

Accredited Standards Committee\*

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

**Doc. No.:** T10/08-132r0

**Date:** March 13, 2008

**Reply to:** John Lohmeyer

To: T10 Membership  
From: Ralph Weber and John Lohmeyer  
Subject: SCSI Commands, Architecture, & Protocol Working Group Meeting -- March 12-13, 2008  
Raleigh, NC

## Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. SCSI Architecture Model Topics
  - 4.1 SAM-5 Response Fence for protocol services (06-341) [Elliott]
  - 4.2 SAM-5 SCSI Initiator and Target Port capability attributes (07-429) [Elliott]
  - 4.3 SAM-4 Letter Ballot comments resolution document (07-478) [Penokie]
  - 4.4 SAM-5 New Project proposal (08-124) [Penokie]
5. Command Set Topics
  - 5.1 SCSI Primary Commands Proposals
    - 5.1.1 SPC-4: ASC/ASCQ Reservations for ATA REQUEST SENSE (07-081) [Overby]
    - 5.1.2 SPC-4 Download microcode I\_T nexus usage (08-008) [Elliott]
    - 5.1.3 SPC-4: Group Persistent Reservations - Proposal (08-025) [Butt]
    - 5.1.4 SPC-4: CbCS field byte alignment changes (08-101) [Butt]
    - 5.1.5 SPC-4, Completing the SET IDENTIFYING INFORMATION command (08-108) [Evans]
    - 5.1.6 SPC-4 UML Conventions and CbCS UML Updates (08-113) [Weber]
    - 5.1.7 SPC-4 CbCS capability validation omissions (08-129) [Weber]
    - 5.1.8 SPC-4 RECEIVE CREDENTIAL command 'adjustments' (08-128) [Weber]
    - 5.1.9 SPC-4 SBC-3 SAS-2.1 Power condition enhancements (08-126) [Elliott]
    - 5.1.10 Constraints on SPC-4 SA creation based on Usage Type (08-138) [Weber]
    - 5.1.11 CbCS SECURITY PROTOCOL IN/OUT tweaks in SPC-4 (08-141) [Weber]
    - 5.1.12 Capability-based Command Security (CbCS) [the rewrite] (08-145) [Weber]
    - 5.1.13 SPC-4 ESP-SCSI field alignments (08-158) [Weber]
  - 5.2 SCSI Block Commands Proposals
    - 5.2.1 SBC-3 DIF Granularity (08-044) [Sheffield]
    - 5.2.2 SBC-3 SPC-4: Protection Type 3 Reference Tag Clarification (08-116) [Penokie]
    - 5.2.3 SBC - START/STOP command additions (08-139) [Knight]
    - 5.2.4 SBC - Thin Provisioning (08-149) [Knight]
    - 5.2.5 Non-volatile cache becoming volatile (08-156) [Penokie]
  - 5.3 SCSI Enclosure Services Proposals
    - 5.3.1 SES-2 revision 19 letter ballot comment resolution as of ses2r19a (08-049) [Elliott]
  - 5.4 Other Proposals
    - 5.4.1 OSD-2 Conditional Attributes Setting (08-112) [Weber]
    - 5.4.2 OSD-2 CDB Continuations Definition and Usage (08-105) [Weber]

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- 5.4.3 SAS: Add low power transceiver options (08-015) [Houlder]
- 6. SCSI Protocol Topics
  - 6.1 USB Attached SCSI Proposals
    - 6.1.1 Minutes: Draft T10 UAS WG 2008-02-06 Minutes (08-102) [Geldman]
    - 6.1.2 MSC (USB) Command Queuing V4 (08-166) [McGowan/Geldman]
- 7. Old Business
- 8. New Business
- 9. Review of Working Drafts
  - 9.1 USB Attached SCSI Working Draft (UAS) [Stevens]
- 10. Review of Recommendations to the Plenary
- 11. Meeting Schedule
- 12. Adjournment

## Results of Meeting

### 1. Opening Remarks

John Lohmeyer called the meeting to order at 9:00 a.m. Wednesday, March 12, 2008. He thanked Fred Knight of NetApp for hosting the meeting. As usual, the people present introduced themselves.

### 2. Approval of Agenda

The draft agenda was approved with no additions or changes.

The following items were added/revised during the course of the meeting:

- 4.4 SAM-5 New Project proposal (08-124) [Penokie]
- 5.4.3 SAS: Add low power transceiver options (08-015) [Houlder]
- 6.1.2 MSC (USB) Command Queuing V4 (08-166) [McGowan/Geldman]

### 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. Noud Snelder	V	BDT
Mr. David Peterson	P	Brocade
Mr. Kevin Marks	P	Dell, Inc.
Mr. Sean Dolan	A	EMC
Mr. David Black	A	EMC Corp.
Mr. Gary S. Robinson	P	EMC Corp.
Mr. William Martin	P	Emulex
Mr. Robert H. Nixon	A	Emulex
Mr. Ralph O. Weber	P	ENDL Texas
Mr. Mike Fitzpatrick	P	Fujitsu
Mr. Curtis Ballard	A	Hewlett Packard Co.
Mr. Rob Elliott	P	Hewlett Packard Co.
Mr. Dan Colegrove	P	Hitachi Global Storage Tech.

Mr. Kevin Butt	P	IBM Corp.
Mr. Steve McGowan	V	Intel Corporation
Mr. Joel Silverman	P	Kawasaki Microelectronics Am
Mr. Dennis Moore	P	KnowledgeTek, Inc.
Mr. John Geldman	P	Lexar Media, Inc.
Mr. Dennis Kleppen	A	LSI Corp.
Mr. John Lohmeyer	P	LSI Corp.
Mr. George Penokie	A	LSI Corp.
Mr. Paul Wassenberg	A	Marvell Semiconductor, Inc.
Mr. Michael Forney	V	Microsoft Corp.
Mr. Robert Griswold	A	Microsoft Corp.
Mr. Frederick Knight	P	NetApp
Mr. Mark Overby	P	Nvidia Corp.
Dr. Paul Suhler	P	Quantum Corp.
Mr. Yoni Shternhell	A	SanDisk Corporation
Mr. Martin Furuholm	V	Seagate
Mr. Gerald Houlder	P	Seagate Technology
Mr. Erich Oetting	P	Sun Microsystems, Inc.
Mr. Roger Cummings	P	Symantec
Mr. Halvard Eriksen	AV	Tandberg Storage
Mr. Mark Evans	P	Western Digital
Mr. Curtis Stevens	A	Western Digital

35 People Present

Status Key: P - Principal  
 A - Alternate  
 AV - Advisory Member  
 E - Emeritus  
 L - Liaison  
 V - Visitor

## 4. SCSI Architecture Model Topics

### 4.1 SAM-5 Response Fence for protocol services (06-341) [Elliott]

Rob Elliott requested that discussion of the proposal to reflect transport layer ordering of commands and task management functions in SAM-4 (06-341r1) be deferred to the next meeting, and noted that the proposal will be carried over to SAM-5.

### 4.2 SAM-5 SCSI Initiator and Target Port capability attributes (07-429) [Elliott]

Rob Elliott requested that discussion of this topic be deferred to the next meeting, and noted that the proposal will be carried over to SAM-5.

### 4.3 SAM-4 Letter Ballot comments resolution document (07-478) [Penokie]

George Penokie reported that all SAM-4 letter ballot comments have been resolved during the scheduled conference calls. SAM-4 r13e contains all the comments resolutions and 07-478r3 reflects all the resolutions.

Rob Elliott requested that consideration of the letter ballot comment resolutions be deferred to May.

#### **4.4 SAM-5 New Project proposal (08-124) [Penokie]**

John Lohmeyer presented a new project proposal for SAM-5 (08-124r0). Several corrections were requested and George Penokie agreed to prepare a new revision.

George Penokie moved that 08-124r1 (r0 as revised) be recommended as a new project proposal for SAM-5. Fred Knight seconded the motion. In the absence of objections, the motion passed unanimously.

### **5. Command Set Topics**

#### **5.1 SCSI Primary Commands Proposals**

##### **5.1.1 SPC-4: ASC/ASCQ Reservations for ATA REQUEST SENSE (07-081) [Overby]**

Mark Overby requested that this topic be removed from future agendas.

##### **5.1.2 SPC-4 Download microcode I\_T nexus usage (08-008) [Elliott]**

Rob Elliott presented a proposal to clarify what happens when download microcode Write Buffer commands are sent concurrently on multiple I\_T nexuses (08-008r1). The group requested the addition of a mode that allows microcode activation from any I\_T nexus. Rob agreed to prepare a new revision.

Rob Elliott moved that 08-008r2 (r1 as revised) be recommended for inclusion in SPC-4. Kevin Butt seconded the motion. In the absence of objections, the motion passed unanimously.

##### **5.1.3 SPC-4: Group Persistent Reservations - Proposal (08-025) [Butt]**

Kevin Butt led the group in the review of the detailed text changes needed to define team reservations (08-025r3). Numerous corrections and enhancements were requested.

Kevin agreed to prepare a new revision for consideration at the next meeting.

##### **5.1.4 SPC-4: CbCS field byte alignment changes (08-101) [Butt]**

Kevin Butt asked that discussion of this topic be removed from future agendas because the changes in 08-101r1 will be integrated in 08-145 (see agenda item 5.1.12).

##### **5.1.5 SPC-4, Completing the SET IDENTIFYING INFORMATION command (08-108) [Evans]**

Mark Evans presented a proposal to copy a paragraph concerning waiting for non-volatile memory to become ready from REPORT IDENTIFYING INFORMATION to SET IDENTIFYING INFORMATION (08-108r0). The group requested changes, and Mark agreed to prepare a new revision.

Mark Evans moved that 08-108r1 (r0 as revised) be recommended for inclusion in SPC-4. Bill Martin seconded the motion. In the absence of objections, the motion passed unanimously.

##### **5.1.6 SPC-4 UML Conventions and CbCS UML Updates (08-113) [Weber]**

Ralph Weber presented a proposal to add a UML conventions section to SPC-4 and update the CbCS UML diagram to be consistent with the conventions (08-113r1). The group requested several changes and Ralph agreed to prepare a new revision.

Ralph Weber moved that 08-113r2 (r1 as revised) be recommended for inclusion in SPC-4. Bob Nixon seconded the motion. In the absence of objections, the motion passed unanimously.

### **5.1.7 SPC-4 CbCS capability validation omissions (08-129) [Weber]**

Ralph Weber asked that discussion of this topic be removed from future agendas because the changes in 08-129r0 had been integrated in 08-145 (see agenda item 5.1.12).

### **5.1.8 SPC-4 RECEIVE CREDENTIAL command 'adjustments' (08-128) [Weber]**

Ralph Weber asked that discussion of this topic be removed from future agendas because the changes in 08-128r2 had been integrated in 08-145 (see agenda item 5.1.12).

### **5.1.9 SPC-4 SBC-3 SAS-2.1 Power condition enhancements (08-126) [Elliott]**

Rob Elliott presented a review of existing power management commands defined in SCSI (08-126r0), and led the group in a lively discussion of possible approaches to develop enhanced SCSI power management. A revised proposal, a new proposal, or new proposals were promised for the next meeting, but specifics were sketchy.

### **5.1.10 Constraints on SPC-4 SA creation based on Usage Type (08-138) [Weber]**

Ralph Weber presented a proposal to allow a range of Usage Type values to indicate that the SA must include the Authentication Step (08-138r0). The group requested that the proposal reflect the fact that CbCS was not incorporated in SPC-4 r13. Other minor changes also were requested and Ralph agreed to prepare a new revision.

Ralph Weber moved that 08-138r1 (r0 as revised) be recommended for inclusion in SPC-4. David Black seconded the motion. In the absence of any objections, the motion passed unanimously.

### **5.1.11 CbCS SECURITY PROTOCOL IN/OUT tweaks in SPC-4 (08-141) [Weber]**

Ralph Weber asked that discussion of this topic be removed from future agendas because the changes in 08-141r0 had been integrated in 08-145 (see agenda item 5.1.12).

### **5.1.12 Capability-based Command Security (CbCS) [the rewrite] (08-145) [Weber]**

Ralph Weber and Kevin Butt reviewed the preliminary rewrite of the 07-454r5 CbCS proposal (08-145r0). The group noted several modifications to the proposed text, and Ralph agreed to include them in the next revision.

Ralph closed by noting that discussion of the subject will continue at the next meeting.

### **5.1.13 SPC-4 ESP-SCSI field alignments (08-158) [Weber]**

Ralph Weber presented a proposal to clarify the usage of pad bytes in pre-encryption plaintext and make all sequence numbers be naturally aligned to eight-byte boundaries (08-158r0). The group requested that the AES CBC alignment be corrected to 16 bytes; that an entry be added to the informative annex for differences between IKEv2 and IKEv2-SCSI; and that the plaintext padding rules be slightly clarified. Ralph agreed to prepare a new revision.

Ralph Weber moved that 08-158r1 (r0 as revised) be recommended for inclusion in SPC-4. Kevin Butt seconded the motion. In the absence of objections, the motion passed unanimously.

## **5.2 SCSI Block Commands Proposals**

### **5.2.1 SBC-3 DIF Granularity (08-044) [Sheffield]**

In the absence of Bob Sheffield, discussion of the proposal define finer granularity of DIF (08-044r0) was deferred to the next meeting.

### **5.2.2 SBC-3 SPC-4: Protection Type 3 Reference Tag Clarification (08-116) [Penokie]**

George Penokie presented a proposal to clarify that the Type 3 Reference Tag is the same as the Application Tag (08-116r0). The group requested changes in the Control Mode Page ATO bit definition, and eventually agreed that the majority of the definition should be moved from SPC-4 to SBC-3.

George stated that the requested changes were too complex for an on-the-fly rewrite. He agreed to bring a revised proposal to the next meeting for further consideration.

### **5.2.3 SBC - START/STOP command additions (08-139) [Knight]**

Fred Knight presented a proposal to add ATA-oriented power management features to the START STOP UNIT command (08-139r0). The group requested some changes, and Fred agreed to prepare a new revision.

Fred Knight moved that 08-139r1 (r0 as revised) be recommended for inclusion in SBC-3. Bill Martin seconded the motion. In the absence of objections, the motion passed unanimously.

### **5.2.4 SBC - Thin Provisioning (08-149) [Knight]**

Fred Knight asked that discussion of the thin disk provisioning proposal be deferred to the next meeting.

### **5.2.5 Non-volatile cache becoming volatile (08-156) [Penokie]**

George Penokie presented a proposal to modify SBC-3 and SPC-4 to deal with the fact that non-volatile cache may become volatile (i.e., when the battery dies) (08-156r0). The group noted that the unit attention precedence needed to be specified in the proposal. The group requested other minor changes, and George agreed to prepare a new revision for consideration at the next meeting.

## **5.3 SCSI Enclosure Services Proposals**

### **5.3.1 SES-2 revision 19 letter ballot comment resolution as of ses2r19a (08-049) [Elliott]**

Rob Elliott reported that SES-2 letter ballot comment resolutions will be handled in a special meeting to follow the T10 Plenary meeting.

## **5.4 Other Proposals**

### **5.4.1 OSD-2 Conditional Attributes Setting (08-112) [Weber]**

Ralph Weber asked that discussion of this topic be deferred to the next meeting.

### **5.4.2 OSD-2 CDB Continuations Definition and Usage (08-105) [Weber]**

Ralph Weber presented a proposal to formalize the continuation of OSD CDBs into the Data-Out Buffer and defined two uses of the continuation (08-105r0). Gerry Houlder noted that the proposal was the same as what traditional SCSI calls parameter data. Ralph noted that this interpretation is correct, but the difference is that the OSD CDB continuation needs a formal definition for security purposes.

The group requested a few changes, and Ralph agreed to prepare a new revision.

Ralph Weber moved that 08-105r1 (r0 as revised) be recommended for inclusion in OSD-2. Rob Elliott seconded the motion. The motion passed 5:0:15.

### **5.4.3 SAS: Add low power transceiver options (08-015) [Houlder]**

Gerry Houlder asked that discussion of this topic be deferred to the next meeting.

## 6. SCSI Protocol Topics

### 6.1 USB Attached SCSI Proposals

#### 6.1.1 Minutes: Draft T10 UAS WG 2008-02-06 Minutes (08-102) [Geldman]

John Geldman asked that this topic be removed from future agendas.

#### 6.1.2 MSC (USB) Command Queuing V4 (08-166) [McGowan/Geldman]

Steve McGowan presented a proposal to use sets of USB-2/3 pipes to implement UAS transport links (08-166r0). The group discussed the advantages and disadvantages of the proposal. The group provided Steve with some background on the SAM-4 expectations that might apply to his transport protocol design.

UAS editor Curtis Stevens thanked the group for advising him on how best to incorporate the multi-pipe mechanism in future UAS proposals.

## 7. Old Business

There was no old business.

## 8. New Business

There was no new business.

## 9. Review of Working Drafts

### 9.1 USB Attached SCSI Working Draft (UAS) [Stevens]

The group reviewed how to post early revisions of the UAS draft, the mention of USB-3 in the early UAS drafts, and approaches to fallback operation. Curtis took notes on how to post the next early UAS revision, and what to put in document.

## 10. Review of Recommendations to the Plenary

Ralph Weber noted that the following recommendations have been made to the T10 plenary:

For inclusion in SAM-5:

08-124r1 (SAM-5 New Project proposal) [Penokie]

For inclusion in SPC-4:

08-108r1 (Completing the SET IDENTIFYING INFORMATION command) [Evans]

08-008r2 (Download microcode I\_T nexus usage) [Elliott]

08-113r2 (UML Conventions and CbCS UML Updates) [Weber]

08-138r1 (Constraints on SPC-4 SA creation based on Usage Type) [Weber]

08-158r1 (SPC-4 ESP-SCSI field alignments) [Weber]

For inclusion in SBC-3:

08-139r1 (SBC - START/STOP command additions) [Knight]

For inclusion in OSD-2:

08-105r1 (CDB Continuations Definition and Usage) [Weber]

## **11. Meeting Schedule**

The next meeting of the SCSI Commands, Architecture, and Protocols Working Group will be Wednesday, May 7, 2008 from 9 a.m. until 7 p.m. and resuming Thursday, May 8, 2008 from 9 a.m. until noon. The meeting will be in Santa Clara, CA at the Hotel Valencia (Reservations: 866-842-0100) hosted by Nvidia.

## **12. Adjournment**

The meeting was adjourned at 11:40 a.m. on Thursday March 13, 2008.