

Accredited Standards Committee\*

## InterNational Committee for Information Technology Standards (INCITS)

Doc. No.: T10/05-094r0
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Date: March 8, 2005

Reply to: John Lohmeyer

To: T10 Membership  
From: Ralph Weber and John Lohmeyer  
Subject: SAS Protocol WG -- Mar 7, 2005  
Dana Point, CA

### Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. Old Business
  - 4.1 SAS-1.1 Items
    - 4.1.1 SAS-1.1, protocol for changing driver amplitude (03-285) [Evans]
    - 4.1.2 SAS Signal Class Proposal (04-220) [Fairchild]
    - 4.1.3 SAS-1.1: PHY VACANT SMP Function Response (04-333) [Sheffield]
  - 4.2 SAS 1.1 External Connector Interoperability (05-010) [Fairchild]
  - 4.3 SAS-2 Items
    - 4.3.1 SAS-2 More counters (04-172) [Elliott]
    - 4.3.2 SAS-2 More phy test patterns (04-222) [Elliott and Fairchild]
5. New Business
  - 5.1 SAS-1.1 - COMWAKE Received clarification (05-058) [Sheffield]
  - 5.2 SAS-1.1 OOB Signal Transmitter Requirements (05-075) [Wanamaker]
  - 5.3 SAS-1.1 SMP Enclosure WWN and Connector information (05-055) [Johnson]
  - 5.4 SAS-1.1 Link layer timeout race conditions (05-086) [Elliott]
  - 5.5 SAS-1.1: Discovery Process Missing Route Table Rules (05-089) [Johnson]
  - 5.6 SAS-1.1, Responding to an OPEN address frame while in the BreakWait state (05-093) [Evans]
  - 5.7 SAS 1.1 - Link and Port layer state machine fixes (05-106r0) [Penokie]
  - 5.8 SAS-1.1 SAM-4 Overlapped tag handling (05-107r0) [Elliott]
  - 5.9 SAS-1.1 State Transition Ambiguity (05-103r0) [Martin]
  - 5.10 SAS-1.1 Missing confirmations in Table J.4 (05-102r0) [Martin]
6. Review of Recommendations
7. Meeting Schedule
8. Adjournment

### Results of Meeting

#### 1. Opening Remarks

John Lohmeyer called the meeting to order at 9:00 a.m. Monday, March 7, 2005. He thanked Skip Jones of QLogic for hosting the meeting. As usual, the people present introduced themselves.

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## 2. Approval of Agenda

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

5.10 SAS-1.1 Missing confirmations in Table J.4 (05-102r0) [Martin]

## 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:

Name	S	Organization
Mr. Tim Symons	P	Adaptec, Inc.
Mr. Doug Cole	A	Dallas Semiconductor
Mr. Kevin Marks	P	Dell, Inc.
Mr. Kenneth Hirata	A	Emulex
Mr. Robert H. Nixon	P	Emulex
Mr. Ralph O. Weber	P	ENDL Texas
Mr. Rob Elliott	P	Hewlett Packard Co.
Mr. Steven Fairchild	V	Hewlett Packard Co.
Mr. Dan Colegrove	P	Hitachi Global Storage Tech.
Mr. George O. Penokie	P	IBM / Tivoli Systems
Mr. Schelto van Doorn	V	Intel Corp
Mr. Bill Bissonette	A	Intel Corp.
Mr. Robert Sheffield	P	Intel Corp.
Mr. Brian Day	V	LSI Logic Corp.
Mr. Tim Hoglund	V	LSI Logic Corp.
Mr. Steve Johnson	V	LSI Logic Corp.
Mr. John Lohmeyer	P	LSI Logic Corp.
Mr. Mark Evans	P	Maxtor Corp.
Mr. Jeff Mastro	A	Microsoft Corp.
Mr. Mark Overby	P	Nvidia Corp.
Mr. Greg Elkins	V	QLogic Corp.
Mr. Arie Krantz	V	QLogic Corp.
Mr. Gilbert Romo	V	QLogic Corp.
Mr. Gerald Houlder	P	Seagate Technology
Mr. William Martin	P	Sierra Logic, Inc.
Mr. Gregory Tabor	AV	Vitesse Semiconductor
Mr. Jeff Williams	AV	Xiotech Corp.
Mr. Bob Hansen	V	Xyratex

28 People Present

Status Key: P - Principal  
 A,A# - Alternate  
 AV - Advisory Member  
 L - Liaison  
 V - Visitor

## 4. Old Business

### 4.1 SAS-1.1 Items

#### 4.1.1 SAS-1.1, protocol for changing driver amplitude (03-285) [Evans]

Mark Evans requested that discussion of this topic be deferred to the next meeting, and that the content be deferred to SAS-2.

#### 4.1.2 SAS Signal Class Proposal (04-220) [Fairchild]

Steve Fairchild requested that item be removed from future agendas.

#### 4.1.3 SAS-1.1: PHY VACANT SMP Function Response (04-333) [Sheffield]

Bob Sheffield reviewed the original proposal (04-333r0). He noted that the proposal seems useful, particularly in light of some behaviors observed at plug fests. He reviewed previous discussions where it was agreed that the vacant phy indication is not sufficient.

Steve Fairchild suggested just turning off phys that are not in use. Tim Hoglund responded that it is not clear how to accomplish that. Steve noted that maintaining backwards compatibility with existing discovery methods is very hard and turning phys off would be compatible.

Steve Johnson suggested putting a table routing indication on the vacant phy, which would have the effect of never putting an entry in the routing tables. Discussions along these lines led to agreements on specific changes in the proposal.

Bob Sheffield moved that 04-333r1 (r0 as revised) be recommended for inclusion in SAS-1.1. Tim Hoglund seconded the motion. In the absence of any objections, the motion passed unanimously.

### 4.2 SAS 1.1 External Connector Interoperability (05-010) [Fairchild]

Steve Fairchild presented a proposal to correct problems with interconnecting devices using 4-way external connectors (05-010r2). The proposal eliminated the table of rules for connecting components (from r0) and replaced it with two new SAS icons, indicating SAS Expander Input and SAS Expander Output, respectively.

George Penokie stated that the proposed icons are not sufficiently different visually. Steve agreed to ask STA to design better icons.

The text of the proposal was reviewed in detail and several minor corrections were requested. Steve agreed to revise the proposal.

Steve Fairchild moved that 05-010r3 (r2 as revised) be recommended for inclusion in SAS-1.1. Bob Nixon seconded the motion. In the absence of any objections, the motion passed unanimously.

### 4.3 SAS-2 Items

#### 4.3.1 SAS-2 More counters (04-172) [Elliott]

Rob Elliott requested that discussion of this topic be deferred to the next meeting.

#### 4.3.2 SAS-2 More phy test patterns (04-222) [Elliott and Fairchild]

Rob Elliott noted that this topic has been referred to the SAS Phy working group and should be removed from future agendas of this working group.

## 5. New Business

### 5.1 SAS-1.1 - COMWAKE Received clarification (05-058) [Sheffield]

Bob Sheffield presented a proposal to correct an ambiguity in the definition of the OOB\_COMINIT state (05-058r0). The group requested wording changes to maintain consistency with other state machine definitions. Bob agreed to revise the proposal.

Bob Sheffield moved that 05-058r1 (r0 as revised) be recommended for inclusion in SAS-1.1. Bill Martin seconded the motion. In the absence of any objections, the motion passed unanimously.

### 5.2 SAS-1.1 OOB Signal Transmitter Requirements (05-075) [Wanamaker]

George Penokie stated that this item should be handled in the SAS Phy working group and should be removed from future agendas of this working group.

### 5.3 SAS-1.1 SMP Enclosure WWN and Connector information (05-055) [Johnson]

Steve Johnson presented a proposal to add SES-like information to the REPORT GENERAL and SMP DISCOVER responses (05-055r0).

Concerns were raised about what the responses contain if the device does not support SES. The group agreed that returning all zeros would sufficiently identify such cases, and Steve agreed to revise the proposal accordingly.

Steve Johnson moved that 05-055r1 (r0 as revised) be recommended for inclusion in SAS-1.1. Kevin Marks seconded the motion. The motion passed 12:0:2.

### 5.4 SAS-1.1 Link layer timeout race conditions (05-086) [Elliott]

George Penokie and Rob Elliott presented a proposal to correct problems in the Break Wait state (05-086r0).

Bill Martin requested a straw poll on whether the response time limits in 05-086r0 should be added without regard to how the other issues are resolved. The results were 3 votes in favor adding response time limits and 9 votes opposed.

Rob Elliott requested a straw poll on the action in response to receipt of an Open with the choices being:

- rejecting the Open and staying in Break Wait,
- transitioning to Selected

The results were 7 favoring the rejecting option, 2 favoring transitioning to Selected.

### 5.5 SAS-1.1: Discovery Process Missing Route Table Rules (05-089) [Johnson]

Steve Johnson presented a proposal to update the Route Table construction rules (05-089r0). Based on the discussion under item 4.1.3, several other changes were made and Steve agreed to revise the proposal.

Steve Johnson moved that 05-089r1 (r0 as revised) be recommended for inclusion in SAS-1.1. Bob Sheffield seconded the motion. In the absence of any objections, the motion passed unanimously.

### **5.6 SAS-1.1, Responding to an OPEN address frame while in the BreakWait state (05-093) [Evans]**

Mark Evans presented a proposal to correct problems in the Break Wait state (05-093r0). The group preferred this proposal over the one in item 5.4 (see straw polls in item 5.4).

The proposal was considered incomplete until changes could be proposed for the XL (Expander Link layer) state machine. This issue was worked over lunch hour.

Tim Hoglund described the XL state machine changes. Mark Evans led the group in a review of the substance but not the detail of the changes.

Mark Evans moved that 05-093r1 (r0 as revised) be recommended for inclusion in SAS-1.1. Tim Hoglund seconded the motion. The motion passed 9:4:6.

### **5.7 SAS 1.1 - Link and Port layer state machine fixes (05-106r0) [Penokie]**

George Penokie reviewed a proposal to fix several oversights in the state machine definitions (05-106r0).

Several omissions in the proposal were discussed and changes were considered. George and Mark agreed to revise the proposal.

Mark Evans moved that 05-106r1 (r0 as revised) be recommended for inclusion in SAS-1.1. Bill Martin seconded the motion. In the absence of objections, the motion passed unanimously.

### **5.8 SAS-1.1 SAM-4 Overlapped tag handling (05-107r0) [Elliott]**

Rob Elliott presented a proposal to make SAS-1.1 overlapped tag checking more consistent with SAS-1 (05-107r0). The group requested a few changes and Rob agreed to revise the proposal.

Rob Elliott moved that 05-107r1 (r0 as revised) be recommended for inclusion in SAS-1.1. Mark Overby seconded the motion. The motion passed 10:1:5.

### **5.9 SAS-1.1 State Transition Ambiguity (05-103r0) [Martin]**

After discussing state transitions in other proposals, Bill Martin asked that this topic be removed from future agendas.

### **5.10 SAS-1.1 Missing confirmations in Table J.4 (05-102r0) [Martin]**

Bill Martin presented a list of confirmation responses that are listed in normative text but not in Annex J (05-102r0). The completeness of this list was reviewed.

Rob Elliott proposed that the annex be removed, but Bill Martin stated that his engineers found it valuable.

Bill Martin moved that 05-102r0 be recommended for inclusion in SAS-1.1. Mark Overby seconded the motion. The motion passed 8:0:9.

## **6. Review of Recommendations**

The following documents were recommended for inclusion in SAS-1.1 during this meeting:

04-333r1 (PHY VACANT SMP Function Response) [Sheffield]

05-010r3 (External Connector Interoperability) [Fairchild]  
05-058r1 (COMWAKE Received clarification) [Sheffield]  
05-055r1 (SMP Enclosure WWN and Connector information) [Johnson]  
05-089r1 (Discovery Process Missing Route Table Rules) [Johnson]  
05-093r1 (Responding to an OPEN address frame while in the BreakWait state) [Evans]  
05-102r0 (Missing confirmations in Table J.4) [Martin]  
05-107r1 (Overlapped tag handling) [Elliott]  
05-106r1 (Link and Port layer state machine fixes) [Penokie/Evans]

## **7. Meeting Schedule**

A SAS Protocol Working Group meeting is scheduled for:

Monday, May 2, 2005 commencing at 9:00 a.m. in Oklahoma City, OK at the Oklahoma City Hotel (405-235-2780), hosted by Fujitsu.

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

## **8. Adjournment**

The meeting was adjourned at 6:35 p.m. on Monday March 7, 2005.