACCEPT - DONE (

4.2.4 Device names. Replace 2nd sentence with "A SAS address used as a device name shall not be used as any other name or identifier (e.g., a device name, port name, port identifier, or logical unit name (see SAM-3))."

4.2.6 Port identifiers. Replace 2nd sentence with "A SAS address used as a port identifier shall not be used as any other name or identifier (e.g., a device name, port name, or logical unit name (see SAM-3)) but may be used as a port identifier in one or more other SAS domains (see 4.1.3)."

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 initial 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.

---

Author: relliott  
Subject: Note  
Date: 5/20/2005 12:55:26 PM

 ACCEPT - DONE (as "SAS target port (e.g., including each STP target port of each STP/SATA bridge)"

and change "SAS ports report... IDENTIFY address frame" to "SAS ports in end devices report their port identifiers in the IDENTIFY address frame (see 7.8.2). Expander devices containing SAS ports (e.g., SAS ports attached to virtual phys, or STP target ports in STP/SATA bridges) report the port identifiers of those SAS ports in the SMP DISCOVER function (see 10.4.3.5)."

Should STP/SATA bridges be mentioned here too? They don't report their address in an IDENTIFY address frame

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/22/2005 2:40:42 PM  
ACCEPT - DONE

Figure 32  
Change  
"SSP\_TF (transmit frame) state machine"  
to  
"SSP\_TF (transmit frame control) state machine"

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/22/2005 2:41:03 PM  
ACCEPT - DONE

Figure 32  
  
Change  
"SSP\_TC (transmit credit) state machine"  
to  
"SSP\_TC (transmit credit control) state machine"

---



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

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

---

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 5:37:15 PM  
ACCEPT - DONE

Per May meeting, change "HARD\_RESET" to "The HARD\_RESET primitive sequence" to avoid confusion with "SMP HARD RESET" and "hard reset"

---

Author: RElliott  
Subject: Highlight  
Date: 5/20/2005 5:39:08 PM  
ACCEPT - DONE

Per May WG, after HARD\_RESET, add primitive sequence to avoid confusion with phy operation of HARD RESET and SAM-3 condition called hard reset.

---

Author: relliott  
Subject: Highlight  
Date: 6/11/2005 10:06:35 AM  
ACCEPT - DONE  
REVIEW

Change: "stop transmitting valid dwords on each of the phys contained in that port. Each phy may then participate in new phy reset sequences and start transmitting."

to:  
"stop transmitting valid dwords on each of the phys contained in that port. Each phy may then participate in new phy reset sequences (e.g., respond to incoming COMINITs) and shall originate a new link reset sequence if one is not detected."

---

Author: relliott  
Subject: Underline  
Date: 5/22/2005 3:01:17 PM  
ACCEPT - DONE  
REVIEW

Change "Expander devices shall not forward HARD\_RESETs to other phys"

to:  
"If the port processing a hard reset is an expander port, the expander device shall not originate a hard reset sequence on any of its other phys."

---

Author: relliott  
Subject: Cross-Out  
Date: 5/22/2005 3:00:27 PM  
ACCEPT - DONE

Delete "(see SAM-3)." This sentence also applies to expander ports, not just SAS ports. The fact that it agrees with the SCSI architecture model is incidental.

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 5:25:40 PM  
ACCEPT - DONE

Per May meeting, change "HARD\_RESETs" to "HARD\_RESET primitives" to avoid confusion with "SMP HARD RESET" and "hard reset"

---

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  
Subject: Highlight  
Date: 5/22/2005 3:02:28 PM  
ACCEPT - DONE  
REVIEW

Change: "If the port is an SSP port,"

to:  
"If the port processing the hard reset is an SSP port, "

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 3:06:34 PM  
ACCEPT - DONE  
REVIEW

Change "If the port is an STP port, the ATA device shall perform the actions defined for power-on or hardware reset in ATA."

to:  
"If the port processing the hard reset is an STP port in an STP/SATA bridge, the SATA host port shall originate a link reset sequence.

If the port processing the hard reset is an STP port that is not in an STP/SATA bridge, the STP target device shall perform the actions defined for power-on or hardware reset in ATA/ATAPI-7 V1."

The first sentence covers non-expander based STP/SATA bridges (in an expander, it's an expander port that receives the hard reset, so nothing happens to the STP/SATA

bridges. They are only reset with the SMP HARD RESET function specifying the phy they own).

The second sentence covers native STP target ports. Based on Maxtor's ATA domain comment, we no longer claim an STP target port is an "ATA device" (since ATA devices only comprehend one host) - it's a more wordly entity that borrow from the ATA architecture.

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 3:08:47 PM  
ACCEPT - DONE

Change "If the port is an expander port,"  
to:  
"If the port processing a hard reset is an expander port,"

---

Author: relliott\_hpq  
Subject: Note  
Date: 5/22/2005 3:11:34 PM  
ACCEPT - DONE (Split 4.4.2 Hard reset into 3 subsections - overview, Additional hard reset processing by SAS ports, and Additional hard reset processing by expander ports.  
See comments on individual paragraphs for specific wording changes.)

#### 4.4.2 Hard reset

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

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 3:10:36 PM  
ACCEPT - DONE  
REVIEW

"After processing a hard reset, a phy shall originate a link reset sequence."

merge this sentence into the previous sentence containing "may then participate in new phy reset sequences" sentence, resulting in:

"Each phy may then participate in new phy reset sequences (e.g., respond to incoming COMINITs) and shall originate a new link reset sequence if one is not detected. "

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 3:11:16 PM  
ACCEPT - DONE  
REVIEW

Change "After the link reset sequence completes,"  
to:  
"After processing a hard reset, "

---

Author: thoglund\_lsi  
Subject: Highlight  
Date: 5/21/2005 3:11:52 PM  
ACCEPT - DONE (per May WG)

remove OPEN\_REJECT (WAITING FOR BREAK). see 05-145r0.

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 3:15:33 PM  
ACCEPT - DONE  
REVIEW

Change "STP or SMP connection requests," to "STP ports, SMP ports, or SSP initiator ports" to be consistent with b) and cover all remaining cases

---

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: relliott  
Subject: Highlight  
Date: 5/22/2005 3:17:15 PM  
ACCEPT - DONE

Change: "If the time expires, then the port shall send"

to: "If the I\_T nexus loss time expires in an SSP port, then the port shall send"

since this only applies to SSP

---


Author: bday\_lsi  
Subject: Comment on Text  
Date: 5/22/2005 3:17:41 PM  
ACCEPT - DONE (simplified to 'I\_T nexus loss is handled by teh port layer state machines.")

missing "is"

---

Author: gop\_ibm

Date: 5/22/2005 3:17:45 PM

 ACCEPT - DONE (simplified to "I\_T nexus loss is handled by the port layer state machines.")

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: ghouder\_seg

Subject: Note

Date: 5/22/2005 3:17:48 PM

 ACCEPT - DONE (simplified to "I\_T nexus loss is handled by the port layer state machines.")

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..."


---

Author: relliott  
Subject: Note  
Date: 5/8/2005 6:45:23 PM  
 ACCEPT - DONE

Add:

A set of phys with table routing attributes using the same external connector (see 5.2.3.3) is called an enclosure out port. A set of phys with subtractive routing attributes using the same external connector is called an enclosure in port.

---

Author: thoglund\_isi  
Subject: Highlight  
Date: 4/28/2005 11:33:51 AM  
 ACCEPT - 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: 5/20/2005 5:40:33 PM  
REJECT (see response in 4.1.1)

4.6.2 Expander ports  
6th Paragraph, 1st Sentence  
Change  
"... internal SMP port using ..."  
to  
"... internal SMP target port using ..."

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:20:06 AM  
ACCEPT - DONE  
Change "phy attached to the SATA device"  
to  
"expander phy containing the STP/SATA bridge (i.e., the expander phy attached to the SATA device or SATA port selector)"

---

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"

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 5:42:23 PM  
ACCEPT - DONE

after rate; add and

---

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".

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 5:48:11 PM

1 ACCEPT - DONE

Change "Confirmation that the ECM did not find an operational expander phy capable of routing to the requested destination SAS address, or has determined that the requested destination SAS address maps back to the requesting port (see 7.12.5.2 and 7.12.5.3)."

to an a)b) format:

"Confirmation that:

- a) there is no operational expander phy capable of routing to the requested destination SAS address; or
- b) the requested destination SAS address maps back to the requesting port (see 7.12.5.2 and 7.12.5.3).

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/20/2005 5:48:16 PM

1 ACCEPT - DONE (changed format to an a)b)c) list, but didn't change the "and" to an "or" and break the meaning. Changed to:

"Confirmation that

- a) the requested destination SAS address maps back to the requesting port;
  - b) the requesting port is using the direct routing method or the table routing method; and
  - c) the ECM has not chosen to return Arb Reject (No Destination) (see 7.12.5.2 and 7.12.5.3).
- ")

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

1 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..."

---



Author: kmarks\_dell  
Subject: Highlight  
Date: 6/11/2005 10:01:38 AM

**1** REJECT (deleted the virtual phy phrase instead. This is a state machine message name, and there is no state machine for a virtual phy describing this message. Table 15 - Expander phy to BPP requests. There are plenty of other non-state machine-based Broadcast reasons that aren't in this table.)

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: relliott  
Subject: Highlight  
Date: 6/11/2005 10:06:17 AM

**1** ACCEPT - DONE

Delete "See 7.11." from each entry in the table and add " See 7.11 for more information on broadcasts" above the table

---

Author: rlsheffi\_intc  
Subject: Highlight  
Date: 6/11/2005 10:02:48 AM

**1** REJECT (deleted the virtual phy phrase instead. This is a state machine message name, and there is no state machine for a virtual phy describing this message. Did not add the STP/SATA bridge line, because there is no state machine for that either. There are plenty of other non-state machine-based Broadcast reasons that aren't in this table.)

Table 15 - Expander phy to BPP requests.

**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

---

Author: gop\_ibm  
Date: 4/19/2005 8:54:10 PM  
ACCEPT - 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?

---

Author: relliott  
Subject: Cross-Out  
Date: 5/20/2005 10:02:19 AM  
ACCEPT - DONE

change "routed SAS address" to "SAS address" to avoid having to define "routed SAS address" in chapter 3

---

Author: relliott  
Subject: Cross-Out  
Date: 5/20/2005 10:02:50 AM  
ACCEPT - DONE

change "routed SAS address" to "SAS address" to avoid having to define "routed SAS address" in chapter 3

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 10:22:11 AM  
ACCEPT - DONE

Redraw Expander route table figure 44 using 10 point text

---


Author: relliott  
Subject: Highlight  
Date: 5/20/2005 10:06:49 AM  
ACCEPT - DONE

Change "  
<bullet> Routed SAS address  
<bullet> Enable/disable bit"  
to  
ROUTED SAS ADDRESS field and  
DISABLE EXPANDER ROUTE ENTRY bit

in part since the font of the bullets is wrong in the PDF file

---


Author: bday\_lsi  
Subject: Comment on Text  
Date: 5/21/2005 9:31:51 AM

 ACCEPT - DONE (they were intended, but I guess don't help. Removed them)

There are a few dangling lines in the diagram

---

Author: gop\_ibm  
Date: 5/21/2005 9:38:06 AM

 ACCEPT - DONE (the numbers are the traversal order, not phy numbers. Added "Traversal order: " next to the 1 and changed the note to: "Note: Assume that the phy with the lowest phy identifier in each expander device is on the top right and the remaining phys have increasing phy identifiers assigned in a counter-clockwise direction")


4.7.1 Discover process overview

Figure 45

The note in this figure implies that all the phys are indicated by numbers. However, there are several places where there appear to be multiple links but only one phy number. There also appears to be unconnected phys that are not numbered. This all needs to be fixed.

---

Author: gop\_ibm  
Date: 5/21/2005 9:39:11 AM

 REJECT (that's irrelevant to the discussion of the order of traversal)


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: goulder\_seg  
Subject: Note  
Date: 5/21/2005 9:41:39 AM

 ACCEPT - DONE (it was trying to show that both end devices (not in expanders) and SAS devices in expanders are visited. However, it's true that those end devices are also SAS devices, so "SAS device" can be used in each case (not "end device". So, will change to that.)  
REVIEW


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.

---

Author: gop\_ibm  
Date: 5/7/2005 3:09:51 PM  
 ACCEPT - DONE (based on 5/5 vote 6-2-2)

4.7.1 Discover process overview  
This << need not >> should be changed to << is not required to >>

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/22/2005 3:33:05 PM  
 ACCEPT - DONE ("aborted prior to completion and restarted...")


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: 5/21/2005 9:42:35 AM  
 REJECT (unnecessary verbosity)

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: 6/18/2005 2:35:08 PM  
 ACCEPT - DONE (Any expander that is between two others is obviously attached to two other expanders, but that doesn't mean it needs to be disabled in one of them. Added a figure showing two examples of illegal topologies - one with multiple paths to a SAS device, one with multiple paths to an expander device (creating a loop).

Changed text to:

"If the management application client detects a port that the discover process has not already configured with a SAS address it has already found attached to another expander device, it should the SMP PHY CONTROL function (see 10.4.3.10) to disable all the expander phys attached to that SAS address except for phys in the expander device with the lowest SAS address. Figure 47 shows some illegal topologies."

)  
REVIEW

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.

from:

"If the management application client detects a port with a SAS address it has already found attached to another expander device, it has found a routing loop and may break the loop by using the SMP PHY CONTROL function (see 10.4.3.10) to disable all the expander phys attached to that SAS address except for phys in the expander device with the lowest SAS address."

---

Author: rlsheffi\_intc  
Subject: File Attachment  
Date: 5/29/2005 3:59:40 PM  
 ACCEPT - DONE (track with response to text comment next to this one)

Example expander device configuration (file attached)

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

---

Author: bnixon\_elx  
Subject: Highlight  
Date: 5/21/2005 9:58:56 AM  
ACCEPT - DONE (see reply to Intel comment)

Emulex concurs with the following issue identified by Intel:

Page: 124; Author: rlsheffi;

Comment: There is no place in the standard that specifies when (if ever) the ATTACHED SAS ADDRESS is set to zero.

---

Author: rlsheffi\_intc  
Subject: Highlight  
Date: 5/21/2005 9:58:30 AM  
ACCEPT - DONE (setting to zero is not necessary. Instead, deleting this row. If the ATTACHED DEVIC TYPE is zero, then the ATTACHED SAS ADDRESS field is irrelevant)  
REVIEW

There is no place in the standard that specifies when (if ever) the ATTACHED SAS ADDRESS is set to zero. There probably should be (perhaps on any transition to SP0: OOB\_COMINIT?).

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

---

Author: relliott  
Subject: Highlight  
Date: 7/23/2005 3:24:32 PM  
ACCEPT - DONE

"directly attached device;" has been confused with any end device attached to a subtractive or table phy. It is not the intent of the optimization process to exclude those SAS addresses.

Change to:

"device directly attached to the expander device being configured" to make this a bit more clear

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/21/2005 9:48:05 AM  
ACCEPT - DONE (change "in an existing expander device route table" to "accepted.")  
REVIEW

4.7.3 discover process optimization  
5th Paragraph, list a)

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

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

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

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/21/2005 9:59:00 AM  
ACCEPT - DONE (added "(e.g., detects entries that appear to have been filled in by a discover process with optimization disabled)")

4.7.3 discover process optimization  
6th Paragraph, 1st Sentence


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

What is defined as an inconsistency, add example?

---

Author: gop\_ibm

Date: 5/21/2005 9:43:36 AM

 REJECT (but will delete the whole parenthetical phrase instead)


4.7.4 Expander route index order

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

---

Author: gop\_ibm

Date: 5/21/2005 9:44:18 AM

 REJECT (but that would be wrong, because it is also referring to fanout expander phys (see the parenthetical expression above)

4.7.4 Expander route index order

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

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 1:27:24 PM  
ACCEPT - DONE

1 Change "the root edge expander device" to "edge expander device R" to avoid using a term that some think needs to be defined in chapter 3

---



Author: thoglund\_isi  
Subject: Highlight  
Date: 4/28/2005 1:32:48 PM

**T** 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 specifies 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

**T** 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.

"

---

Author: relliott  
Subject: Highlight  
Date: 5/7/2005 3:16:10 PM

 REJECT (but add "Fixed and free terminology have no relationship to the application.")


## 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: 5/8/2005 5:37:28 PM

 ACCEPT - DONE

## 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  
rsheffi Accepted 4/7/2005 2:33:45 PM

---

Author: relliott  
Subject: Note  
Date: 6/25/2005 4:12:26 PM  
ACCEPT - DONE

Change "SATA-style" to "SATA" everywhere. (in the connector names)

---

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)

---

Author: bbyssone\_intc  
Subject: Cross-Out  
Date: 5/8/2005 5:37:52 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: 5/8/2005 5:38:11 PM  
ACCEPT - DONE (deleted the note instead)

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: 5/10/2005 12:40:31 PM  
REJECT (deleted entirely instead)

**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: 5/8/2005 5:38:35 PM  
ACCEPT - DONE (deleted the note instead)

**Figure 53 - Internal wide cabled environment - controller to backplane - symmetric cable**

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


This removes reference to whether it is compact or not.

---

Author: gop\_ibm  
Date: 5/8/2005 5:38:18 PM  
ACCEPT - DONE (deleted the note instead)


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. >>

---

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: goulder\_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: 5/20/2005 6:40:05 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: 5/8/2005 5:38:40 PM  
 ACCEPT - DONE (deleted the note instead)

5.2.2 SAS cables and connectors

Figure 54

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

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/8/2005 5:38:47 PM  
 ACCEPT - DONE (deleted the note instead)

**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: 5/8/2005 5:38:56 PM

 ACCEPT - DONE (deleted the note instead)

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. >>

---

Author: gop\_ibm

Date: 5/8/2005 5:39:04 PM


 ACCEPT - DONE (deleted the note instead)

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. >>


---

Author: relliott  
Subject: Note  
Date: 5/21/2005 10:33:39 AM  
 ACCEPT - DONE  
REVIEW

Move "SAS internal cable SATA-style signal cable receptacle" out of the SAS Drive connector part of the table into a new part labeled "SATA-style internal connectors used by SAS". Strip of "SAS internal cable" from its name since that is not used elsewhere.

In this new section, add rows for:  
SATA-style host plug (attaches to SATA-style signal cable receptacle)  
SATA device plug (attaches to either SAS Drive cable receptacle or SAS Drive backplane receptacle)

---

Author: RElliott  
Subject: Note  
Date: 5/8/2005 5:41:55 PM  
 ACCEPT - DONE


At the May T10 plenary, the SCSI Trade Association requested these names be applied to the connectors:

SFF-8470 = "SAS 4x"  
SFF-8482 = "SAS Drive"  
SFF-8484 = "SAS 4i"  
SFF-8087 = "Mini SAS 4x"  
SFF-8088 = "Mini SAS 4i"

with "[backplane/cable] receptacle/plug" added afterwards, as appropriate.

The T10 plenary discussed changing 4x to 4e, but voted to keep 4x. From 05-165r0 minutes: "George Penokie moved that '4x' be changed to '4e' in the SAS-1.1 connector definitions. Kevin Marks seconded the motion. The motion failed 9:11:9:16=45. "

---

Author: RElliott  
Subject: Note  
Date: 5/8/2005 5:42:12 PM  
 ACCEPT - DONE

Change the order of the connector sections to:

internal  
SAS Drive  
SAS Drive plug  
SAS Drive cable receptacle  
SAS Drive backplane receptacle  
SAS 4i  
SAS 4i cable receptacle  
SAS 4i plug  
Mini SAS 4i  
Mini SAS 4i cable plug  
Mini SAS 4i receptacle  
  
external  
SAS 4x  
SAS 4x cable plug  
SAS 4x receptacle  
Mini SAS 4x  
Mini SAS 4x cable plug  
Mini SAS 4x receptacle

..

---



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"

---

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

Delete either

---

Author: relliott  
Subject: Highlight  
Date: 4/28/2005 5:09:40 PM  
TACCEPT - 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:"

---


Author: relliott  
Subject: Highlight  
Date: 5/11/2005 7:14:46 PM  
 ACCEPT - DONE

Table 23  
Change GROUND to SIGNAL GROUND in both signal segments

---



Author: relliott  
Subject: Note  
Date: 5/21/2005 10:57:20 AM  
 ACCEPT - DONE  
 REVIEW

Table 23 - SAS internal connector pin assignments

Except for some poorly worded text below this table, SAS does not explain that this table is from the drive's perspective. For example, S2/S3 are labeled RP+/RP-, meaning they are the receive signals for the drive. Whatever is attached to the drive (backplane receptacle or a cable receptacle) needs to deliver transmit signals TP+/TP- on those pins.

For cables, there are separate connector pin assignments and cable definitions. If the other side of the cable is a SATA-style host receptacle, the pin assignments are defined by SATA, where S2/S3 is labeled T+/T-. The SAS cable assembly figures show how S2/S3 on the SATA-style host receptacle (T+/T-) routes to S2/S3 on the SAS Drive cable receptacle (RP+/RP-).

For backplanes, there might not be a cable involved, and it is not well-stated that a backplane containing a SAS device or expander device must use S2/S3 for TP+/TP-. If the backplane is just a passthrough from a SAS 4i or Mini SAS 4i connector, however, it would still want to call them R+/R- (because the SAS 4i or Mini SAS 4i pinouts and cable assembly construction swap the T and R). It would probably be confusing to provide figures showing backplanes constructed with every combination of on-board devices and connectors, though.

Suggestions:

1. Label the current pin assignment column "SAS Drive plug and SAS Drive cable receptacle"
  2. Add a "SAS Drive backplane receptacle" column showing T and R signals swapped, so S2/S3 carry TX+/- . This is really only true for a backplane containing a SAS device/ expander device but is not true for a backplane just routing from another connector. Ignore the latter situation since a note explaining this is probably more confusing than saying nothing.
  3. Add footnote on the power segment: "Backplane receptacle connectors and SAS Drive cable receptacle connectors provide V<sub>33</sub>, V<sub>5</sub>, and V<sub>12</sub>. SAS Device plug connectors receive V<sub>33</sub>, V<sub>5</sub>, and V<sub>12</sub>."
- 


Author: relliott  
Subject: Highlight  
Date: 5/11/2005 7:15:26 PM  
 ACCEPT - DONE

Table 23  
Add "segment" after "primary signal", "secondary signal", and "power", since this column caused confusion in a phy WG conference call

---



Author: kmarks\_dell  
Subject: Highlight  
Date: 4/22/2005 8:57:20 AM  
 ACCEPT - DONE

Table 23 - SAS internal connector pin assignments

Note c

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


---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 6:59:25 PM  
 ACCEPT - DONE

Delete "On cable assemblies, backplanes, or any other connection media, the Tx signal from one internal connector pair shall be connected to the corresponding Rx signal of the other internal connector pair (i.e., the TP+ signal pin of connector 1 shall connect to the RP+ signal pin of connector 2) if there is an internal connector at both ends of the transmission media." in favor of table changes (see new comment)

---

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: 5/11/2005 7:35:05 PM  
 ACCEPT - DONE


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. >>

---


Author: relliott  
Subject: Highlight  
Date: 5/8/2005 2:13:59 PM  
 ACCEPT - DONE

"only one expander device"

s/b


"no more than one expander device"

---

Author: relliott  
Subject: Note  
Date: 5/11/2005 7:36:52 PM  
 ACCEPT - DONE


Replace figure 62 (external receptacle) with a fully shaded version

---

Author: sjvandoo\_intc  
Subject: Note  
Date: 5/11/2005 7:36:47 PM  
 ACCEPT - DONE


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: bblissone\_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.

---

---

Author: jneer\_molex  
Subject: Note  
Date: 5/8/2005 1:30:24 PM  
ACCEPT - DONE (The May WG decided to change the external signal assignments altogether.)

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: 5/8/2005 1:31:10 PM  
ACCEPT - DONE (tables for the connectors remain; duplicate connector signal assignments removed from the cable figures)

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  
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: 5/8/2005 2:07:50 PM  
ACCEPT - DONE

**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: 5/8/2005 2:08:00 PM  
ACCEPT - DONE

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: 5/8/2005 2:08:11 PM

 ACCEPT - DONE

#### 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.

---

Author: acox\_seg  
Subject: Note  
Date: 5/11/2005 7:40:16 PM  
ACCEPT - DONE

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: 5/11/2005 7:40:25 PM  
ACCEPT - DONE

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  
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: 5/8/2005 2:09:53 PM  
ACCEPT - DONE

**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: 5/20/2005 6:39:55 PM  
ACCEPT - DONE

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: 5/8/2005 2:10:01 PM

 ACCEPT - DONE

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: 5/8/2005 2:12:41 PM

 ACCEPT - DONE

5.2.3.3.6 SAS external compact receptacle connector

Insert two paragraphs below before


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

text to be inserted:

A SAS external compact receptacle connector may be used by one or more SAS devices (e.g., one SAS device using "physical links 0 and 3, another using physical link 1, and a third using physical link 2).

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

---

Author: acox\_seg  
Subject: Note  
Date: 5/11/2005 7:40:34 PM  
 ACCEPT - DONE

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: 5/11/2005 7:40:44 PM  
 ACCEPT - DONE

Figure 64 - SAS external compact receptacle connector

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

---

Author: risheffi\_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  
risheffi 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.

---

Author: acox\_seg  
Subject: Highlight  
Date: 5/8/2005 2:15:45 PM

 ACCEPT - DONE (This table does match 05-084r2. In May, the WG voted to change the external pinout to match the internal pinout, and use +-+ order for both A and B sides.)


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: 5/8/2005 5:43:26 PM

 ACCEPT - DONE (per May WG)

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: relliott  
Subject: Note  
Date: 7/23/2005 5:24:37 PM

 ACCEPT - DONE


(per Jay Neer, Molex)

SFF-8086 is not going to define which pins are short/long, so SAS needs to do so. SFF-8086 defines 3 mating dimensions, first/second/third mate. Using those dimensions, grounds are first mate; signals are third mate.

Add a column to the Mini SAS 4x connector table indicating the mating length of each pin.

---


Author: kmarks\_dell  
Subject: Note  
Date: 5/8/2005 2:16:11 PM

 ACCEPT - DONE (per May WG)

Update per T10/05-138r0.

---

Author: kmarks\_dell  
Subject: Note  
Date: 5/11/2005 7:55:17 PM

 ACCEPT - DONE (although SFF-8088 is adding two more keys and shifting these to 2,4,6 from 1,3,5)

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: 5/8/2005 2:25:37 PM


 ACCEPT - DONE

5.2.3.3.8 External compact connector keying

change: may

to: shall

---

Author: acox\_seg  
Subject: Highlight  
Date: 5/8/2005 2:32:54 PM  
 ACCEPT - DONE


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: RElliott  
Subject: Note  
Date: 5/10/2005 12:41:29 PM  
 ACCEPT - DONE

Per SCSI trade association feedback in May, make every statement regarding keys and key slots in the Mini SAS 4x connector be SHALL not may or SHOULD.

---


Author: acox\_seg  
Subject: Note  
Date: 5/8/2005 5:44:11 PM  
 ACCEPT - DONE

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: RElliott  
Subject: Note  
Date: 5/8/2005 5:44:17 PM  
 ACCEPT - DONE

May WG wants the cable connector with 3 key slots to be outside the scope of the standard.

---



Author: kmarks\_dell  
Subject: Note  
Date: 5/11/2005 11:30:03 PM  
 ACCEPT - DONE (but kept same order for the receptacles; the plugs move up into the previous section so they are ahead)

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: 5/8/2005 2:40:14 PM  
 ACCEPT - DONE (the figure was incorrect - the May WG didn't want 3 key slots on the cable plug)

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: 5/8/2005 2:40:36 PM  
 ACCEPT - DONE

Editor's Note 1


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

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/8/2005 2:35:30 PM  
 ACCEPT - DONE

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: 5/8/2005 2:39:16 PM  
 ACCEPT - DONE

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:

to:

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

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/8/2005 2:39:18 PM

 ACCEPT - DONE

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: 5/8/2005 2:39:26 PM


 ACCEPT - DONE

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

Receptacle only needs key in position 1.

---

Author: gop\_ibm

Date: 5/8/2005 2:40:21 PM

 ACCEPT - DONE (the figure was incorrect; the May WG decided the receptacle only contains one key not two)

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: 5/8/2005 2:40:29 PM

 ACCEPT - DONE

Editor's Note 2

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

---

Author: acox\_seg  
Subject: Highlight  
Date: 5/8/2005 2:41:05 PM  
 ACCEPT - DONE

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: 5/8/2005 2:40:51 PM  
 ACCEPT - DONE

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: RElliott  
Subject: Note  
Date: 5/8/2005 5:45:04 PM  
 ACCEPT - DONE

Should the subtractive receptacle and table receptacle have the middle key? slightly more robust mechanical but not necessary.

May WG Vote 1-0-(everyone else) to go to 1 key.

end: key 3

subtractive: key 5

table: key 1

The new SATA outer keys will be called key 0 and key 6.

---



Author: kmarks\_dell  
Subject: Note  
Date: 5/8/2005 5:45:16 PM  
 ACCEPT - DONE

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

Receptacle only needs key in position 5.


---

Author: gop\_ibm  
Date: 5/8/2005 5:45:47 PM  
 ACCEPT - DONE (but the figure was incorrect; WG voted to only use one key in the receptacle)

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: lohmeier\_lsi  
Date: 5/8/2005 2:41:16 PM  
 ACCEPT - DONE

Editor's Note 3

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

---

Author: kmarks\_dell  
Subject: Note  
Date: 5/11/2005 7:54:35 PM  
 ACCEPT - DONE (05-139r0 not incorporated as written. Kept tables for connectors, made figures for each cable only show the cable itself and not the boards attached to it. Added "36 circuit" wording in the internal connector definitions (and 26 in the external).)

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: 5/8/2005 2:41:44 PM

 REJECT (whole sentence deleted instead)

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 internal 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, >>

---

Author: relliott

Subject: Note

Date: 5/11/2005 7:21:37 PM


 ACCEPT - DONE

Label the "key slot" on the SAS 4i cable receptacle connector

---

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: relliott

Subject: Note

Date: 5/11/2005 7:21:44 PM


 ACCEPT - DONE

Label the "key" on the SAS 4i plug 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.

---



Author: acox\_seg  
Subject: Highlight  
Date: 5/8/2005 2:46:10 PM

**1** REJECT (vendor-specific includes 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

**1** ACCEPT - 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

---

Author: acox\_seg  
Subject: Highlight  
Date: 5/8/2005 2:46:27 PM

 REJECT (vendor-specific includes 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

 REJECT (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...."

---

Author: acox\_seg  
Subject: Note  
Date: 5/20/2005 6:39:32 PM  
ACCEPT - DONE

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: 5/22/2005 3:35:33 PM  
ACCEPT - DONE

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...."

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  
ACCEPT - 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)

---

Author: acox\_seg  
Subject: Note  
Date: 5/13/2005 9:11:29 AM  
 ACCEPT - DONE

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: 5/13/2005 9:11:35 AM  
 ACCEPT - DONE

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: goulder\_seg  
Subject: Note  
Date: 5/10/2005 5:20:41 PM  
 ACCEPT - DONE

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: 5/8/2005 5:46:19 PM  
 ACCEPT - DONE (since the May WG changed the external pinout to match this one, the rows become the same except for the Sidebands)

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  
risheffi Accepted 4/7/2005 2:57:01 PM

---


Author: bbissone\_intc  
Subject: Highlight  
Date: 5/10/2005 5:36:40 PM  
 REJECT (This was different than the external compact connector pinout. The May WG decided to change the external rather than change this one, because this leads to simpler cable assemblies)

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  
risheffi Accepted 4/7/2005 2:57:57 PM


---

Author: relliott  
Subject: Note  
Date: 5/10/2005 5:28:52 PM  
 ACCEPT - DONE  
REVIEW

Sideband numbers agreed to at the May WG and teleconferences (based on simplifying certain hybrid cable designs):

(controller side)  
A8 Sideband 7  
A9 Sideband 3  
A10 Sideband 4  
A11 Sideband 5  
B8 Sideband 0  
B9 Sideband 1  
B10 Sideband 2  
B11 Sideband 6


---

Author: relliott  
Subject: Note  
Date: 7/23/2005 5:24:54 PM  
 ACCEPT - DONE

(per Jay Neer, Molex)  
SFF-8086 is not going to define which pins are short/long, so SAS needs to do so. SFF-8086 defines 3 mating dimensions, first/second/third mate. Using those dimensions, grounds and sidebands are first mate; signals are third mate.


Add a column to each Mini SAS 4i connector table (controller and backplane) indicating the mating length of each pin.

---

Author: gop\_ibm  
Date: 5/8/2005 2:49:35 PM  
 ACCEPT - DONE (the sidebands were incorrect)


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: 5/8/2005 2:49:44 PM  
 ACCEPT - DONE

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

---

Author: acox\_seg  
Subject: Highlight  
Date: 5/8/2005 2:50:09 PM  
 REJECT (vendor-specific includes not using)

#### 5.2.3.4.7 SAS internal compact 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: relliott  
Subject: Cross-Out  
Date: 4/19/2005 8:59:58 PM  
 ACCEPT - DONE


Delete "how"

---

Author: gop\_ibm  
Date: 5/8/2005 2:50:42 PM  
 ACCEPT - DONE (although another IBM comment insists the signal assignments are correct, this comment was correct - this table was messed up)

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: bbissonne\_intc  
Subject: Note  
Date: 5/8/2005 2:51:31 PM  
 ACCEPT - DONE (since the external pinout was changed by the May WG to match this one, the rows become the same except for the sidebands)

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  
risheffi Accepted 4/7/2005 2:58:38 PM


---

Author: relliott\_hpq  
Subject: Note  
Date: 5/8/2005 2:52:06 PM  
 ACCEPT - DONE (fixed to match the figure. 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: relliott  
Subject: Note  
Date: 5/10/2005 5:27:46 PM  
 ACCEPT - DONE  
REVIEW

Sideband numbers agreed to at the May WG and teleconferences (based on simplifying certain hybrid cable designs):


(Backplane side)  
A8 Sideband 0  
A9 Sideband 1  
A10 Sideband 2  
A11 Sideband 6  
B8 Sideband 7  
B9 Sideband 3  
B10 Sideband 4  
B11 Sideband 5

---

Author: gop\_ibm  
Date: 5/8/2005 2:52:15 PM  
 REJECT (the IBM comment at the top of the table says the table is broken, not "correct." 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: lohmeier\_lsi  
Date: 5/8/2005 2:52:24 PM  
 ACCEPT - DONE

Editor's Note 5

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

---

Author: acox\_seg  
Subject: Highlight  
Date: 5/8/2005 2:52:43 PM

 REJECT (vendor-specific includes 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: 5/8/2005 2:54:12 PM

 ACCEPT - DONE (sections reordered so internal + internal wide are both in the same area. Connectors renamed per STA recommendation. Sentences that say things like "A SAS initiator device shall use an xyz connector" all removed, since they were incomplete and incorrect.)

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.

---



Author: kmarks\_dell  
Subject: Highlight  
Date: 4/24/2005 11:07:53 AM

**1** 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: bbissonne\_intc  
Subject: Comment on Text  
Date: 5/8/2005 5:47:58 PM

**1** REJECT (originally, 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. However, the host plug details were removed altogether after the May WG to avoid redundancy in the cable figures.)

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

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/24/2005 11:08:08 AM

1 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 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"

---

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: 5/10/2005 12:24:43 PM  
 ACCEPT - DONE

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: 5/10/2005 12:25:14 PM  
 ACCEPT - DONE

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.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 4/28/2005 7:34:06 PM  
ACCEPT - DONE

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

---

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".

---

Author: relliott\_hpq

Subject: Note

Date: 5/10/2005 12:25:53 PM

ACCEPT - DONE (this figure was correct. Deleting controller/backplane connector details from the figure to avoid possibility of problems.)

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

Subject: Note

Date: 5/10/2005 12:26:58 PM

ACCEPT - DONE (without the informative annex)

Define:

1. controller table
2. backplane table
3. figure for cables (not showing controller to cable or backplane to cable usage of the cable)

Cables include:

8470 to 8470

8470 to 8088

8088 to 8088

8484 to 8484

8087 to 8087

8484 to 8087

fanout 8484 to SATA hosts

fanout 8484 to 8482 (SAS receptacles)

fanout 8087 to SATA hosts

fanout 8087 to 8482 (SAS receptacles)

maybe an informative annex:

show each controller/backplane connector attached to each of those cables

hybrid external to internal is outside the scope of the standard.

---

Author: RElliott

Subject: Note

Date: 5/10/2005 12:27:29 PM

ACCEPT - DONE (in the hybrid cable figure, the other two are "not defined by this standard")

for 8087 to 8484 connectors, must define how to map 6 to 8 sidebands

---

Author: relliott\_hpq

Subject: Note

Date: 5/10/2005 12:27:52 PM

ACCEPT - DONE (sidebands are the only difference.)

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: 5/10/2005 12:28:15 PM

ACCEPT - DONE (switched to weird SIDEBAND numbering scheme based on hybrid cables)

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: RElliott

Subject: Note

Date: 5/10/2005 12:29:50 PM

REJECT (went with weird signal assignments based on hybrid cable; kept SIDEBAND0-7 nomenclature)

8484 controller connector has:

SIDEBAND0 on pin 14 (next to channel 1)

...

SIDEBAND5 on pin 19 (next to channel 2)

8087 controller:

A8 SIDEBANDY0

A9 SIDEBANDY1

A10 SIDEBANDY2

A11 SIDEBANDY3

Backplane:

SIDEBANDZ0

SIDEBANDZ1

SIDEBANDZ2

SIDEBANDZ3

B8 SIDEBANDZ0 SIDEBANDY0  
B9 SIDEBANDZ1 SIDEBANDY1  
B10 SIDEBANDZ2 SIDEBANDY2  
B11 SIDEBANDZ3 SIDEBANDY3

Hybrid cable connects these electrically:

8484 side (e.g. controller)	8087 side (e.g. backplane)
pin 14 (e.g. SIDEBAND0)	A8 (e.g. SIDEBANDZ0)
pin 15 (e.g. SIDEBAND1)	A9 (e.g. SIDEBANDY0)
pin 16 (e.g. SIDEBAND2)	A10 (e.g. SIDEBANDZ1)
pin 17 (e.g. SIDEBAND3)	A11 (e.g. SIDEBANDY1)
pin 18 (e.g. SIDEBAND4)	B8 (e.g. SIDEBANDZ2)
pin 19 (e.g. SIDEBAND5)	B9 (e.g. SIDEBANDY2)
<none>	B10 (e.g. SIDEBANDZ3)
<none>	B11 (e.g. SIDEBANDY3)


8087 side (e.g. controller)	8484 side (e.g. backplane)
B8 (e.g. SIDEBAND0)	pin 19 (e.g. SIDEBAND 0)
A8 (e.g. SIDEBAND1)	pin 18
B9 (e.g. SIDEBAND2)	pin 17
A9 (e.g. SIDEBAND3)	pin 16
B10 (e.g. SIDEBAND4)	pin 15
A10 (e.g. SIDEBAND5)	pin 14
B11 (e.g. SIDEBAND6)	<none>
A11 (e.g. SIDEBAND7)	<none>

---

Author: bbissonne\_intc

Subject: Note

Date: 5/10/2005 12:42:35 PM

 REJECT (external pinouts changed instead)

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: 5/10/2005 12:30:55 PM

 REJECT (sidebands were wrong)


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: 5/10/2005 12:31:03 PM

 ACCEPT - DONE

Editor's Note 6

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


---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/10/2005 12:42:58 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: 5/10/2005 12:42:54 PM  
 REJECT (changed external instead. This connector has a benefit in that lane numbers don't change.)

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: 5/10/2005 7:34:38 PM  
 REJECT (sidebands were wrong)

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: 5/10/2005 12:32:04 PM  
 ACCEPT - DONE

Editor's Note 7

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


---



Author: bbissonne\_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

---

Author: relliott\_hpq

Subject: Note

Date: 5/10/2005 12:33:20 PM

 REJECT (label them "signal return" rather than "ground" instead, with text describing that they might be connected together. Shown unconnected in hybrid/fanout cables, or connected to peers in symmetric non-hybrid cables.)

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: 5/29/2005 4:00:34 PM

 ACCEPT - DONE (this one didn't really change, except ground wiring details removed)

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


---

Author: gop\_ibm  
Date: 5/10/2005 12:34:26 PM  
 ACCEPT - DONE

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: lohmeier\_lsi  
Date: 5/10/2005 12:34:32 PM  
 ACCEPT - DONE

Editor's Note 8

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

---


Author: relliott  
Subject: Note  
Date: 5/10/2005 12:35:28 PM  
 REJECT (would have agreed, but controller connector details removed entirely just leaving the cable connector).

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.)

---

Author: relliott  
Subject: Note  
Date: 5/10/2005 12:35:38 PM


 REJECT (would have agreed, but controller connector details removed entirely just leaving the cable connector).

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: bbissonne\_intc  
Subject: Note  
Date: 5/10/2005 12:43:20 PM


 ACCEPT - DONE (but RT+/- not changed in this connector - changed in external instead. Changed the A/B interleaving to reduce crossover lines.)

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: 5/10/2005 12:36:48 PM


 REJECT (sidebands were wrong)

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: lohmeier\_lsi  
Date: 5/10/2005 12:36:55 PM

 ACCEPT - DONE

Editor's Note 9


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

---

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)

5.2.4.3.5 SAS internal compact wide cable keying

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


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

---

Author: acox\_seg

Subject: Highlight

Date: 5/10/2005 12:37:42 PM

 REJECT (this section is really for external cables, not internal compact wide. Moved and fixed 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: 5/10/2005 12:37:44 PM


 ACCEPT - DONE (move and fixed 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: gshoulder\_seg

Subject: Note

Date: 5/10/2005 12:37:54 PM

 ACCEPT - DONE

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: lohmeier\_Isi

Date: 5/10/2005 12:38:04 PM

 ACCEPT - DONE

Editor's Note 10


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

---

Author: kmarks\_dell

Subject: Cross-Out

Date: 5/10/2005 12:38:21 PM

 ACCEPT - DONE (moved and fixed terms rather than deleted them, 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: 5/10/2005 12:38:40 PM

 ACCEPT - DONE

Editor's Note 11

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

---

Author: risheffi\_intc  
Subject: Highlight  
Date: 5/21/2005 12:00:25 PM

**T** REJECT (the maximum TDR rise time row is the only one with a difference, and that is being removed per another Intel comment)

## 5.2.5 Backplanes

Table 30: Column heading:

Delete the 1.5 Gbps column. The assumption is that all cables/connectors/backplanes are 3G capable, and so must pass the 3G spec.

Applies to tables 31 & 32 as well

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

---

Author: gop\_ibm  
Date: 4/24/2005 11:34:50 AM

**T** 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: bbissonne\_intc  
Subject: Comment on Text  
Date: 5/20/2005 6:42:45 PM

**T** ACCEPT - DONE (remove this row in each table. Apply note b to every line in the table - move a,b,c,d footnotes up to Requirement line in table 30. Add "The equivalent maximum TDR rise time from 20% to 80% shall be 70 ps." to the start of note b in each table)

## 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  
risheffi Accepted 4/7/2005 3:30:52 PM

---

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 11:17:43 PM

**T** ACCEPT - DONE (per 5/10 SAS phy call)

Change "Media (backplane or cable)" to "Bulk cable or backplane"


and "media' to "bulk cable or backplane" throughout the footnotes

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 11:19:21 PM

**T** ACCEPT - DONE

In each of the mated connector rows, change the note c reference to a new note reference, containing the last sentence of note c.

---

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 11:18:07 PM  
 ACCEPT - DONE (per 5/10 SAS phy call)


Change "Media (cable)" to "Bulk cable"  
  
and "media" to "bulk cable" throughout the footnotes

---

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 11:19:50 PM  
 ACCEPT - DONE


In the mated connector row, change the note c reference to a new note reference, containing the last sentence of note c.

---

Author: RElliott  
Subject: Highlight  
Date: 5/21/2005 11:59:57 AM  
 ACCEPT - DONE (with 5.3 rather than 5.3.3)

Note f is the wrong note for this.  
  
Insertion loss(new footnote) see 5.3.3  
  
(new footnote) The external cable shall comply with the rules for a TxRx connection for a CT compliance point as defined in 5.3.3.

---

Author: RElliott  
Subject: Highlight  
Date: 5/21/2005 12:00:09 PM  
 ACCEPT - DONE (replaced by reference to 5.3)

16 dB is questionable

---



Author: relliott  
Subject: Highlight  
Date: 5/21/2005 11:15:25 AM  
 ACCEPT - DONE ("from any single aggressor pair offset by..." should solve the issues, per May 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: 5/21/2005 12:00:32 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: 7/23/2005 4:30:30 PM  
 ACCEPT - DONE (05-251r0 adds one combined total near-end crosstalk number)

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  
Subject: Note  
Date: 7/23/2005 4:35:05 PM  
 ACCEPT - DONE

Incorporate 05-251r0 which provides crosstalk requirements for the Mini SAS cables (internal and external)




---

Author: relliott\_hpq

Subject: Highlight

Date: 5/10/2005 7:39:31 PM

 ACCEPT - DONE (increase to 50 ps; see Tyco comment)

5.2.6 Impedance and media specifications  
Table 31 external cables

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


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

---

Author: afan\_tyco

Subject: Note

Date: 5/20/2005 6:42:20 PM

 ACCEPT - DONE (Raised to 50 ps. The budget from transmitter to receiver is 15 ps to 75 ps, with a difference of 60 ps. Ashlie says 60 ps is fine and 50 ps is acceptable. The May SAS phy WG felt it prudent to leave 10 ps of slop in the number.

The WG also discussed adding a footnote mentioning that common mode emissions play into this - e.g. the common mode voltage shall not be greater than 150 mV. Deferred to SAS-2.

A better way to specify this would be to specify a full set of s parameters for the cables, including maximum common mode emissions (Scd). Deferred to SAS-2.)

#1

Table 31 (for External Cables), page 131:  
Maximum Intra-pair skew: 20ps

Comments: Compare to Table 32 (For Internal Wide Cables), 20ps is not practically possible. External cable is expected to be several times longer than internal cables, but the skew budget is not.


Suggest: Need to propose a reasonable budget or leave it off the spec until a reasonable budget is determined.

---

Author: relliott

Subject: Highlight

Date: 5/21/2005 11:49:58 AM

 ACCEPT - DONE

ground s/b SIGNAL GROUND

---

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 11:18:21 PM  
ACCEPT - DONE (per 5/10 SAS phy call)

Change "Media (cable)" to "Bulk cable"  
  
and "media" to "bulk cable" throughout the footnotes

---

Author: relliott  
Subject: Highlight  
Date: 5/11/2005 11:19:58 PM  
ACCEPT - DONE

In each of the mated connector rows, change the note c reference to a new note reference, containing the last sentence of note c.

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 11:32:22 AM  
ACCEPT - DONE  
REVIEW

g s/b e  
  
g discusses the far-end of the mated cable assembly, which doesn't really apply to "mated connectors." e is the footnote used for imbalance in the media (cable) section above.

---

Author: RElliott  
Subject: Highlight  
Date: 5/21/2005 12:02:11 PM  
ACCEPT - DONE  
c, d footnotes are wrong - delete them

note f belongs here instead defining the frequency range. 10 MHz is fine for now as the bottom of the measurement, although it differs from the SDD21 baseline in chapter 5.3.  
  
Add "The internal wide cable is part of a TxRx connection that complies with the requirements for IT compliance points in 5.3.3."

---

Author: relliott  
Subject: Note  
Date: 7/23/2005 4:30:45 PM  
ACCEPT - DONE (05-251r0 adds one combined total near-end crosstalk number)

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: 5/10/2005 7:38:32 PM  
ACCEPT - DONE (keep the row here, keep the value 10 ps for internal wide, add footnotes h and k from the external table)

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: relliott  
Subject: Highlight  
Date: 5/21/2005 11:54:37 AM  
ACCEPT - DONE

ground s/b SIGNAL GROUND

---

Author: rlsheffi\_intc  
Subject: Cross-Out  
Date: 5/21/2005 2:07:52 PM  
REJECT (it doesn't matter if the connector supplier says the connector is compliant if the board or cable assembly it is on is not compliant. That's what the "that contain or comprise" phrase is covering)

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: risheffi\_intc

Subject: Highlight

Date: 5/10/2005 8:13:42 PM

**T**ACCEPT - DONE (per May SAS phy WG, replaced entire paragraph with "Signal characteristics for compliance points are measured at physical positions called probe points in a test load (see 5.3.2). Measurements at the probe points in a test load approximate measurements at the compliance point in the actual TxRx connection. Some components in the test load may be de-embedded as described in B.4.")

The remaining text will be left in 5.3.2 (where a copy of it already is anyway: "Probe points identify the position in the test load where the signal properties are measured but do not imply that physical probing is used for the measurement. Physical probing may be disruptive to the signals and should not be used unless verified to be non-disruptive.")

#### 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

risheffi Accepted

4/14/2005 11:05:52 PM


---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 10:04:23 PM  
 ACCEPT - DONE

Delete "(e.g., with a SAS plug (see 5.2.3.2.1), SAS internal cable receptacle (see 5.2.3.2.2), SAS internal cable SATA-style signal cable receptacle (see ATA/ATAPI-7 V3), SAS backplane receptacle (see 5.2.3.2.3), SAS internal wide cable receptacle (see 5.2.3.4.2), SAS internal wide plug (see 5.2.3.4.3), SAS internal compact wide cable plug (see 5.2.3.4.5), or SAS internal compact wide receptacle (see 5.2.3.4.6))"


since internal and internal wide are all now under the same "internal" section.

---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 10:04:56 PM  
 ACCEPT - DONE


Delete "(e.g., with a SAS external cable plug (see 5.2.3.3.2), a SAS external receptacle (see 5.2.3.3.3), a SAS external compact cable plug (see 5.2.3.3.5), or a SAS external compact receptacle (see 5.2.3.3.6))." since internal and external are each their own sections now, so there should be no confusion what an external connector is.

---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 10:06:50 PM  
 ACCEPT - DONE

Delete "with SAS external connectors."

---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 10:07:02 PM  
 ACCEPT - DONE

Delete "with SAS internal connectors."

---


Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 10:07:17 PM  
~~ACCEPT - DONE~~  
Delete "with SAS internal connectors."

---

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: relliott

Subject: Cross-Out

Date: 5/11/2005 10:07:29 PM


 ACCEPT - DONE

Delete "with SAS internal connectors."

---

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 >>


---



Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 10:07:48 PM  
 ACCEPT - DONE


Delete "with SAS internal connectors."

---

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: 5/10/2005 8:14:31 PM  
 ACCEPT - DONE (this wording deleted from 5.3.1, replaced there by other wording (see Intel comment). So, it is now unique here.)


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: RElliott  
Subject: Note  
Date: 5/10/2005 5:39:35 PM  
 ACCEPT - DONE


DC s/b D.C.

---

Author: RElliott  
Subject: Oval  
Date: 5/10/2005 6:18:55 PM  
 ACCEPT - DONE


In each test load figure, show the red dot representing the compliance point left of the DC blocks (right of the connector).  
  
Dot must cover both + and -.

---

Author: RElliott  
Subject: Highlight  
Date: 5/10/2005 6:19:04 PM  
 ACCEPT - DONE


After "Probe points" add "(e.g., SMA connector, with termination provided by the test equipment)" in each of the test load figures

---

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"

---

Author: relliott  
Subject: Note  
Date: 5/10/2005 5:39:32 PM  
 ACCEPT - DONE


DC s/b D.C.

---

Author: relliott  
Subject: Note  
Date: 5/10/2005 5:41:36 PM  
 ACCEPT - DONE


DC s/b D.C.

---

Author: relliott  
Subject: Note  
Date: 5/29/2005 4:06:57 PM  
 ACCEPT - DONE (rather than strictly following significant digit rules, kept one decimal point everywhere)  
REVIEW

There are too many significant digits in some of the Sdd21 equations. 10.884 dB doesn't make sense when the Sdd21 equation uses 6.5, 2.0, 3.3.


---

Author: relliott  
Subject: Rectangle  
Date: 5/21/2005 2:47:22 PM  
 ACCEPT - DONE

Format this "where:" list per other IBM comments

"f is the"

---

Author: relliott  
Subject: Rectangle  
Date: 5/21/2005 2:47:32 PM  
 ACCEPT - DONE

Format this "where:" list per other IBM comments

"f is the"

---

Author: relliott  
Subject: Rectangle  
Date: 5/21/2005 2:47:45 PM  
 ACCEPT - DONE

Format this "where:" list per other IBM comments

"f is the"


---

Author: relliott  
Subject: Rectangle  
Date: 5/21/2005 2:47:55 PM  
 ACCEPT - DONE

Format this "where:" list per other IBM comments


"f is the"

---

Author: relliott  
Subject: Note  
Date: 5/10/2005 5:41:56 PM  
 ACCEPT - DONE

DC s/b D.C.

---


Author: blye\_pmcs  
Subject: Note  
Date: 7/15/2005 2:44:05 PM  
 ACCEPT - DONE (per May phy WG. Incorporated 05-194r0 which has the new equation. Per July WG discussion, limited each number to one decimal point.)

1. Barry will change to be flat after 3 GHz
  2. maybe add a note saying "The low-loss TCTF is designed for 3 Gbps SATA applications and ..."
  3. Equation as written has a lot more loss than the graph. The graph represents what was intended. Barry will provide corrected equation.
- )

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).


1. Should the Low-loss TCTF be similarly specified with kinks at 1,5GHz and 3,0GHz?
  2. 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.
  3. Although probably not relevant to this discussion, this TCTF also allows more loss than that allowed by the corresponding SATA2 cable specification.
- 

Author: relliott  
Subject: Rectangle  
Date: 5/21/2005 2:48:09 PM  
 ACCEPT - DONE

Format this "where:" list per other IBM comments


"f is the"

---

Author: RElliott  
Subject: Cross-Out  
Date: 5/10/2005 6:20:57 PM  
 ACCEPT - DONE


Delete "over which a bit error ratio (BER) of < 10<sup>-12</sup> is achieved." Keep the BER objective stated only one place.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/10/2005 6:33:54 PM  
 ACCEPT - DONE ("The TxRx connection shall support a bit error ratio (BER) that is less than 10<sup>-12</sup> (i.e., fewer than one bit error per 10<sup>12</sup> bits).")

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<sup>-12</sup>.


---

Author: rlsheffi\_intc  
Subject: Highlight  
Date: 5/10/2005 6:33:48 PM  
 ACCEPT - DONE ("The TxRx connection shall support a bit error ratio (BER) that is less than 10<sup>-12</sup> (i.e., fewer than one bit error per 10<sup>12</sup> bits).")

**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: RElliott  
Subject: Note  
Date: 7/24/2005 3:18:39 PM  
 ACCEPT - DONE  
REVIEW

The TxRx connection is not required to follow the TCTF after the knee (1.5 or 3 GHz depending on the physical link rate of interest). Should also kick in at some minimum (100 MHz) not 0 MHz.


Per July WG, change as follows:

- 1) Change reference in table 38 from section "5.3" to section "5.3.3"
  - 2) In item "a" of section 5.3.3, remove reference to table 99
  - 3) In item "a" of section 5.3.3, add text "over the frequency range of 50 to 3000 MHz".
  - 4) In item "b" of section 5.3.3, add text "over the frequency range of 50 to 3000 MHz".
- 

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/22/2005 8:57:38 AM  
 ACCEPT - DONE

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

---

Author: RElliott  
Subject: Note  
Date: 6/11/2005 9:48:07 AM  
 ACCEPT - DONE (per May phy WG. Incorporated 05-184r0 which adds the knee.)

this should be limited to up to the knee in the figures (e.g. 3 GHz for 3 Gbps)

- a) the loss of the TCTF test load plus ISI for all frequencies from 50 MHz to 3000 MHz
- b) ... from 50 MHz to 3000 MHz...

(50 rather than 10 because the TCTF equations don't go that low)

---



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: relliott  
Subject: Highlight  
Date: 5/11/2005 9:59:48 PM  
 ACCEPT - DONE

Per 5/10 SAS phy concall:

Change media to TxRx connection

---



Author: mevans\_mxo  
Subject: Highlight  
Date: 5/10/2005 12:45:34 PM  
 ACCEPT - DONE (per May WG)

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

---


Author: relliott  
Subject: Note  
Date: 7/24/2005 3:19:21 PM  
 ACCEPT - DONE

Add pointers to 5.3.6.1 and 5.3.7.1 pointing to where the A.C. coupling rules are.

coupling vs. coupled makes it hard to find too.

Add to footnote a: "A.C. coupling requirements for transmitter devices are described in 5.3.6.1. A.C. coupling requirements for receiver devices are described in 5.3.7.1."


---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 11:54:48 AM  
 ACCEPT - DONE

ground s/b SIGNAL GROUND

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:24:48 AM

 ACCEPT - DONE  
REVIEW

Change "a SATA device is attached" to "SATA is supported"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:25:06 AM

 ACCEPT - DONE

Change "a SATA device is not attached" to "SATA is not supported"

---

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: 6/25/2005 4:24:10 PM

 ACCEPT - DONE (Reworded quite a bit of text to make sense of this. This originated in T11 proposal 00-051v0 for FC-PI).

"With impedance measured using amplitude in units of r (i.e., the reflection coefficient, a dimensionless unit) and duration in units of time, the area of the impedance dip caused by this capacitance is the receiver termination time constant. The receiver termination time constant shall not be greater than the values shown in this table.


An approximate value for the receiver termination time constant is given by the product of the amplitude of the dip in units of r and the width of the dip in units of time, as measured at the half amplitude point. The amplitude is defined as the difference in the reflection coefficient between the reflection coefficient at the nominal impedance and the reflection coefficient at the minimum impedance point.)

#### 5.3.3 General electrical characteristics

This << impedance dip (amplitude as r, the reflection coefficient, and duration in time) caused >> should be << impedance dip (i.e., amplitude as r, the reflection coefficient, and duration in time) caused >>

---


Author: relliott  
Subject: Note  
Date: 5/10/2005 6:58:42 PM

 ACCEPT - DONE

In note f (used by maximum differential impedance imbalance and receiver termination time constant), add some paragraph breaks before "An approximate value..." and "The value of the receiver device excess..."

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 11:54:55 AM

 ACCEPT - DONE

ground s/b SIGNAL GROUND

---



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: 5/10/2005 7:22:33 PM  
ACCEPT - DONE (as two sentences: "Transmitter device transients are measured at nodes  $V_P$  and  $V_N$  with respect to GROUND on the test circuit shown in figure 101 during all power state and mode transitions. Receiver device transients are measured at nodes  $V_P$  and  $V_N$  with respect to GROUND on the test circuit shown in figure 102 during all power state and mode transitions.")

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: relliott  
Subject: Highlight  
Date: 5/11/2005 9:59:08 PM  
ACCEPT - DONE

Move the remnants of "5.3.5 Electrical TxRx connections" into 5.3.3.

---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 9:56:24 PM  
ACCEPT - DONE

Delete "TxRx connections may be divided into TxRx connection segments. In a single TxRx connection individual TxRx connection segments may be formed from differing media and materials, including traces on printed wiring boards and optical fibers. This subclause applies only to TxRx connection segments that are formed from electrically conductive media."

---

Author: bbissone\_intc  
Subject: Inserted Text  
Date: 5/21/2005 2:11:02 PM  
REJECT (whole paragraph deleted instead)

**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  
Date: 5/11/2005 10:58:37 PM  
REJECT (whole paragraph deleted instead)

**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

---


Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 9:56:46 PM

 ACCEPT - DONE

Delete "electrical"


---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 9:57:02 PM

 ACCEPT - DONE

Delete "that are composed entirely of electrically conducting media"


---

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.


---

Author: relliott  
Subject: Note  
Date: 5/22/2005 11:21:40 AM  
 ACCEPT - DONE  
REVIEW

Change "0,5 x additional sinusoidal jitter" to "ASJ/2", since that's how it is expressed in figure 102.

Change "additional sinusoidal jitter" to "ASJ" and include ASJ in the list of terms after the "where":  
"ASJ is the additional sinusoidal jitter defined in figure 103"


---

Author: relliott  
Subject: Note  
Date: 5/22/2005 11:15:55 AM  
 ACCEPT - DONE  
REVIEW

X2op should just be X2 in this equation. There is no X2op in figure 102.


(could also rename X2 to X2op in the figure, but then Z2 and -Z2 would need to be renamed too)

---


Author: gop\_ibm  
Date: 5/21/2005 2:48:26 PM  
 ACCEPT - DONE

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: 5/21/2005 2:48:53 PM  
 REJECT (instead reformatted in borderless table format per IBM comment)  
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: 5/10/2005 7:23:49 PM  
 REJECT (per May phy WG: not important enough to bother with)  
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: relliott  
Subject: Note  
Date: 7/23/2005 4:26:58 PM  
 ACCEPT - DONE

Reformat the A.C. coupling paragraphs as an unordered list so they stand out better:  
"A.C. coupling requirements for transmitter devices are as follows:  
a) transmitter devices using inter-enclosure TxRx connections (i.e., attached to CT compliance points) shall be A.C. coupled to the interconnect through a transmission network;  
b) transmitter devices using intra-enclosure TxRx connections (i.e., attached to IT compliance points) that support SATA shall be A.C. coupled to the interconnect through a transmission network; and  
c) transmitter devices using intra-enclosure TxRx connections (i.e., attached to IT compliance points) that do not support SATA may be A.C. or D.C. coupled."


---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:26:16 AM  
 ACCEPT - DONE  
Change "support being attached to SATA devices" to "support SATA"


---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 7:23:30 PM  
 ACCEPT - DONE  
Change "do not support being attached to SATA devices" to "do not support SATA"

---

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)".


---

Author: risheffi\_intc  
Subject: Cross-Out  
Date: 6/11/2005 9:47:57 AM  
 ACCEPT - DONE

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


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

---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 7:46:02 PM  
 ACCEPT - DONE


Change "skew" to "intra-pair skew"

---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 7:49:00 PM  
 ACCEPT - DONE


Change "skew" to "intra-pair skew"

---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 7:46:10 PM  
 ACCEPT - DONE

Change "skew" to "intra-pair skew"

---

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.

---

Author: risheffi\_intc  
Subject: Cross-Out  
Date: 5/22/2005 3:56:50 PM


 REJECT (per the May SAS phy WG. Since different test loads are used by different tables, it is helpful to list them in the table names)


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  
risheffi Accepted 4/14/2005 11:04:10 PM

---

Author: risheffi\_intc  
Subject: Cross-Out  
Date: 5/22/2005 3:56:47 PM


 ACCEPT - DONE (per May phy WG)

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

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

---

Author: gop\_ibm  
Date: 5/1/2005 1:28:12 AM

 ACCEPT - DONE ("if SATA is not supported")

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: 5/1/2005 1:28:27 AM

 ACCEPT - DONE ("if SATA is supported")

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: 5/1/2005 1:28:19 AM

 ACCEPT - DONE ("if SATA is not supported")

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: gop\_ibm  
Date: 5/1/2005 1:28:35 AM

 ACCEPT - DONE ("if SATA is supported")

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: relliott  
Subject: Highlight  
Date: 5/10/2005 7:46:22 PM

 ACCEPT - DONE

Change "skew" to "intra-pair skew"

---

Author: relliott  
Subject: Highlight

Date: 5/1/2005 1:38:10 AM

ACCEPT - DONE

Change "attaching a SATA device is not supported" to "SATA is not supported"

---

Author: relliott

Subject: Highlight

Date: 5/1/2005 1:38:36 AM

ACCEPT - DONE

Change "attaching a SATA device is supported" to "SATA is supported"

---

Author: kmarks\_dell

Subject: Highlight

Date: 5/30/2005 5:14:46 PM

ACCEPT - DONE (change to 240 mV, not "see SATAII-PHY", in both cases. If the phy supports either SAS or SATA being attached, then it must deliver 240 mV to make the SAS receiver happy. Only if it ONLY supported SATA would 225 mV be the proper number, but this standard doesn't define such an environment. Also, 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: relliott

Subject: Highlight

Date: 5/22/2005 2:30:24 PM

ACCEPT - DONE

Change "jitter output requirements" to "jitter requirements" so the definition of "jitter output" can be dropped in chapter 3

---

Author: relliott

Subject: Highlight

Date: 5/10/2005 7:49:13 PM

ACCEPT - DONE

Change "skew" to "intra-pair skew"

---

Author: relliott

Subject: Highlight

Date: 5/10/2005 7:46:34 PM

ACCEPT - DONE

Change "skew" to "intra-pair skew"

---

Author: mevans\_mxo

Subject: Highlight

Date: 5/10/2005 12:44:52 PM

ACCEPT - DONE (per May WG)

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 attaching to a SATA device is supported.

Note f allows 3,0Gbps ALIGN(0) dwords but does not allow 1,5 Gbps D24.3 characters.



Suggestion is to apply note g instead.

---

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: bbissonne\_intc  
Subject: Comment on Text  
Date: 5/22/2005 3:57:19 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).

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

---

Author: risheffi\_intc  
Subject: Cross-Out  
Date: 5/22/2005 3:57:22 PM


 REJECT (per the May SAS phy WG. Since different test loads are used by different tables, it is helpful to list them in the table names)

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  
risheffi Accepted 4/14/2005 11:04:19 PM

---

Author: risheffi\_intc  
Subject: Cross-Out  
Date: 5/22/2005 3:58:07 PM

 ACCEPT - DONE

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

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

---


Author: relliott  
Subject: Note  
Date: 5/22/2005 11:41:06 AM

 ACCEPT - DONE

Table 39  
Add a Units column and delete the "Units are in UI." sentence from the footnote

---


Author: gop\_ibm  
Date: 5/7/2005 3:07:25 PM

 ACCEPT - DONE (added comments for new acronyms in chapter 3)

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

---


Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:32:19 AM

 ACCEPT - DONE

Change "being attached to SATA devices" to "SATA"

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/22/2005 4:22:36 PM


 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  
Subject: Cross-Out  
Date: 5/22/2005 4:00:45 PM

 ACCEPT - DONE

Delete "if the 1,5 Gbps transfer rate is supported." since SATA 3 Gbps is now supported in SAS-1.1.

---

Author: relliott\_hpq  
Subject: Note  
Date: 5/22/2005 4:14:37 PM

 REJECT (SATA IO will define a SAS level OOB burst as a transient that their devices must tolerate. Bill Bissonette (Intel) to work that through SATA IO. Since SAS receivers only require 240 mV (although SATA receivers tolerate 225 mV) there is a 15 mV window where SAS receivers might need more signal level than SATA, thus toggling could help. Wording changes noted in additional comments.)

5.3.7.5 Transmitter device signal output levels for OOB signals

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

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

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

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

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 4:05:30 PM  
ACCEPT - DONE

Move this down after COMINIT has been thoroughly discussed:

"As soon as COMSAS has been exchanged, the transmitter device shall increase its transmit levels to the SAS voltage levels specified in table 37 (see 5.3.7) and table 38 (see 5.3.7.3)."

---

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

---

Author: relliott  
Subject: Note  
Date: 5/22/2005 4:25:26 PM  
ACCEPT - DONE (with "signal level" changed to "signal output level" throughout this subclause, too)  
REVIEW

Section reworded as:

Transmitter devices supporting SATA shall use SATA Gen1i or Gen2i signal levels (see SATAII-PHY) during the first OOB sequence (see 6.7) after a power on or hard reset. If the phy does not receive COMINIT within a hot-plug timeout (see 6.7.5), the transmitter device shall increase its transmit levels to the SAS signal levels specified in table 45 (see 5.3.6) and table 46 (see 5.3.6.3) and perform the OOB sequence again. If no COMINIT is received within a hot-plug timeout of the second OOB sequence, the transmitter device shall initiate another OOB sequence using SATA Gen1i or Gen 2i signal levels. The transmitter device shall continue alternating between transmitting COMINIT using SATA Gen1i or Gen 2i signal levels and transmitting COMINIT with SAS signal levels until the phy receives COMINIT.

If the phy both transmits and receives COMSAS (i.e., a SAS phy or expander phy is attached), the transmitter device shall set its transmit levels to the SAS signal levels. If it had been using SATA Gen1i or Gen2i signal levels, this mode transition (i.e., output voltage change) may result in a transient (see 5.3.4) during the idle time between COMSAS and the SAS speed negotiation sequence (see 6.7.4.2).

If the transmitter device is using SAS signal levels and the phy does not receive COMSAS (i.e., a SATA phy is attached), the transmitter device shall set its transmit levels to the SATA Gen1i or Gen 2i signal levels and restart the OOB sequence.

Transmitter devices that do not support SATA shall transmit OOB signals using SAS 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: Highlight  
Date: 5/1/2005 1:33:14 AM  
ACCEPT - DONE  
Change "SATA device is detected rather than a SAS target device" to "SATA phy is detected"


---

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

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:32:49 AM

 ACCEPT - DONE

Change "being attached to SATA devices" to "SATA"

---


Author: relliott  
Subject: Note  
Date: 7/23/2005 4:28:06 PM

 ACCEPT - DONE

Reformat the A.C. coupling sentence so it stands out better. Separate from the impedance sentence and write as:  
"A.C. coupling requirements for receiver devices are as follows:  
a) all receiver devices (i.e., attached to IR or CR compliance points) shall be A.C. coupled to the interconnect through a receive network."

---


Author: relliott  
Subject: Highlight  
Date: 5/10/2005 6:42:03 PM

 ACCEPT - DONE

Change "within a BER of 10-12" to "within the required BER (see 5.3.3)" to avoid restating the BER requirement throughout the standard

---


Author: relliott  
Subject: Highlight  
Date: 5/22/2005 4:24:56 PM

 ACCEPT - DONE

"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"

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 4:26:14 PM  
ACCEPT - DONE ("when the signal has")

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: 5/10/2005 6:41:31 PM  
ACCEPT - DONE

Change "within the BER objective" to "within the required BER (see 5.3.3)"

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 4:29:56 PM  
ACCEPT - DONE ("with the common-mode signal Vcm as specified in table 36.")

"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: 5/22/2005 4:26:35 PM  
ACCEPT - DONE (change to "as")

Delete "that is"?

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 4:26:30 PM  
ACCEPT - DONE

Delete "the"?

---

Author: gop\_ibm  
Date: 5/22/2005 4:27:27 PM  
ACCEPT - DONE ("Jitter tolerance is illustrated in figure 102 for....")

5.3.8.1 Receiver device characteristics overview  
This << The jitter tolerance figure is listed in figure 102 for all >> should be << The jitter tolerance value is listed in figure 102 for all >>

---

Author: gop\_ibm  
Date: 5/22/2005 4:27:51 PM  
ACCEPT - DONE ("Figure 102 assumes...")

5.3.8.1 Receiver device characteristics overview  
This << The figure given assumes that any external >> should be << The value given assumes that any external >>

---

Author: RElliott  
Subject: Highlight  
Date: 5/22/2005 4:29:39 PM  
ACCEPT - DONE (as "Jitter tolerance for receiver device compliance points...")

fix Rx compliance points

---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 4:28:09 PM  
ACCEPT - DONE ("receiver device")

Is "receiving phy" the right term?

---


Author: rlsheffi\_intc  
Subject: Cross-Out  
Date: 5/22/2005 4:29:58 PM  
REJECT (per the May SAS phy WG. Since different test loads are used by different tables, it is helpful to list them in the table names)

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: 5/22/2005 4:30:01 PM  
 ACCEPT - DONE (per May SAS phy WG)

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: relliott  
Subject: Note  
Date: 5/1/2005 1:40:03 AM  
 ACCEPT - DONE  
REVIEW

Table 40  
Change "SATA device" to "SATA phy" throughout, so port selectors are also included

---

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: 5/22/2005 4:34:09 PM

 REJECT ("SATA device attached" is intended to encompass port selectors/port multipliers too. Changing wording globally to "supports SATA" or "SATA phy is attached" as appropriate. SATA phy definition updated to include port selectors as an entity that can contain a SATA phy.)

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: 5/22/2005 4:34:44 PM

 REJECT ("SATA device attached" is intended to encompass port selectors/port multipliers too. See response to other comment on this table.)

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.

---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 7:46:42 PM

 ACCEPT - DONE

Change "skew" to "intra-pair skew"

---

Author: rlsheffi\_intc  
Subject: Cross-Out  
Date: 5/10/2005 7:27:12 PM



 REJECT (per the May SAS phy WG. Since different test loads are used by different tables, it is helpful to list them in the table names)

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: 5/10/2005 7:29:45 PM

 ACCEPT - DONE (per May SAS phy WG)

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: relliott  
Subject: Highlight  
Date: 5/1/2005 1:37:15 AM

 ACCEPT - DONE

Change "attaching a SATA device is not supported" to "SATA is not supported"

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:29:56 AM

 ACCEPT - DONE

Change "attaching a SATA device is supported" to "SATA is supported"

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 2:30:34 PM

 ACCEPT - DONE

Change "jitter output requirements" to "jitter requirements" so the definition of "jitter output" can be dropped in chapter 3

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 7:49:29 PM

 ACCEPT - DONE

Change "skew" to "intra-pair skew"

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 7:46:52 PM

 ACCEPT - DONE

Change "skew" to "intra-pair skew"

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/10/2005 12:45:07 PM



 ACCEPT - DONE (per May WG)


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: relliott  
Subject: Highlight  
Date: 5/1/2005 1:30:37 AM

 ACCEPT - DONE  
Change "attachment to SATA devices" to "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 attaching to a SATA device is supported. Note f allows 3,0Gbps ALIGN(0) dwords but does not allow 1,5 Gbps D24.3 characters.

Suggestion is to apply note g instead.

---

Author: relliott  
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: bbissonne\_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 Gbps 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

---



Author: rlsheffi\_intc  
Subject: Cross-Out  
Date: 5/10/2005 7:30:17 PM  
 ACCEPT - DONE (per May SAS phy WG)

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: relliott  
Subject: Note  
Date: 5/22/2005 11:40:43 AM  
 ACCEPT - DONE


Table 41  
Add a Units column and delete the "Units are in UI." sentence from the footnote

---

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.

---

Author: risheffi\_intc  
Subject: Cross-Out  
Date: 5/22/2005 4:35:06 PM  
 ACCEPT - DONE (per May SAS phy WG)

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

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

---



Author: relliott  
Subject: Note  
Date: 5/22/2005 11:40:54 AM  
 ACCEPT - DONE


Table 42  
Add a Units column and delete the "Units are in UI." sentence from the footnote

---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 6:39:24 PM  
 ACCEPT - DONE


Change "a BER of 10-12." to "the required BER (see 5.3.3)"  
to avoid restating the required BER throughout the standard

---

Author: relliott  
Subject: Cross-Out  
Date: 5/22/2005 11:23:46 AM  
 ACCEPT - DONE


Delete "the mask in" and add a comma after the )

---


Author: relliott  
Subject: Highlight  
Date: 6/25/2005 4:35:11 PM  
 ACCEPT - DONE

3 s/b 3.75 per the 04-370r3 introduction


---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 11:43:01 AM  
 ACCEPT - DONE  
3 Gbps s/b 3,0 Gbps for consistency


---

Author: relliott  
Subject: Highlight  
Date: 6/25/2005 4:35:16 PM  
 ACCEPT - DONE  
3 s/b 3.75 per the 04-370r3 introduction


---

Author: relliott  
Subject: Highlight  
Date: 5/22/2005 11:43:06 AM  
 ACCEPT - DONE  
3 Gbps s/b 3,0 Gbps for consistency


---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:41:03 AM  
 ACCEPT - DONE  
Change "being attached to SATA devices" to "SATA"

---

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: relliott  
Subject: Highlight  
Date: 5/1/2005 1:43:31 AM  
 ACCEPT - DONE  
Change "being attached to SATA devices" to "SATA"

---


ACCEPT - DONE

Change "being attached to SATA devices" to "SATA"

---

Author: gop\_ibm

Date: 5/7/2005 3:10:06 PM

 ACCEPT - DONE (based on 5/5 vote 10-1-2)

5.3.9 Spread spectrum clocking

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

---

Author: relliott

Subject: Highlight

Date: 5/1/2005 1:42:31 AM

 ACCEPT - DONE

Change "SATA device" to "SATA phy"

---

Author: relliott

Subject: Highlight

Date: 5/1/2005 1:43:19 AM


 ACCEPT - DONE

Change "being attached to SATA devices" to "SATA"

---

Author: gop\_ibm

Date: 5/7/2005 3:10:17 PM

 ACCEPT - DONE (based on 5/5 vote 10-1-2)

5.3.10 Non-tracking clock architecture

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

---

Author: relliott

Subject: Highlight

Date: 5/1/2005 1:41:32 AM

 ACCEPT - DONE

Change "being attached to SATA devices" to "SATA"

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/22/2005 9:01:43 AM  
ACCEPT - 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..."

---

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)"

---

Author: gop\_ibm

Date: 5/21/2005 2:49:27 PM

 ACCEPT - DONE (although this isn't really an equation...)

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.

---

Author: relliott

Subject: Highlight

Date: 9/19/2005 5:42:20 PM

 ACCEPT - DONE

Change "Conversion example" to "Conversion from byte notation to character name example"

---

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: 5/22/2005 4:53:30 PM  
ACCEPT - DONE (but substantially rewritten per comment on otherwise)

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: 5/22/2005 4:53:23 PM  
ACCEPT - DONE (but substantially rewritten per comment on otherwise)

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: 5/22/2005 4:52:41 PM  
ACCEPT - DONE (

RD for the sub-blocks shall be calculated as follows:  
a) If the sub-block contains more ones than zeros, then RD at the end of a sub-block is positive;  
b) If the sub-block contains more zeros than ones, then RD at the end of a sub-block is negative;  
c) If the sub-block contains equal numbers of zeros and ones, then:  
A) if it is a six-bit sub-block containing 000111b, then RD at the end of the sub-clock is positive;  
B) if it is a six-bit sub-block containing 111000b, then RD at the end of the sub-clock is negative;  
C) if it is a four-bit sub-block containing 0011b, then RD at the end of the sub-clock is positive;  
D) if it is a four-bit sub-block containing 1100b, then RD at the end of the sub-clock is negative; and  
E) otherwise, RD at the end of the sub-block is the same as at the beginning of the sub-block)

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.

---

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: relliott

Subject: Highlight

Date: 9/19/2005 5:43:59 PM

 ACCEPT - DONE


Change "Only K28.3, K28.5, and K28.6 are used in this standard" to "The only control characters used in this standard are K28.3, K28.5, and K28.6"

---

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".

---



Author: kmarks\_dell

Subject: Highlight

Date: 4/20/2005 9:14:58 AM

**T** REJECT (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

**T** REJECT (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 >>

---

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..."

---

Author: gshoulder\_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 the 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  
shall not transmit ALIGN (0) primitives at a physical link rate faster than its lowest supported physical link rate."

---

Author: RElliott  
Subject: Underline  
Date: 5/30/2005 5:08:18 PM  
ACCEPT - DONE

To match a should not rule being placed in the SP PHY\_Ready states, Change:  
"A receiver device shall detect an OOB signal after receiving four consecutive idle time/burst time pairs (see"

to:  
"A receiver device shall detect an OOB signal after receiving four consecutive idle time/burst time pairs (see figure 111) while the SP\_DWS state machine (see 6.9) has not achieved dword synchronization (see 6.8.4.9 and 6.8.5.8)  
, and may but should not detect an OOB signal after receiving four consecutive idle time/burst time pairs while the SP\_DWS state machine has achieved dword synchronization."

---

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: relliott  
Subject: Highlight  
Date: 5/1/2005 12:24:21 AM  
ACCEPT - DONE

Change "supports being attached to SATA devices" to "supports SATA"

---

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  
ACCEPT - DONE

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

---

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: 5/20/2005 5:38:29 PM  
ACCEPT - DONE

Per May meeting, change "HARD\_RESET" to "The HARD\_RESET primitive sequence before an IDENTIFY address frame" to avoid confusion with "SMP HARD RESET" and "hard reset"

---

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"

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 5:38:36 PM  
ACCEPT - DONE

Per May meeting, change "HARD\_RESET" to " HARD\_RESET primitive sequence before an IDENTIFY address frame" to avoid confusion with "SMP HARD RESET" and "hard reset"

---

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.

---


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: relliott  
Subject: Note  
Date: 9/1/2005 1:28:17 PM

 ACCEPT - DONE

"2048 ALIGNs" and "2048/2^n-1 ALIGNs" are wrong in the SATA speed negotiation figure. The underlying rule is 54.6 usec of ALIGNs at each rate. At 1.5 Gbps, that means 2048. At 3 Gbps, that means 4096.

Change the figure to just provide the time.

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:27:24 AM


 ACCEPT - DONE

### Change

"SAS initiator devices and expander devices may be directly attached to SATA devices."  
to  
"SAS initiator phys and expander phys may support SATA (e.g., support being directly attached to a SATA device or a SATA port selector)."

---

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.


---

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

Power-on remove the -

---




Author: relliott  
Subject: Note  
Date: 4/23/2005 1:46:17 PM  
 ACCEPT - DONE  
REVIEW 6.7.4.2 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  
 ACCEPT - DONE  
6.7.4.2  
Figure 113  
"Speed negotiation window" s/b "Speed negotiation window time"

---

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: 5/1/2005 8:32:00 PM  
ACCEPT - DONE  
REVIEW

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

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 8:53:04 PM  
ACCEPT - DONE  
REVIEW

Change:

"If the phy has detected a valid physical link rate in the previous speed negotiation window, it shall enter the final speed negotiation 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."

---

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"

---

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.

---

Author: Relliott  
Subject: Note  
Date: 5/29/2005 2:51:23 PM  
ACCEPT - DONE

Add SP25 and SP26 into the list of states in SP.

Author: gop\_ibm  
Date: 4/30/2005 8:11:11 AM

ACCEPT - DONE (but with "set to zero" not "set to one" in the last sentence - "The SP state machine shall maintain a MgmtReset state machine variable to indicate whether a Management Reset request has been received. Any SP state that receives a Management Reset request shall set the MgmtReset state machine variable to one before making a transition to the SP7:OOB\_AwaitCOMSAS state (see 6.8.3.2). Any SP state that receives a power on, or a hard reset shall set the MgmtReset state machine variable to zero before making the transition to the SP7:OOB\_AwaitCOMSAS state.")  
REVIEW

#### 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: 4/30/2005 8:08:43 AM

REJECT (used IBM suggestion instead: The SP state machine shall maintain a MgmtReset state machine variable to indicate whether a Management Reset request has been received. Any SP state that receives a Management Reset request shall set the MgmtReset state machine variable to one before making a transition to the SP7:OOB\_AwaitCOMSAS state (see 6.8.3.2). Any SP state that receives a power on, or a hard reset shall set the MgmtReset state machine variable to zero before making the transition to the SP7:OOB\_AwaitCOMSAS state.)

#### 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: 4/30/2005 8:09:56 AM  
ACCEPT - DONE

#### 6.8.1 SP state machine overview

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

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/1/2005 12:02:41 AM

ACCEPT - DONE (as "If the phy supports SATA port selectors, the SP state machine shall maintain a COMWAKE\_Received state machine variable to indicate whether a COMWAKE detected message was received in the SP0:OOB\_COMINIT state or the SP1:OOB\_AwaitCOMX state since the last time the SP0:OOB\_COMINIT state was entered.")  
REVIEW


#### 6.8.1. fifth paragraph: Change to:

If the phy supports attachment to a SATA device (i.e., the phy is [contained in, vs. attached to] 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 vs. indicate] whether a COMWAKE detected message was received in SP0:OOB\_COMINIT or SP1:OOB\_AwaitCOMX since the last time SP0:OOB\_COMINIT was entered. [ibm says delete the rest:] 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: 4/30/2005 9:58:22 PM  
ACCEPT - DONE  
REVIEW


#### 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.

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.>>

---

Author: relliott  
Subject: Note  
Date: 5/22/2005 5:00:25 PM  
 ACCEPT - DONE


Add "The SP transmitter shall complete any physical link rate change requested with the Set Rate message within RCDT (see table 66 in 6.7.4.2)."  
to accept the IBM comment to remove wording implying such a rule from SP8.

---

Author: RElliott

Subject: Note

Date: 5/30/2005 6:01:14 PM

 ACCEPT - DONE (avoided adding a new Disabled state to avoid complicating the figures, although that might be a better way to think of it)  
REVIEW

Addressing Dell comment on pg 297:

add a Disable Phy request from upper layers that sends any state back to SP0:OOB\_COMINIT.


Once in SP0:OOB\_COMINIT for that reason, transitions out of SP0 are prevented until a power on, hard reset, or Management Reset occurs. Also don't do the "upon entry" stuff.

Maybe add a SP27:Disabled state, left when one of those happens.

---

Author: gop\_ibm

Date: 5/29/2005 2:58:37 PM

 ACCEPT - DONE (per May WG vote 2-1-4)

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: 5/29/2005 2:57:23 PM

 ACCEPT - DONE (added "(from all states)" into SP0)

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: 5/1/2005 12:13:38 AM

 ACCEPT - DONE (per other Dell comment, not adding it to the figure)

**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.**

---


---

Author: mevans\_mxo  
Subject: Highlight  
Date: 4/30/2005 10:08:55 PM

 ACCEPT - DONE (as "If the phy supports SATA port selectors and this state receives a COMWAKE Detected message, this state shall:  
a) set the COMWAKE\_Received state machine variable to one; and  
b) if the attached sata port selector bit in the DISCOVER response is set to zero:  
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.  
")  
REVIEW

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: 4/30/2005 8:19:10 AM  
 ACCEPT - DONE  
REVIEW

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: 4/30/2005 9:34:53 PM

 REJECT (deleted paragraph per IBM comment just putting this rule in the overall state machine description)

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: 4/30/2005 8:19:47 AM  
 ACCEPT - DONE (though moot because the paragraph is then deleted per another ibm comment)

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


---

Author: relliott\_hpq  
Subject: Highlight  
Date: 4/30/2005 8:20:05 AM

 ACCEPT - DONE (though moot because the paragraph is then deleted per another ibm comment)


6.8.3.2.1 SP0:OOB\_COMINIT state description  
  
"SMP Reset request" is not defined anywhere.

---

Author: gop\_ibm  
Date: 4/30/2005 8:21:00 AM  
 REJECT (already stated globally based on earlier IBM comment)


6.8.3.2.3 Transition SP0:OOB\_COMINIT to SP3:OOB\_AwaitCOMINIT\_Sent  
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

---

Author: gop\_ibm  
Date: 4/30/2005 8:21:12 AM  
 REJECT (already stated globally based on earlier IBM comment)

6.8.3.2.4 Transition SP0:OOB\_COMINIT to SP4:OOB\_COMSAS  
Add into this section << The state machine shall set the MgmtReset state machine variable to zero before the transition. >>

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 4/30/2005 10:29:22 PM  
 ACCEPT - DONE (as "If the phy supports SATA port selectors and this state receives a COMWAKE Detected message, this state shall:  
a) set the COMWAKE\_Received state machine variable to one; and  
b) if the attached sata port selector bit in the DISCOVER response is set to zero:



- 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.

")

REVIEW

6.8.3.3.1, second paragraph: Change to: If:

- a) the phy supports attachment to a SATA device (i.e., the phy is contained in an STP/SATA bridge);
- b) the phy supports attachment to a SATA port selector; and
- c) this state receives a COMWAKE Detected message;

then this state shall set the COMWAKE\_Received state machine variable to one, and, if the value of the ATTACHED SATA PORT SELECTOR bit in the DISCOVER response is zero, this state shall:

- a) set the ATTACHED SATA PORT SELECTOR bit in the DISCOVER response to one; and
- b) send a SATA Port Selector Change confirmation to the link layer.

---

Author: gop\_ibm

Date: 5/1/2005 12:04:46 AM


1 ACCEPT - DONE (but whole paragraph rewritten per Maxtor comment)

6.8.3.3.1 State description

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

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 4/30/2005 10:30:00 PM


 ACCEPT - DONE (as "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, the state machine shall, before the transition:  
a) set the attached sata port selector bit in the DISCOVER response to zero; and  
b) send a SATA Port Selector Change confirmation to the link layer.  
")  
REVIEW

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: relliott  
Subject: Note  
Date: 4/30/2005 10:31:10 PM

 ACCEPT - DONE


SP1 to SP4

To match resolution of Maxtor comment in SP1 to SP0, reword last paragraph as:

If the attached sata port selector bit in the DISCOVER response is set to one, the state machine shall, before the transition:

- a) set the attached sata port selector bit in the DISCOVER response to zero; and
  - b) send a SATA Port Selector Change confirmation to the link layer.
- 


Author: mevans\_mxo  
Subject: Highlight  
Date: 4/30/2005 10:40:13 PM

 ACCEPT - DONE (as "If the phy supports SATA port selectors, the attached sata port selector bit in the DISCOVER response is set to zero, and this state receives a COMWAKE Detected message, it 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.  
")  
REVIEW

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: 5/1/2005 12:06:00 AM

 ACCEPT - DONE (as "If the phy supports SATA port selectors, the attached sata port selector bit in the DISCOVER response is set to zero, and this state receives a COMWAKE Detected message, 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.  
")

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.


---

Author: gop\_ibm  
Date: 5/1/2005 12:05:45 AM  
ACCEPT - DONE

6.8.3.6.1 State description


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

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/1/2005 12:06:29 AM  
 ACCEPT - DONE


6.8.3.6.1, third paragraph: See the previous comment (page break carryover)

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 4/30/2005 10:44:19 PM  
 ACCEPT - DONE (also moved "in the DISCOVER response" to after "bit")

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: 5/1/2005 12:08:11 AM  
 ACCEPT - DONE

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: 4/30/2005 10:44:26 PM  
 ACCEPT - DONE (also moved "in the DISCOVER response" to after "bit")

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".

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: 5/1/2005 12:08:21 AM  
 ACCEPT - DONE

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: 4/30/2005 8:21:47 AM  
 REJECT (already stated globally based on earlier IBM comment)

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: 5/29/2005 1:38:31 PM  
 ACCEPT - DONE (add COMSAS Completed into SP5. Pass as an "argument with the transition" into SP6, and have SP6 refer to both the message and the argument.)

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: 5/1/2005 12:09:33 AM  
 REJECT (changing to "supports SATA" style wording throughout instead)

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."


---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:09:42 AM  
 ACCEPT - DONE

Change "to zero" to "to zero before the transition" to match IBM comment on SP7 to SP6.

---

Author: gop\_ibm  
Date: 4/30/2005 9:38:04 PM


 ACCEPT - DONE

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: 4/30/2005 10:46:14 PM


 ACCEPT - DONE

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: 5/1/2005 12:29:35 AM

 REJECT (but changed to "the phy supports SATA" to match other changes)

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: RElliott  
Subject: Note  
Date: 5/30/2005 1:20:17 PM

 ACCEPT - DONE

SP7:OOB\_AwaitCOMSAS to SP16:SATA\_COMWAKE

To support expanders that don't support spinup hold state, add another combination causing this transition:


the phy supports SATA

the phy does not implement SATA spinup hold

the COMSAS Detect Timeout timer expires

---


Author: relliott  
Subject: Highlight  
Date: 4/30/2005 9:40:35 PM

 ACCEPT - DONE

Change "to zero" to "to zero before the transition" to match IBM comment on SP7 to SP6.

---

Author: gop\_ibm  
Date: 5/1/2005 12:12:28 AM

 ACCEPT - DONE (but the SATA Spinup Hold confirmation removed from this state altogether per Dell comment)

REVIEW

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: 5/1/2005 12:13:00 AM

 ACCEPT - DONE (fixed the colon and removed SATA Spinup Hold confirmation)

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.

---

Author: RElliott  
Subject: Cross-Out  
Date: 5/30/2005 1:20:03 PM


 ACCEPT - DONE

Delete "this phy is in an expander device;" and just say "the phy implements SATA spinup hold" in item d). SAS phys supporting SATA might also implement some form of spinup hold; there is no need to tie expanders into it here. (only expanders define the SATA Spinup Hold confirmation going to the link layer, but that doesn't mean non-expander SP state machines cannot walk through the same states)

---

Author: gop\_ibm

Date: 5/29/2005 2:58:56 PM

 ACCEPT - DONE (per May WG vote 2-1-4)


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.


---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 10:11:35 AM

 ACCEPT - DONE  
Change "entering this state" to "entry into this state"

---

Author: gop\_ibm  
Date: 5/22/2005 4:59:54 PM

 ACCEPT - DONE (deleted from here. Added "The SP transmitter shall complete any physical link rate change requested with the Set Rate message within RCDT (see table 66 in 6.7.4.2)." in the SP transmitter section.)


---

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: 5/22/2005 5:01:37 PM

 REJECT (introducing parenthesis would just annoy other frequent commenters. Deleting instead, and adding "The SP transmitter shall complete any physical link rate change requested with the Set Rate message within RCDT (see table 66 in 6.7.4.2)." to the SP transmitter section to replace it)

---

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: relliott  
Subject: Note  
Date: 5/1/2005 8:15:20 PM

 ACCEPT - DONE

Change the second a)b) list into a A)B) list under the first b)

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/1/2005 8:14:43 PM

 ACCEPT - DONE (as "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: relliott  
Subject: Note  
Date: 5/1/2005 10:08:29 AM

 ACCEPT - DONE

To a), add "(i.e., if this is the first speed negotiation window)"

---

Author: gop\_ibm  
Date: 4/30/2005 8:22:13 AM

 REJECT (already stated globally based on earlier IBM comment)


---

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: relliott  
Subject: Highlight  
Date: 5/1/2005 10:11:45 AM  
ACCEPT - DONE

 Change "entering this state" to "entry into this state"


---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 10:11:55 AM  
ACCEPT - DONE

 Change "entering this state" to "entry into this state"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 10:12:05 AM  
ACCEPT - DONE

 Change "entering this state" to "entry into this state"

---


Author: gop\_ibm  
Date: 4/30/2005 8:22:20 AM  
REJECT (already stated globally based on earlier IBM comment)

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. >>

---

Author: gop\_ibm

Date: 4/30/2005 8:22:27 AM

 REJECT (already stated globally based on earlier IBM comment)

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: 5/1/2005 9:03:31 PM

 REJECT (useful, and similar statement is in the SP11 to SP12 transition about success)

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: 4/30/2005 8:22:41 AM

 REJECT (already stated globally based on earlier IBM comment)

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. >>

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 10:29:40 AM  
ACCEPT - DONE  
REVIEW  
Change and to or in a)

---

Author: gop\_ibm  
Date: 4/30/2005 8:22:47 AM  
REJECT (already stated globally based on earlier IBM comment)

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: relliott  
Subject: Highlight  
Date: 5/1/2005 8:18:10 PM  
ACCEPT - DONE  
REVIEW  
Change "the state machine has not fallen back (i.e., transitioned from SP14:SAS\_Fail to SP8:SAS\_Start) during this current SAS speed negotiation sequence." to "this is not the final speed negotiation window."

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 8:18:49 PM  
ACCEPT - DONE  
REVIEW  
After "SAS Speed Negotiation Window Rate argument with the transition" add "set to the next higher speed negotiation window rate"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 10:33:29 AM  
ACCEPT - DONE  
REVIEW  
Change "speed negotiation has progressed to where it failed and then had fallen back to the last negotiated speed and then subsequently passed." to "this is the final speed negotiation window"

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/1/2005 9:05:49 PM  
REJECT (but entire section rewritten; see new comment)

6.8.4.8.1, lettered list: Change "window" to "window rate" in three places.

---

Author: relliott  
Subject: Note  
Date: 5/1/2005 9:07:33 PM  
ACCEPT - DONE  
REVIEW

There is no reason to enumerate all the transition text in the state description itself, as is currently done.

Change:

- "a) the maximum SAS speed negotiation window has been attempted and there haven't been any successful negotiated physical link rates;
- b) the SAS speed negotiation failed after dropping back to the last successful SAS speed negotiation window;
- c) the SAS speed negotiation has failed and there was a previous successful SAS speed negotiation; or
- d) no SAS speed negotiation has previously passed and the maximum SAS speed negotiation window has not yet been attempted."

to:

- "This state determines if:
- a) another SAS speed negotiation window is required; or
  - b) the SAS speed negotiation sequence is complete."
- 

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/1/2005 8:23:56 PM  
REJECT (but entire section rewritten; see new comment)

6.8.4.8.2, lettered list: Change "window" to "window rate" in two places. Change "haven't" to "have not".

---

Author: relliott  
Subject: Note  
Date: 5/1/2005 8:26:56 PM  
ACCEPT - DONE  
REVIEW


Change:

- "a) the maximum SAS speed negotiation window has been attempted and there haven't been any successful negotiated physical link rates; or
- b) the SAS speed negotiation failed after dropping back to the last successful SAS speed negotiation window."

to:

- "This transition shall occur if the current speed negotiation window is:
- a) the maximum SAS speed negotiation window; or
  - b) the final SAS speed negotiation window."

---


Author: relliott  
Subject: Note  
Date: 5/1/2005 8:26:49 PM  
 ACCEPT - DONE  
REVIEW

Change:

to:


If the previous SAS speed negotiation window was successful, this transition shall occur and shall include:  
a) a SAS Speed Negotiation Window Rate argument set to the previous speed negotiation window rate; and  
b) a Final SAS Speed Negotiation Window argument.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/1/2005 7:48:52 PM  
 ACCEPT - DONE (with many more changes - see new comment)

6.8.4.8.3, lettered lists: Change "window" to "window rate" in five places.

---

Author: relliott  
Subject: Note  
Date: 5/1/2005 8:28:46 PM  
 ACCEPT - DONE  
REVIEW

Change:


"a) after setting the SAS speed negotiation window to one greater than the current SAS speed negotiation window; and  
b) b) if no SAS speed negotiation has previously passed and the maximum supported SAS speed negotiation window has not yet been attempted."

to:

If the previous SAS speed negotiation window failed and the current speed negotiation window is not the maximum SAS speed negotiation window , this transition shall occur and shall include a SAS Speed Negotiation Window Rate argument set to the next higher speed negotiation window rate.

---


Author: mevans\_mxo  
Subject: Highlight  
Date: 5/1/2005 7:49:05 PM

 ACCEPT - DONE (with many more changes - see new comment on previous page)

See previous comment. [page break carryover]

---

Author: relliott\_hpq  
Subject: Note  
Date: 5/30/2005 5:01:07 PM

 ACCEPT - DONE (per May phy WG, add a SHOULD rule that OOB detection should not run unless dword sync has been lost. As:

"This transition shall occur after:

- a) receiving a DWS Lost message, if this state does not send a Start DWS message; or
- b) receiving a DWS Lost message followed by a COMINIT Detected message, if this state does not send a Start DWS message; or
- c) receiving a DWS Reset message.

This transition may but should not occur after receiving a COMINIT Detected message before receiving a DWS Lost message, or after receiving a COMINIT Detected message after sending a Start DWS message (i.e., the SP state machine should ignore COMINIT Detected messages unless the SP\_DWS state machine has indicated loss of dword synchronization).")

REVIEW

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: relliott  
Subject: Highlight  
Date: 5/1/2005 10:12:12 AM

 ACCEPT - DONE

Change "entering this state" to "entry into this state"

---

Author: gop\_ibm  
Date: 4/30/2005 8:22:55 AM

 REJECT (already stated globally based on earlier IBM comment)

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. >>

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:30:38 AM

 ACCEPT - DONE

Change "SATA device phy" to "SATA phy"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:31:40 AM


 ACCEPT - DONE

Change "SAS initiator devices that support being attached to SATA devices; expander devices attached to SATA devices" to "SAS initiator phys that support SATA; expander phys that support SATA"

---

Author: gop\_ibm

Date: 5/29/2005 2:59:16 PM

 ACCEPT - DONE (per May WG vote 2-1-4)

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.

---

Author: gop\_ibm

Date: 4/30/2005 8:23:04 AM

 REJECT (already stated globally based on earlier IBM comment)

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: 4/30/2005 8:23:13 AM

 REJECT (already stated globally based on earlier IBM comment)

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: relliott

Subject: Highlight

Date: 5/1/2005 10:12:20 AM


 ACCEPT - DONE

Change "entering this state" to "entry into this state"

---

Author: gop\_ibm

Date: 4/30/2005 8:23:23 AM

 REJECT (already stated globally based on earlier IBM comment)


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. >>

---

Author: gop\_ibm

Date: 4/30/2005 8:23:30 AM

 REJECT (already stated globally based on earlier IBM comment)


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: 4/30/2005 8:23:36 AM

 REJECT (already stated globally based on earlier IBM comment)

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: RElliott

Subject: Note

Date: 5/30/2005 5:02:24 PM

 ACCEPT - DONE (Match change in SAS\_PHY\_Ready state and add a SHOULD rule that OOB detection should not run unless dword sync has been lost. As:

"This transition shall occur after:

- a) receiving a DWS Lost message, if this state does not send a Start DWS message; or
- b) receiving a DWS Lost message followed by a COMINIT Detected message, if this state does not send a Start DWS message; or
- c) receiving a DWS Reset message.


This transition may but should not occur after receiving a COMINIT Detected message before receiving a DWS Lost message, or after receiving a COMINIT Detected message after sending a Start DWS message (i.e., the SP state machine should ignore COMINIT Detected messages unless the SP\_DWS state machine has indicated loss of dword synchronization).")

REVIEW

---

Author: gop\_ibm

Date: 4/30/2005 8:23:45 AM

 REJECT (already stated globally based on earlier IBM comment)

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. >>

---



Author: gop\_ibm

Date: 4/30/2005 8:23:52 AM

 REJECT (already stated globally based on earlier IBM comment)


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: 4/30/2005 8:23:58 AM

 REJECT (already stated globally based on earlier IBM comment)

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. >>

---

Author: gop\_ibm

Date: 5/30/2005 6:25:55 PM

ACCEPT - DONE (a: change the T to double underlined "from all states". b: add cutout to the other figures like the transition to SP0. c: accepted d: see a). e) rejected)

## 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.

- a) For one thing there should only be one state shown. The SPx representation is not correct.
  - b) 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.
  - c) There is no description of the transmitter and receiver signals.
  - d) 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.
  - e) 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: 5/29/2005 2:59:29 PM

ACCEPT - DONE (per May WG vote 2-1-4)

## 6.8.6.1 State description

Figure 120

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

---

Author: RElliott

Subject: Note

Date: 5/29/2005 2:59:38 PM

ACCEPT - DONE

Add "(from any state)" with double underline

replacing the T

---

Author: gop\_ibm

Date: 5/29/2005 3:07:30 PM

ACCEPT - DONE

## 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: 4/30/2005 10:51:17 PM

ACCEPT - DONE

## 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: 4/30/2005 10:52:35 PM

ACCEPT - DONE

## 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. >>

---

Author: gop\_ibm  
Date: 4/30/2005 9:43:07 PM  
 ACCEPT - DONE  
 REVIEW

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: 4/30/2005 9:45:25 PM  
 ACCEPT - DONE (deleted sentence, which agrees with an IBM comment. Added "If this state machine is in an expander phy, this state shall send a SATA Spinup Hold confirmation to the link layer." per the second part of the comment)

6.8.7.1 State description

1st Paragraph, 2nd Sentence

Remove


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

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

Add

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

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/1/2005 9:08:25 PM  
 REJECT (sentence removed per previous comment)

6.8.7.1 State description

1st Paragraph, 2st Sentence


change if not removed by previous comment.

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

to

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

---


Author: gop\_ibm  
Date: 4/30/2005 9:54:12 PM  
 ACCEPT - DONE

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: 4/30/2005 9:46:26 PM  
 ACCEPT - DONE (it's under all conditions. added "If this state machine is in an expander phy, this state shall send a SATA Spinup Hold confirmation to the link layer." per Dell comment)

6.8.7.1 State description

Figure 121

There is no description as to under what conditions the << (in expander phys) SATA Spinup Hold >> confirmation is sent. This needs to be fixed.

---



Author: kmarks\_dell  
Subject: Note  
Date: 5/1/2005 12:20:57 AM  
 ACCEPT - DONE (left here)

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: 5/29/2005 3:09:27 PM  
 ACCEPT - DONE (actually, the entire label removed to match the IBM comments on all the other figures.)

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: 4/30/2005 9:48:15 PM

 ACCEPT - DONE

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: 4/30/2005 9:48:52 PM

 ACCEPT - DONE (but sentence then deleted per IBM comment)

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

1st Paragraph, 2nd Sentence

change

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

to


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

---

Author: relliott\_hpq

Subject: Cross-Out

Date: 4/30/2005 9:49:20 PM

 REJECT (sentence deleted per IBM comment)


6.8.7.2 Transition SP26 to SP0

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

---

Author: gop\_ibm

Date: 4/30/2005 8:24:45 AM

 REJECT (already stated globally based on earlier IBM comment. Plus, here, it's wrong - sometimes it is set to one.)

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: 5/30/2005 5:27:29 PM

 ACCEPT - DONE (don't even reference "loss of dword sync" in the BREAK case since going to SP0 (running a link reset sequence) for any reason suffices as a reason. 7.12.8 changed to only refer to link reset sequence, not loss of dword sync.)

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.

---

Author: relliott


Subject: Highlight

Date: 5/21/2005 8:56:38 PM

ACCEPT - DONE

'SP\_DWS state machines" s/b "SP\_DWS state machine"

---

Author: ghouder\_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

**T** 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: 5/1/2005 12:21:37 AM

**T** 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: relliott  
Subject: Highlight  
Date: 5/1/2005 12:34:11 AM

**T** ACCEPT - DONE

Change "attached to SATA devices" to "that detect an attached SATA phy"

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/23/2005 4:28:35 PM

**T** 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)."

---

Author: gop\_ibm

Date: 4/23/2005 4:32:12 PM

 REJECT (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 >>

---



Author: thoglund\_Isi

Subject: Highlight

Date: 5/21/2005 3:13:52 PM

ACCEPT - DONE (per May WG)

change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.

---

Author: relliott  
Subject: Highlight  
Date: 4/22/2005 3:50:01 PM  
ACCEPT - 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).

---

Author: thoglund\_Isi

Subject: Highlight

Date: 5/21/2005 3:14:02 PM

ACCEPT - DONE (per May WG)

change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.


---

Author: relliott  
Subject: Highlight  
Date: 4/22/2005 3:50:25 PM  
ACCEPT - DONE

1  
Table 67

Change "the list of primitive encodings" to "this table"

---

Author: relliott  
Subject: Note  
Date: 7/23/2005 4:14:46 PM  
 ACCEPT - DONE

Incorporate 05-224r1, which moves the Continued primitive sequence contents into 7.17.

---

Author: relliott  
Subject: Cross-Out  
Date: 5/20/2005 11:05:12 AM  
~~ACCEPT - DONE~~

Delete (i.e., connection requests that have not reached the destination phy) after "partial pathways" since it is not a complete restatement of the definition

---

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.

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/20/2005 12:18:19 PM

**1** ACCEPT - 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: 6/17/2005 2:12:01 PM

**1** ACCEPT - DONE (suggested wording presumes SSP/SCSI - NOTIFY would apply to a native STP/ATA target as well. Changed so the SSP/SCSI content is just in the example:

"A SAS target device with multiple SAS target ports shall honor NOTIFY (ENABLE SPINUP) from all its SAS target ports equivalently (e.g., if a SAS target device contains two SSP target ports A and B, powers on in the Stopped state, and receives a START STOP UNIT command with the start bit set to one through SSP target port A, then a NOTIFY (ENABLE SPINUP) received on SSP target port B causes the SAS target device to spin up its rotating media (see 10.2.10)).")

REVIEW

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.

---



Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:29:07 PM  
ACCEPT - DONE

Change .. to .

---

Author: thoglund\_Isi  
Subject: Highlight  
Date: 5/21/2005 3:14:15 PM  
ACCEPT - DONE (per May WG)

change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.

---

Author: thoglund\_Isi  
Subject: Highlight  
Date: 5/21/2005 5:34:30 PM

ACCEPT - DONE (per May WG, added NOTE after the table: "Some SAS phys also transmit OPEN\_REJECT (RETRY) if they receive an OPEN address frame while in the SL\_CC5: BreakWait state (see 7.14.4.7).")


remove clause b)  
see 05-145r0

---

Author: relliott\_hpq

Subject: Note

Date: 5/21/2005 5:48:20 PM

 ACCEPT - DONE (delete the destination phy list. Put the expander list in 7.12.4.1. Also see 7.12.5.2, 7.12.5.3 which have some OPEN\_REJECT rules. Rewrite some of those rules in terms of Arb Reject rather than OPEN\_REJECT.)

## 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: 5/21/2005 6:56:39 PM

 ACCEPT - DONE (It should be item 3 alone. STP RESOURCES BUSY comes from the STP target phy and its SL\_CC state machine, not the expander phy/XL state machine. So, it doesn't belong in this list at all.)

This list is being deleted anyway in favor of changing the list of Arb Reject reasons in 7.12 from an unordered to an ordered list.)

Should this be an item 4) instead of combined together with item 3)?

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 8:17:33 PM  
ACCEPT - DONE

Change transmitter to phy

---

Author: ghoulder\_seg  
Subject: Note  
Date: 5/21/2005 8:19:09 PM

ACCEPT - DONE (after sending DONE (CREDIT TIMEOUT), the phy enters a mode where it must keep receiving frames (assuming it has sent RRDY credit) or it will BREAK the connection.

Rewritten as "The SSP state machine (see 7.16.7) timed out waiting for an RRDY or received a CREDIT BLOCKED, and the phy is going to transmit BREAK if it provides transmit frame credit for 1 ms without receiving a frame or a DONE."

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.

---

Author: relliott

Subject: Highlight

Date: 4/22/2005 3:51:37 PM

ACCEPT - DONE

1 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.

---

Author: gop\_ibm

Date: 4/23/2005 4:48:41 PM

ACCEPT - 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. >>.

---

Author: relliott

Subject: Highlight

Date: 9/19/2005 5:55:07 PM

ACCEPT - DONE

Change "SSP/SMP data dword" to "Address frame, SSP frame, and SMP frame data dword"

---

Author: relliott

Subject: Highlight

Date: 9/19/2005 5:55:22 PM

ACCEPT - DONE

Change "SSP/SMP CRC output" to "Address frame, SSP frame, and SMP frame CRC output"

---

Author: relliott

Subject: Highlight

Date: 9/19/2005 5:57:02 PM

ACCEPT - DONE

Change "generation bit order" to "bit ordering" to match the STP figure

---

Author: relliott

Subject: Highlight


Date: 9/19/2005 5:57:19 PM

ACCEPT - DONE

Change "CRC" to "Address frame, SSP frame, and SMP frame CRC"


---

Author: relliott  
Subject: Highlight  
Date: 9/19/2005 5:54:26 PM

 ACCEPT - DONE  
Change "STP data dword" to "STP frame data dword"


---

Author: relliott  
Subject: Highlight  
Date: 9/19/2005 5:54:40 PM

 ACCEPT - DONE  
Change "STP CRC output" to "STP frame CRC output"

---

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"

---



Author: mevens\_mxo

Subject: Highlight

Date: 4/23/2005 4:56:50 PM


**1** ACCEPT - 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.

---

Author: gop\_ibm

Date: 4/23/2005 4:57:54 PM

 REJECT (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). >>

---

Author: goulder\_seg

Subject: Note

Date: 5/20/2005 4:38:04 PM

 REJECT (deleted that sentence (and its neighbors) in favor of a reference to 4.1.3 instead)

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."

---

Author: relliott

Subject: Highlight

Date: 5/20/2005 5:32:11 PM

 ACCEPT - DONE


Per May meeting, change "HARD\_RESET" to "HARD\_RESET primitive sequence" to avoid confusion with "SMP HARD RESET" and "hard reset"

---

Author: relliott

Subject: Highlight

Date: 5/20/2005 5:32:18 PM

 ACCEPT - DONE


Per May meeting, change "HARD\_RESET" to "HARD\_RESET primitive sequence" to avoid confusion with "SMP HARD RESET" and "hard reset"

---

Author: relliott

Subject: Highlight

Date: 5/20/2005 4:23:16 PM

 ACCEPT - DONE

REVIEW

Change "If a device supports more than one phy, it shall transmit the same SAS address on all phys for which it is capable of sharing within a port." to a simpler pointer to 4.1.3:


"The SAS address in the outgoing IDENTIFY address frame and the SAS address in the incoming IDENTIFY address frame determine the port to which a phy belongs (see 4.1.3)."

---

Author: relliott

Subject: Cross-Out

Date: 5/20/2005 4:23:24 PM

 ACCEPT - DONE

REVIEW

Delete "If a device detects the same SAS address incoming on different phys, it shall consider those phys part of the same wide port." in favor of a pointer to 4.1.3

---

Author: relliott  
Subject: Cross-Out  
Date: 5/20/2005 4:23:33 PM  
ACCEPT - DONE  
REVIEW

Delete "If a device detects different SAS addresses incoming on different physical links, it shall consider those physical links as independent physical links and consider those phys part of different ports."

in favor of a pointer to 4.1.3.

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 4:19:18 PM  
ACCEPT - DONE

device s/b phy

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 4:19:22 PM  
ACCEPT - DONE

device s/b phy

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/20/2005 5:32:41 PM  
ACCEPT - DONE (reworded these 3 paragraphs as:

If a phy receives a valid IDENTIFY address frame within 1 ms of phy reset sequence completion, the SAS address in the outgoing IDENTIFY address frame and the SAS address in the incoming IDENTIFY address frame determine the port to which a phy belongs (see 4.1.3). The phy ignores subsequent IDENTIFY address frames and HARD\_RESET primitives until another phy reset sequence occurs.

If a phy receives a HARD\_RESET primitive sequence within 1 ms of phy reset sequence completion, it shall be considered a reset event and cause a hard reset (see 4.4.2) of the port containing that phy.

If a phy does not receive a HARD\_RESET primitive sequence or a valid IDENTIFY address frame within 1 ms of phy reset sequence completion, it shall restart the phy reset sequence.

")  
REVIEW

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: relliott  
Subject: Underline  
Date: 5/21/2005 7:14:03 PM  
ACCEPT - DONE

After "The discover information may be used to select connection rates for connection requests." add (see 7.8.2)" to point to the OPEN address frame section where this is discussed

---

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.

---

Author: relliott

Subject: Highlight


Date: 5/21/2005 8:55:56 PM

ACCEPT - DONE

Change "SL\_IR state machines" to "SL\_IR\_IRC state machine"


---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 6:15:28 PM

 ACCEPT - DONE  
Change "Transmit IDENTIFY or HARD\_RESET" to "SL\_IR\_TIR (transmit IDENTIFY or HARD\_RESET)"


---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 6:15:46 PM

 ACCEPT - DONE  
Change "Receive IDENTIFY Address Frame" to "SL\_IR\_RIF (receive IDENTIFY address frame)"

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/20/2005 6:16:06 PM


 ACCEPT - DONE (to "SL\_IR\_IRC (identification and hard reset control)")

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.

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 5:33:19 PM  
ACCEPT - DONE

HARD RESET s/b HARD\_RESET primitive sequence

per May meeting

---

Author: risheffi\_intc  
Subject: Highlight  
Date: 5/1/2005 9:58:57 AM  
ACCEPT - 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  
risheffi Accepted 4/14/2005 11:05:28 PM

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 5:34:17 PM  
ACCEPT - DONE

HARD\_RESET s/b HARD\_RESET primitive sequence  
per May meeting

---



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: relliott  
Subject: Highlight  
Date: 5/20/2005 5:34:33 PM  
ACCEPT - DONE

HARD\_RESET s/b HARD\_RESET Received message

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 5:35:05 PM  
ACCEPT - DONE

HARD\_RESET s/b HARD\_RESET Received message

---

Author: relliott  
Subject: Highlight  
Date: 5/20/2005 5:34:39 PM  
ACCEPT - DONE

HARD\_RESET s/b HARD\_RESET Received message

---

Author: bnixon\_elx  
Subject: Note  
Date: 5/30/2005 6:10:37 PM  
REJECT (SL\_IR state machines don't run if SATA was detected; they only support SAS physical links.)

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: 5/30/2005 6:12:34 PM  
REJECT (SL\_IR state machines don't run if SATA was detected; they only support SAS physical links. Since SAS doesn't define link layer + higher state machines for SATA mode, there is no need for such a message - an expander phy speaking SATA is not using an XL state machine, it's using something similar to it but vendor-specific.)

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 [request] 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: 5/1/2005 9:58:48 AM  
ACCEPT - DONE (just changed "in SAS" to "in STP" rather than duplicate a paragraph)  
REVIEW

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.

---

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: 5/30/2005 6:07:51 PM  
REJECT (changed SP to clearly go to SP0 on DISABLE instead. See comment on first SP figure)

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: 5/30/2005 6:13:26 PM  
REJECT (physical phys handled by changing SP to clearly go to SP0 if DISABLE is invoked, leaving this row just to handle the (vendor-specific) virtual phy case.)

**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: 5/1/2005 9:53:32 AM  
ACCEPT - DONE (as "started processing a reset requested by")

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: relliott  
Subject: Highlight  
Date: 5/21/2005 8:02:43 PM  
ACCEPT - DONE  
"COMWAKE detected" s/b "COMWAKE Detected"

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/1/2005 9:53:52 AM  
ACCEPT - DONE (as "completed processing a reset requested by")

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  
Date: 5/21/2005 8:01:21 PM  
ACCEPT - DONE (in the list as a shall, not a should)

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)."

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 4/23/2005 5:08:35 PM

**T** 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: relliott  
Subject: Highlight  
Date: 5/21/2005 2:53:14 PM

**T** ACCEPT - DONE  
Change "an STP target port in an expander device attached to a SATA device. The SATA device"

to  
"an STP target port of an STP/ SATA bridge in an expander device. The SATA device behind the STP/SATA bridge"

---

Author: mevans\_mxo  
Subject: Cross-Out  
Date: 4/23/2005 5:10:03 PM

**T** ACCEPT - DONE (agree; the source phy should apply an L\_T nexus loss timer and not immediately assume the destination is lost)  
**T** 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).

---

Author: relliott  
Subject: Highlight  
Date: 9/7/2005 2:52:49 PM


**T** ACCEPT - DONE  
(comment from Brian Day, LSI Logic)

"If the OPEN address frame reaches the destination, it shall return either OPEN\_ACCEPT or OPEN\_REJECT" is not always true. If OPENs cross and the destination wins, it doesn't return OPEN\_ACCEPT or OPEN\_REJECT.

Change to:

If the OPEN address frame reaches the destination, it returns either OPEN\_ACCEPT or OPEN\_REJECT unless the OPEN address frame passed an OPEN address frame from the destination with higher arbitration priority (see 7.12.3). "


---

Author: RElliott  
Subject: Note  
Date: 5/21/2005 3:01:13 PM  
 ACCEPT - DONE (on all sections like this.)


After a phy transmits an OPEN address frame, it shall expect one or more of the results listed in table 91.

Result ...  
Receive AIP (with text that this happens more than once)  
Receive OPEN\_ACCEPT  
Receive OPEN\_REJECT  
Receive OPEN address frame  
Receive BREAK  
Open Timeout timer expires


---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 3:02:41 PM  
 ACCEPT - DONE  
Change "when it receives" to "each time it receives" to emphasize that this happens more than once


---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:07:39 PM  
 ACCEPT - DONE  
Change "This is sent" to "OPEN\_ACCEPT is transmitted"


---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:08:00 PM  
 ACCEPT - DONE  
Change "This is sent in response" to "OPEN\_REJECT is transmitted"

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:56:27 PM  
 ACCEPT - DONE  
Change "expander device" to "expander device in the partial pathway"

---

Author: relliott  
Subject: Highlight  
Date: 5/29/2005 3:56:34 PM  
 ACCEPT - DONE  
Change "destination port or expander port" to "destination phy or an expander device in the partial pathway"

---

should use phy not port here, and match wording in other rows

---


Author: kmarks\_dell  
Subject: Cross-Out  
Date: 5/1/2005 10:13:40 PM

 ACCEPT - DONE

**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: 6/11/2005 10:21:04 AM

 ACCEPT - DONE (added "The Arbitration Wait Time timer is in the port layer state machine (see 8.2.2)." in the first paragraph discussing the timer. Added "A SAS port shall stop the Arbitration Wait Time timer and set it to zero when it has no more frames to send." as a standalone paragraph above the shall stop paragraph.)  
REVIEW

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.

---

Author: mevans\_mxo

Subject: Highlight

Date: 5/21/2005 7:54:02 PM

**T** ACCEPT - DONE (Change "compares" to "comparisons compare" and expand to "comparisons compare the PATHWAY BLOCKED COUNT fields and the SOURCE SAS ADDRESS fields of the OPEN address frames of the blocked connection requests as described in...")

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.

---

Author: relliott

Subject: Highlight


Date: 5/21/2005 6:59:22 PM

**T** ACCEPT - DONE

Change "instruct the arbitrating expander phy to reject the connection request by transmitting OPEN\_REJECT (PATHWAY BLOCKED)" to use the ECM message name Arb Reject instead of OPEN\_REJECT:


"reply to a connection request with Arb Reject (Pathway Blocked)"

---

Author: RElliott  
Subject: Note  
Date: 5/21/2005 7:32:00 PM  
 ACCEPT - DONE (merged all of 7.12.5 into 7.12.4)


compare this section to 7.12.4.1. Why are expander rules spread across two different sections?

---


Author: relliott  
Subject: Note  
Date: 5/21/2005 7:22:37 PM  
 ACCEPT - DONE

As part of integrating 7.12.4 and 7.12.5, move the entire contents of 7.12.4.1 All expander devices into 7.12.4.2 Arbitration status, because each sentence relates to AIP.

---


Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:33:51 PM  
 ACCEPT - DONE  
Change "an edge expander device" to "the ECM in an edge expander device"

---

Author: relliott  
Subject: Note  
Date: 5/21/2005 7:31:29 PM  
 ACCEPT - DONE


Move 7.12.5.2 Edge expander devices into 7.12.4.x to get rid of the duplicitous 7.12.5 hierarchy

---

Author: relliott  
Subject: Cross-Out  
Date: 5/20/2005 10:26:21 AM  
 ACCEPT - DONE

Change "routed SAS addresses" to "SAS addresses" to avoid need for defining routed SAS address in chapter 3

---


Author: relliott  
Subject: Note  
Date: 7/23/2005 5:57:29 PM  
 ACCEPT - DONE  
REVIEW

In the July SAS WG meeting, Bob Sheffield (Intel) asked how expander phys attached to other expander phys in the same expander device are supposed to be handled. The routing rules included an exception for table routing phys but not direct routing phys.

Reword this whole section into an ordered list starting with the comparison to the expander's own SAS address:


"When the ECM in an edge expander device receives a connection request:

- 1) if the destination SAS address is that of the expander device itself, the ECM shall arbitrate for access to its SMP target port and forward the connection request;
- 2) if the destination SAS address matches the SAS address of a device to which one of the expander phys is attached, the ECM shall arbitrate for access to one of the matching phys and forward the connection request;
- 3) if the destination SAS address matches an enabled SAS address in the expander route table for one or more expander phys which has a table routing attribute (see 4.6.7.1) and is attached to an edge expander device, the ECM shall arbitrate for access to one of the matching phys and forward the connection request; and
- 4) if at least one phy has the subtractive routing attribute and is attached to an expander device (i.e., it is attached to an edge expander device or a fanout expander device and the phy is using the subtractive routing method), and the request did not come from that expander device, the ECM shall arbitrate for access to one of the subtractive routing phys and forward the connection request."

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:35:26 PM  
 ACCEPT - DONE


Change "OPEN\_REJECT (NO DESTINATION)." to Arb Reject (No Destination)"

---


Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:38:15 PM  
 ACCEPT - DONE

Change "OPEN\_REJECT (NO DESTINATION)." to "Arb Reject (NO DESTINATION)"

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:39:27 PM  
 ACCEPT - DONE  
Change "OPEN\_REJECT (NO DESTINATION)" to "Arb Reject (No Destination)" etc throughout this paragraph

---

Author: gop\_ibm  
Date: 5/21/2005 7:37:45 PM  
 REJECT (semicolon joins closely related thoughts)

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). >>


---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:39:55 PM  
ACCEPT - DONE

 Change "OPEN\_REJECT (BAD DESTINATION)" to "Arb Reject (Bad Destination)"


---

Author: relliott  
Subject: Note  
Date: 5/21/2005 7:31:32 PM  
ACCEPT - DONE

 Move 7.12.5.3 Fanout expander devices into 7.12.4.y to get rid of the duplicitous 7.12.5 hierarchy

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:34:13 PM  
ACCEPT - DONE

 Change "a fanout expander device" to "the ECM in a fanout expander device"

---

Author: relliott  
Subject: Note  
Date: 7/23/2005 5:57:58 PM  
ACCEPT - DONE  
REVIEW

In the July SAS WG meeting, Bob Sheffield (Intel) asked how expander phys attached to other expander phys in the same expander device are supposed to be handled. The routing rules included an exception for table routing phys but not direct routing phys.


Reword this whole section into an ordered list starting with the comparison to the expander's own SAS address:

"When the ECM in a fanout expander device receives a connection request:


- 1) if the destination SAS address is that of the expander device itself, the ECM shall arbitrate for access to its SMP target port and forward the connection request;
  - 2) if the destination SAS address matches the SAS address of a device to which one of the expander phys is attached, the ECM shall arbitrate for access to one of the matching phys and forward the connection request; and
  - 3) if the destination SAS address matches an enabled SAS address in the expander route table for one or more expander phys which has a table routing attribute (see 4.6.7.1) and is attached to an edge expander device, the ECM shall arbitrate for access to one of the matching phys and forward the connection request."
-



Author: relliott  
Subject: Highlight  
Date: 5/21/2005 7:38:42 PM

 ACCEPT - DONE  
Change "OPEN\_REJECT (NO DESTINATION)" to Arb Reject (No Destination)" etc. throughout this paragraph

---

Author: gop\_ibm  
Date: 5/21/2005 7:37:55 PM  
 REJECT (semicolon joins closely related thoughts)

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: relliott  
Subject: Highlight  
Date: 5/21/2005 7:40:04 PM

 ACCEPT - DONE  
Change "OPEN\_REJECT (BAD DESTINATION)" to "Arb Reject (Bad Destination)"

---

Author: gop\_ibm  
Date: 5/21/2005 3:04:27 PM

 ACCEPT - DONE (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 change to "After a phy transmits a BREAK to abort a connection request, it shall expect one of the results listed in table 104" - see similar changes on table 91 on page 299.)

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: 5/21/2005 7:51:06 PM

 REJECT (that BREAK stuff only lasted one revision)

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.

---

Author: gop\_ibm

Date: 5/21/2005 3:05:02 PM

ACCEPT - DONE (this is from the source phy's perspective, not the destination phy's perspective)

Will change to "After a phy transmits CLOSE to close a connection, it shall expect one of the results listed in table 105" - see similar changes on table 91 on page 299.)

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.>>

---

Author: gop\_ibm

Date: 5/21/2005 7:51:48 PM

 REJECT (the flawed OPEN\_REJECT concept was tossed by the May WG)


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: 5/21/2005 3:05:27 PM

 ACCEPT - DONE (this is from the source phy perspective, not the destination phy.

Will change to "After a phy transmits a BREAK to break a connection, it shall expect one of the results listed in table 106" - see similar changes on table 91 on page 299.)

7.12.8 Breaking a connection


This statement is 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: 5/30/2005 5:26:07 PM

 ACCEPT - DONE (as "In addition to a BREAK, a connection is considered broken if a link reset sequence starts (i.e., the SP state machine transitions from SP15: SAS\_PHY\_Ready or SP22:SATA\_PHY\_Ready to SP0:OOB\_COMINIT (see 6.8)).")  
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))"

---

Author: relliott

Subject: Cross-Out

Date: 5/21/2005 8:36:29 PM

 ACCEPT - DONE


Delete "and in 7.12.6," since there are no rules in that Aborting a connection request section pertinent to breaking a full-fledge connection.

---

Author: relliott

Subject: Note

Date: 5/21/2005 8:34:51 PM

 ACCEPT - DONE

Move the SSP specific rules into a new 7.16.x section called Breaking an SSP connection (next to the Opening/Closing an SSP connection sections).

Add "See 7.16.x for additional rules on breaking an SSP connection."

---

Author: mevans\_mxo

Subject: Highlight

Date: 5/21/2005 2:52:30 PM

1 ACCEPT - DONE ("A phy shall start rate matching at the selected connection rate with the first dword that is not...").

word this concept as an e.g. in the table:

Rate matching for 3,0 Gbps to 1,5 Gbps may be a repeated pattern of an ALIGN followed by a dword or a repeated pattern of a dword followed by an ALIGN  
)

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: relliott  
Subject: Highlight  
Date: 5/1/2005 12:50:25 AM

1 ACCEPT - DONE

- a) Change "If an STP initiator port discovers a SATA device behind an STP/SATA bridge with" to "If an expander phy attached to a SATA phy is using",
  - b) change "the STP initiator port" to "an STP initiator port"
  - c) change "the STP initiator port should" to "a management application client should"
  - d) change last "pathway" to "pathway from that STP initiator port"
-

Author: kmarks\_dell

Subject: Highlight

Date: 5/20/2005 6:21:54 PM

ACCEPT - DONE (as "SL\_CC (connection control)(part 1)")



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.

---

Author: kmarks\_dell

Subject: Highlight

Date: 5/20/2005 6:22:55 PM

ACCEPT - DONE as "SL\_CC (connection control)(part 2)"



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: 5/20/2005 6:23:29 PM

ACCEPT - DONE (as "SL\_RA (receive OPEN address frame)")



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: 5/20/2005 6:22:24 PM


ACCEPT - DONE



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.

---

Author: relliott  
Subject: Note  
Date: 5/20/2005 10:33:50 AM  
 ACCEPT - DONE  
Table 100 - SL\_CC timers  
Left justify the right column


---



Author: RElliott  
Subject: Note  
Date: 5/30/2005 2:57:12 PM  
 ACCEPT - DONE


Throughout SL\_CC, add a "(see 7.14.4.3.x)" reference from the main state description to the transition next to the send phrase that causes said transition. This helps avoid overlap and confusion between the main state description and the transition descriptions. SL\_CC is more muddled than XL and sometimes only describes the send action in the transition description, not in the main state description.

---

Author: bday\_Isi  
Subject: Comment on Text  
Date: 5/30/2005 6:16:23 PM  
 ACCEPT - DONE

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 >>

---

Author: relliott  
Subject: Highlight  
Date: 4/20/2005 7:45:56 PM  
 ACCEPT - DONE

"a Inbound" s/b "an Inbound"

---

Author: relliott  
Subject: Note  
Date: 6/4/2005 4:04:42 PM  
 ACCEPT - DONE  
REVIEW


(derived from text from Tim Hoglund, LSI)

To go along with other comments removing the flawed BREAK livelock prevention scheme in sas1r09, add "NOTE nn - Possible livelock scenarios can occur when a SAS phy transmits BREAK to abort a connection request (e.g., if its Open Timeout timer expires). SAS phys should respond to OPEN Address frames faster than 1 ms to reduce susceptibility to this problem."

---

Author: gop\_ibm

Date: 5/21/2005 8:27:17 PM

 ACCEPT - DONE (added "(see 7.17.6)" which discusses some of the rules on choosing to send CLOSE (CLEAR AFFILIATION). A complete solution would have a Clear Affiliation message flowing down from the STP transport layer through the port layer into SL\_CC, but since SAS does not define state machines for STP, I don't think that's worthwhile)

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: relliott

Subject: Note

Date: 6/4/2005 4:10:43 PM

 ACCEPT - DONE

REVIEW

(based on text from Tim Hoglund, LSI)


To go along with removal of the flawed BREAK livelock solution in sas1r09, add "Possible livelock scenarios can occur when a SAS phy transmits BREAK to break a connection (e.g., if its Close Timeout timer expires). SAS phys should respond to CLOSE faster than 1 ms to reduce susceptibility to this problem."

---

Author: thoglund\_lsi

Subject: Highlight

Date: 5/21/2005 3:22:29 PM


 ACCEPT - DONE (deleted the "should" rule. Changed the note from a warning that future versions of the standard may require this to "Some SAS phys may" do this.)

functional issue -- this behavior does not completely solve BREAK timing problems. see 05-145r0 for further details.

---

Author: gop\_ibm

Date: 5/21/2005 8:27:26 PM

 ACCEPT - DONE (added "(see 7.17.6)" which discusses some of the rules on choosing to send CLOSE (CLEAR AFFILIATION). A complete solution would have a Clear Affiliation message flowing down from the STP transport layer through the port layer into SL\_CC, but since SAS does not define state machines for STP, I don't think that's worthwhile)

#### 7.14.4.9.1 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: relliott

Subject: Note

Date: 6/4/2005 4:10:29 PM

 ACCEPT - DONE

REVIEW


(based on text from Tim Hoglund, LSI)

To go along with removal of the flawed BREAK livelock solution in sas1r09, add "Possible livelock scenarios can occur when a SAS phy transmits BREAK to break a connection (e.g., if its Close Timeout timer expires). SAS phys should respond to CLOSE faster than 1 ms to reduce susceptibility to this problem."

---

Author: gop\_ibm


Date: 4/25/2005 5:17:51 PM

 ACCEPT - 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). >>

---


Author: relliott  
Subject: Note  
Date: 5/20/2005 10:32:35 AM  
 ACCEPT - DONE  
Table 101 - XL timers  
Left justify the right cells

---

Author: relliott\_hpq

Subject: Note

Date: 6/11/2005 10:28:49 AM

 ACCEPT - DONE (implemented the awful "alternative" option of passing arguments with the Backoff Reverse Path message, and then with the transition into XL5)

## 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

---

Author: relliott\_hpq

Subject: Note

Date: 6/25/2005 5:12:24 PM

 REJECT (in XL1, if Forward Open is received from the ECM, it transitions to XL5 if the Forward Open arrived in time or ignores it if it did not.)

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

 ACCEPT - 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: 6/11/2005 10:36:40 AM

 ACCEPT - DONE (change the argument to a Partial Pathway Timeout Expired request that is sent separate from Request Path)


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. >>

---

Author: relliott  
Subject: Note  
Date: 6/25/2005 5:13:16 PM

 REJECT (Port 1 gets an Arb Lost and Port 0 gets an Arb Won. The ECM doesn't grant conflicting wins.)

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\_Isi  
Subject: Highlight  
Date: 6/11/2005 10:45:28 AM


 ACCEPT - DONE

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: 6/11/2005 10:47:17 AM


 REJECT (this is unfortunately how the obtuse SAS state machines describe flip-flops)

Qlogic Corp #001 PDF page 328 7.15.4.5 Transition XL1:Request\_Path to XL5:Forward\_Open

The following changes eliminate confusion regarding the arguments associated with the OPEN Address Frame received message. In the last sentence of this section, "This transition shall include an OPEN Address Frame Received argument containing the arguments received in the Forward Open indication.", replace "transition" with "state" and replace the end of the sentence beginning with "containing the arguments ..." with "with the transition".

---

Author: ccarlson\_qlgc  
Subject: Note  
Date: 6/11/2005 10:48:28 AM

 ACCEPT - DONE

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\_Isi  
Subject: Highlight  
Date: 6/11/2005 10:48:43 AM

 ACCEPT - DONE

...shall occur if:


- a) a Forward\_Open indication has not been received; and
  - b) a BREAK Received message is received
-



Author: RElliott  
Subject: Underline  
Date: 5/30/2005 2:33:18 PM  
 ACCEPT - DONE


After "after sending a Forward Open request." add "to the ECR" to be consistent with other IBM comments

---

Author: RElliott  
Subject: Note  
Date: 5/30/2005 2:38:37 PM  
 ACCEPT - DONE

add "(see 7.15.6.x)" next to OPEN\_REJECT, OPEN\_ACCEPT, and Forward Break lines, pointing out the associated transition


---

Author: RElliott  
Subject: Underline  
Date: 5/30/2005 2:34:09 PM  
 ACCEPT - DONE

after "after sending a Transmit OPEN\_REJECT message" add "to the XL transmitter" to be consistent with other IBM comments

---


Author: RElliott  
Subject: Underline  
Date: 5/30/2005 2:35:13 PM

 TACCEPT - DONE

after "after sending a Transmit OPEN\_ACCEPT message" add "to the XL transmitter" to be consistent with other IBM comments

---

Author: gop\_ibm  
Date: 5/30/2005 2:37:53 PM


 TACCEPT - DONE ("to the ECR")

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: 5/21/2005 8:29:17 PM


 TACCEPT - DONE

7.15.7.2 Transition XL4:Open\_Reject to XL0:Idle

This << This transition shall occur after OPEN\_REJECT has been transmitted. >> should be << This transition shall occur after the OPEN\_REJECT message has been sent to the XL transmitter. >>. Note that there is no response from the XL transmitter in the XL state machine figure. So if you really want to want until the OPEN\_REJECT is transmitted then that will have to be added into the figure and the XL transmitter section.

---

Author: RElliott  
Subject: Underline  
Date: 6/18/2005 2:54:35 PM

 TACCEPT - DONE


OPEN Address Frame Received message or argument

to handle the argument added by other comments

---

Author: gop\_ibm

Date: 4/25/2005 5:30:44 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 5:31:33 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, 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

 ACCEPT - 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

## 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: 5/30/2005 2:55:44 PM


 ACCEPT - DONE

Throughout XL, add a "(see 7.15.x.x)" reference from the main state description to the transition next to the send phrase that causes said transition. This helps avoid overlap and confusion between the main state description and the transition descriptions.

Author: RElliott

Subject: Note

Date: 5/30/2005 6:17:26 PM


 REJECT (they're grouped into a set that results in a transition and another set that happens repeatedly)

## 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:

---

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: 5/30/2005 2:44:54 PM  
ACCEPT - DONE

## 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: 5/30/2005 2:45:17 PM  
ACCEPT - DONE (also removed the path resources part, since that's in the main state description)

## 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: 5/30/2005 2:45:25 PM  
ACCEPT - DONE

## 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: 5/30/2005 2:45:32 PM  
ACCEPT - DONE

## 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: 5/30/2005 2:45:39 PM  
ACCEPT - DONE

## 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: 5/1/2005 12:51:49 AM  
ACCEPT - DONE

Change "SATA physical link" to "SATA phy"

---


Author: relliott  
Subject: Highlight  
Date: 4/22/2005 3:53:58 PM  
ACCEPT - DONE

## 7.15.10.1 XL7

Change

"SATA\_ERROR primitive" to just "SATA\_ERROR" since it is not really a primitive



---

Author: gop\_ibm  
Date: 5/30/2005 2:47:50 PM  
 ACCEPT - DONE

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: Note  
Date: 6/4/2005 4:11:56 PM  
 ACCEPT - DONE  
 REVIEW


(based on text from Tim Hoglund, LSI)

To go along with removal of the flawed BREAK livelock solution in sas1r09, add "Possible livelock scenarios can occur when a SAS phy transmits BREAK to break a connection (e.g., if its Close Timeout timer expires). SAS phys should respond to CLOSE faster than 1 ms to reduce susceptibility to this problem."

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:52:25 AM  
 ACCEPT - DONE  
Change "SATA physical link" to "SATA phy"


---

Author: relliott  
Subject: Highlight  
Date: 4/22/2005 3:54:12 PM  
 ACCEPT - 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  
 REJECT (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 ???.>>

---

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: 5/1/2005 9:46:08 AM  
ACCEPT - DONE

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\_Isi  
Subject: Highlight  
Date: 5/21/2005 3:17:36 PM  
ACCEPT - DONE (deleted this misguided feature, per May WG)

functional issue -- this behavior does not completely solve BREAK timing problems. see 05-145r0 for further details.

---

Author: mevans\_mxo

Subject: Highlight

Date: 4/25/2005 5:44:54 PM

1 ACCEPT - 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

1 ACCEPT - 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.


---



Author: kmarks\_dell

Subject: Highlight

Date: 4/25/2005 5:48:09 PM

 REJECT (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.

---

Author: relliott

Subject: Note

Date: 9/19/2005 6:10:41 PM

 ACCEPT - DONE


left-justify the interlock requirement column

---

Author: relliott\_hpq

Subject: Note

Date: 5/21/2005 8:33:56 PM

 ACCEPT - DONE (moved the pertinent paragraph from 7.12.8 into a new 7.16.x Breaking an SSP connection section, and have 7.12.8 point to here)

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

---


Author: relliott  
Subject: Note  
Date: 5/21/2005 8:54:58 PM  
 ACCEPT - DONE

Table 103 - SSP link layer timers

Add State machine and Reference columns

---


Author: relliott  
Subject: Note  
Date: 5/20/2005 10:34:18 AM  
 ACCEPT - DONE

Table 103 - SSP link layer timers  
Left-justify the right column

---


Author: kmarks\_dell  
Subject: Highlight  
Date: 5/20/2005 6:00:30 PM  
 ACCEPT - DONE

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: relliott  
Subject: Highlight  
Date: 6/4/2005 4:17:16 PM  
 ACCEPT - DONE (global)

Change state name "Indicate\_Frame\_Tx" to "Transmit Frame"

since this doesn't follow the convention for using the term "indicate"

---

Author: RElliott  
Subject: Note  
Date: 5/30/2005 2:28:40 PM  
 ACCEPT - DONE

underline the blue state machine names sending/receiving messages

---


Author: kmarks\_dell  
Subject: Note  
Date: 5/20/2005 6:25:32 PM  
 ACCEPT - DONE

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: 5/20/2005 6:00:41 PM  
 ACCEPT - DONE

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: relliott  
Subject: Highlight  
Date: 6/4/2005 4:17:28 PM  
 ACCEPT - DONE (global)

Change state name "Indicate\_DONE\_Tx" to "Transmit DONE"

since this doesn't follow the convention for using the term "indicate"

---



Author: kmarks\_dell  
Subject: Highlight  
Date: 5/30/2005 2:30:43 PM  
 ACCEPT - DONE

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  
Subject: Note  
Date: 7/11/2005 9:39:26 AM  
 ACCEPT - DONE

(for Bill Martin)


Delete DONE Timeout confirmation which was removed in sas1r08

---

Author: relliott\_hpq

Subject: Note

Date: 5/30/2005 2:30:40 PM

 ACCEPT - DONE (added "and all other SSP state machines". Did not draw line directly from SSP\_D to every state machine on this page.)

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.

---


Author: kmarks\_dell  
Subject: Highlight  
Date: 5/20/2005 6:03:56 PM  
 ACCEPT - DONE

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: 5/20/2005 6:03:45 PM  
 ACCEPT - DONE

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: 5/20/2005 6:03:29 PM  
 ACCEPT - DONE

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: 5/20/2005 6:28:11 PM  
 ACCEPT - DONE

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: 5/20/2005 6:04:09 PM  
 ACCEPT - DONE

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: 5/20/2005 6:04:21 PM  
 ACCEPT - DONE

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

In Receive Interlocked Frame Monitor

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

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/30/2005 2:25:44 PM

**T** ACCEPT - DONE (more drastic changes needed to agree with other Maxtor comments. Reword this whole state machine in terms of a Number Of Frames Transmitted counter and a Number Of ACKs/NAKs Received counter. Both start at zero and increment, then are set to zero when the connection closes.

New text:

"This state machine monitors the number of frames transmitted with a Number Of Frames Transmitted counter and monitors the number of ACKs and NAKs received with a Number Of ACKs/NAKs Received counter. This state machine ensures that an ACK or NAK is received for each frame transmitted and reports an ACK/NAK timeout if they are not.

When the Number Of Frames Transmitted counter equals the Number Of ACKs/NAKs Received counter, the ACK/NAK count is balanced and this state machine shall send the Tx Balance Status (Balanced) message to the SSP\_TF2:Tx\_Wait state. When the Number Of Frames Transmitted counter does not equal the Number Of ACKs/NAKs Received counter, the ACK/NAK count is not balanced and this state machine shall send the Tx Balance Status (Not Balanced) message to the SSP\_TF2:Tx\_Wait state.

Each time a Frame Transmitted message is received, this state machine shall increment the Number Of Frames Transmitted counter.

If the ACK/NAK count is not balanced, each time an ACK Received message is received, this state machine shall:

- a) increment the Number Of ACKs/NAKs Received counter; and
- b) send an ACK Received confirmation to the port layer.

If the ACK/NAK count is not balanced, each time a NAK Received message is received, this state machine shall:

- a) increment the Number Of ACKs/NAKs Received counter; and
- b) send an NAK Received confirmation to the port layer.

")

REVIEW

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

**T** 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: 5/21/2005 9:05:04 PM

**T** ACCEPT - DONE (it would increment, not decrement. Reworded the whole section - see other comment)

7.16.7.3, first lettered list: Change item (a) to: decrement the ACK/NAK count by one.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/21/2005 9:05:13 PM

**T** ACCEPT - DONE (it would be increment, not decrement. Reworded the whole section - see other comment)


7.16.7.3, second lettered list: Change item (a) to: decrement the ACK/NAK count by one.

---

Author: bmartin\_sierra

Subject: Note

Date: 5/21/2005 9:05:37 PM

 ACCEPT - DONE (rewritten as:

"When this state machine receives an Enable Disable SSP (Enable) message, Request Close message, or Request Break message, the Number Of Frames Transmitted counter shall be set to zero and the Number Of ACKs/NAKs Received counter shall be set to zero." to agree with response to Maxtor comments on previous page)

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.

---



Author: gop\_ibm  
Date: 5/30/2005 2:24:46 PM  
REJECT

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: 5/21/2005 4:01:11 PM  
ACCEPT - DONE

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: relliott  
Subject: Note  
Date: 6/4/2005 4:09:35 PM  
 ACCEPT - DONE  
REVIEW

(based on text from Tim Høglund, LSI)

Add "Possible livelock scenarios can occur when a SAS phy transmits BREAK to break a connection (e.g., if its Done Timeout timer expires). SAS phys should respond to DONE faster than 1 ms to reduce susceptibility to this problem."

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/20/2005 6:06:13 PM  
ACCEPT - DONE

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: 5/20/2005 6:06:22 PM  
ACCEPT - DONE

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: 5/20/2005 6:06:31 PM  
ACCEPT - DONE

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: 5/20/2005 6:06:43 PM  
ACCEPT - DONE

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.

---

Author: gop\_ibm  
Date: 5/1/2005 9:44:26 AM  
ACCEPT - DONE

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: relliott  
Subject: Highlight  
Date: 5/21/2005 9:14:23 PM  
ACCEPT - DONE

To match Maxtor comments in SSP\_TIM...

Change "This state machine monitors the number of frames received versus the number of ACKs and NAKs transmitted."

to:  
"This state machine monitors the number of frames received with a Number Of Frames Received counter and monitors the number of ACKs and NAKs transmitted with a Number Of ACKs/NAKs Transmitted counter."

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 9:14:32 PM  
ACCEPT - DONE  
REVIEW

To match Maxtor comments in SSP\_TIM...

Change:

"This state machine shall use the ACK Transmitted message and the NAK Transmitted message to keep track of the number of ACKs and NAKs transmitted. This state machine shall use the Frame Received message to keep a track of the number of frames received."

to:  
"Each time a Frame Received message is received, this state machine shall increment the Number Of Frames Received counter.  
Each time an ACK Transmitted message or a NAK Transmitted is received, this state machine shall increment the Number Of ACKs/NAKs Transmitted counter."

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 5/21/2005 9:15:04 PM  
ACCEPT - DONE (as "When the Number Of Frames Received counter equals the Number Of ACKs/NAKs Transmitted counter, this state machine shall send an Rx Balance Status (Balanced) message to the SSP\_RF state machine." to match comments in SSP\_TIM)

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: 5/21/2005 9:15:14 PM  
ACCEPT - DONE (as "When the Number Of Frames Received counter does not equal the Number Of ACKs/NAKs Transmitted counter, this state machine shall send an Rx Balance Status (Not Balanced) message to the SSP\_RF state machine." to match comments in SSP\_TIM)

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: relliott  
Subject: Highlight  
Date: 5/21/2005 9:14:49 PM  
ACCEPT - DONE  
REVIEW

To match Maxtor comments in SSP\_TIM...

change:  
"When the SL state machines send the Enable Disable SSP (Enable) message, the number of the ACKs and NAKs transmitted shall be set to the number of frames received."

to:  
"When this state machine receives an Enable Disable SSP (Enable) message, Request Close message, or Request Break message, the Number Of Frames Received counter shall be set to zero and the Number Of ACKs/NAKs Transmitted counter shall be set to zero."


---

Author: gop\_ibm  
Date: 5/1/2005 9:44:50 AM  
ACCEPT - DONE

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). >>

---

Author: relliott  
Subject: Note  
Date: 7/23/2005 4:15:12 PM  
 ACCEPT - DONE

Incorporate 05-224r1, which moves the Continued primitive sequence contents into this section and changes "port" to "phy" a few places.

---



Author: relliott  
Subject: Note  
Date: 5/1/2005 9:43:17 AM  
 ACCEPT - DONE

Figure 154 - STP flow control  
Add "1,5 Gbps SAS physical link" and "1,5 Gbps SATA physical link" labels

---

Author: gop\_ibm  
Date: 5/1/2005 9:42:26 AM


 ACCEPT - DONE (deleted the 1,5 Gbps reference altogether)

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: 5/1/2005 9:42:33 AM


 ACCEPT - DONE (deleted the 1,5 Gbps reference altogether)

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: 5/1/2005 9:42:38 AM


 ACCEPT - DONE (deleted the 1,5 Gbps reference altogether)

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: 5/21/2005 3:55:45 PM

 ACCEPT - DONE (only allow "clear immediately and start returning WAITING ON CONNECTION").

Added inside item c) as:

"If a connection is already established to the STP target port on one phy while an SMP PHY CONTROL request specifying a phy operation of CLEAR AFFILIATION is processed by an SMP target port on another phy, the affiliation shall be cleared and the STP target port shall respond to new connection attempts with:

A) AIP (WAITING ON CONNECTION) and/or OPEN\_REJECT (RETRY), if the STP target port is in an expander device; or

B) OPEN\_REJECT (RETRY), if the STP target port is in a SAS device;

rather than OPEN\_REJECT (STP RESOURCES BUSY);"

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: 5/21/2005 3:44:52 PM



 ACCEPT - DONE (as " to avoid confusing SATA devices which only understand one SATA host.")

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.

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:53:39 AM

 ACCEPT - DONE  
 REVIEW (maybe "SATA phy" is better?)

"SATA device port" to "SATA device"

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 3:23:33 PM  
ACCEPT - DONE

Change , to .

---

Author: relliott  
Subject: Note  
Date: 9/1/2005 2:14:24 PM  
ACCEPT - DONE

(comment from NEC) Add:

"If a wide STP initiator port receives an incoming connection request from an STP target port while it has a connection established with that STP target port, it shall reject the request with OPEN\_REJECT (RETRY)."

There is a rule for targets but not for initiators, but it can happen to initiators if a multibit error happens on a BREAK.

With wide links between initiator and all expanders:  
init - exp0 - exp1 - exp2 - SATA target

assume exp1 to exp2 has too many bit errors, so exp1 runs link reset sequence and sends BREAK to exp0 followed by idle dwords  
BREAK has bit errors, lost SATA target sends XRDY  
exp2 sends OPEN to exp1 via another phy  
exp1 forwards OPEN to exp0 via another phy  
exp0 forwards OPEN to init via another phy

---



Author: kmarks\_dell  
Subject: Highlight  
Date: 5/20/2005 6:29:17 PM  
ACCEPT - DONE

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"

---

Author: gop\_ibm

Date: 5/1/2005 9:25:44 AM

 REJECT (2 goes with 258 in using numerical format)

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: 5/20/2005 6:32:29 PM

 ACCEPT - DONE

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: 5/20/2005 6:29:27 PM  
ACCEPT - DONE

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: 5/1/2005 9:24:48 AM  
ACCEPT - DONE

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.

---

Author: gop\_ibm

Date: 5/1/2005 9:21:59 AM

 REJECT (2 goes with 258 both in numerical format)

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: 5/1/2005 9:24:30 AM

 ACCEPT - DONE

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. >>

---

Author: relliott

Subject: Highlight

Date: 5/21/2005 9:00:44 PM

ACCEPT - DONE

1 Change "This state machine" to "The PL\_OC state machine" for consistency with other timers introduction sentences

---

Author: relliott\_hpq  
Subject: Note  
Date: 6/11/2005 10:55:48 AM

ACCEPT - DONE (add "The PL\_OC state machine shall maintain:  
a pool of pending Tx Frame messages for each destination SAS address; and  
as many pending Tx Open message slots as there are phys in the port." to emphasize that it's a state machine wide resource.)

#### 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: 6/11/2005 11:08:01 AM

ACCEPT - DONE (added to the timer table a "maximum number of timers" column:  
"I\_T Nexus Loss timer = One per destination SAS address  
Arbitration Wait Time timer = One per pending Tx Open message"

Added to PL\_OC1:

"If an I\_T Nexus Loss timer expires for a destination SAS address, this state shall perform the following:

- a) delete the I\_T Nexus Loss timer for the SAS address;
- b) send a Transmission Status (I\_T Nexus Loss) confirmation for each pending Tx Frame message for the SAS address; and
- c) discard each pending Tx Frame message for the SAS address and any corresponding pending Tx Open messages."

)

REVIEW

#### 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).

---

Author: gop\_ibm

Date: 4/25/2005 9:45:59 AM

ACCEPT - 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 ; >>

---

Author: gop\_ibm

Date: 4/25/2005 9:44:16 AM


ACCEPT - 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 ; >>

---



Author: RElliott  
Subject: Highlight  
Date: 6/17/2005 2:30:48 PM  
 ACCEPT - DONE  
REVIEW


"this state shall send a Close Connection message"

needs to be watered down to a "should" per LSI comment on page 451.

PL\_PM will close the connection if the Bus Inactivity Time Limit expires. If PL\_OC closes it when it has no frames left, PL\_PM never gets a chance to be in charge.

Add a note explaining some of that: "The PL\_PM state machine sends a Close Connection request to the link layer upon receipt of a Close Connection message or on expiration of the Bus Inactivity Time Limit timer (see 8.2.3.4.1)."

---

Author: relliott  
Subject: Note  
Date: 6/17/2005 6:11:13 PM  
 ACCEPT - DONEREVIEW

To address the comment on page 379 about synchronizing the link and port layers,

add "After this state sends a Tx Frame message to a PL\_PM state machine, it shall not send another Tx Frame message to that PL\_PM state machine until it receives a Transmission Status (Frame Transmitted) message."

---

Author: RElliott  
Subject: Highlight  
Date: 6/17/2005 6:15:34 PM

**T** REJECT (this looks out of place because the Balance Required paragraphs are tucked after COMMAND/TASK paragraphs and DATA paragraphs. Move them down below the DATA paragraphs instead of changing the text.)

Change:  
DATA frame  
to:  
Balance Required argument  
(or would that be more unclear?)


---

Author: mevans\_mxo  
Subject: Highlight  
Date: 4/25/2005 9:43:39 AM

**T** ACCEPT - 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.


---

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: relliott  
Subject: Highlight  
Date: 5/21/2005 9:00:07 PM  
 ACCEPT - DONE

Change "This state machine" to "The PL\_PM state machine" for consistency with other timers introduction sentences

---

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  
ACCEPT - 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.

---

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"

---

Author: relliott\_hpq

Subject: Note

Date: 6/17/2005 6:13:32 PM

ACCEPT - DONE (Frame Transmitted from the link layer needs to be used by PL\_OC to throttle between every Tx Frame message. That's the state machine that is picking the frames out of the pools. It has some rules about wide links now, but is missing a rule about how many Tx Frames to stuff down one phy.

Added "After this state sends a Tx Frame message to a PL\_PM state machine, it shall not send another Tx Frame message to that PL\_PM state machine until it receives a Transmission Status (Frame Transmitted) message." in the PL\_OC2 frame transmission section.

Another approach would be to add a queue between PL\_PM and SSP\_TF or between PL\_OC and PL\_PM.)  
REVIEW

#### 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: RElliott

Subject: Highlight

Date: 5/28/2005 4:12:16 PM

ACCEPT - DONE

is zero,

s/b

the xyz field is set to zero

---

Author: RElliott

Subject: Highlight

Date: 5/30/2005 2:23:49 PM

REJECT (DEFER to SAS-2)

based on LSI comment on page 451, "not start" probably should be "start" so if the target has no frames to send, it still runs this timer and sends DONE if it is idle for too long

Need to work on the idea in general of how long targets should wait to send their DONE when opened by an initiator when the target has nothing to send.

---

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. >>

---

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: 5/1/2005 9:19:09 AM  
REJECT

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..."

---


Author: relliott  
Subject: Highlight  
Date: 6/17/2005 5:57:18 PM  
ACCEPT - DONE

Transmit Frame request s/b Tx Frame request

since this refers to the port-to-link request, not the transport-to-port request

---

Author: RElliott  
Subject: Note  
Date: 6/17/2005 6:30:42 PM

 ACCEPT - DONE (added:

"After this state receives a DONE Received (Normal) or DONE Received (Credit Blocked) confirmation, if it does not receive a Tx Frame message within 1 ms, then this state shall send a Disable Tx Frames message to the PL\_OC state machine."

)  
REVIEW

Per LSI comment on page 451,

If DONE Received (...[normal]...) reason is received, the port layer needs to send a Close Connection request within 1 ms of when it has no more frames to send. (regardless of Bus Inactivity Time Limit based rules)

---

Author: relliott  
Subject: Note  
Date: 9/1/2005 1:26:30 PM


 ACCEPT - DONE

Add this to the end of the PM3 state description to support a request that is shown in the figure:

"If this state receives an SMP Transmit Break message, then this state shall send an SMP Transmit Break request to the link layer."

---


Author: bday\_lsi  
Subject: Comment on Text  
Date: 5/1/2005 9:13:51 AM

 ACCEPT - DONE

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: 5/1/2005 9:16:47 AM

 ACCEPT - DONE (as "and the connection request was for an SMP connection")

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".

---



Author: gop\_ibm

Date: 4/20/2005 12:24:11 PM

**T** ACCEPT - DONE (and added space between words)


9.2.1 SSP frame format

This << dataoffset >> should be in smallcaps.

---

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.

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 3:41:48 PM

**T** ACCEPT - DONE

"The COMMAND frame is sent by an SSP initiator port to request that a command be processed by the device server in a logical unit."

to:  
"The COMMAND frame is sent by an SSP initiator port to request that a command be processed by the device server in a logical unit (see 9.2.3.3, 9.2.3.4, 9.2.3.5, and 9.2.3.6)."

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/24/2005 8:58:37 AM

**T** ACCEPT - 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

**T** ACCEPT - 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: 5/28/2005 2:20:37 PM

**T** ACCEPT - DONE (change "with SAS-1.1 or later" to "with this standard")

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 >>

---

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).>>

---

Author: RElliott

Subject: Highlight

Date: 5/30/2005 2:23:09 PM

ACCEPT - DONE

Change:

"The TASK frame is sent by an SSP initiator port to request that a task management function be processed by the task manager in a logical unit."

to:


"The TASK frame is sent by an SSP initiator port to request that a task management function be processed by the task manager in a logical unit (see 9.2.3.2)."

---

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: 5/21/2005 9:18:05 PM

 ACCEPT - DONE

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..."

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 3:40:41 PM

 ACCEPT - DONE


Change:

"The XFER\_RDY frame is sent by an SSP target port to request write data from the SSP initiator port."

to:  
"The XFER\_RDY frame is sent by an SSP target port to request write data from the SSP initiator port during a write command or a bidirectional command (see 9.2.3.4 and 9.2.3.6)."

---

Author: gop\_ibm  
Date: 5/28/2005 4:11:24 PM

 ACCEPT - DONE (that's true of all transport layer frames, and is already discussed in 9.2.3 Sequences of SSP frames. Rather than add more layering-violating statements throughout 9.2.2.x...


Beefed up section 9.2.3 into an overview and separate subclauses for each sequence type. Made the paragraph about frames being transmitting during one or more connections into its own paragraph, and changed the example from a read command to a write command, so XFER\_RDY is also mentioned.)  
REVIEW

#### 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  
"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 (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.

---


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: 5/28/2005 3:38:38 PM

 ACCEPT - DONE

Change:

"The DATA frame is sent by an SSP initiator port to deliver write data (i.e., a write DATA frame) and is sent by an SSP target port to deliver read data (i.e., a read DATA frame)."

to:

"During a write command or a bidirectional command (see 9.2.3.4 and 9.2.3.6), one or more write DATA frames are sent by an SSP initiator port to deliver write data.


During a read command or a bidirectional command (see 9.2.3.5 and 9.2.3.6), one or more read DATA frames are sent by an SSP target port to deliver read data."

---

Author: RElliott

Subject: Note

Date: 5/28/2005 3:31:03 PM

 ACCEPT - DONE (changed all section names to "COMMAND frame - Command information unit", changed all information unit names to Mixed Case, clarified their names in the table in 9.1.1)

Add sentence defining terms "read DATA information unit" and "write DATA information unit" which will be used by 04-143

---

Author: RElliott

Subject: Highlight

Date: 5/28/2005 3:43:24 PM

 ACCEPT - DONE

Change:

"The maximum size of the data IU is the maximum size of any IU in an SSP frame (see 9.2.1). The minimum size of the data IU is one byte."

to:

The maximum size of the Data information unit (i.e., the data field) is the maximum size of any information unit in an SSP frame (see 9.2.1). The minimum size of the Data information unit is one byte."

and move down by the DATA field definition.

---

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.

---

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: RElliott  
Subject: Highlight  
Date: 5/28/2005 3:39:54 PM  
 ACCEPT - DONE  
Change:

"The RESPONSE frame is sent by an SSP target port to deliver SCSI status (e.g., GOOD or CHECK CONDITION) and sense data, or to deliver SSP-specific status (e.g., illegal frame format)."

to:

"The RESPONSE frame is sent by an SSP target port to deliver:

- a) service response, SCSI status (e.g., GOOD or CHECK CONDITION) and sense data, if any, for a command (see 9.2.3.3, 9.2.3.4, 9.2.3.5, and 9.2.3.6);
  - b) service response for a task management function (see 9.2.3.2); or
  - c) SSP-specific response (e.g., illegal frame format).
- 

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.

---



Author: RElliott  
Subject: Cross-Out  
Date: 5/28/2005 3:15:25 PM  
ACCEPT - DONE

Delete "The maximum size of the RESPONSE frame is the maximum size of any IU in an SSP frame (see 9.2.1)."

which is wrong. The maximum size of the RESPONSE IU is that, not the RESPONSE frame.

This sentence doesn't seem particularly useful anyway, since 9.2.1 has a table showing the maximum size of each IU already.

---

Author: relliott  
Subject: Highlight  
Date: 9/19/2005 6:16:18 PM  
ACCEPT - DONE

add "in 9.2.2.5.3" after "(see table 118"

---

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."  
"

---

Author: gop\_ibm

Date: 5/7/2005 3:10:32 PM

 ACCEPT - DONE (based on 5/5 vote 10-1-2)

9.2.2.5.4 RESPONSE information unit SENSE\_DATA format

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

---

Author: RElliott

Subject: Note

Date: 5/28/2005 3:37:56 PM

 ACCEPT - DONE

9.2.3 Sequences of SSP frames

Split this into 9.2.3.x subsections for task management, non-data command, write command, read command, bidirectional command.

Add a figure for non-data command.

Cross reference to the appropriate subsections from each of the IU subclauses.

---

Author: RElliott

Subject: Highlight

Date: 5/28/2005 4:02:01 PM

 ACCEPT - DONE

Join "Frames may be interleaved in any order when multiple commands and/or task management functions are outstanding."

and: "RESPONSE frames may be returned in any order (i.e., the order in which TASK frames and COMMAND frames are sent has no effect on the order that RESPONSE frames are returned)."

into their own standalone paragraph, as:

"When multiple commands and/or task management functions are outstanding, frames from each of the individual sequences may be interleaved in any order. RESPONSE frames may be returned in any order (i.e., the order in which TASK frames and COMMAND frames are sent has no effect on the order that RESPONSE frames are returned)."

---

Author: RElliott

Subject: Underline

Date: 5/28/2005 4:04:00 PM

 ACCEPT - DONE

Move this into its own paragraph:

"Frames may be transmitted during one or more

connections (e.g., the COMMAND frame could be transmitted in a connection originated by the SSP initiator port, and the DATA frames and RESPONSE frame transmitted in one or more connections originated by the SSP target port)."

and change the example to a write command, which exercises more of the frame types:

"Frames in a sequence may be transmitted during one or more connections (e.g., for a write command using a single XFER\_RDY frame, the COMMAND frame could be transmitted in a connection originated by the SSP initiator port, the XFER\_RDY frame in a connection originated by the SSP target port, the DATA frames in one or more connections originated by the SSP initiator port, and the RESPONSE frame in a connection originated by the SSP target port. Or, they could all be transmitted in one connection.)."

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 3:48:30 PM  
ACCEPT - DONE

To parallel e.g.s added for the other figures, after "task management function" add "(e.g., ABORT TASK)"

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 3:46:30 PM  
ACCEPT - DONE

To help clarify that "write command" doesn't just mean WRITE (nn),  
after "write command," add "(e.g., MODE SELECT)"

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 3:46:52 PM  
 ACCEPT - DONE


To help clarify that "read command" doesn't just mean READ (nn),  
after "read command," add "(e.g., INQUIRY, REPORT LUNS, or MODE SENSE)"

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 3:47:37 PM  
 ACCEPT - DONE

To help explain what a bidirectional command is, after "bidirectional command" add "(e.g., XDWRITEREAD (see SBC-2))"

---

Author: relliott\_hpq  
Subject: Note  
Date: 5/28/2005 4:11:02 PM  
 ACCEPT - DONE (as "The SSP target port may send read DATA frames for a bidirectional command at the same time it is receiving write DATA frames for the same bidirectional command.")

#### 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.

---

---

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: relliott  
Subject: Note  
Date: 6/12/2005 11:28:27 AM

ACCEPT - DONE as ("If an SSP initiator port transmits a COMMAND frame and receives a NAK for that frame, then the COMMAND frame was not received. The SSP initiator port should retransmit, in the same or in a new connection, the COMMAND frame at least one time (see 9.2.6.2.3.3.2). The SSP initiator port may reuse the tag.")

add: "If an SSP initiator port transmits a COMMAND frame and receives a NAK for that frame, then the COMMAND frame was not received."

---

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: 6/12/2005 12:58:47 PM

REJECT (pointing to the state machines for might cause more confusion)

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: 6/12/2005 11:17:51 AM

ACCEPT - DONE (Add a DATA paragraph:  
"If the SSP initiator port receives a read DATA frame for the I\_T\_L\_Q nexus of the command before the RESPONSE frame for the QUERY TASK, then the COMMAND frame was received and is being processed by the target port, and the read DATA frame is valid."

and include it in the "neither" list in the 5th paragraph in this section.  
)  
REVIEW

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: 6/5/2005 3:22:41 PM  
ACCEPT - DONE (see LSI comment)

9.2.4.2 COMMAND frame link layer errors

May be missing a DATA paragraph (per 9.2.6.3.3.2.6)

---

Author: relliott  
Subject: Cross-Out  
Date: 6/5/2005 3:15:48 PM  
ACCEPT - DONE

Delete "(i.e., NAKed or lost)." NAK handled in its own paragraph.

---

Author: relliott\_hpq  
Subject: Highlight  
Date: 6/5/2005 3:14:02 PM  
ACCEPT - DONE (reworded)

#### 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: 6/5/2005 3:13:43 PM

ACCEPT - DONE (as "If the SSP initiator port determines the COMMAND frame was not received, it should retransmit the COMMAND frame at least one time.")

#### 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."

---

Author: relliott  
Subject: Note  
Date: 6/12/2005 11:28:39 AM

**T** ACCEPT - DONE (as "If an SSP initiator port transmits a TASK frame and receives a NAK for that frame, then the TASK frame was not received. The SSP initiator port should retransmit, in the same or in a new connection, the TASK frame at least one time with the retransmit bit set to one (see 9.2.6.2.3.3.2). The SSP initiator port may reuse the tag.")

add:

If an SSP initiator port transmits a TASK frame and receives a NAK for that frame, then the TASK frame was not received.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 10:16:35 AM

**T** ACCEPT - DONE (but the proposed change loses the RETRANSMIT bit=1 requirement, and step 3 implies the transport layer owns the tag. Changed more like the COMMAND section above.

"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):

- 1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT) (see 7.16.8.6.5); and
- 2) the application client calls Send Task Management Request () using the same tag (see 10.2.2);
- 3) the SSP initiator port transmits the TASK frame with the retransmit bit set to one in a new connection to the SSP target port (see 9.2.6.2.2.2).

)

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: relliott  
Subject: Underline  
Date: 6/12/2005 10:17:51 AM

**T** ACCEPT - DONE  
After "was received" add "by the SSP target port"

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 1:00:15 PM

**T** ACCEPT - DONE (as "If an SSP initiator port transmits a TASK frame and receives a NAK for that frame, then the TASK frame was not received. The SSP initiator port: a) should retransmit the TASK frame at least one time; and b) may reuse the tag of the TASK frame. " moved to the beginning of the section)

9.2.4.3, third paragraph: Change to: If an SSP initiator port does not receive an ACK or a RESPONSE frame for a TASK frame, then the application client should send a Send Task Management protocol service request for a the same task management function and the SSP initiator port should transmit the TASK frame in a new connection to the SSP target port at least once.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:01:24 PM

**T** REJECT

9.2.4.4.2, first paragraph: Change to: If an SSP target port transmits an XFER\_RDY frame and does not receive an ACK or NAK for that frame (e.g., times out, or the connection is broken), then:

- 1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT) (see 7.16.7.6.5);
  - 2) the ST\_TTS state machine constructs a new XFER\_RDY frame setting the RETRANSMIT bit set to one and setting the value in the TARGET PORT TRANSFER TAG field to a value that is different than the value in the TARGET PORT TRANSFER TAG field in the previous XFER\_RDY frame (see 9.2.6.3.3.5); and
  - 3) the SSP target port transmits the XFER\_RDY frame in a new connection with the SSP initiator port.
- 

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:02:00 PM

**T** REJECT

9.2.4.4.2, second paragraph: Change to: If an SSP target port transmits an XFER\_RDY frame and receives a NAK for that frame, then:

- 1) the ST\_TTS state machine constructs a new XFER\_RDY frame setting the RETRANSMIT bit set to one and setting the value in the TARGET PORT TRANSFER TAG field to a value that is different than the value in the TARGET PORT TRANSFER TAG field in the previous XFER\_RDY frame (see 9.2.6.3.3.5); and
  - 2) the SSP target port transmits the XFER\_RDY frame to the SSP initiator port.
- 

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:01:37 PM

**T** REJECT

9.2.4.4.2, third paragraph: Change the last sentence to: The ST\_ITS state machine does not send requests to transmit any additional write DATA frames for the previous XFER\_RDY frame after sending a request to transmit a write DATA frame for the new XFER\_RDY frame.

---

Author: mevans\_mxo  
Subject: Highlight



Date: 6/12/2005 12:05:06 PM

**T** ACCEPT - DONE (as:

- 1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT) (see 7.16.8.6.5);
- 2) the device server calls Send Command Complete () to return 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); and
- 3) the SSP target port transmits the RESPONSE frame in a new connection.")

9.2.4.4.3, first paragraph: Change to: If an SSP target port transmits an XFER\_RDY frame and does not receive an ACK or NAK for that frame (e.g., times out, or the connection is broken), then:

- 1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT) (see 7.16.7.6.5);
  - 2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED COMMAND and the additional sense code set to ACK/NAK TIMEOUT (see 10.2.3);
  - 3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and
  - 4) the SSP target port transmits the RESPONSE frame in a new connection with the SSP initiator port.
-

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:03:41 PM

**T** ACCEPT - DONE (as:

"1) the device server calls Send Command Complete () to return CHECK CONDITION status for that command with the sense key set to ABORTED COMMAND and the additional sense code set to NAK RECEIVED (see 10.2.3); and  
2) the SSP target port transmits the RESPONSE frame in the same or a new connection.")

9.2.4.4.3, second paragraph: Change to: If an SSP target port transmits an XFER\_RDY frame and receives a NAK for that frame, then:

1) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED COMMAND and the additional sense code set to ACK/NAK TIMEOUT (see 10.2.3);  
2) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and  
3) the SSP target port transmits the RESPONSE frame to the SSP initiator port.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 11:47:26 AM

**T** REJECT (this just rewords the "in a new connection" phrase unnecessarily)

9.2.4.5.2, first paragraph: Change to: If an SSP target port transmits a read DATA frame and does not receive an ACK or NAK for that frame (e.g., times out, or the connection is broken), then:

1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT) (see 7.16.7.6.5); and  
3) the SSP target port retransmits, in a new connection with the SSP initiator port, all of the read DATA frames since a previous time when ACK/NAK balance occurred (see 9.2.6.3.3.4).

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 11:47:49 AM

**T** REJECT (this just rewords the "in a new connection" phrase unnecessarily)

9.2.4.5.2, second paragraph: Change to: If an SSP target port transmits a read DATA frame and receives a NAK for that frame, then, in the same or in a new connection, the SSP target port retransmits all of the read DATA frames since a previous time when ACK/NAK balance occurred (see 9.2.6.3.3.4).

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 11:39:20 AM

**T** REJECT (the retry point for write DATA frame errors is supposed to be the last XFER\_RDY requested offset, not any ACK/NAK balance point.)

9.2.4.5.2, third paragraph: Change to: If an SSP initiator port transmits a write DATA frame and does not receive an ACK or NAK for that frame (e.g., times out, or the connection is broken), then:

1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT) (see 7.16.7.6.5); and  
3) the SSP initiator port retransmits, in a new connection with the SSP target port, all of the write DATA frames since a previous time when ACK/NAK balance occurred (see 9.2.6.2.3).

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 11:45:30 AM

**T** REJECT (changing "transmit to "send a request to transmit" is just unnecessary wording, and the proposed changes are not self-consistent anyway (it leaves in "after sending a write DATA frame" at the end). I will change send to transmit whenever frames, not messages, are being referenced.)

9.2.4.5.2, fourth paragraph: Change to: If an SSP initiator port receives a new XFER\_RDY frame or a RESPONSE frame for a command while retransmitting or preparing to retransmit write DATA frames for that command, then the ST\_IFR state machine and ST\_ITS state machine stops sending requests to retransmit the write DATA frames and processes the XFER\_RDY frame or RESPONSE frame (see 9.2.6.2.2 and 9.2.6.2.3). The ST\_ITS state machine does not send a request to transmit a write DATA frame for the previous XFER\_RDY frame after sending a write DATA frame in response to the new XFER\_RDY frame.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 11:48:09 AM

**T** REJECT (this just rewords the "in a new connection" phrase unnecessarily)

9.2.4.5.2, fifth paragraph: Change to: If an SSP initiator port transmits a write DATA frame and receives a NAK for that frame, then, in the same or in a new connection, the SSP initiator port retransmits all of the write DATA frames since a previous time when ACK/NAK balance occurred (see 9.2.6.3.3.4).

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 11:42:16 AM

**T** REJECT

9.2.4.5.2, seventh paragraph: Change to: The ST\_ITS state machine and ST\_TTS state machine send requests to retransmit each DATA frame that does not receive an ACK at least one time (see 9.2.6.2.3 and 9.2.6.3.3). The number of times the state machines retransmit each DATA frame is vendor-specific.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 11:54:13 AM

**T** ACCEPT - DONE (as:

- "1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT) (see 7.16.8.6.5);
  - 2) the device server calls Send Command Complete () to return 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); and
  - 3) the SSP target port transmits the RESPONSE frame in a new connection.
- )

9.2.4.5.3, first paragraph: Change to: If an SSP target port transmits a read DATA frame and does not receive an ACK or NAK for that frame (e.g., times out, or the connection is broken), then:

- 1) the SSP\_TF state machine closes the connection with DONE (ACK/NAK TIMEOUT) (see 7.16.7.6.5);
- 2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED COMMAND and the additional sense code set to ACK/NAK TIMEOUT (see 10.2.3);
- 3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and
- 4) the SSP target port transmits the RESPONSE frame in a new connection with the SSP initiator port.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 11:52:50 AM

**T** ACCEPT - DONE (as:

- "1) the device server calls Send Command Complete () to returns CHECK CONDITION status for that command with the sense key set to ABORTED COMMAND and the additional sense code set to NAK RECEIVED (see 10.2.3); and
- 2) the SSP target port transmits the RESPONSE frame in the same or a new connection."

9.2.4.5.3, second paragraph: Change to: If an SSP target port transmits a read DATA frame and receives a NAK for that frame, then:

- 1) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED COMMAND and the additional sense code set to ACK/NAK TIMEOUT (see 10.2.3);
- 2) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and
- 3) the SSP target port transmits the RESPONSE frame to the SSP initiator port.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 4/20/2005 4:15:54 PM

**T** ACCEPT - 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: 6/10/2005 9:06:18 PM

**T** ACCEPT - DONE

9.2.4.5.3 DATA frame without transport layer retries

2nd to last paragraph

Change

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

to

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

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

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 6/10/2005 9:06:35 PM

**T** ACCEPT - DONE

9.2.4.5.3 DATA frame without transport layer retries

Last sentence

Change

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

to

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

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

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 4/20/2005 4:14:58 PM

**T** 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: mevens\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:08:12 PM  
REJECT

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: mevens\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:11:44 PM  
REJECT (per IBM comment, the retransmit bit is one not zero here. It could be zero since the initiator definitely didn't receive the first one. However, it's simpler for logic analyzers if it's one.)

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: 6/10/2005 9:08:35 PM  
ACCEPT - DONE  
REVIEW

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: mevens\_mxo  
Subject: Highlight  
Date: 6/10/2005 9:09:07 PM  
REJECT

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: mevens\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:15:01 PM  
ACCEPT - DONE (as:

"If an SSP initiator port receives a RESPONSE frame with a retransmit bit set to one, and it has previously received a RESPONSE frame for the same I\_T\_L\_Q nexus, the ST\_IFR state machine discards the extra RESPONSE frame (see 9.2.6.3.2). If the ST\_IFR state machine has not previously received a RESPONSE frame for the I\_T\_L\_Q nexus, then it considers the RESPONSE frame to be the valid RESPONSE frame.")

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: 6/10/2005 9:09:41 PM  
ACCEPT - DONE

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: 6/12/2005 12:15:25 PM  
ACCEPT - DONE (as " If the ST\_IFR state machine has not previously received a RESPONSE frame for the I\_T\_L\_Q nexus, then it considers the RESPONSE frame to be the

valid RESPONSE frame.")

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: 6/12/2005 12:14:37 PM  
ACCEPT - DONE

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: 6/10/2005 9:10:11 PM  
ACCEPT - DONE

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: 6/12/2005 12:18:38 PM

 ACCEPT - DONE (added "See 9.2.4 for transport layer handling of link layer errors (e.g., using transport layer retries)." and in 9.2.4 added "See 9.2.5 for transport layer handling of transport layer errors (e.g., invalid frame contents).")

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: 6/12/2005 2:16:00 PM

 REJECT (this is transport layer error handling section, and shouldn't be concerned about ACKs which are a link layer phenomenon.)

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: 6/12/2005 12:30:44 PM

 REJECT (after an a)b) list this is reasonable, but there's no need to do this globally)

9.2.5.2 SSP initiator port error handling summary


Add a then to all the if statements so they all read <<if ....then ... >>

---

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  
Subject: Note  
Date: 6/12/2005 2:12:12 PM  
 ACCEPT - DONE  
REVIEW

To parallel handling of an unexpected XFER\_RDY, add

"If an SSP initiator port receives a read DATA frame in response to a command with no read data, the ST\_IFR state machine discards the frame (see 9.2.6.2.2.3) and the application client aborts the command (see 10.2.2)."

---


Author: relliott\_hpq  
Subject: Highlight  
Date: 6/18/2005 2:51:41 PM  
 REJECT (but the state machine has the details now)

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: 6/18/2005 2:51:23 PM  
 ACCEPT - DONE (cross ref added later in the paragraph per Maxtor comment)

9.2.5.2 SSP initiator port error handling summary

This << If an SSP initiator port receives a read DATA frame with a data offset that was not expected, the ST\_ITS state machine discards that frame and any subsequent read DATA frames received for that command >>

would be clearer if changed to << If an SSP initiator port receives a read DATA frame with a data offset that was not expected (see 9.2.6.2.3.7.1), the ST\_ITS state machine discards that frame and any subsequent read DATA frames received for that command >>

---

Author: relliott\_hpq  
Subject: Note  
Date: 6/18/2005 2:50:18 PM  
 REJECT (no change here, but the state machine as modified by 05-143 will have all the details)

9.2.5.2 SSP initiator port error handling summary

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

Comment from Rich Deglin, Vitesse:

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

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

---

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: relliott  
Subject: Highlight  
Date: 6/12/2005 2:21:06 PM  
ACCEPT - DONE

Change "XFER\_RDY frame" to "XFER\_RDY or RESPONSE frame" since RESPONSE is the other defined frame type that is target-to-initiator only

---

Author: gop\_ibm  
Date: 6/12/2005 12:33:02 PM  
REJECT (reasonable after an a)b) list but not globally)

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: 6/12/2005 12:33:39 PM  
REJECT

9.2.5.3, second paragraph: Change "the ST\_TTS state machine" to "then the SSP target port".

---

Author: gop\_ibm  
Date: 6/11/2005 9:22:52 AM  
ACCEPT - DONE

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: 6/12/2005 12:33:57 PM  
REJECT

9.2.5.3, third paragraph: Change "the ST\_TTS state machine" to "then the SSP target port".

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:34:11 PM  
REJECT

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.

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 6/12/2005 12:40:17 PM  
ACCEPT - DONE

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: 5/20/2005 6:49:59 PM

1 ACCEPT - DONE

#### 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: 5/20/2005 6:50:25 PM

1 ACCEPT - DONE

#### 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 >>

---




---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:40:37 PM

 REJECT  
9.2.5.3, eighth paragraph: Change "the ST\_TFR state machine" to "then the SSP target port".


---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:40:41 PM

 REJECT  
9.2.5.3, ninth paragraph: Change "the ST\_TFR state machine" to "then the SSP target port".

---

Author: relliott\_hpq  
Subject: Highlight  
Date: 6/18/2005 2:49:55 PM

 REJECT (but the state machine as modified by 05-143 will have all the details)


9.2.5.3 SSP target port [transport layer] error handling summary

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

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

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:41:50 PM


 REJECT (this is a transport layer error, so going into connection detail is unnecessary)

9.2.5.3, eleventh paragraph: Change to: If an SSP target port receives a write DATA frame with a data offset that was not expected, then:

- 1) the ST\_TTS state machine discards the frame (see 9.2.6.3.3.6.1);
- 2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED COMMAND and the additional sense code set to DATA OFFSET ERROR (see 10.2.3);
- 3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and
- 4) the SSP target port transmits the RESPONSE frame in the same or a new connection with the SSP initiator port.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:42:00 PM


 REJECT (this is a transport layer error, so going into connection detail is unnecessary)

9.2.5.3, twelfth paragraph: Change to: If an SSP target port receives a write DATA frame with more write data than expected (i.e., the write DATA frame contains data in excess of that requested by an XFER\_RDY frame or, for first burst data, indicated by the FIRST BURST LENGTH field in the Disconnect-Reconnect mode page), then:

- 1) the ST\_TTS state machine discards the frame (see 9.2.6.3.3.6.1);
- 2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED COMMAND and the additional sense code set to TOO MUCH WRITE DATA (see 10.2.3);
- 3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and
- 4) the SSP target port transmits the RESPONSE frame in the same or a new connection with the SSP initiator port.

---

Author: mevans\_mxo  
Subject: Highlight  
Date: 6/12/2005 12:42:08 PM


 REJECT (this is a transport layer error, so going into connection detail is unnecessary)

9.2.5.3, thirteenth paragraph: Change to: If an SSP target port receives a zero length write DATA frame, then:

- 1) the ST\_TTS state machine discards the frame (see 9.2.6.3.3.6.1);
- 2) the device server sends a Send Command Complete protocol service request with CHECK CONDITION status for that command with the sense key set to ABORTED COMMAND and the additional sense code set to INFORMATION UNIT TOO SHORT (see 10.2.3);
- 3) the transport layer constructs a RESPONSE frame containing the status, sense key, and additional sense code; and
- 4) the SSP target port transmits the RESPONSE frame in the same or a new connection with the SSP initiator port.

---


Author: mevans\_mxo  
Subject: Note  
Date: 6/12/2005 12:44:21 PM

 REJECT (deleted "The ST\_TFR discards any subsequent..." from the 11th paragraph instead. After the command is terminated, all frames are effectively discarded because the tag is no longer valid. No point in mentioning write DATA frames specially.)

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: 7/24/2005 3:15:26 PM

 ACCEPT - DONE (incorporated 05-143r5)

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: Relliott  
Subject: Note

Date: 9/12/2005 11:34:33 AM

 ACCEPT - DONE


Expert I/O made several comments on the transport layer state machines in 05-225r0.

They should all have been addressed by the state machine rewrite in 05-143r5, incorporated into sas1r09e.

---

Author: gop\_ibm

Date: 6/4/2005 4:58:41 PM

 REJECT

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: 6/4/2005 4:58:33 PM

 ACCEPT - DONE

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;

---

Author: relliott\_hpq

Subject: Note

Date: 6/12/2005 12:50:33 PM

 ACCEPT - DONE (in PL\_PM3, added " including the tag of the frame that was ACKed." after "If this state receives an ACK Transmitted confirmation, then this state shall send an ACK Transmitted confirmation to the transport layer")

## 9.2.6.2.1 ST\_I state machines

Comment from ExpertIO in 05-141r0:

### SSP Transport Layer – Ack Transmitted Confirmation Needs TagArgument

#### 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.

---



Author: kmarks\_dell  
Subject: Highlight  
Date: 5/20/2005 6:09:45 PM  
 ACCEPT - DONE

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: 6/11/2005 9:25:21 AM  
 ACCEPT - DONE (Cancel changed to be honored by all states)

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: 6/11/2005 9:25:35 AM  
 ACCEPT - DONE (Cancel changed to be honored by all states)

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.

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 3:47:10 PM  
ACCEPT - DONE

change "ST\_ITS1:Initiator\_Start state in an ST\_ITS state machine that does not have an active task:"  
to "ST\_ITS state machine for the specified tag"

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 3:47:29 PM  
ACCEPT - DONE

change "ST\_ITS1:Initiator\_Start state in an ST\_ITS state machine that does not have an active task:"  
to  
"ST\_ITS state machine for the specified tag"


---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 3:50:25 PM  
ACCEPT - DONE

Change  
"retransmit bit;"  
to  
"retransmit bit set to one if the tag is currently in use and set to zero if the tag is not currently in use;"


---

Author: relliott  
Subject: Highlight  
Date: 6/7/2005 9:14:48 AM

 ACCEPT - DONE  
Change "relative to the confirmation" to "relative to the Frame Received confirmation"

---

Author: gop\_ibm  
Date: 6/12/2005 12:54:48 PM

 ACCEPT - DONE (in ST\_IFR, add " and may send a vendor-specific confirmation to the SCSI application layer to cause the command using that tag to be aborted." to the rule checking XFER\_RDY information unit length. This is how other optional aborts are handled. Returning Service Delivery or Target Failure would force an abort.)

9.2.6.2.2 ST\_IFR (initiator frame router) state machine

This << If the frame type is XFER\_RDY then this state machine shall check the length of the information unit. If the length of the information unit is not correct, then this state machine shall discard the frame >>


needs to have a << Service Delivery or Target Failure - XFER\_RDY xxxxx to the SCSI application layer >> added

as the description in section 9.2.5.2 states << If an SSP initiator port receives an XFER\_RDY frame that is not 12 bytes long, the ST\_IFR state machine discards the frame (see 8.2.6.2.2). The application client may then abort the command (see 10.2.2).>>.

Without the added words there is no confirmation to the application layer that an abort should occur.


---

Author: relliott  
Subject: Highlight  
Date: 6/7/2005 9:14:41 AM

 ACCEPT - DONE  
Change "relative to the confirmation" to "relative to the Frame Received confirmation"

---

Author: relliott  
Subject: Note  
Date: 6/12/2005 2:13:20 PM

 ACCEPT - DONE  
REVIEW

To parallel handling of XFER\_RDY frames for tasks without write data, add handling of read DATA frames for tasks without read data:

"If the frame type is DATA and the tag is for a task with no read data, then this state machine shall:


discard the frame;

send a Command Complete Received transport protocol service confirmation with the Delivery Result argument set to Service Delivery or Target Failure - DATA Not Expected to the SCSI application layer; and

if there is an ST\_ITS state machine for the tag, send a Return To Start message to that state machine."

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 6/4/2005 5:01:16 PM

 ACCEPT - DONE

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: 6/4/2005 5:02:02 PM

 ACCEPT - DONE

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 exist (i.e. zero bytes).

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 6/4/2005 5:01:05 PM

 ACCEPT - DONE

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  
Subject: Highlight  
Date: 6/4/2005 5:02:23 PM  
ACCEPT - DONE

9.2.6.2.2 ST\_IFR (initiator frame router) state machine


17th Paragraph, 1st Sentence

"items"

s/b


"fields"

---

Author: RElliott  
Subject: Note  
Date: 6/4/2005 5:08:22 PM  
 ACCEPT - DONE


new row  
Transmission Complete (Cancel Acknowledged)  
  
Command Complete Received (Service Delivery or Target Failure - Cancel Acknowledged)  
  
since the port layer does send up that confirmation and ST\_ITS forwards it to ST\_IFR

---

Author: relliott  
Subject: Highlight  
Date: 6/8/2005 5:23:50 PM  
 ACCEPT - DONE


Change "Connection Failed" to "ACK/NAK Timeout"

---

Author: relliott  
Subject: Highlight  
Date: 6/8/2005 5:23:32 PM  
 ACCEPT - DONE


Change "Connection Failed" to "ACK/NAK Timeout"

---

Author: relliott  
Subject: Highlight  
Date: 6/8/2005 5:24:04 PM  
 ACCEPT - DONE


Change "Connection Failed" to "ACK/NAK Timeout"

---

Author: relliott  
Subject: Highlight  
Date: 6/8/2005 5:23:57 PM  
 ACCEPT - DONE


Change "Connection Failed" to "ACK/NAK Timeout"

---

Author: relliott  
Subject: Highlight  
Date: 6/9/2005 10:59:46 AM  
 ACCEPT - DONE

Change "DATA Incorrect Data Length" to "DATA Information Unit Too Short"  
  
to match the name used on the target side for the same condition.

---

Author: relliott  
Subject: Highlight  
Date: 6/9/2005 11:00:09 AM  
 ACCEPT - DONE


Change "Reception Complete (Incorrect Data Length)" to "Reception Complete (Information Unit Too Short)"  
  
to match the name used on the target side for the same condition.

---

Author: bday\_Isi  
Subject: Comment on Text  
Date: 6/9/2005 3:05:14 PM  
 ACCEPT - DONE (changed to "Transmission Complete (Command Failed, ACK/NAK Timeout)")

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.**


---

Author: relliott  
Subject: Highlight  
Date: 6/8/2005 5:24:48 PM  
 ACCEPT - DONE

Change "Connection Failed" to "ACK/NAK Timeout"


---



Author: relliott  
Subject: Highlight  
Date: 6/12/2005 10:28:29 AM  
 ACCEPT - DONE


ST\_ISF3 s/b ST\_ITS3

---

Author: relliott  
Subject: Highlight  
Date: 4/24/2005 10:19:56 AM  
 ACCEPT - DONE

an s/b the

---

Author: kmarks\_dell  
Subject: Note  
Date: 6/5/2005 3:55:58 PM  
 REJECT (the port layer just treats absence of the Non-Interlocked argument as meaning Interlocked, so doesn't explicitly look for Interlocked. Someday it might.)


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 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: 6/5/2005 4:09:49 PM  
 ACCEPT - DONE (as:

"If this state is entered from the ST\_ITS6:Receive\_Data\_In state (e.g., because a COMMAND frame requesting a read operation was NAKed), then:  
a) if the vendor-specific number of retries for the COMMAND frame has not been reached, this state shall send a Transmit Frame (Interlocked) request to the port layer to retransmit the COMMAND frame; and  
b) if the vendor-specific number of retries has been reached, this state send a Transmission Complete (Command Failed, NAK Received) message to the ST\_IFR state machine."

9.2.6.2.3.3.1 State description


The 2nd paragraph tells what to do if the number of retries for a COMMAND has not been reached but there is nothing that states what to do if the number of retries for a COMMAND has been reached. This needs to be fixed.

---

Author: bday\_lsi

Subject: Comment on Text

Date: 6/11/2005 9:32:36 AM

 ACCEPT - DONE (same type of comment for ST\_TTS on page 423)


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: 6/5/2005 4:42:13 PM

 ACCEPT - DONE (part of 05-143)

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

---


Author: kmarks\_dell  
Subject: Highlight  
Date: 6/5/2005 4:50:17 PM  
 ACCEPT - DONE

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: 5/20/2005 6:34:41 PM  
 ACCEPT - DONE

9.2.6.2.3.3.1 State description  
Table 121  
This << (ACK Received >> should be << (ACK Received) >>

---



Author: relliott  
Subject: Note  
Date: 6/6/2005 9:20:08 AM  
 ACCEPT - DONE


Table 121  
Join together the Confirmation received cells with the same names

---

Author: relliott  
Subject: Highlight  
Date: 6/8/2005 5:25:26 PM  
 ACCEPT - DONE


Change "Connection Failed" to "ACK/NAK Timeout"

---

Author: bday\_Isi  
Subject: Comment on Text  
Date: 6/5/2005 4:49:49 PM  
 ACCEPT - DONE


Need to add the retries case to not conflict with last sentence of 9.2.4.2.  
"The Transmit Frame request was for a COMMAND frame, and the vendor-specific number of retries has been reached."

---

Author: relliott  
Subject: Highlight  
Date: 6/8/2005 5:25:36 PM  
 ACCEPT - DONE


Change "Connection Failed" to "ACK/NAK Timeout"

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 5:18:31 PM  
 ACCEPT - DONE


Change "Transmission Complete (Data Failed" to "Transmission Complete (Data-Out Failed"

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 5:18:36 PM  
 ACCEPT - DONE

Change "Transmission Complete (Data Failed" to "Transmission Complete (Data-Out Failed"

---

Author: relliott  
Subject: Highlight  
Date: 6/8/2005 5:25:43 PM  
 ACCEPT - DONE

Change "Connection Failed" to "ACK/NAK Timeout"

---

Author: bday\_Isi  
Subject: Comment on Text  
Date: 6/12/2005 12:55:39 PM

**T** ACCEPT - DONE (deleted the sentence)

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.

---

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: 5/20/2005 6:35:14 PM  
ACCEPT - DONE

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: 6/5/2005 4:49:26 PM  
ACCEPT - DONE (part of 05-143)

9.2.6.2.3.2.1 ST\_ITS2:Initiator\_Send\_Frame

Explain "requested offset is not expected"

---

Author: gop\_ibm  
Date: 6/5/2005 4:43:11 PM  
ACCEPT - DONE (part of 05-143. Although as of r2, 05-143 forgot to refer to RETRY DATA FRAMES bit. Added that.)

9.2.6.2.3.3.1 State description  
This is in 05-143.  
This << If this state machine receives an XFER\_RDY Arrived message and the requested offset is not expected, >>  
was carried over from SAS and looks like it needs more clarification now that retries are allowed.

It should be changed to  
<<If this state machine receives an XFER\_RDY Arrived message, does not support transport layer retries of DATA frames, the RETRY DATA FRAMES bit is set to zero, and the requested offset is not expected, (e.g., the data offset is not set to a value in the DATA OFFSET field in the previous XFER\_RDY information unit plus the number of bytes transferred as a result of the previous XFER\_RDY information unit.) >>

---

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: 5/20/2005 6:35:25 PM  
ACCEPT - DONE


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))

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)

---

Author: relliott\_hpq  
Subject: Note  
Date: 6/5/2005 4:43:50 PM  
 ACCEPT - DONE


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

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 2:52:43 PM  
 ACCEPT - DONE


change "based on the values received" to "using arguments received"

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 3:51:35 PM  
 ACCEPT - DONE


zero. s/b zero;

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 2:52:48 PM  
 ACCEPT - DONE

change "based on the values received" to "using arguments received"


---

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: 6/12/2005 12:57:03 PM  
 REJECT (this "state machine" is already so high a level of abstraction that I don't think such details would help.)

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: relliott  
Subject: Highlight  
Date: 6/5/2005 2:54:06 PM  
 ACCEPT - DONE  
Change

"based on values either received with the Request (Send Command) message if first burst is enabled or with an XFER\_RDY Arrived message:"

to:


"using arguments received with the Request (Send Command) message if first burst is enabled or based on values received in an XFER\_RDY Arrived message"

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 4:48:09 PM  
 ACCEPT - DONE (twice in this a)b) list)

change data to write data

---

Author: gop\_ibm  
Date: 6/5/2005 4:44:51 PM  
 ACCEPT - DONE

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  
Subject: Highlight  
Date: 6/12/2005 10:59:57 AM  
 ACCEPT - DONE  
REVIEW

9.2.6.2.3.7 ST\_ITS6:Receive\_Data\_In state

This state does nothing unique that ST\_ITS2 cannot do. Having this state makes bidirectional commands work worse, and complicates rules that say if the initiator receives XFER\_RDY, read DATA, or RESPONSE frames without seeing the ACK for the command frame, it shall accept them.

Move the contents of this state into ST\_ITS2.

---

Author: relliott\_hpq  
Subject: Highlight  
Date: 6/5/2005 4:45:10 PM  
 ACCEPT - DONE (part of 05-143)


9.2.6.2.3.7.1 ST\_ITS6:Receive\_Data\_In

Expand explanation of "not expected"

---

Author: gop\_ibm

Date: 6/12/2005 10:57:53 AM


 REJECT (It does require order)

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.


---



Author: relliott  
Subject: Highlight  
Date: 6/9/2005 10:58:34 AM  
 ACCEPT - DONE


Change "Reception Complete (Incorrect Data Length)" to "Reception Complete (Information Unit Too Short)"  
to match the name used on the target side for the same condition.

---

Author: bday\_Isi  
Subject: Comment on Text  
Date: 6/9/2005 3:05:34 PM  
 ACCEPT - DONE (changed to "Transmission Complete (Command Failed, ACK/NAK Timeout)")


I think this should be ACK/NAK Timeout instead of Command Failed, Connection Failed, to not conflict with 9.2.4.2 and 10.2.2 to allow command frame retries.

---

Author: bday\_Isi  
Subject: Comment on Text  
Date: 6/9/2005 3:06:55 PM  
 ACCEPT - DONE (changed to "shall send a ... and continue processing messages and confirmations." deleting the next paragraph.)


Based on previous paragraph comment, this paragraph may not be accurate.

---

Author: bday\_Isi  
Subject: Comment on Text  
Date: 6/9/2005 3:07:21 PM  
 REJECT (changed it to Transmission everywhere, but then deleted this sentence)


should be "Reception"

---

Author: relliott  
Subject: Note  
Date: 6/4/2005 5:04:12 PM  
 ACCEPT - DONE


Fix font (paragraph tag) of the two paragraphs below NOTE 54

---

Author: relliott  
Subject: Highlight  
Date: 6/7/2005 9:11:04 AM  
 ACCEPT - DONE

ST\_TFR s/b ST\_IFR


---

Author: relliott  
Subject: Highlight  
Date: 6/12/2005 12:57:13 PM  
 ACCEPT - DONE

ST\_IFR doesn't receive any message with the name "Reception Complete (Cancel Acknowledged) message"

When merged into ST\_ITS2, the existing Transmission Complete (Cancel Acknowledge) covers this case. Delete this paragraph in the move.

---

Author: relliott  
Subject: Highlight  
Date: 6/9/2005 10:58:44 AM  
 ACCEPT - DONE

Change "Reception Complete (Incorrect Data Length)" to "Reception Complete (Information Unit Too Short)"  
to match the name used on the target side for the same condition.

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 8:59:02 PM

ACCEPT - DONE

1 Change "This state machine" to "The ST\_TTS state machine" for consistency with other timers introduction sentences

---



Author: kmarks\_dell  
Subject: Highlight  
Date: 5/20/2005 6:10:00 PM  
 ACCEPT - DONE

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: 5/20/2005 6:36:22 PM  
 ACCEPT - DONE

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.

---

Author: relliott  
Subject: Highlight  
Date: 6/7/2005 9:14:02 AM

1 ACCEPT - DONE  
Change "relative to the confirmation" to "relative to the Frame Received confirmation"

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 6/5/2005 5:38:08 PM  
ACCEPT - DONE

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: 6/5/2005 5:38:21 PM  
ACCEPT - DONE

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: 6/5/2005 5:38:32 PM  
ACCEPT - DONE

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: 6/5/2005 5:38:58 PM  
ACCEPT - DONE

9.2.6.3.2 ST\_TFR (target frame router) state machine  
20th Paragraph, 1st Sentence  
"items"  
s/b  
"fields"

---

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.

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 5:18:55 PM  
ACCEPT - DONE

Change "Transmission Complete (Data Failed)" to "Transmission Complete (Data-In Failed)"

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 5:19:03 PM  
ACCEPT - DONE

Change "Transmission Complete (Data Failed)" to "Transmission Complete (Data-In Failed)"

---

Author: relliott  
Subject: Highlight  
Date: 4/24/2005 10:20:12 AM  
ACCEPT - DONE

an s/b the

---



Author: gop\_ibm  
Date: 4/24/2005 10:07:37 AM  
ACCEPT - 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: relliott  
Subject: Highlight  
Date: 6/6/2005 9:19:10 AM  
ACCEPT - DONE

DATA s/b "read DATA"

---

Author: bday\_Isi  
Subject: Comment on Text  
Date: 6/11/2005 9:32:15 AM  
ACCEPT - DONE (same type of comment on page 409 for ST\_ITS)

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  
ACCEPT - 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. >>

---

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: relliott  
Subject: Note  
Date: 6/6/2005 9:19:56 AM

 ACCEPT - DONE

Table 125  
Join together the Confirmation received cells with the same names

---

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. >>

---

Author: relliott  
Subject: Highlight  
Date: 6/7/2005 6:14:47 PM

 ACCEPT - DONE

Change "Transmission Complete (Response Delivery Failed)"  
to  
"Transmission Complete (Response Failed)"  
  
to match other message names

---


Author: relliott  
Subject: Highlight  
Date: 6/5/2005 5:19:17 PM

 ACCEPT - DONE

Change "Transmission Complete (Data Failed)" to "Transmission Complete (Data-In Failed)"


---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 5:19:27 PM

 ACCEPT - DONE


Change "Transmission Complete (Data Failed)" to "Transmission Complete (Data-In Failed)"

---

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. >>

---

Author: relliott  
Subject: Note  
Date: 9/19/2005 2:46:31 PM  
 ACCEPT - DONE

The text added in sas1r09e advanced the balance point too far. Change to:

When the number of Transmission Status (Frame Transmitted) confirmations for Transmit Frame (Non-Interlocked) requests equals the number of Transmission Status (ACK Received) confirmations and the Transmit Frame request was for a read DATA frame, this state shall set the Balance Point Read Data Offset state machine variable to the current Read Data Offset state machine variable.

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 2:49:22 PM  
ACCEPT - DONE

To match other sections, change "This state shall use arguments received in the Request (Send Data-In) message to construct the frame (see 9.2.6.3.2).

This state shall generate the following values when constructing the frame:"

to

"This state shall construct a read DATA frame using arguments received in the Request (Send Data-In) message (see 9.2.6.3.2):"

---

Author: relliott  
Subject: Highlight  
Date: 6/5/2005 4:48:34 PM  
ACCEPT - DONE

Change "specified data" to "specified read data"

---

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: relliott  
Subject: Highlight  
Date: 6/5/2005 4:48:40 PM  
ACCEPT - DONE

Change "specified data" to "specified read data"

---

Author: kdbutt\_ibm  
Subject: Note  
Date: 6/17/2005 6:23:59 PM  
ACCEPT - DONE (handled by 05-143)

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;

---

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: 6/5/2005 5:42:17 PM  
 REJECT (handled by 05-143 which puts this in a new table. It does require ordering, and 05-143 includes a footnote to that effect)

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: 6/5/2005 5:42:33 PM  
 ACCEPT - DONE (part of 05-143)

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: 6/17/2005 6:20:27 PM  
 ACCEPT - DONE (05-143)

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.

---

Author: gop\_ibm

Date: 6/11/2005 9:33:39 AM

**T** ACCEPT - DONE (as "This state shall process the write data received in the Data-Out Arrived message using the Data-Out device server buffer argument.")

9.2.6.3.3.7.1 State description

This << This state shall process the data received in the Data-Out Arrived message using the Device Server Buffer (e.g., logical block address) to which the data is to be transferred. >> should be << This state shall process the SSP frame contents using the Device Server Buffer (e.g., logical block address) to which the data is to be transferred. >>

---

Author: gop\_ibm

Date: 6/11/2005 9:34:16 AM

**T** REJECT

9.2.6.3.3.7.2 Transition ST\_TTS6:Process\_Data\_Out to ST\_TTS5:Receive\_Data\_Out

This << state has processed the data received in a Data-Out Arrived message.>> should be << has processed the SSP frame contents. >>

---

Author: gop\_ibm

Date: 4/24/2005 10:18:22 AM

**T** ACCEPT - 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>>

---

Author: risheffi\_intc  
Subject: Inserted Text  
Date: 5/30/2005 2:21:06 PM

**T** ACCEPT - DONE (per 5/2 meeting, but without creating a request message to SL\_IR. Since SATA state machines are not defined, just handwave how this is done. Just added the cross reference to 7.11)

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  
risheffi Accepted 4/14/2005 11:05:54 PM

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/21/2005 5:12:30 PM  
**T** REJECT (see response on pg 431)

9.4.1 SMP transport layer overview

In Table 128 - SMP FRAME TYPE field

Change

"9.4.2"

to

"10.4.3.1"

as 9.4.2 is proposed for removal below.

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/21/2005 5:13:03 PM  
**T** REJECT (see response on pg 431)

9.4.1 SMP transport layer overview

In Table 128 - SMP FRAME TYPE field

Change

"9.4.3"

to

"10.4.3.2"

as 9.4.3 is proposed for removal below.

---



Author: kmarks\_dell  
Subject: Cross-Out  
Date: 5/21/2005 5:11:39 PM

**REJECT** (This is the main response for a slew of related comments about reorganizing the SMP frame definitions in the transport/application layers.

The frame definitions in SAS have other layer-to-layer duplication of fields. For example, the CRC field is shown in both the SSP frame format and the SMP frame format defined in the transport layer, even though it is essentially owned (probably generated and definitely checked) by the link layer.

In SMP, since the transport layer header is only one byte long (not even a full dword), we chose to duplicate it in the application layer and avoid confusing everyone with byte numbers that are just one byte off. There is a sentence in the application layer where SMP FRAME TYPE is first mentioned that describes this - "The smp frame type field is included in each frame format defined in this clause, although that field is parsed by the SMP transport layer (see 9.4)"

SSP is less confusing since the header is significantly longer and is a multiple of dwords - 24 bytes (8 dwords).  
)

Remove Section 9.4.2 - SMP\_REQUEST FRAME as it is redundant with 10.4.3.1

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

---

Author: kmarks\_dell  
Subject: Cross-Out  
Date: 5/21/2005 5:10:43 PM

**REJECT** (see response on page 431)

#### 9.4.2 SMP\_REQUEST frame

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

---

Author: kmarks\_dell  
Subject: Cross-Out  
Date: 5/21/2005 5:10:57 PM

**REJECT** (see response on page 431)

Remove Section 9.4.3 - SMP\_RESPONSE frame as it is redundant with 10.4.3.2 and seems to have a slightly different format than 10.4.3.2.

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

---

Author: gop\_ibm  
Date: 5/20/2005 6:47:03 PM

**ACCEPT - DONE**

#### 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: 5/20/2005 6:49:16 PM

**ACCEPT - DONE**

#### 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: relliott  
Subject: Note  
Date: 5/21/2005 4:03:56 PM  
 ACCEPT - DONE

Add "This state machine shall start in the MT\_IP1:Idle state." to match Dell comment on SSP\_TF

---

Author: relliott  
Subject: Highlight  
Date: 5/21/2005 8:58:01 PM  
 ACCEPT - DONE

Change "This state machine" to "The MT\_IP state machine" for consistency with other timers introduction sentences

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/21/2005 4:56:59 PM  
T ACCEPT - DONE

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: 5/21/2005 5:15:03 PM  
T REJECT (see response on pg 431)

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: 5/21/2005 5:13:33 PM  
T REJECT (see response on pg 431)

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

1st Paragraph

change

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

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

to

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

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

per proposed removal of SMP\_REQUEST table 129.

---

Author: kmarks\_dell

Subject: Highlight

Date: 5/21/2005 5:14:45 PM

**1** REJECT (see response on pg 431)

9.4.5.2.3.1 State description

1st Paragraph

Change

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

a) request bytes;"

to


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

a) function; and

b) additional request bytes;"


per proposed removal of SMP\_REQUEST table 129.

---

Author: relliott  
Subject: Note  
Date: 5/21/2005 4:04:44 PM  
 ACCEPT - DONE

Add "This state machine shall start in the MT\_TP1:Idle state." to match Dell comment on SSP\_TF.

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 5/21/2005 4:57:07 PM  
 ACCEPT - DONE

9.4.5.3.2.1 State description

Add text

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

---

Author: kmarks\_dell

Subject: Highlight

Date: 5/21/2005 9:20:32 PM

**1** REJECT (see response on pg 431)

9.4.5.3.3.1 State description

1st Paragraph

Change

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

to

"This state waits for a Send SMP Response request, which includes the following arguments:  
a) function;  
b) function result; and  
c) response bytes."

per proposed removal of SMP\_RESPONSE table 130.

---

Author: kmarks\_dell

Subject: Highlight

Date: 4/25/2005 1:50:58 PM

**1** REJECT (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.

---

Author: relliott  
Subject: Note  
Date: 5/30/2005 2:09:00 PM  
 ACCEPT - DONE (added CellIndentList0[Reset] paragraph tags and used globally inside tables)

Consider a non-indented 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])) >>

---



Author: mevens\_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.

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/20/2005 4:30:47 PM  
ACCEPT - 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.

---

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.

---

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  
10.2.1.12  
"Used to set" s/b "Specifies"

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/25/2005 1:53:43 PM

**T** ACCEPT - DONE (changed "and delivers" to "with")

10.2.2 Application client error handling  
1st sentence

"delivers"  
s/b  
"returns"

---

Author: relliott  
Subject: Highlight  
Date: 6/9/2005 10:59:14 AM

**T** ACCEPT - DONE

Change "DATA Incorrect Data Length" to "DATA Information Unit Too Short"

to match the name used on the target side for the same condition.

---

Author: gop\_ibm  
Date: 4/20/2005 4:40:51 PM

**T** 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). >>

---

Author: RElliott  
Subject: Highlight  
Date: 6/11/2005 9:35:16 AM

**T** ACCEPT - DONE (changed Connection Failed to ACK/NAK Timeout everywhere else instead. Deleted item j above.)

solves LSI comments in ch9 pg 367/407 and pg 374/414)

... - ACK/NAK Timeout does not exist in section 9.

It should be Connection Failed here. Delete item j) above.

---

---

Author: relliott  
Subject: Note  
Date: 6/12/2005 10:12:28 AM  
ACCEPT - DONE  
REVIEW

Add "After a Received Task Management Function Executed () call with a Service Response of Service Delivery or Target Failure - ACK/NAK Timeout, an application client should call Send Task Management Request () with identical arguments, including the same tag."

which is what 9.2.4.3 says happens, but there is no text that actually says to do that.

---

Author: relliott  
Subject: Highlight  
Date: 6/12/2005 10:11:43 AM  
ACCEPT - DONE  
REVIEW

change "After a Command Complete Received () or Received Task Management Function Executed () call,"  
to "After a Command Complete Received () or Received Task Management Function Executed () call returns a Service Response other than Service Delivery or Target Failure - ACK/NAK Timeout, "

since for TASK frames the application client is supposed to reissue with the same tag (and with RETRANSMIT set to one) on an ACK/NAK Timeout, and for COMMAND frames the previous paragraph describes the procedure in detail (and results in tag reuse at the end).

---

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: relliott  
Subject: Highlight  
Date: 6/11/2005 9:35:43 AM  
ACCEPT - DONE ("ACK/NAK TIMEOUT" used throughout)

Table 147 - Device server error handling

DELIVERY FAILURE - ACK/NAK TIMEOUT maps to additional sense code set to ACK/NAK TIMEOUT

The left does not exist anywhere in this revision - it's called DELIVERY FAILURE - CONNECTION FAILED everywhere.

Change it to one or the other term throughout.

---

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

Remove extra "calls" in sentence.

"b) an SSP target port 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

REJECT (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.

---

Author: relliott  
Subject: Note  
Date: 6/12/2005 12:39:27 PM  
ACCEPT - DONE

make field names smallcaps

---

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.

---



Author: kmarks\_dell  
Subject: Highlight  
Date: 4/20/2005 5:32:49 PM  
ACCEPT - 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: relliott  
Subject: Highlight  
Date: 9/19/2005 2:53:09 PM  
ACCEPT - DONE

Reserved should be "SPF (0b)"  
Found during September T10 meeting week.

---

Author: bday\_Isi  
Subject: Comment on Text  
Date: 6/17/2005 2:28:53 PM


ACCEPT - DONE (PL\_OC should be modeled as not being required ("shall") to close connections when it has no more frames. It should only be recommended ("should") to close them at that time. See new comment added pn page 332. See new comment on DONE Received in PL\_PM3. See comment in PL\_PM3 about when the Bus Inactivity Timer starts (to be rejected))

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.
-

Author: relliott  
Subject: Note  
Date: 9/7/2005 9:19:57 AM  
 ACCEPT - DONE

Add "This value may be rounded as defined in SPC-3." to MAXIMUM CONNECT TIME LIMIT, since SPC-3 does define it as a rounded parameter.


---

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 >>

---

Author: relliott  
Subject: Cross-Out  
Date: 9/7/2005 9:21:22 AM  
 ACCEPT - DONE

Delete "The device server may round this value down as defined in SPC-3." from MAXIMUM BURST SIZE. SPC-3 does not define this as a rounded parameter.

---

Author: relliott  
Subject: Note  
Date: 9/19/2005 2:56:25 PM  
ACCEPT - DONE

Change "SPF" to "SUBPAGE FORMAT (SPF)" to match the usage in other bit descriptions in the mode pages.

---

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.

---



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: relliott  
Subject: Note  
Date: 9/19/2005 2:56:34 PM  
 ACCEPT - DONE


Change "SPF" to "SUBPAGE FORMAT (SPF)" to match the usage in other bit descriptions in the mode pages.

---

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. >>

---


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)"

---

Author: gop\_ibm  
Date: 4/20/2005 5:34:26 PM  
 ACCEPT - DONE

10.2.7.3.2 Protocol-Specific Logical Unit mode page - short format  
This << SPF field shall >> should be << SPF bit shall >>

---

Author: relliott  
Subject: Note  
Date: 9/19/2005 2:56:41 PM  
 ACCEPT - DONE


Change "SPF" to "SUBPAGE FORMAT (SPF)" to match the usage in other bit descriptions in the mode pages.

---

Author: RElliott  
Subject: Highlight  
Date: 7/13/2005 2:26:33 PM  
 ACCEPT - DONE

add "Port" after Protocol-Specific"

---

Author: RElliott  
Subject: Highlight  
Date: 7/13/2005 2:26:40 PM  
 ACCEPT - DONE


add "Port" after Protocol-Specific"

---

Author: RElliott  
Subject: Highlight  
Date: 7/13/2005 2:26:47 PM  
 ACCEPT - DONE


add "Port" after Protocol-Specific"

---

Author: relliott  
Subject: Note  
Date: 9/19/2005 2:51:44 PM  
 ACCEPT - DONE

The PAGE CODE field is really a 6 bit field per SPC-3. Bits 7:6 of byte 0 should be marked Reserved. Found during September T10 meeting week.


---

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: 7/13/2005 2:32:19 PM  
 ACCEPT - DONE

Add "port" after "protocol-specific"

---

Author: RElliott  
Subject: Highlight  
Date: 7/13/2005 2:32:13 PM  
 ACCEPT - DONE

Add "port" after "protocol-specific"

---



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)"

---

Author: RElliott  
Subject: Highlight  
Date: 7/13/2005 2:32:06 PM  
 ACCEPT - DONE

Add "port" after "protocol-specific"

---

Author: RElliott  
Subject: Highlight  
Date: 7/13/2005 2:26:57 PM  
ACCEPT - DONE

add "Port" after Protocol-Specific"

---

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.

---




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.

---

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: 5/10/2005 12:15:07 PM  
ACCEPT - DONE (stall to shall)

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. >>

---

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: 5/11/2005 11:38:16 PM

 ACCEPT - DONE (The May protocol WG chose to require that the NAA binary format always be present and that the SCSI name string format be optional (disregarding the SAM-3 "should" advice that if a SCSI name string format identifier is present, it should be the only one.

Incorporated as:


"In the Device Identification VPD page (83h) returned by the INQUIRY command (see SPC-3), each logical unit in a SAS target device shall include an identification descriptor for the SAS target device name (see 4.2.4) using NAA format and may include an identification descriptor for the SAS target device name using the SCSI name string format as listed in table 168." with a new table containing NAA format and SCSI name string format columns.)

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)"

---


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

---

Author: relliott  
Subject: Highlight  
Date: 5/28/2005 6:26:42 PM

**T** ACCEPT - DONE (deleted this sentence in favor of better rules in 4.2.x)

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

**T** REJECT (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..

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:55:31 AM  
ACCEPT - DONE  
Change "SATA device" to "SATA phy"

---

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). >>

---

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. >>

---

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 1 024 bytes (i.e., 1 024 bytes of data + 4 bytes of header + 4 bytes of CRC). >>

---




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: 5/30/2005 12:26:28 PM

 ACCEPT - DONE (the second rule has to override the first rule. As: "If the SMP target port has transmitted BROADCAST (CHANGE) for any reason described in 7.11 other than forwarding a BROADCAST (CHANGE) since transmitting a REPORT GENERAL response, it shall increment this field at least once from the value in the previous REPORT GENERAL response.")

Sierra\_Logis-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: 5/7/2005 3:10:47 PM  
 ACCEPT - DONE (based on 5/5 WG vote 10-1-2)

## 10.4.3.3 REPORT GENERAL function

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

---

Author: thoglund\_isi  
Subject: Highlight  
Date: 5/11/2005 10:52:08 PM

**T** ACCEPT - DONE (per May protocol WG, delete this whole paragraph. Not applicable to the optimized algorithm, stated in the wrong place, self-inconsistent...)

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

**T** 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

**T** 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

**T** 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

**T** 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

---

Author: relliott\_hpq  
Subject: Highlight  
Date: 5/10/2005 12:21:19 PM

**T** ACCEPT - DONE (also deleted keyword from 3.3.x)

- 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

**T** REJECT (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.

---

Author: kmarks\_dell

Subject: Highlight

Date: 4/25/2005 2:11:12 PM

 REJECT (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.

---

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

---

Author: RElliott  
Subject: Underline  
Date: 5/30/2005 12:29:21 PM  
ACCEPT - DONE

Move "The ATTACHED DEVICE TYPE field shall only be set to..." to below the table and format as an a)b) list so the times that this field changes stand out better.

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:56:35 AM  
ACCEPT - DONE

Change "SATA device" to "SATA phy"

---

Author: relliott\_hpq  
Subject: Note  
Date: 5/28/2005 6:23:17 PM  
REJECT (May VG vote. Update annex code instead)

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.

---


Author: RElliott  
Subject: Note  
Date: 5/30/2005 12:37:45 PM  
 ACCEPT - DONE


Table 178 - negotiated physical link rate field

Add names to the negotiated physical link rates rows and use them rather than the numerical values when referenced.

0h - UNKNOWN  
1h - DISABLED  
2h - PHY\_RESET\_PROBLEM  
3h - SPINUP\_HOLD  
4h - PORT\_SELECTOR  
8h - G1  
9h - G2

Change references are like "field is set to G1 (i.e., 8h) or G2 (i.e., 9h)". There are not very many in the standard.

---

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: RElliott  
Subject: Highlight  
Date: 7/13/2005 2:30:42 PM  
 ACCEPT - DONE

add "Port" after "Protocol-Specific"

---

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: 5/28/2005 6:23:33 PM  
 REJECT (May VG vote. Update annex code instead)

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.

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:59:15 AM  
 ACCEPT - DONE  
Change "Phy is enabled; This field shall be updated to this value after the speed negotiation sequence completes indicating a negotiated physical link rate of 1,5 Gbps."  
to  
"Phy is enabled; 1,5 Gbps physical link rate. This field shall be updated to this value after the speed negotiation sequence completes"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 12:59:44 AM

 ACCEPT - DONE

Change "Phy is enabled; This field shall be updated to this value after the speed negotiation sequence completes indicating a negotiated physical link rate of 3,0 Gbps."  
to  
"Phy is enabled; 3,0 Gbps physical link rate. This field shall be updated to this value after the speed negotiation sequence completes."

---



Author: relliott\_hpq  
Subject: Note  
Date: 9/19/2005 4:16:19 PM  
ACCEPT - DONE (

Note: this was incorporated wrong in sas1r09e, fixed in sas1r10 (noticed by Bill Martin, Sierra Logic).

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 one), then the attached sata port selector bit, the attached sata device bit, and the attached sata host bit shall each be set to zero."

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"

---

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

**T** 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

**T** ACCEPT - DONE  
"link reset sequence" s/b "identification sequence"

---

Author: relliott  
Subject: Highlight  
Date: 4/25/2005 2:15:50 PM

**T** 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

**T** ACCEPT - DONE  
"link reset sequence" s/b "identification sequence"

---

Author: relliott  
Subject: Highlight  
Date: 4/25/2005 2:15:59 PM

**T** ACCEPT - DONE  
"the SMP TARGET value" s/b "the value of the SMP TARGET PORT field"

---

Author: relliott  
Subject: Highlight  
Date: 4/25/2005 2:22:59 PM

**T** ACCEPT - DONE  
"link reset sequence" s/b "identification sequence"

---

Author: relliott  
Subject: Cross-Out  
Date: 4/25/2005 2:25:09 PM

~~**T** 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

**T** 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)."

---

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: 5/30/2005 1:36:27 PM  
ACCEPT - DONE (keeping only the i.e. and dropping the spinup hold time reference altogether)

#### 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: relliott  
Subject: Note  
Date: 5/30/2005 1:35:21 PM  
ACCEPT - DONE

Change SAS device, expander device, and SATA device in the ATTACHED SAS ADDRESS field paragraph to SAS phy, expander phy, and SATA phy.

---

Author: rlsheffi\_intc  
Subject: Inserted Text  
Date: 5/30/2005 12:55:08 PM  
REJECT (The attached SAS address field is \_not\_ supposed to be zeroed out like that; it persists until a new value is known. If the physical link is experiencing errors and repeatedly getting reset, this helps make the field readable - you can tell what it is trying to talk to.)

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  
risheffi Accepted 4/14/2005 11:04:44 PM

---

Author: relliott  
Subject: Highlight  
Date: 5/30/2005 12:55:24 PM  
ACCEPT - DONE (as "The attached phy identifier field contains a phy identifier for the attached phy:  
a) If the attached phy is a SAS phy or an expander phy, the attached phy identifier field contains the value of the phy identifier field received in the IDENTIFY address frame during the identification sequence:  
A) 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;  
B) 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;  
and  
b) If the attached phy is a SATA device phy, the attached phy identifier field contains 00h;  
c) If the attached phy is a SATA port selector phy and the expander device is able to determine the port of the SATA port selector to which it is attached, the attached phy identifier field contains 00h or 01h; and  
d) If the attached phy is a SATA port selector phy and the expander device is not able to determine the port of the SATA port selector to which it is attached, the attached phy identifier field contains 00h.  
")


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, the attached phy identifier field contains 00h.  
If the attached phy is a SATA port selector, the attached phy identifier field should contain 00h or 01h if the expander device is able to determine the port of the SATA port selector to which it is attached and shall contain 00h if the expander device is not able to determine ..."

---

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: RElliott  
Subject: Note  
Date: 5/30/2005 1:35:59 PM  
 ACCEPT - DONE  
REVIEW


Add text about when the attached phy identifier field is updated - same as the ATTACHED SAS ADDRESS field.  
"The attached phy identifier field shall be updated:  
a) after the identification sequence completes, if a SAS phy or expander phy is attached; or  
b) after the COMSAS Detect Timeout timer expires (see 6.8.3.9), if a SATA phy is attached."

---

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: Note  
Date: 5/21/2005 9:55:42 AM  
 ACCEPT - DONE

change "is not 000b" to "is set to a value other than 000b"

---

Author: relliott  
Subject: Rectangle  
Date: 5/21/2005 9:55:27 AM  
 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.

---

Author: gop\_ibm

Date: 5/7/2005 3:10:58 PM

ACCEPT - DONE (based on 5/5 WG vote 10-1-2)

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."

---

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: 5/11/2005 10:50:58 PM

 ACCEPT - DONE (per May protocol WG and phy WG, add "The <xxx> field is set to a vendor-specific value after power on." for each of the fields)

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.

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/25/2005 4:38:25 PM

**T** 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

**T** 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

**T** 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

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/22/2005 9:03:43 AM  
ACCEPT - 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: 9/1/2005 2:28:02 PM  
ACCEPT - DONE

(updated from sas1r09d to remove SP15:SAS\_PHY\_Ready from the list, since this field only applies to phys in SATA mode)

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 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.

---



Author: gop\_ibm

Date: 4/23/2005 2:55:56 PM

**T**REJECT (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. >>

---

Author: gop\_ibm

Date: 4/23/2005 2:56:21 PM

**T**REJECT (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. >>

---

Author: relliott  
Subject: Cross-Out  
Date: 5/20/2005 10:25:39 AM  
ACCEPT - DONE

Change "routed SAS address" to "SAS address" to avoid need for defining routed SAS address in chapter 3

---

Author: gop\_ibm

Date: 4/23/2005 2:56:31 PM

**T**REJECT (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. >>

---

Author: relliott  
Subject: Cross-Out  
Date: 5/20/2005 10:25:52 AM  
ACCEPT - DONE

Change "routed SAS address" to "SAS address" to avoid need for defining routed SAS address in chapter 3

---

Author: kmarks\_dell  
Subject: Highlight  
Date: 4/20/2005 7:15:08 PM  
ACCEPT - 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."

---

Author: kmarks\_dell

Subject: Highlight

Date: 5/30/2005 3:15:23 PM

**T** ACCEPT - DONE (as ", if implemented (see 6.8.3.9)."

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."

---

Author: relliott

Subject: Highlight

Date: 5/1/2005 1:09:28 AM

**T** ACCEPT - DONE

Change "not a SATA phy" to "a SAS phy or an expander phy"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:11:27 AM

T ACCEPT - DONE  
Change "this command shall cause the phy to" to "the phy shall"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:10:43 AM

T ACCEPT - DONE  
Change "attachment of a SATA port selector" to "SATA port selectors"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:13:16 AM

T ACCEPT - DONE  
REVIEW  
Change "that causes the SATA port selector to engage the attached phy as the active phy (and consequently render the alternate phy inactive)" to "which causes the SATA port selector to select the attached phy as the active host phy and make its other host phy inactive"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:14:18 AM

T ACCEPT - DONE  
Change "implement an STP/SATA bridge or does not support attachment of a SATA port selector," to "support SATA port selectors"

---

Author: relliott  
Subject: Highlight  
Date: 5/1/2005 1:15:35 AM

T ACCEPT - DONE  
Change "does support attachment of a SATA port selector but is attached to a SAS device, the expander device" to "supports SATA port selectors but is attached to a SAS phy or an expander phy, the SMP target port"

---

Author: gop\_ibm  
Date: 4/28/2005 6:28:12 PM

T REJECT (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.

---

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."

---



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"

---

Author: kmarks\_dell

Subject: Highlight

Date: 4/20/2005 7:18:58 PM

**1** REJECT (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 TableA.1 — JTPAT for RD+.

---

Author: kmarks\_dell

Subject: Highlight


Date: 4/20/2005 7:19:24 PM

**1** REJECT (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 TableA.2 — JTPAT for RD

---

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-;"

---

Author: risheffi\_intc  
Subject: Highlight  
Date: 5/28/2005 6:21:41 PM

**T** ACCEPT - DONE (downgraded all "shall"s in this section. Updated terminology in the figures to be consistent with each other. Added a few cross references into chapter 5 (and there back to here) for the figures applicable to this standard (signal output at transmitter device and signal tolerance at the receiver device).)

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  
risheffi Accepted 4/14/2005 11:04:03 PM

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 5:12:30 PM

**T** ACCEPT - DONE

Change "connection" to "physical link" which is a bit more descriptive of this section

---

Author: relliott  
Subject: Highlight  
Date: 5/28/2005 4:24:03 PM

**T** ACCEPT - DONE (as "physical link")

reword "duplex link"


---

Author: relliott  
Subject: Highlight  
Date: 5/28/2005 4:41:57 PM

**T** ACCEPT - DONE (as "physical link")


reword "duplex link"

---

Author: relliott  
Subject: Note  
Date: 5/11/2005 10:48:37 PM  
 ACCEPT - DONE


Add PCB to acronym list

---

Author: blye\_pmcs  
Subject: Note  
Date: 5/11/2005 10:47:57 PM  
 ACCEPT - DONE


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.

---

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: 5/11/2005 10:38:29 PM  
 ACCEPT - DONE

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"

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 4:42:57 PM  
ACCEPT - DONE

Reword to get rid of "shall."

As:  
"Receiver sensitivity is defined as the minimum vertical inner eye opening at which the receiver chip delivers the required BER (see 5.3.3) with the horizontal eye opening at its minimum (i.e., maximum jitter is present) and all activity quiesced except for the receiver itself. "

---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 6:38:13 PM  
ACCEPT - DONE

After "required BER." add "(see 5.3.3)"

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 4:43:17 PM  
ACCEPT - DONE  
Reword to get rid of "shall"

As:  
"Receiver sensitivity is defined as the minimum vertical inner eye opening at which the receiver chip delivers the required BER (see 5.3.3) with the horizontal eye opening at its minimum (i.e., maximum jitter is present) and all activity quiesced except for the receiver itself. "

---

Author: relliott  
Subject: Cross-Out  
Date: 5/10/2005 6:35:26 PM  
ACCEPT - DONE

Delete "The term"

---

Author: RElliott  
Subject: Underline  
Date: 5/28/2005 4:44:46 PM  
ACCEPT - DONE

To parallel wording changes in the previous paragraph to get rid of "shall", change "receiver device sensitivity is defined as the minimum vertical inner eye opening measured at the signal output point for the input to the receiver device at which the receiver chip (i.e., the receiver circuit in the chip package on the board containing the receiver device interoperability point as shown in figure B.3) delivers the required BER with all activity expected in the application for the receiver circuit present (i.e., not quiesced as for the receiver sensitivity definition), with the CJTPAT (see Annex A), and the minimum horizontal eye opening in the signal at the receive device interoperability point."

to:  
"Receiver device sensitivity is defined as the minimum vertical inner eye opening measured at the signal output point for the input to the receiver device at which the receiver chip (i.e., the receiver circuit in the chip package on the board containing the receiver device interoperability point as shown in figure B.3) delivers the required BER (see 5.3.3) with:  
a) the minimum horizontal eye opening;  
b) all activity expected in the application for the receiver circuit present (i.e., not quiesced as for the receiver sensitivity definition); and  
c) the CJTPAT pattern being received (see Annex A).  
"

---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 6:38:20 PM  
ACCEPT - DONE

After "required BER." add "(see 5.3.3)"

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 4:47:21 PM  
ACCEPT - DONE

"laboratory quality" s/b "laboratory-quality"

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 4:47:27 PM  
ACCEPT - DONE

"laboratory quality" s/b "laboratory-quality"

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 4:47:56 PM  
ACCEPT - DONE

is s/b are

---



---

Author: relliott  
Subject: Highlight  
Date: 5/29/2005 5:37:25 PM  
ACCEPT - DONE (ports to phys)

reword "full-duplex traffic on all ports"

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 4:49:23 PM  
ACCEPT - DONE

Change "are included" to "may be included"

since the example of return loss is not included in SAS-1.1

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 6:21:23 PM  
T REJECT

interoperability points.

s/b  
compliance points (global)

---

Author: relliott  
Subject: Highlight  
Date: 5/10/2005 8:08:20 PM  
T ACCEPT - DONE

Change "point" to "interoperability point" for consistency

---

Author: relliott  
Subject: Cross-Out  
Date: 5/10/2005 8:05:22 PM  
T ACCEPT - DONE


Delete "in this subclause."

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 4:58:42 PM  
T ACCEPT - DONE


"device signal output at the transmitter device" s/b "transmitter device signal output"

---

Author: RElliott  
Subject: Cross-Out  
Date: 5/28/2005 4:53:20 PM  
 ACCEPT - DONE

Delete "In figure B.5" since this paragraph applies to many figures (listed at the end of the paragraph)

---

Author: RElliott  
Subject: Highlight  
Date: 5/28/2005 4:53:55 PM  
 ACCEPT - DONE

Change "a instrumentation-quality" to "an instrumentation-quality"

---

Author: gop\_ibm  
Date: 4/20/2005 7:20:32 PM  
ACCEPT - 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


ACCEPT - 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. >>

---

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

---

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)

---

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

---

Author: gop\_ibm

Date: 4/20/2005 7:21:53 PM

**T** REJECT (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

**T** ACCEPT - 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

**T** REJECT (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

**T** ACCEPT - 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: kmarks\_dell  
Subject: Highlight  
Date: 4/25/2005 11:31:09 AM

**T** 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

**T** 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

**T** ACCEPT - DONE

"drive activity indication" s/b "device activity indication"

---

Author: relliott  
Subject: Highlight  
Date: 4/28/2005 6:40:15 PM

**T** 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

**T** 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 >>

---

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: 5/29/2005 5:33:31 PM

ACCEPT - DONE (reduce this to a short note just warning that some SATA devices don't return their initial register FIS in all cases, and that forcing a HARD RESET or LINK RESET is the way to get them to do so. As:

"SATA device not transmitting initial Register Device-to-Host FIS  
Some SATA devices do not return the initial Register Device-to-Host FIS after a link reset sequence if they did not detect the COMINIT during the link reset sequence (e.g., if the SATA device originated the link reset sequence). While waiting for the initial Register Device-to-Host FIS, an STP/SATA bridge returns:

In the SMP DISCOVER response (see 10.4.3.5):  
the attached device type field is set to 000b;  
the negotiated physical link rate field is set to 8h or 9h;  
the attached sata device bit is set to one; and  
the attached sas address field is set to the SAS address of the STP target port of the STP/SATA bridge;  
and

OPEN\_REJECT (NO DESTINATION) for connection requests to the SAS address of the STP target port.

If an STP initiator port detects this situation for a vendor-specific amount of time, an SMP application client should send an SMP PHY CONTROL function requesting a phy operation of LINK RESET or HARD RESET to originate a new link reset sequence. The SATA device is expected to detect...)

Annex G:

Add annex G.5 as follows:

G.5 Discovery of a SATA device

An expander phy with STP/SATA bridge in the SATA Spinup Hold state is indicated in the DISCOVER response NEGOTIATED PHYSICAL LINK RATE field (a value of 3h indicates the phy is enabled and a SATA device has been detected, but it's in the spinup-hold state). An expander device generates a BROADCAST (CHANGE) for the following conditions:

- a) the phy loses DWS sync and the SP state machine transitions to the 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.

Anytime the SMP management client detects a BROADCAST (CHANGE) from a phy with a STP/SATA bridge, the SMP management client should issue a DISCOVER command to determine the ATTACHED DEVICE TYPE, ATTACHED SAS ADDRESS, and the NEGOTIATED PHYSICAL LINK RATE.

If the NEGOTIATED PHYSICAL LINK RATE is 3h, the phy is in the SATA Spinup Hold state, and the SMP management client should issue an SMP PHY CONTROL command with a PHY CONTROL FUNCTION of HARD RESET or LINK RESET to cause link initialization to happen again - this time bypassing the SATA Spinup Hold state.

After finding the NEGOTIATED PHYSICAL LINK RATE field set to 8h or 9h (indicating that speed negotiation has completed at 1.5 Gbps or 3.0 Gbps, respectively), the SMP management client may issue the SMP REPORT PHY SATA command to see if there's a signature FIS there yet or not.

If the expander doesn't support the SATA SPINUP HOLD state, then the NEGOTIATED PHYSICAL LINK rate field will sequence all the way to 8h or 9h - indicating speed negotiation has completed and the link is ready.

The "ATTACHED SATA DEVICE" bit in the DISCOVER response byte 15 indicates if the attached device is a SATA device - determined by having transitioned to the SATA speed negotiation states rather than to the SAS speed negotiation states (which it did because it got a COMSAS timeout). If the initial FIS is not yet present, the SMP management client should wait for the next BROADCAST (CHANGE) from the STP/SATA bridge indicating receipt of the initial FIS, and then reissue the DISCOVER and SMP REPORT PHY SATA command.

In some hot-plug cases, a SATA device may not send an initial Register - Device to Host FIS (due to timing where the device does not see the initial COMINIT). In this case the STP/SATA bridge will complete speed negotiation, but will not receive an initial FIS. If this occurs, the SMP management client should time-out after a vendor-specific interval of time and then, after sending a SMP REPORT PHY SATA command that does not report a received initial FIS, the SMP management client should send an SMP PHY CONTROL command specifying a HARD RESET or LINK RESET. This will send a COMINIT to the SATA device, and will cause the SATA device to send the initial Register - Device to Host FIS following link initialization.

So - at anytime following the link initialization sequence, it is possible via DISCOVER and REPORT PHY SATA SMP commands to determine:

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

---

Author: thoglund\_Isi  
Subject: Highlight  
Date: 5/21/2005 3:18:00 PM  
ACCEPT - DONE (per May WG)


change back to OPEN\_REJECT (RESERVED STOP 0). see 05-145r0.

---

Author: RElliott  
Subject: Note  
Date: 7/11/2005 9:38:40 AM  
 ACCEPT - DONE


(for Bill Martin)  
Add Dword Received from SP\_DWS receiver to SL, XL, SSP, etc. receivers

---

Author: RElliott  
Subject: Note  
Date: 7/11/2005 9:37:57 AM  
 ACCEPT - DONE

(for Bill Martin)  
Add Open Failed (STP Resources Busy)


---

Author: kmarks\_dell  
Subject: Note  
Date: 5/29/2005 4:54:43 PM  
 ACCEPT - DONE

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: 5/29/2005 5:36:44 PM  
 ACCEPT - DONE (added new subroutine and call it from DiscoverAndConfigure:

```
// this determines if the expander has a table routed phy attached to the  
// sas address and phyIndex provided
```

```
static  
int CheckForTableAttribute(struct TopologyTable *Expander,  
                           byte PhyIndex,  
                           quadword SASAddress)  
{  
    int table = 0;  
    byte phyCount;  
  
    for(phyCount = 0;  
        phyCount < Expander->Device.NumberOfPhys;  
        phyCount++)  
    {  
        // did we find the address attached locally  
        if((SASAddress ==  
            Expander->Phy[phyCount].Result.AttachedSASAddress) &&  
            (phyCount == PhyIndex) &&  
            (Expander->Phy[phyCount].Result.RoutingAttribute == TABLE))  
        {  
            table = 1;  
            break;  
        }  
    }  
  
    return(table);  
}
```

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.

---

Author: RElliott

Subject: Note

Date: 5/29/2005 5:05:09 PM

 REJECT (it's just sample code, doesn't have to be perfect)


Since the letter ballot comment requesting this value be defined in the standard was rejected, update code to not use a reserved value in the RoutingAttribute field

---

Author: RElliott


Subject: Note

Date: 5/29/2005 5:05:13 PM

 REJECT (it's just sample code, doesn't have to be perfect)

Since the letter ballot comment requesting this value be defined in the standard was rejected, update code to not use a reserved value in the PhysicalLinkRate field

---

Author: RElliott  
Subject: Note  
Date: 5/29/2005 4:37:28 PM  
 ACCEPT - DONE

Add:

```
// make sure if the attached device type is 0, that the  
// sas address is 0, to simplify the qualified address  
// check  
if(discover->AttachedDeviceType == 0)  
{  
  discover->AttachedSASAddress = 0;  
}
```

---




Author: relliott  
Subject: Highlight  
Date: 5/11/2005 10:17:30 PM  
ACCEPT - DONE

Since STA requested that icons be mandatory for Mini SAS 4x, move this text into the external cables section in chapter 5:

"Additional icons for connectors are defined to guide users into making compatible attachments (i.e., not attaching expander device table routing phys to expander device table routing phys, which is not allowed by this standard).

Connectors that have one or more matching icons are intended to be attached. Connectors that do not have a matching icon should not be attached together."


---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 10:20:12 PM  
 ACCEPT - DONE

Delete "M.2.2 SAS icons for non-cable connectors" as its content moves into chapter 5 as shall for Mini SAS 4x and should for SAS 4x

---

Author: RElliott  
Subject: Note  
Date: 5/11/2005 10:19:09 PM

 ACCEPT - DONE (but per Molex request, went with subtractive=circle and table=diamond which matched the artwork already provided for the standard. Also, the subtractive-to-subtractive cable will not be defined by this standard.)

May WG agreed on:

a) no color specifications on the icons themselves (SFF-8088 doesn't have a color spec on the latch either)

b) receptacle:

subtractive: diamond

table: circle

end device: circle and diamond (side by side)

c) cable:

diamond on one side (e.g., recessed, or printed)

circle on the other side


subtractive-to-subtractive cable: diamond on both sides

(non standard cable: both diamond and circle)

d) icon on the same side as the extra key or key slot.

---


Author: RElliott  
Subject: Note  
Date: 5/11/2005 10:17:51 PM

 ACCEPT - DONE (incorporated into chapter 5)

per May SCSI Trade Association (STA) input, make the icons be a shall rather than should for the Mini SAS 4x connector. This means they need to be in a normative annex or in the main body.

---

Author: gshoulder\_seg  
Subject: Note  
Date: 5/8/2005 3:56:30 PM

 ACCEPT - DONE (STA provided new 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: lohmeier\_Isi  
Date: 5/8/2005 3:56:34 PM


 ACCEPT - DONE (STA provided new icons)

Editor's Note 12

Resolve this note.

---

Author: lohmeier\_Isi  
Date: 5/8/2005 3:56:39 PM

 ACCEPT - DONE (STA provided new icons)


Editor's Note 13

Resolve this note.

---

Author: lohmeier\_lsi

Date: 5/8/2005 3:56:43 PM

 ACCEPT - DONE (STA provided new icons)

Editor's Note 14

Resolve this note.

---

Author: relliott

Subject: Cross-Out

Date: 5/11/2005 10:20:36 PM


 ACCEPT - DONE

Delete "M.2.3 SAS icons for cable connectors" as its content moves into chapter 5 as shall for Mini SAS 4x and should for SAS 4x

---

Author: lohmeier\_lsi

Date: 5/8/2005 3:56:47 PM

 ACCEPT - DONE (STA provided new icons)


Editor's Note 15

Resolve this note.

---

Author: lohmeier\_lsi


Date: 5/8/2005 3:56:52 PM

 ACCEPT - DONE (STA provided new icons)

Editor's Note 16

Resolve this note.


---

Author: relliott  
Subject: Cross-Out  
Date: 5/11/2005 10:21:23 PM  
 ACCEPT - DONE

Delete "Figure M.7 shows the SAS icon for the end of a cable that attaches to either end devices, expander device table routing phys, or expander device subtractive routing phys."

as the May phy WG chose not to define any such cables.

---

Author: lohmeier\_lsi  
Date: 5/30/2005 3:15:52 PM  
 ACCEPT - DONE (STA provided new icons)

Editor's Note 17

Resolve this note.

---