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

To: T10 Membership
From: John Lohmeyer and Ralph Weber
Subject: SAT Working Group Meeting -- December 12, 2005
            Las Vegas, NV

Agenda

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    4.2   SAT - SEND DIAGNOSTIC Command and Self Test Results (05-245) [Bellamy]
5. New Business
    5.1   SAT: I_T Nexus Loss (06-001) [Sheffield]
    5.2   SAT - Make ATA Status Return Descriptor optional (06-005) [Sheffield]
    5.3   SAT: TEST UNIT READY Translation (06-008) [Overby]
    5.4   SAT Clarify error handling for PIO data-in commands (06-020) [Elliott]
6. Review of (SAT) Working Draft
7. Review of Recommendations
8. Meeting Schedule
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Results of Meeting

1.   Opening Remarks

John Lohmeyer called the meeting to order at 0900 December 12, 2005. John thanked Dan Colegrove of Hitachi for hosting the meeting. As is customary, the people attending introduced themselves.

2.   Approval of Agenda

The draft agenda was approved without revision.

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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              Name                    S          Organization
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Mr. Ron Roberts                       A  Broadcom Corp.
Mr. Ralph O. Weber                    P  ENDL Texas
Mr. Wayne Bellamy                     V  Hewlett Packard Co.
Mr. Dan Colegrove                     P  Hitachi Global Storage Tech.
Mr. Robert Sheffield                  P  Intel Corp.
Mr. John Lohmeyer                     P  LSI Logic Corp.
Mr. Frank Shu                         V  Microsoft
Mr. Jim Hatfield                      V  Seagate Technology
Mr. William Martin                    P  Sierra Logic, Inc.
Mr. Curtis Stevens                    P  Western Digital

10 People Present

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

4.1 SAT Work Items List (06-004) [Sheffield]

Bob Sheffield reviewed the current work items list (06-004r0). Bob noted that SAT does not yet describe the use of READ LOG EXT for error recovery on NCQ commands. The group discussed covering the issue in a January proposal or as a Letter Ballot comment.

Bob noted that all SAT work items of record have been completed. He stated that the four proposals recommended today will be provisionally integrated in SAT revision 7a which will be available in time for the January meeting. Changes approved during the Working Draft review (see agenda item 6), if any, also will be incorporated in the provisional SAT revision 7a.

4.2 SAT - SEND DIAGNOSTIC Command and Self Test Results (05-245) [Bellamy]

Wayne Bellamy reviewed the latest revision of his proposal to map SEND DIAGNOSTIC into ATA actions (05-245r3). Failure to incorporate default selftest changes agreed upon in November bothered Bill Martin because his company had already implemented reading LBA 0, reading the highest LBA, and reading a random LBA in the middle. The method for determining the current device temperature needed to be inclusive of all the listed steps, and changing the 'or' on the list to an 'and' was sufficient to achieve this result.

Wayne agreed to revise the proposal. Wayne Bellamy moved that 05-245r4 (r3 as modified) be recommended for inclusion in SAT. Bob Sheffield seconded the motion. In the absence of any objections, the motion passed unanimously.

5. New Business

5.1 SAT: I_T Nexus Loss (06-001) [Sheffield]

Bob Sheffield presented a proposal to integrate the SAS-2 handling for I_T Nexus handling into SAT (06-001r0). Concerns were raised about whether the proposal is ahead of its time because the reference is SAS-2 and ATA

mentions I_T Nexus Loss only in draft ATA-8 documents which may or may not continue to contain such information.

To limit the scope of the proposal, the new subclause title was changed to SAM-3 I_T nexus loss. Other minor editorial corrections were also requested.

Bob Sheffield moved that 06-001r1 (r0 as modified) be recommended for inclusion in SAT. Ron Roberts seconded the motion. In the absence of any objections, the motion passed unanimously.

5.2 SAT - Make ATA Status Return Descriptor optional (06-005) [Sheffield]

Bob Sheffield presented a proposal to make use of the ATA Status Return descriptor optional (06-005r0). Both Curtis Stevens and Jim Hatfield objected to the change on the grounds that some ATA commands require use of the ATA Status Return descriptor function to detect whether a command ultimately finished.

Ralph Weber suggested that the lack of resources which motivated the proposal should not affect the handling of the command that retrieves the status. Instead, commands that might need the status saved should be blocked with Busy status.

Bob asked for a straw poll on whether efforts should be made to modify the proposal to make it acceptable to the majority of those present. The straw poll did not favor continued work on the proposal 3:5.

Bob withdrew the proposal.

5.3 SAT: TEST UNIT READY Translation (06-008) [Overby]

On behalf of the absent Mark Overby, Bob Sheffield presented a proposal to update the definition of the Test Unit Ready command (06-008r0). Concerns were raised regarding the content and ordering of the list of commands the SATL is required to send. The absence of a CHECK POWER MODE command was a problem because its use appears SAT revision 7.

The group found 06-008r0 sufficiently unsatisfactory to warrant development of a completely new proposal (06-022r0). Bob Sheffield moved that 06-022r0 be recommended for inclusion in SAT. Ron Roberts seconded the motion. The motion passed 6:0:2.

5.4 SAT Clarify error handling for PIO data-in commands (06-020) [Elliott]

Wayne Bellamy presented a proposal to clarify the handling of errors that occur during transmission of the last DRQ block (06-020r0). The proposal's claim that most commands affected by these conditions include error detecting checksums was contested by Jim Hatfield. Only the commands listed in the proposal have such checksums, most others do not.

Some present suggested that PIO usage be prohibited in SAT. Dan Colegrove argued that ATA drives perform billions of commands in PIO mode with almost no errors detected, which is why T13 has never taken steps to change the behavior. Dan also noted the last block is protected even if the status is sent first, because the transfer quality is the same throughout the entire transfer operation. That is, all data is checked as it is placed into the drive's buffer and none is checked as it is transferred to the host.

Because the proposed changed failed to address the full breadth of the problem described in the proposal overview, the group decided to reduce the changes to exactly the IDENTIFY DEVICE, IDENTIFY PACKET DEVICE, SMART READ DATA, and READ LOG EXT commands.

Ralph Weber moved that 06-020r1 (r0 as modified) be recommended for inclusion in SAT. Wayne Bellamy seconded the motion. In the absence of any objections, the motion passed unanimously.

6. Review of (SAT) Working Draft

Bob Sheffield presented several issues raised by Rob Elliott in an e-mail message. Rob suggested adding an ordering priority to table 33 to improve performance. The group concluded that the purpose of SAT was to define interoperable implementations, not to define high-performance implementations. Jim Hatfield noted that performance issues are complex and should not be baked into the SAT standard. Wayne Bellamy noted that the HP preference was for avoiding use of PIO if at all possible. The group recommended that HP write such preferences into their purchase specifications since the SAT standard needs to be silent on the subject.

Bob Sheffield led a review of revision 7 of the working draft.

How best to reference SATA information in SATA-IO documents was discussed. The choices were complex and the possibility was discussed that references would need to be revised during the SAT Letter Ballot. The SAT functional protocol reference model figure was updated. The translation for unit attention conditions was reviewed with an eye toward the fact that ATA has no notifications for asynchronous conditions.

7. Review of Recommendations

The following items were recommended to the plenary for inclusion into SAT:

    05-245r4 (SEND DIAGNOSTIC Command and Self Test Results) [Bellamy]
    06-001r1 (I_T Nexus Loss) [Sheffield]
    06-022r0 (Rewrite TEST UNIT READY) [Sheffield]
    06-020r1 (Clarify error handling for PIO data-in commands) [Elliott/Weber]

8. Meeting Schedule

A SAT Working Group meeting is scheduled for:

    Tuesday January 10, 2006 from 9:00 a.m. to 12:00 p.m. in Phoenix, AZ at the Embassy Suites Hotel Phoenix - Scottsdale, hosted by Intel.

9. Adjournment

The meeting was adjourned at 1755 December 12, 2005.