Accredited Standards Committee*
InterNational Committee for Information Technology Standards (INCITS)

Doc. No.:	T10/07-313r0
Date:	July 10, 2007
Reply to:	John Lohmeyer

To: T10 Membership
From: Ralph Weber and John Lohmeyer
Subject: SAS Protocol WG -- July 9, 2007
           Colorado Springs, CO

Agenda

1. Opening Remarks
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3. Attendance and Membership
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    5.6 SAS-2: More Transport Layer Retries Fixes (07-311) [Penokie]
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7. Non-zoning Expander topics
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    7.3 SAS-2: REPORT BROADCAST function (07-075) [Penokie]
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    7.6 SAS-2 SMP PHY CONTROL and affiliations (07-277) [Elliott]
    7.7 SAS-2 SMP DISCOVER virtual phy clarifications (07-280) [Elliott]
    7.8 SAS-2 SMP function result tweaks (07-287) [Elliott]
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8. Physical WG overlap topics
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9. New Business
10. Review of Recommendations
11. Meeting Schedule
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Results of Meeting

1.   Opening Remarks

John Lohmeyer called the meeting to order at 9:00 a.m. Monday, July 9, 2007. He thanked LSI for hosting the meeting. As usual, the people present introduced themselves.

2.   Approval of Agenda

The draft agenda was approved with no additions and changes.

No additions and changes were made during the course of the meeting.

3.   Attendance and Membership

Attendance at working group meetings does not count toward minimum attendance requirements for T10 member-ship. Working group meetings are open to any person or organization directly and materially affected by T10's scope of work. The following people attended the meeting:

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            Name                    S          Organization
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Mr. Chris Fore                  P  Adaptec, Inc.
Mr. Gregory Tabor               P  Dallas Semiconductor
Mr. Kevin Marks                 P  Dell, Inc.
Mr. Ralph O. Weber              P  ENDL Texas
Mr. David Freeman               AV Finisar Corp.
Mr. Mike Lawson                 AV Finisar Corp.
Mr. Mike Fitzpatrick            P  Fujitsu
Mr. Rob Elliott                 P  Hewlett Packard Co.
Mr. Dan Colegrove               P  Hitachi Global Storage Tech.
Mr. George O. Penokie           P  IBM Corp.
Dr. Mark Seidel                 A  Intel Corp.
Mr. Pak Seto                    V  Intel Corp.
Mr. Joel Silverman              P  Kawasaki Microelectronics Am
Mr. Brad Besmer                 V  LSI Corp.
Mr. Jeffrey J. Gauvin           V  LSI Corp.
Mr. Tyson Hartshorn             V  LSI Corp.
Mr. Steve Johnson               V  LSI Corp.
Mr. John Lohmeyer               P  LSI Corp.
Mr. Steven Schauer              V  LSI Corp.
Mr. David Uddenberg             V  LSI Corp.
Mr. David Geddes                P  Marvell Semiconductor, Inc.
Mr. Mark Overby                 P  Nvidia Corp.
Mr. Tim Symons                  P  PMC-Sierra
Mr. Michael Rogers              A  Samsung
Mr. Gerald Houlder              P  Seagate Technology
Mr. Tom Skaar                   V  Seagate Technology
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Mr. Stephen Finch               P  STMicroelectronics, Inc.
Mr. Charlie Curtin              V  Vitesse Semiconductor
Mrs. Zenta Darnell              V  Vitesse Semiconductor
Mr. Jim Scott                   P  Vitesse Semiconductor
Mr. Mark Evans                  P  Western Digital

31 People Present


Status Key:  P    -  Principal
             A,A# -  Alternate
             AV   -  Advisory Member
             E    -  Emeritus
             L    -  Liaison
             V    -  Visitor
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4. Miscellaneous topics

No miscellaneous topics were presented to the group.

5. General Protocol topics

5.1 SAS-2 Redundant primitive sequence error handling (07-089) [Elliott]

Rob Elliott ask that discussion of a proposal to correct number of error cases for which the recipient's Redundant Primitive detection rules are unclear, especially in light of the 6 Gbs usage of Decision Feedback Equalization (07-089r1) be deferred to the next meeting.

5.2 SAS-2 CRC fixes (07-130) [Tuikov]

In the absence of Luben Tuikov, Rob Elliott presented the latest revision of a proposal to correct an error in the SAS-2 CRC equations (07-130r4).

Rob Elliott moved that 07-130r4 be recommended for inclusion in SAS-2. Jim Scott seconded the motion. In the absence of objections, the motion passed unanimously.

5.3 SAS-2 SPC-4 Protocol-Specific VPD pages (07-153) [Elliott]

Rob Elliott presented a proposal to define protocol-specific VPD pages which SAS-2 would use to aid in managing transport layer retries (07-153r0).

No changes were requested in the SAS-2 portions of the proposal and the group referred the proposal to the CAP working group for further processing.

5.4 SAS-2 STP bus inactivity time limit clarification (07-285) [Elliott]

Rob Elliott presented a proposal to make the STP bus inactivity timing mechanism consistent across all of SAS-2 (07-285r0).

Rob Elliott moved that 07-285r0 be recommended for inclusion in SAS-2. Joel Silverman seconded the motion. In the absence of objections, the motion passed unanimously.

5.5 SAS 2 TARGET PORT TRANSFER TAG ST_T state machine fix (07-288) [Day]

In the absence of Brian Day, Jeff Gauvin presented a proposal to make the transfer tag usage consistent across all of SAS-2 (07-288r0).

Jeff Gauvin moved that 07-288r0 be recommended for inclusion in SAS-2. Joel Silverman seconded the motion. In the absence of objections, the motion passed unanimously.

5.6 SAS-2: More Transport Layer Retries Fixes (07-311) [Penokie]

George Penokie presented a proposal to cleanup counter manipulations in the transport layer retry handling (07-311r0). The group raised concerns about an off-by-one problem and after careful review the major change appeared to affect a state machine parameter value added by the proposal. All other proposed text aligned perfectly with the modified parameter definition, which made the definition change the simplest one possible.

George agreed to revise the definition and make three other minor changes to handle instances where the two values in a comparison operation would be equal.

George Penokie moved that 07-311r1 (r0 as revised) be recommended for inclusion. Mark Evans seconded the motion. In the absence of any objections, the motion passed unanimously.

5.7 SAS-2: Transport layer write flowcharts (07-317) [Penokie]

George Penokie presented a series of flowcharts that depicted the operation of transport layer retries for write commands (07-317r0). He noted that reaching group consensus on the flowchart representation of write transport layer retries was the first step toward clarifying the state machine definitions in SAS-2.

The group discussed the flowcharts in great detail and George noted minor changes to be used in future transport layer write retries proposals.

6. Zoning topics

6.1 SAS-2 OPEN_REJECT ZONE VIOLATION priority (07-284) [Elliott]

Rob Elliott presented a proposal to swap the error reporting priorities for the Connection Rate Not Supported and Zone Violation errors.

Rob Elliott moved that 07-284r0 be recommended for inclusion in SAS-2. Tim Symons seconded the motion. In the absence of objections, the motion passed unanimously.

6.2 SAS-2 Zoning interaction with enclosure services (07-293) [Elliott]

Rob Elliott presented a proposal that built upon the SES-2 changes from 07-163r0 with corollary changes in SAS-2 (07-293r0).

Rob Elliott moved that 07-293r0 be recommended for inclusion in SAS-2. Tim Symons seconded the motion. In the absence of objections, the motion passed unanimously.

6.3 SAS-2 Zone phy information clarifications (07-305) [Elliott]

Rob Elliott presented a proposal that was drafted in response to a Note that a recent Editor's meeting identified as a problem (07-305r0). The trouble lay in the Note's claim that the Requested Inside ZPSDS bit may be changed by the expander device after a link reset sequence. The essence of the proposal was the addition of mechanisms for setting saved values for Zoning Phy parameters such as Requested Inside ZPSDS.

The group raised numerous questions about the nature of the '*saved*' values. Some present questioned the applicability of the proposal to all existing implementations. Others attempted to add more '*saved value*' controls with an eye toward accommodating a larger body of implementations.

Rob Elliott agreed to prepare a new revision of consideration at the next meeting.

6.4 SAS-2 Configured zone group (07-308) [Symons]

Tim Symons presented a document (07-308r0) which demonstrated one of the needs for the changes proposed in 07-305. All the questions raised about the document only served as further justification for implementing the changes in the more complete document (see item 6.3).

Tim Symons asked that further discussion of this topic be in regards to 07-308 be covered under agenda item 6.3 and that this item be removed from future agendas.

6.5 SAS-2 Route table discovery process (07-306) [Symons]

Tim Symons presented a proposal to define how the zone group route values are set in a route table (07-306r0). Questions were raised about the clarity of the wording and several corrections were noted, the most significant of which was constraining the actions described in the proposal to a Management Application Client that is embedded in an Expander.

Tim agreed to prepare a new revision of the proposal. Tim Symons moved that 07-306r1 (r0 as revised) be recommended for inclusion in SAS-2. Ralph Weber seconded the motion. In the absence of objections, the motion passed unanimously.

6.6 SAS-2 Zone group valid bit (07-307) [Symons]

Tim Symons presented a proposal to clarify the setting of the Zone Group Valid bit (07-307r0). Rob Elliott requested that new text moved into the table to which the note that started Tim's troubles referred and Tim agreed to prepare a new revision.

Tim Symons moved that 07-307r1 (r0 as revised) be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. In the absence of objections, the motion passed unanimously.

6.7 SAS-2 Zone route table entries for subtractive ports (07-312) [Symons]

Tim Symons presented a proposal to address SAS-2 r10 editor's note 7 (07-312r1). The group hammered Tim with editorial corrections and concerns about requirements which were seen as too strong for what is essentially vendor-specific data. Tim agreed to prepare a new revision.

Tim Symons moved that 07-312r2 (r1 as revised) be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. In the absence of objections, the motion passed unanimously.

7. Non-zoning Expander topics

7.1 SAS-2 Broadcast after count update (06-459) [Tuikov]

In the absence of Luben Tuikov, discussion of this topic was deferred to the next meeting.

7.2 SAS-2 Self-Configuration Status Updates (07-039) [Hartshorn, Johnson]

Tyson Hartshorn presented a proposal to support more than 256 descriptors in the Report Self-Configuration Status SMP function and to provide indicators in Report General and Discover List SMP functions to determine if new events have been added (07-039r3).

The group requested several changes and Tyson agreed to prepare a new revision.

Tyson Hartshorn moved that 07-039r4 (r3 as revised) be recommended for inclusion in SAS-2. Chris Fore seconded the motion. In the absence of objections, the motion passed unanimously.

7.3   SAS-2: REPORT BROADCAST function (07-075) [Penokie]

George Penokie presented a proposal to report the number of various Broadcast types originated by a particular Phy (07-075r4). He noted that counters proposed in 07-103 (see item 7.5) had been incorporated in the latest revision.

The group discussed how best (or even whether) to add features to SAS-2 that allow the source of a Broadcast to be discovered without polling every Phy in the domain. After a lengthy discussion, the concern was distilled to problems with the larger numbers of bytes of data which would cause the response to exceed a SAS frame.

One way to address to the frame explosion problem was to reinstate Tyson's 07-103 proposal, which would result in a second SMP function being defined and the returned data being split about 50/50 between the pair of SMP functions.

George and Tyson agreed to remove the Report Phy Event logs information from 07-075r4. The group reviewed this proposal in detail.

George Penokie moved that 07-075r5 (r4 as revised) be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. In the absence of any objections, the motion passed unanimously.

7.4   SAS-2 Changes to Report Phy Event logging and reporting (07-102) [Hartshorn]

Tyson Hartshorn presented a proposal to retrieve Phy event information or logs on multiple Phys rather than querying each Phy individually (07-102r2). Rob Elliott requested several changes and Tyson agreed to prepare a new revision.

Tyson Hartshorn moved that 07-102r3 (r2 as revised) be recommended for inclusion in SAS-2. Tim Symons seconded the motion. In the absence of objections, the motion passed unanimously.

7.5   SAS-2 Changes to Report Phy Broadcast Counts logging and retrieval method (07-103) [Hartshorn]

Tyson Hartshorn asked that discussion of this topic be deferred to the next meeting.

7.6   SAS-2 SMP PHY CONTROL and affiliations (07-277) [Elliott]

Rob Elliott presented a proposal to prohibit link resets from all non-affiliated initiators (07-277r0).

Rob Elliott moved that 07-277r0 be recommended for inclusion in SAS-2. Tim Symons seconded the motion. In the absence of objections, the motion passed unanimously.

7.7   SAS-2 SMP DISCOVER virtual phy clarifications (07-280) [Elliott]

Rob Elliott presented a proposal to define the meaning of the Attached fields when the Phy is a virtual Phy (07-280r0). The group requested minor changes and Rob agreed to prepare a new revision.

Rob Elliott moved that 07-280r1 (r0 as revised) be recommended for inclusion in SAS-2. Steve Johnson seconded the motion. In the absence of objections, the motion passed unanimously.

7.8 SAS-2 SMP function result tweaks (07-287) [Elliott]

Rob Elliott presented a proposal to correct several SMP function result inconsistencies (07-287r0).

Rob Elliott moved that 07-287r0 be recommended for inclusion in SAS-2. Tim Symons seconded the motion. In the absence of objections, the motion passed unanimously.

7.9 SAS-2 Configurable expander table-to-table error handling (07-300) [Elliott]

Rob Elliott presented a proposal to close a currently ill-defined error case for table-to-table expander attachments (07-300r0). The group asked that the table-to-table connection which the proposal explicitly prohibited be allowed and Rob agreed to revise the proposal accordingly.

Rob Elliott moved that 07-300r1 (r0 as revised) be recommended for inclusion in SAS-2. Joel Silverman seconded the motion. In the absence of objections, the motion passed unanimously.

8.   Physical WG overlap topics

8.1 SAS-2 SMP DISCOVER support for SNW-3 phy capabilities (07-091) [Elliott]

Rob Elliott reviewed a proposal to map SNW-3 support in the Phy to the SMP functions (07-091r3). He noted that the controlling features had been removed in the latest revision. He noted that a table of preferred speeds that was lost in a previous revision had been restored. He noted the addition of a flowchart showing the speed negotiation process.

Rob Elliott moved that 07-091r3 be recommended for inclusion in SAS-2. Steve Finch seconded the motion. In the absence of objections, the motion passed unanimously.

8.2 SAS-2 Mode and log page support for SNW-3 phy capabilities (07-214) [Elliott]

Rob Elliott presented a proposal to define mode page access to SNW-3 information in Phys (07-214r1).

Rob Elliott moved that 07-214r1 be recommended for inclusion in SAS-2. Mark Evans seconded the motion. In the absence of objections, the motion passed unanimously.

8.3 SAS-2 Far-end retimed loopback phy test function (07-119) [Elliott]

Rob Elliott presented a proposal to define a far-end loopback testing mechanism for SAS (07-119r3).

The group requested several changes and Rob agreed to prepare a new revision for consideration by the next meeting.

9.   New Business

No new business was brought before the group.

10. Review of Recommendations

The following documents were recommended for consideration by the Plenary:

    For inclusion in SAS-2:
    07-284r0 (OPEN_REJECT ZONE VIOLATION priority) [Elliott]
    07-293r0 (Zoning interaction with enclosure services) [Elliott]
    07-306r1 (Route table discovery process) [Symons]
    07-307r1 (Zone group valid bit) [Symons]
    07-312r2 (Zone route table entries for subtractive ports) [Symons]

07-039r4 (Self-Configuration Status Updates) [Hartshorn, Johnson]
07-075r5 (REPORT BROADCAST function) [Penokie]
07-102r3 (Changes to Report Phy Event logging and reporting) [Hartshorn]
07-277r0 (SMP PHY CONTROL and affiliations) [Elliott]
07-280r1 (SMP DISCOVER virtual phy clarifications) [Elliott]
07-287r0 (SMP function result tweaks) [Elliott]
07-300r1 (Configurable expander table-to-table error handling) [Elliott]
07-091r3 (SMP DISCOVER support for SNW-3 phy capabilities) [Elliott]
07-214r1 (Mode and log page support for SNW-3 phy capabilities) [Elliott]
07-130r4 (CRC fixes) [Tuikov]
07-285r0 (STP bus inactivity time limit clarification) [Elliott]
07-288r0 (TARGET PORT TRANSFER TAG ST_T state machine fix) [Day]
07-311r1 (More Transport Layer Retries Fixes) [Penokie]

11. Meeting Schedule

A SAS Protocol Working Group meeting is scheduled for:

Monday, September 17, 2007 commencing at 9:00 a.m. in Vancouver, BC Canada at the Four Seasons Hotel (Reservations: vcr.reservations@fourseasons.com) hosted by PMC-Sierra.

A teleconference call was tentatively scheduled for three hours on Wednesday, 8 August starting at 10 a.m. Central Daylight Time.

Other teleconference calls will be announced on the T10 reflector as needed.

12. Adjournment

The meeting was adjourned at 6:00 p.m. on Monday July 9, 2007.