

To: T10 Technical Committee
From: Robert Sheffield, Intel (robert.i.sheffield@intel.com)
Date: 21 August 2005
Subject: 04-391r7 SAT: Work Items List

Revision history

Revision 0 (8 November 2004) - First revision

Revision 1 (16 December 2004) - Add completed items, and target/Lun mapping.

Revision 2 (18 January 2005) - Add REASSIGN BLOCKS & reassign security modes task

Revision 3 (18 March 2005):

- a) Add 04-218r8 INQUIRY data contents integration as a completed task.
- b) Mark done restructuring SAT to include a clause on SCSI extensions to SAT
- c) Tag the ATAPI extensions item as clause 14 instead of 13 (due to item-b above)
- d) Add a task to add a subclause for reporting ATA host capabilities in INQUIRY VPD data.
- e) Modified the scope of the ATA power modes task.
- f) Modified target/LUN mapping task to include two PATA drives on a cable.
- g) Added some new tasks.
- h) Marked Passthrough Commands and SATL-specific mode page as done.

Revision 4 (18 May 2005):

- a) Removed duplicate "Device States" work item (DF bit - in clause-5).
- b) Change ATAPI translation task owner from Mark Overby to David Hawks
- c) Add INQUIRY product revision translation and REQUEST SENSE cleanup tasks (both done).
- d) Changed REPORT TASK MANAGEMENT functions task owner to "Open"
- e) Added 16-byte commands support task.
- f) Added caching and informational exceptions mode pages tasks.
- g) Added log pages 0, 2Fh, and 10h tasks.
- h) Added mode page policy VPD page task.
- i) Added SEND DIAGNOSTIC cleanup task.
- j) Added task to provide a mode-pages summary list.
- k) Added an end-to-end data protection translation task.
- l) Added a WRITE SAME translation task.
- m) Added a projected timeline for SAT completion.

Revision 5 (20 May 2005):

- a) Added a criticality column with items identified in the May 19, 2005 teleconference marked as critical.
- b) Defined terms, critical and non-critical for the Criticality column.
- c) Fixed the number of bytes used to fetch disk capacity in item (5) READ CAPACITY (16) (changed [2,4] to [4,8]).
- d) Noted that item (6), SEND DIAGNOSTIC, also involves the self-test results page, and added Wayne Bellamy as co-owner.
- e) Added a note to item (20) (summary of mode pages) that summaries of log pages (and parameters) and VPD pages are also required.
- f) Reordered table 1 to put critical items first, non-critical next, and completed items last.

Revision 6 (7 June 2005):

- a) Marked several items, 'in-progress';
- b) Added task to provide a 'mantra' statement about consistency with other SCSI documents;
- c) Added task management clarification to Steve Johnson's NCQ task;
- d) Added a task to handle removable devices (Overby).

Revision 7 (21 August 2005):

- a) Marked several items DONE.
- b) Marked some as Posted.
- c) Added proposal numbers for some.
- d) Added spinup device state information to the device error states task for Sheffield.
- e) Added a critical task to define the Control mode page (Qerr and background timer).
- f) Added a non-critical task to handle removable medium.
- g) Modified target dates for milestones leading to SAT completion.

Related documents

SAT-r04 - SCSI / ATA Translation revision 4

Overview

There are several remaining work items yet to be done to complete the SAT standard. This document briefly describes each work item, with the intent that any of the SAT WG contributors can volunteer to draft proposals to provide the needed text related to each of these items.

The Criticality column in table 1 indicates whether the SAT editor (in accordance with the general wishes of the SAT WG) would delay start of the 30-day SAT letter ballot (table 2 row 3) in order to include the described feature. For critical items the editor would delay letter ballot. Non-critical items may (and should) be included in the standard, but their inclusion is contingent upon plenary approval to integrate the corresponding proposals into the SAT working draft by the date specified for all proposals to be integrated (table 2 row 2).

Table 1 — SAT work items (part 1 of 5)

Item	Description	Owner	Status	Criticality
1)	SMART section. Clause 11 has some skeleton text, but this section needs much elaboration to adequately address the translation, needs to be moved into a subclause under the Log Pages section of the "parameters" chapter. It needs to include translations for log pages 00h, 10h, and 2Fh.	Steve Johnson, Wayne Bellamy	05-142r1 In progress	Critical
2)	Add a subclause to specify ATA power modes.	Mark Evans	(05-226) Posted	Critical
3)	Draft subclause 5.3 Device Error States to describe handling of device error conditions (e.g. if DF is one, return a sense key of HARDWARE ERROR with an additional sense code of [LOGICAL UNIT FAILURE or INTERNAL TARGET FAILURE]). Include SATL handling initialization and spinup states, and SATL interaction with the SAS SP state machine SATA_SpinupHold state. The SATL should detect when the ATA transport is holding off initialization of the interconnect and return CHECK CONDITION status with the sense key set to NOT READY and the additional sense code set to LOGICAL UNIT NOT READY, NOTIFY (ENABLE SPINUP) REQUIRED for media access comands. Include the idea that the SATL has to "remember" when the attaced disk is supposed to be in the STOPPED state so it knows to reject media access commands (INITIALIZING COMMAND REQUIRED) instead of translating to a corresponding ATA media access command.	Bob Sheffield	New	Critical
4)	Define PIO modes for all SCSI/ATA translations that generate READ/WRITE commands to non-packet devices. This involves adding a column to the translation tables at the start of each command subclause to specify whether DMA is supported (by both the SATL and the device), and adding appropriate rows to list non-DMA PIO commands used.	Sheffield	05-247r0 Posted	Critical

Table 1 — SAT work items (part 2 of 5)

Item	Description	Owner	Status	Criticality
5)	Add READ CAPACITY (16) and other 16-byte CDB commands that access media. Be sure to check IDENTIFY DEVICE to determine if the 48-bit feature set is supported and enabled because the capacity is reported as a 4-byte field if it's not supported and enabled - and a 8-byte field if it is supported and enabled.	Bob Sheffield	05-247r0 Posted	Critical
6)	Clean up SEND DIAGNOSTIC command (make it consistent with SCSI). This is tied to the self-test results page.	Bob Sheffield & Wayne Bellamy		Critical
7)	Add text: "if the non-packet device is reset, the SATL shall generate a UNIT ATTENTION condition..."	Mark Overby	Working	Critical
8)	Define the Control mode page including emulation of Qerr and a field to report estimated completion time for background self-test.	TBD	placeholder	Non-critical
9)	ATAPI Translations. Clause 14, "Translation for ATAPI devices" is currently a place-holder for this information. This section will probably expand to at least two sections, (ATAPI translations for Primary SCSI commands, and ATAPI translations for SCSI Block Commands), and may require an dedicated architecture section as well.	David Hawks	Placeholder	Non-critical
10)	Add a subclause for reporting ATA host capabilities in INQUIRY VPD data	Mark Overby		Non-critical
11)	Add a subclause for a SATL-specific mode page to specify ATA security modes (may be in a common SATL protocol-specific mode page).	Mark Overby	In progress	Non-critical
12)	Add informative text in the task-management subclause referring to the SCSI-2/SPI to describe translation of "Bus Reset".	Steve Johnson	In progress	Non-critical
13)	Rewrite sections to better define NCQ mapping, including handling of commands queued internally by the SATL and clarification of task management.	Steve Johnson	In progress	Non-critical
14)	Define handling of legacy TCQ handling for SATA devices that implement TCQ instead of NCQ	Steve Johnson	In progress	Non-critical
15)	Describe Target/LUN mapping options, in particular when a SATA port multiplier is involved (e.g. if the port multiplier is attached to an STP/SATA bridge in an expander, the SATL <i>might</i> present it as a target represented by the SAS address of the STP/SATA bridge with LUNs representing the SATA devices attached to the port multiplier). Also address two PATA drives on a common cable. This could also address the possibility of defining a WLUN to represent the SATL itself, even when no ATA devices are attached. This should be an informative annex - some don't want to be restricted to reporting devices as logical units or as target devices for specific configurations.	Sheffield, Elliott	New	Non-critical

Table 1 — SAT work items (part 3 of 5)

Item	Description	Owner	Status	Criticality
16)	Report Supported Task Management Functions proposal. (note: April SAT WG couldn't remember why this is needed)	Open	New	N/A
17)	Add the mode page policy VPD page to the INQUIRY VPD section and include a table of supported mode pages indicating that each is shared, and refer to SPC-3 and SBC-2	Wayne Bellamy		Non-critical
18)	End-to-end data protection handling in SAT	Steve Johnson		Non-critical
19)	Handle removable medium devices and test unit ready extensions to see if media is present.	Mark Overby		Non-critical
20)	Like the list of supported commands in SAT clause 7, there should be a summary of mode pages supported. Copy SBC-2 table 98 (listing mode pages) and modify to show SBC-2 & SPC-3 references in one column and SAT paragraph references where applicable in another column. Do same for log pages and parameters and INQUIRY VPD pages.	Bob Sheffield	Done in SAT-r05	Critical
21)	Write Same translation	Curtis Stevens	(05-177) Done	Non-critical
22)	Draft a proposal for the READ MEDIA SERIAL NUMBER command	Mark Overby	(05-227) Done	Non-critical
23)	Mode pages and Log pages. Clause 10 defines some mode page and log page translations. The task remaining is to take a thorough look at the defined SPC-3 and SBC-2 mode and log pages to determine what else needs specific translation in SAT. There also may be a need to define a SAT-specific mode page. Specifically: <ul style="list-style-type: none"> • Caching mode page. • Informational Exceptions mode page • Log page 0 - Supported log pages list • Log page 2Fh - SMART Informational Exceptions Condition • Log page 10h - diagnostic self-test results • Read/Write Error Recovery mode page 	Wayne Bellamy, (Mark Overby will help)	05-142r1 05-238r0 05-239r0 05-241r0 Done 7/05	Critical

Table 1 — SAT work items (part 4 of 5)

Item	Description	Owner	Status	Criticality
24)	Sense Data and Error Reporting. Clause 12 currently is a place-holder for error reporting. It contains general templates for CDBs and data structures, which will be deleted when this clause is completed. Many of the required ASC/ASCQ responses are specified in-line in the main text, but it is likely there is general error reporting translation that needs to be specified, but is not so directly tied to the defined command translations to warrant putting the descriptions in the command translation subclauses themselves. This section will cover any needed sense reporting translation not covered in the command translation clauses. ATAPI may need special treatment here, since in most cases the ATAPI translation will be to forward the status reported by the ATAPI device.	Wayne Bellamy	05-233r0 Done 7/05	Critical
25)	Define REASSIGN BLOCKS command	Bellamy	05-136r2 Done 7/05	Critical
26)	Make sure there's a "mantra" statement in the scope to try to make SAT consistent with SPC-3, SBC-2, and SAM-3.	Bob Sheffield	Done (SAT-r05)	N/A
27)	Post rough draft defining basic content of SATL standard (T10/04-136r0 SCSI to ATA Command Translations).	Steve Johnson and Samantha Ranaweera	Done June 2004	N/A
28)	T10 plenary approval of SAT project proposal (T10/04-174r3).	Sheffield	Done July 2004	N/A
29)	Reformat for T10 standards template and post first SAT draft.	Sheffield	Done August 2004	N/A
30)	Define and incorporate common table format for translations (04-260r2).	Stevens / Sheffield	Done Sept. 2004	N/A
31)	Add SAT-specific INQUIRY page 0x83 (04-219r3)	Elliott, Bellamy, Sheffield	Done Sept 2004	N/A
32)	Define semantics to distinguish ATA devices (that don't support the packet command set) from ATAPI devices (that do support the packet command set).	Sheffield	Done- SAT-r1	N/A
33)	Extend the general clause to identify objectives and guidelines to focus on consistency in implementations for SAT-aware and non-SAT aware operating systems and the importance of limiting flexibility to ensure correct results, as much as possible, for existing (non-standard) SCSI-ATA translation implementations.	Sheffield	Done - SAT-r1	N/A
34)	Applied several refinements to task-management functions and supported command op-code translations based on SAT draft review in the August '04 teleconference, September '04 SAT WG meeting, and October '04 teleconference.	Sheffield	Done - SAT-r1	N/A
35)	Add a subclause for 04-218 SAT INQUIRY contents revising standard inquiry data and adding the Device Identification VPD page.	Elliott, Bellamy	Done - SAT-r2	N/A

Table 1 — SAT work items (part 5 of 5)

Item	Description	Owner	Status	Criticality
36)	Restructure draft standard to break-out a separate clause for SATL-specific SCSI extensions to include new SCSI commands (e.g. ATA passthrough), new SATL mode pages (e.g. a mode page to specify ATA transfer/timing modes and security modes, and power modes).	Bob Sheffield	Done - SAT-r2	N/A
37)	ATA Passthrough command	Curtis Stevens	Done	N/A
38)	Add a subclause for a SATL-specific mode page to specify ATA transfer/timing modes (may be in a common SATL protocol-specific mode page).	Mark Overby	Done	N/A
39)	Define INQUIRY product revision translation (05-137r1)	Wayne Bellamy	Done	N/A
40)	Cleanup REQUEST SENSE and deal with autosense (05-109r0)	Mark Overby	Done	N/A
41)	Move INQUIRY VPD pages from their current location in the description of INQUIRY to a subclause under the "Pages" clause 10 in SAT-r4	Bob Sheffield	Done SAT-r4	N/A
42)	Delete document template information in clause-12 (it's confusing when the clause is supposed to have error reporting information)	Bob Sheffield	Done SAT-r4	N/A

Editor's Note 1: [Need to start adding tasks to address in SAT-2.](#)

Timeline

Table-2 shows the planned timeline.

Table 2 — SAT Timeline

Item	Description	Target Date	Commit Date
I 1)	All contributed proposals submitted	20 June 2005 Sept 2005	12 July 2005
I 2)	All proposals integrated	12 July 2005 Oct 2005	13 Sept 2005
I 3)	Begin 30-day letter ballot	26 July 2005 Dec 2005	29 Sept 2005
I 4)	Letter ballot close	25 Aug 2005 Jan 2006	28 Oct 2005
I 5)	Letter ballot comment resolution meetings	Sept 2005 Feb 2006	Nov 2005
I 6)	Posting of letter ballot comment resolution	30 Sept 2005 Feb 2006	26 Nov 2005
I 7)	Plenary vote to fwd to INCITS	10 Nov 2005 April 2006	12 Jan 2006