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

To: T10 Membership
From: Ralph Weber and John Lohmeyer
Subject: SAS Protocol WG -- January 15, 2007
          Lake Mary, FL

Agenda

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    6.11 SAS-2 Expander Route Table (CONFIGURE ADDRESS RESOLVED) (07-038) [Johnson]
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8. Review of Recommendations
9. Meeting Schedule
10. Adjournment

Results of Meeting

1.   Opening Remarks

George Penokie called the meeting to order at 9:00 a.m. Monday, January 15, 2007. He thanked Roger Cummings of Symantec for hosting the meeting. As usual, the people present introduced themselves.

2.   Approval of Agenda

The draft agenda was approved with the following additions and changes:

    6.12   SAS-2 Address Resolved Configuration (06-303) [Johnson]

The following additions and changes were made during the course of the meeting:

    6.7   SAS-2 Zone manager key (06-373) [Elliott]

3.   Attendance and Membership

Attendance at working group meetings does not count toward minimum attendance requirements for T10 membership. 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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SAS Protocol Working Group Attendance Report - January 2007


            Name                    S         Organization
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Mr. Steve Robalino                 A  Dallas Semiconductor
Mr. Gregory Tabor                  P  Dallas Semiconductor
Mr. Kevin Marks                    P  Dell, Inc.
Mr. Mickey Felton                  A# EMC Corp.
Mr. William Martin                 P  Emulex
Mr. Ralph O. Weber                 P  ENDL Texas
Mr. Nathan Hastad                  P  General Dynamics
Mr. Rob Elliott                    P  Hewlett Packard Co.
Mr. Jeff Wolford                   V  Hewlett Packard Co.
Mr. Dan Colegrove                  P  Hitachi Global Storage Tech.
Mr. George O. Penokie              P  IBM Corp.
Mr. Pak Seto                       V  Intel Corp.
Mr. Robert Sheffield               P  Intel Corp.
Mr. Dennis Moore                   P  KnowledgeTek, Inc.
Mr. Praveen Viraraghavan           V  LSI Logic Corp
Mr. Brad Besmer                    V  LSI Logic Corp.
Mr. Brian Day                      V  LSI Logic Corp.
Mr. Steve Johnson                  V  LSI Logic Corp.
Mr. John Lohmeyer                  P  LSI Logic Corp.
Mr. Graeme Weston-Lewis            V  LSI Logic Corp.
Mr. David Geddes                   P  Marvell Semiconductor, Inc.
Mr. Mark Overby                    P  Nvidia Corp.
Mr. Tim Symons                     P  PMC-Sierra
Mr. Craig W. Carlson               AV QLogic Corp.
Mr. Paul Entzel                    P  Quantum Corp.
Mr. Michael Rogers                 AV Samsung
Mr. Gerald Houlder                 P  Seagate Technology
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Mr. Stephen Finch               P  STMicroelectronics, Inc.
Mr. Anders Liverud              AV Tandberg Storage
Mr. Doug Loree                  V  Toshiba
Mr. John Dillard                V  Vitesse
Mr. Jim Scott                   P  Vitesse Semiconductor
Mr. Mark Evans                  A  Western Digital
Mr. Jeff Williams               P  Xiotech Corp.
Mr. Bob Hansen                  V  Xyratex

35 People Present

Status Key:  P    -  Principal
             A,A# -  Alternate
             AV   -  Advisory Member
             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: Store-and-Forward Expander Devices (06-386 and 06-422) [Sheffield]

Bob Sheffield asked that discussion of this topic be removed from this and future agendas.

5.2 SAS-2 Response to abandon-class OPEN_REJECT (06-322) [Elliott]

Rob Elliott presented a proposal to define how STP initiators, targets, and expanders handle receipt of abandon class primitives (06-322r3). Rob highlighted the requirement for picking a new connection rate when a previously working connection rate fails to function.

The group requested minor wording changes and Rob agreed to prepare a new revision.

Rob Elliott moved that 06-322r4 (r3 as revised) be recommended for inclusion in SAS-2. Bill Martin seconded the motion. In the absence of any objections, the motion passed unanimously.

5.3 SAS-2 Change to phy reset sequence 10ms rule (06-471) [Day]

Brian Day presented a proposal to allow COMRESETs more frequently than once every 10 ms (06-471r1). Brian explained that the concerns raised last time could not apply because of existing requirements. Rob Elliott asked that Brian check the hot plug timeout requirements already in SAS-2 for potential conflicts with the proposed changes. The check was made and no problems were discovered.

Brian Day moved that 06-471r1 be recommended for inclusion in SAS-2. Rob Elliott seconded the motion. In the absence of any objections, the motion passed unanimously.

5.4 SAS-2: ST_TTS retransmitted DATA frames (06-371) [Sheffield]

Bob Sheffield presented a proposal to modify the proposal discussed in agenda item 5.7 so that backing up to any ACK/NAK balance point would be allowed (06-371r1). He noted that other group discussions on this topic suggested that intermediate ACK/NAK balance points were considered desirable, which was his goal all along. After some discussion, 06-470r3 (the agenda item 5.7 topic) was revised to Bob's satisfaction.

Bob asked that discussion of this topic be removed from future agendas.

5.5   SAS-2: Initiator handling of retransmit read DATA frames (06-467) [Sheffield]

Bob Sheffield presented a proposal to broaden the initiator handling of retransmitted read DATA frames when the original frames were received without errors so that the originally received data may be used (06-467r1). George Penokie insisted that the changed be reconciled with the flowchart approved during the November meeting.

The process of reconciling to the flowchart led George to believe that a far less complex proposal could accomplish the desired result. Bob agreed to revise the proposal, in consultation with George, for consideration at the next meeting.

5.6   SAS-2: SAM-4: Miscellaneous State Machine Fixes (06-451) [Penokie]

George Penokie presented a proposal to correct wording problems in several SAS-2 state machine definitions and specify the Notify Power Loss Immanent requirements in state machine terms (06-451r5). The group requested several changes in the Notify handling. George agreed to prepare a new revision.

George Penokie moved that 06-451r6 (r5 as revised) be recommended for inclusion in SAS-2 and SAM-4. Mark Evans seconded the motion.

Steve Finch moved to divide the question into those parts related and not related to Power Loss Notification. Mark Evans seconded the motion to divide the question.

Steve stated that his interpretation of Power Loss handling differs from the state machine requirements in the proposal and he recommended voting against those changes. George stated that the Power Loss state machine changes had been agreed by several working groups and ought to become part of SAS-2.

The motion to divide the question failed 3:5:10. The motion to recommend 06-451r6 passed 10:1:9.

5.7   SAS-2: Transport layer read data flowchart (06-470) [Penokie]

George Penokie presented a flowchart and detailed changes for target read behavior (06-470r3). He noted that the flowchart was not intended for inclusion in SAS-x. The group discovered several logic errors in the proposed requirements changes using a combination of the requirements text and George's flowchart. George agreed to prepare a new revision.

George Penokie moved that 06-470r4 (r3 as revised) be recommended for inclusion in SAS-2. Mark Evans seconded the motion.

The group discussed the effects of Bob Sheffield's proposal (see agenda item 5.4) on this proposal. George agreed to allow updating the balance point or leaving the balance point unchanged. This was different from the 'shall' requirement statement that George had written, but also was not as simple as changing the 'shall' to a 'may' which was Bob's original request. The agreed changes to were to specify exactly the two options allowed in such cases. George agreed to add this change to the proposal.

Steve Finch suggested adding another mechanism for setting the ACK/NAK balance point. After carefully examining the suggestion, George showed where the written text in his proposal covered Steve's issue. The problem was in the flowcharts, which were not being proposed for inclusion SAS-2.

In the absence of any objections, the motion passed unanimously.

5.8   SAS-2 SPC-4 Enabling and disabling Transport Layer Retries (07-027) [Martin and Elliott]

Rob Elliott presented a proposal to control transport layer retries using a bit in the Command frame (07-027r0). Concerns were raised about backwards compatibility, the proper application of the plan to the various layers in the

SAS-2 model, and how initiators might best be induced the changes. The group requested several enhancements and Rob agreed to prepare a new revision for consideration at the next meeting.

6.   Zoning/Expander topics

6.1 SAS-2 Support multiple STP affiliations (06-188) [Elliott]

Rob Elliott presented a proposal to allow targets to manage multiple SATA affiliations (06-188r3). Rob Elliott moved that 06-188r3 be recommended for inclusion in SAS-2. Tim Symons seconded the motion. Bob Sheffield complained about the lack of sufficient requirements on initiators. The motion passed 5:3:0.

6.2 SAS-2 OPEN_REJECT RETRY during self-configuration changes (06-466) [Elliott]

Rob Elliott presented a proposal to have Expanders that are in the process of self configuring send a reject that can be retried instead of a reject that cannot be retried (06-466r1). Rob Elliott moved that 06-466r1 be recommended for inclusion in SAS-2. Tim Symons seconded the motion. The motion passed 6:0:2.

6.3 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.

6.4 SAS-2 Changes to NEGOTIATED PHYSICAL LINK RATE (06-478) [Day]

Brian Day presented a proposal to update the state machines to add details of reporting physical link rate status (06-478r0). He noted that the proposal could not be reviewed in detail until the SAS Phy working group had completed work on link rate negotiation. The group discussed the proposal only briefly.

6.5 SAS-2 DISCOVER response Attached Device Name for SATA (06-476) [Elliott]

Due to the late hour, Rob Elliott reluctantly agreed to defer discussion of this topic to the next meeting.

6.6 SAS-2 ALIGN insertion rate during STP connections (06-275) [Elliott]

Rob Elliott presented a proposal to clarify issues related to ALIGN insertion on SATA connections (06-275r0). Rob Elliott moved that 06-275r0 be recommended for inclusion in SAS-2. Tim Symons seconded the motion. The motion passed 5:0:3.

6.7 SAS-2 Zone manager key (06-373) [Elliott]

Due to the late hour, Rob Elliott reluctantly agreed to defer discussion of this topic to the next meeting.

6.8 SAS-2: Expander Notification of Temporary Shutdown (07-008) [Penokie]

George Penokie presented a proposal to send Notify primitives before an expander downloads microcode and reboots (07-008r3). A major problem surfaced with delivering information to initiators and the group agreed to schedule a conference call to discuss it.

6.9 SAS-2 Address resolved zoning (07-028) [Symons]

Tim Symons presented a proposal to remove Address Resolved Zoning from SAS-2 (07-028r0). The group turned to discussing improving the definition of Address Resolved Zoning (see agenda item 6.12). Tim agreed to defer consideration of this proposal to the next meeting.

6.10 More Zone Groups (07-017) [Johnson]

Steve Johnson presented a proposal to increase the number of zone groups to 256 (07-017r0). The group requested several changes including a different method for extending zoning support beyond 256 zone groups. Steve agreed to prepare a new revision for consideration at the next meeting.

6.11 SAS-2 Expander Route Table (CONFIGURE ADDRESS RESOLVED) (07-038) [Johnson]

Steve Johnson presented a proposal to define how Address Resolved Zoning is configured (07-028r0). The group requested the addition of details regarding several aspects of Address Resolved configuration such as reporting current settings, persistence issues, and lock/unlock support. Steve agreed to prepare a new revision for consideration at the next meeting.

6.12 SAS-2 Address Resolved Configuration (06-303) [Johnson]

Steve Johnson presented a proposal to more clearly identify support Address Resolved Zoning (06-303r0). The group questioned the need for the proposed support-provided bit, and Steve agreed to study the proposal in light of such issues before the next meeting.

7.   New Business

No new business was brought before the group.

8.   Review of Recommendations

The following documents were recommended for consideration by the Plenary:

    For inclusion in SAS-2:
    06-322r4 (Response to abandon-class OPEN_REJECT) [Elliott]
    06-471r1 (Change to phy reset sequence 10ms rule) [Day]
    06-470r4 (Transport layer read data flowchart) [Penokie]
    06-466r1 (OPEN_REJECT RETRY during self-configuration changes) [Elliott]
    06-188r3 (Support multiple STP affiliations) [Elliott]
    06-275r0 (ALIGN insertion rate during STP connections) [Elliott]

    For inclusion in SAS-2 and SAM-4:
    06-451r6 (Miscellaneous State Machine Fixes) [Penokie]

9.   Meeting Schedule

A SAS Protocol Working Group meeting is scheduled for:

    Monday, March 12, 2007 commencing at 9:00 a.m. in Memphis, TN at the Marriott Memphis Downtown Hotel (http://marriott.com/property/propertypage/memdt?groupCode=scsscsa&app=resvlink) hosted by the SCSI Trade Association.

Teleconference calls will be announced on the T10 reflector as needed.

10. Adjournment

The meeting was adjourned at 8:00 p.m. on Monday January 15, 2007.