

To: T10 Technical Committee
From: Wayne Bellamy (wayne.bellamy@hp.com), Hewlett Packard
Date: May 23, 2005
Subject: T10/05-142r1 SAT - LOG SENSE command and SMART

Revision History

Revision 0 (April 15, 2005) first revision
Revision 1 (May 23, 2005) second revision

Change Details:

- 1) per 4-18-05 SAT T10 WG: add MODE SENSE/MODE SELECT relevant data for Information Exceptions Control mode page for enabling/disabling this page (SMART).
- 2) per 4-18-05 SAT T10 WG: (editing note - SMART can be supported but mat not be enabled.)
- 3) per 4-18-05 SAT T10 WG: (editing note – Log pages “list” should not change dynamically based on enable/disabled of SMART on ATA side.)
- 4) per 5-19-05 SAT T10 WG teleconference call: Ralph Webber provided ASC/ASCQ of (67/0B) for ATA DEVICE FEATURE SET NOT ENABLED (input from Mark Overby). This information is used in Table 3.
- 5) per 5-19-05 SAT T10 WG teleconference call: Add the Self-Test Results Results log page to this proposal.
- 6) per 5-19-05 SAT T10 WG teleconference call: early posting requested regardless of completion.

Related Documents

(T10) sat-r04 – SCSI to ATA Translation (SAT), Revision 4
(T10) spc-3r23 – SCSI Primary Commands - 3, Revision 23
(T13) ata7v1r4b – AT Attachment with Packet Interface - 7 Volume1, Revision 4b

Overview

1. The LOG SENSE command is used by SCSI application clients to retrieve SMART data. The SATL must be able to provide the occurrence of an impending failure (SMART event) to the SCSI application client. This proposal details a method to accomplish this task.
2. The LOG SENSE command is used by SCSI application clients to retrieve the Self-Test Results log page. This proposal will address the emulation (in progress 5-23-05).
3. Complexity of the emulation of the LOG SENSE command is estimated to be minimal.

Suggested changes to SPC-3

Requesting a new ASC and ASCQ assignment as follows:

<u>ASC</u>	<u>ASCQ</u>	
67	0B	ATA DEVICE FEATURE SET NOT ENABLED

Suggested changes to SAT

8.1.4 LOG SENSE command (4Dh) Command Summary

8.2 LOG SENSE command (4Dh)

8.2.1 Command summary

The LOG SENSE command provides a mechanism an application may use to retrieve statistical or diagnostic results, or other operating information about a target or a logical unit. ~~The SATL~~

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shall not support returning any data other than SMART data. Table 1 shows the translation for fields specified in the LOG SENSE CDB.

Table 1 - LOG SENSE command CDB fields

Field	SATType	Description or reference
OPERATION CODE	E	The SATL shall issue an ATA SMART (B0h) command with Features register set to D0h-DAh, LBA Mid register set to 4Fh, and LBA High register set to C2h. The SATL shall emulate the LOG SENSE command by preparing and returning the log page data for the particular page requested.
PPC (Parameter Pointer Control)	U	Parameter Pointer Control: This bit shall be ignored. This bit shall not be supported.
SP (Save Parameters)	U	Save Parameters: This bit shall be ignored. This bit shall not be supported.
PC (Page Control)	E	Page Control: (see 8.2.2)
PAGE CODE	E	If the PAGE CODE does not specify SMART data log page data, the SATL shall return a CHECK CONDITION with SENSE KEY set to ILLEGAL REQUEST and ADDITIONAL SENSE CODE set to INVALID FIELD IN CDB. If the page code specifies the SMART data log page, the SATL shall return SMART data (see -). This field specifies which log page is being requested as defined in SPC-3. For PAGE CODES supported by the SATL see 8.2.3.
PARAMETER POINTER	U	This field shall be ignored. This field shall not be supported.
ALLOCATION LENGTH	I	The SATL shall transfer no more than the number specified in this field. The SATL shall implement this field as defined in SPC-3.
CONTROL	I	(see -) (see 6.4)

Bit or field values that are not supported (values other than 0h) shall cause the SATL to return a CHECK CONDITION with SENSE KEY set to ILLEGAL REQUEST and ADDITIONAL SENSE CODE set to INVALID FIELD IN CDB.

~~The LOG SENSE command provides a mechanism an application may use to retrieve statistical or diagnostic results, or other operating information about a target or a logical unit. The SATL shall not support returning any data other than SMART data. Table shows the translation for fields specified in the LOG SENSE CDB.~~

~~0.1 The SATL shall return SMART data log page data. If the PAGE CODE is another value, the SATL shall terminate the command with CHECK CONDITION STATUS with the SENSE KEY set to ILLEGAL REQUEST and the ADDITIONAL SENSE CODE set to INVALID IN CDB.~~

8.2.2 pc (page control) field

The SATL shall implement this field as defined in SPC-3. The SATL interpretation of the page control values is shown in Table 2.

Table 2 - Page control values

PC	SATType	Description or reference
00b	U	Current values. Threshold values: Not supported.
01b	I	Cumulative values: Supported.
10b	U	Default threshold values: N/A. Not supported.
11b	U	Default cumulative values: N/A. Not supported.

Page control (PC) field values that are not supported shall cause the SATL to return a CHECK CONDITION with SENSE KEY set to ILLEGAL REQUEST and ADDITIONAL SENSE CODE set to INVALID FIELD IN CDB.

8.2.3 PAGE CODE field

The SATL shall implement this field as defined in SPC-3. The SATL translation for the PAGE CODE field is shown in Table 3.

Table 3 - PAGE CODE field values

PAGE CODE	SATType	Description or reference
00h	I	Supported Log Pages log page: The SATL shall implement this page by reporting a list of supported log pages as defined in SPC-3. The SATL shall determine if the non-packet device supports the ATA SMART feature set from the IDENTIFY DEVICE data word 82, bit 0. If the device supports the ATA SMART feature set the SATL shall add log page 2Fh to its list of supported log pages.
10h	E	Self-Test Results log page:
34h 2Fh	E	Informational Exceptions log page: The SATL shall determine if the ATA SMART feature set is supported from the ATA IDENTIFY DEVICE data word 82, bit 0. If the ATA SMART feature set is not supported the SATL shall return a CHECK CONDITION with SENSE KEY set to ILLEGAL REQUEST and ADDITIONAL SENSE CODE set to INVALID FIELD IN CDB. If the ATA SMART feature set is supported the SATL shall determine if the ATA SMART feature set is enabled or disabled from the ATA IDENTIFY DEVICE data word 85, bit 0. If the ATA SMART feature set is disabled the SATL shall return a CHECK CONDITION with SENSE KEY set to ABORTED COMMAND and ADDITIONAL SENSE CODE set to ATA DEVICE FEATURE SET NOT ENABLED (0B/67/0B) . If the ATA SMART feature set is enabled the SATL shall issue the ATA SMART RETURN STATUS command (B0h) with Features register set to DAh, LBA Mid register set to 4Fh, and LBA High register set to C2h to the non-packet device. Data returned from the non-packet device shall be translated (see section 8.2.4) into the appropriate log sense parameter data to be returned to the application client.
All others	U	Not supported.

PAGE CODE field values that are not supported shall cause the SATL to return a CHECK CONDITION with SENSE KEY set to ILLEGAL REQUEST and ADDITIONAL SENSE CODE set to INVALID FIELD IN CDB.

8.2.4 Informational Exceptions log page (2Fh) parameter data

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Data received from a non-packet device in response to an ATA SMART RETURN STATUS command shall be appropriately translated by the SATL into parameter data for the Informational Exceptions log page (2Fh) as defined in SPC-3 prior to delivery to the application client. Table 4 shows the appropriate parameter data translations for data returned from the non-packet device in response to an ATA SMART RETURN STATUS command.

Table 4 - ATA SMART RETURN STATUS translations

Data returned to SATL from non-packet device for ATA SMART RETURN STATUS command	SMART condition	Informational Exceptions log page (2Fh) parameter code 0000h
LBA Mid = 4Fh LBA High = C2h	threshold not exceeded	byte 4 = 00h byte 5 = 00h
LBA Mid = F4h LBA High = 2Ch	threshold exceeded	byte 4 = 5D byte 5 = 10