

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

Doc. No.: T10/05-256r0  
 Date: June 30, 2005  
 Reply to: Bob Sheffield

To: T10 Membership  
 From: Bob Sheffield  
 Subject: SAT Working Group Teleconference -- June 30, 2005

#### Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. Old Business
  - 4.1 SAT Work Items List ([04-391r6](#)) [Sheffield]
  - 4.2 SAT - LOG SENSE command and SMART ([05-142r1](#)) [Bellamy]
  - 4.3 SAT, START STOP UNIT command mapping ([05-226r0](#)) [Evans]
  - 4.4 WRITE BUFFER / Download Microcode [Hatfield]
  - 4.5 SAT - ATA Errors to SCSI Errors - Translation Map ([05-233r1](#)) [Bellamy]
  - 4.6 SAT - Informational Exceptions Control mode page ([05-238r0](#)) [Bellamy]
  - 4.7 SAT - Read-Write Error Recovery mode page ([05-241r0](#)) [Bellamy]
  - 4.8 SAT: Add 16-byte CDBs and PIO modes ([05-247r0](#)) [Sheffield]
5. New Business
  - 5.1 PACKET / non-PACKET Device Definition ([05-253r0](#)) [Overby]
6. Review of ([SAT](#)) Working Draft
7. Review of Recommendations
8. Meeting Schedule
9. Adjournment

#### Results of Meeting

1. Opening Remarks

Bob Sheffield called the meeting to order at 9: a.m. Thursday, June 30, 2005. He thanked himself of Intel Corp. for hosting the meeting. As usual, the people present introduced themselves.

2. Approval of Agenda

The draft agenda was approved with no changes.

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. Ron Roberts	A	Broadcom Corp.
Mr. Kevin Marks	P	Dell Corp.
Mr. Ken Hirata	P	Emulex Corp.
Mr. Wayne Bellamy	V	Hewlett Packard Co.
Mr. Robert Sheffield	P	Intel Corp.
Mr. David Geddes	AV	Marvell Corp.

Mr. Mark Overby	P	Nvidia Corp.
Mr. Greg Elkins	V	Samsung Corp.
Mr. Jim Hatfield	V	Seagate Technology
Mr. Rich Ramos	V	Xyratex Corp.

10 People Present

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

#### 4. Old Business

##### 4.1 SAT Work Items List ([04-391r6](#)) [Sheffield]

Due to the lack of time, Bob Sheffield did not review the status of work items remaining in SAT ([04-391r6](#)).

##### 4.2 SAT - LOG SENSE command and SMART ([05-142r1](#)) [Bellamy]

Due to the lack of time, Wayne Bellamy did not review the status of LOG SENSE command and SMART ([05-142r1](#)).

##### 4.3 SAT, START STOP UNIT command mapping ([05-226r0](#)) [Evans]

Mark Evans was not present to discuss START STOP UNIT command mapping ([05-226r0](#)).

##### 4.4 WRITE BUFFER / Download Microcode [Hatfield]

Because a broader audience was desired, Jim Hatfield asked to defer WRITE BUFFER / Download Microcode to the July meeting.

##### 4.5 SAT - ATA Errors to SCSI Errors - Translation Map ([05-233r1](#)) [Bellamy]

Wayne Bellamy reviewed ([05-233r1](#)), a proposal to define a general mapping of ATA status indications to SCSI sense reporting. Wayne presented tables with varying formats to depict the sense translation, some showing the numerical values for SK, ASC, and ASCQ, and some with textual representations of those values, and asked which format the WG preferred. The WG recommended a format showing the mnemonic representations of the bits in the ATA Status and Error registers in the left-most two columns, and the text representations of SCSI sense key, sense code, and additional sense qualifiers in the right-hand column.

Wayne also asked for feedback on the specific mappings - in particular with respect to an ATA ABRT error. Discussion revealed that an ATA device may report ABRT due to differing causes. ABRT may be due to an invalid field (e.g. bad ATA opcode or bad field in a SET FEATURES command), or ABRT may be due to a problem the drive experiences in executing a valid command. These conditions map to different sense keys in SCSI (ILLEGAL REQUEST and ABORTED COMMAND, respectively). The group agreed that the SATL has little ability to determine the cause of an ABRT error, but may have some ability to avoid issuing invalid commands or parameters to the ATA device by parsing the SCSI requests and reconciling the request with ATA capabilities discovered during

device initialization (e.g., via IDENTIFY DEVICE). The group recommended that the general translation of an ABRT condition reported by the attached non-packet device should be a sense key of ABORTED COMMAND, and the additional sense code set to NO ADDITIONAL SENSE (0B / 00 00).

Wayne also asked the group for guidance in the reporting of the IDNF (ID not found) error. Several options were discussed, but the group settled on recommending a sense key of MEDIUM ERROR and an additional sense code of RECORD NOT FOUND. It was noted that one of the alternatives, (SK,ASC/ASCQ) = (MEDIUM ERROR, LBA OUT OF RANGE) is not a viable alternative because LBA OUT OF RANGE should be reported with a sense key of ILLEGAL REQUEST, not MEDIUM ERROR, and so does not reflect the actual error condition reported by the non-packet device.

Wayne agreed to bring in a revised proposal for discussion at the July meeting.

#### 4.6 SAT - Informational Exceptions Control mode page ([05-238r0](#)) [Bellamy]

Due to the lack of time, Wayne Bellamy did not review the status of Informational Exceptions Control mode page ([05-238r0](#)), however during subsequent review of the SAT working draft the group recommended that this proposal should address handling of the MRIE bit (method of reporting informational exceptions).

Discussion Covered under agenda item, "6. Review of [SAT Working Draft](#)", Editor's note 25.

#### 4.7 SAT - Read-Write Error Recovery mode page ([05-241r0](#)) [Bellamy]

Due to the lack of time, Wayne Bellamy did not review the status of Read-Write Error Recovery mode page ([05-241r0](#)).

#### 4.8 SAT: Add 16-byte CDBs and PIO modes ([05-247r0](#)) [Sheffield]

Due to the lack of time, Bob Sheffield did not review the status of Add 16-byte CDBs and PIO modes ([05-247r0](#)).

### 5. New Business

#### 5.1 PACKET / non-PACKET Device Definition ([05-253r0](#)) [Overby]

Due to the lack of time, Mark Overby did not review the status of PACKET / non-PACKET Device Definition ([05-253r0](#)).

### 6. Review of [SAT Working Draft](#)

Bob Sheffield led a review of the working draft by sequentially looking through each of the editor's notes. Many of them are being addressed by proposals that are currently under development. Bob agreed to modify the editor's notes in the next SAT revision to note the proposals expected to address the issue discussed in the note.

Editor's note 3:

- This suggests the need to again discuss the definition of the "Unspecified" keyword. The WG didn't have any issues. Discuss again in July.

Editor's note 4 (Figure 4):

- It was noted that these colors print as black on greyscale-only printer.
- Bob agreed to modify the figure in the next SAT revision.

Between notes 9 & 10 (subclause 6.3.1, unordered-list item (e):

- 1: Is there actually a defined response to Abort Task (e.g. external SATL)?
  - 2: Responding this way may cause the application client to think there's something seriously wrong with the device.
  - 3: How long is permissible to Abort a command?
    - Is ABORT TASK expected to complete immediately?
    - Can the SATL hold off the response (e.g. to let command complete)?
    - Are these responses the right ones?
- Suggestion - can we just delete unordered list item (e)?

Table 7:

- Use command names not numeric values for opcode and parameters. Bob agreed to make the necessary changes.

Table 9:

Remove this table and refer to table-54 in the Log Pages subclause. Add an "All others" to table-54 as "unspecified" and refer to SPC-3. Page Code 31h is vendor-specific. SAT shouldn't define the use of vendor-specific pages. Need to check with Wayne to see if his SMART / Log page proposal incorporates the intended function here.

These changes are addressed in 05-142: SAT - LOG SENSE and SMART  
 -Overby: must all other page codes be aborted ? make 'unspecified'  
 o to allow satl variations and vendor-specific support

Editor's note 17:

- Should error reporting be covered on a per-command basis (e.g., like REASSIGN BLOCKS)? There was resistance to this as a general rule, but agreement that isolated cases need it. There are no proposals at the moment to add error reporting text to each command translation. Bob agreed to delete this editor's note from the next SAT revision.

Editor's note 24:

- The WG suggested deleting the text, "SET FEATURES may be used to implement MODE SELECT parameters in some cases. Make this consistent throughout the document", from the editor's note. Mode parameters may need to be dealt with on a case-by-case basis since mapping to SET FEATURES is not consistent.

Editor's note 25 (MRIE bit in table 53):

The group recommended:

Specify that the SATL shall support mode-6 (SATType = E), and the SATL may support other modes (SATType - U, unspecified with a reference to SPC-3).

For mode-6, upon receiving a REQUEST SENSE command the SATL shall issue SMART RETURN STATUS to the ATA device, and return status to the application client as defined in SPC-3 (see). HARDWARE IMPENDING FAILURE GENERAL HARD DRIVE FAILURE (5D/10), (5D/00 could be used as well), otherwise no-sense should be reported. Wayne agreed to bring in a revised proposal to a subsequent meeting.

- change to "value 6 shall be supported. all others may be supported much discussion about what sense codes to return

The last editor's note reviewed was editor's note 25 in SAT-r4.

7. Review of Recommendations

The working group made no recommendations to the T10 plenary in this meeting.

8. Meeting Schedule

SAT Working Group meetings are scheduled for:

Monday, June 20, 2005 from 9:00 a.m. to 5:00 p.m. in Irvine, CA, at the Embassy Suites (949-553-8332), hosted Western Digital.

A SAT Working Group meeting is tentatively scheduled for:

Monday, August 20, 2005 from 9:00 a.m. to 6:00 p.m. in Boulder, CO, at the Hotel Boulderado (303.440.2880), hosted by Intel.

Bob Sheffield will post a notice to the T10 and T13 reflectors.

Note: This meeting occurs Monday the same week and location as the T13 plenary meeting.

9. Adjournment

The meeting was adjourned at 11:55 a.m. PDT on Thursday, June 30, 2005.

