

To: T10 Technical Committee  
From: Rob Elliott (elliott@hp.com) and Wayne Bellamy, HP (wayne.bellamy@hp.com)  
Date: 10 September 2004  
Subject: 04-219r3 SAT SPC-3 ATA Information VPD page

### **Revision history**

Revision 0 (8 July 2004) First revision  
Revision 1 (29 July 2004) Incorporated comments from July 2004 SAT WG.  
Revision 2 (23 August 2004) Incorporated comments from 12 August 2004 SAT teleconference.  
Revision 3 (10 September 2004) Incorporated comments from 26 August 2004 SAT WG.

### **Related documents**

sat-r00 - SCSI to ATA Translation (SAT) revision 0 (Bob Sheffield, Intel)  
T10/04-218r0 - SAT INQUIRY contents (Rob Elliott, HP)  
T13/ata7v1r4b - ATA/ATAPI-7 volume 1 revision 4b  
T10/03-157r2 SATA II Specification: Port multiplier revision 1.090 11 August 2003 (Amber Huffman, Intel)  
T10/spc3r19 - SCSI Primary Commands - 3 revision 19

### **Overview**

SCSI to ATA translators should return a VPD page containing the contents of the power-on signature and the results of an IDENTIFY DEVICE or IDENTIFY PACKET DEVICE command returned by the ATA or ATAPI device.

Presence of this VPD page is one indication that the logical unit represents an ATA device being mapped into SCSI by an SATL, or an ATAPI device being accessed through a SATL (with the SCSI command delivered using an ATA PACKET command). Software can use this page to obtain the full serial number, firmware revision, and model number strings for presentation to a user, since they don't have directly corresponding fields in the SCSI standard INQUIRY data.

The IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data could also be retrieved via an ATA passthrough command, but that requires more effort on the part of software and does not provide a way to retrieve the power-on signature.

To further describe the SATL, VENDOR IDENTIFICATION, PRODUCT IDENTIFICATION, and PRODUCT REVISION LEVEL fields identifying the SATL are included in the VPD page.

Adding this VPD page requires the SATL to include the page code in the list returned by the Supported VPD Pages VPD page 00h as well. For ATAPI, this requires modifying the page data returned by the ATAPI device. ATAPI support is proposed as being optional.

### **Suggested changes to SPC-3**

Assign a VPD page code for the ATA Information VPD page (89h).

### **Suggested changes to SAT [\[all text is new\]](#)**

#### **8.1.3.xx ATA Information VPD page**

The ATA Information VPD page contains:

- a) information about the SATL;
- b) signature of the ATA or ATAPI device; and
- c) IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data from the ATA or ATAPI device.

Table 1 defines the ATA Information VPD page.

**Table 1 — ATA Information VPD page**

Byte\Bit	7	6	5	4	3	2	1	0
0	PERIPHERAL QUALIFIER			PERIPHERAL DEVICE TYPE				
1	PAGE CODE (89h)							
2	(MSB)	PAGE LENGTH (568)						(LSB)
3								
4	Reserved							
7								
8	SAT VENDOR IDENTIFICATION							
15								
16	SAT PRODUCT IDENTIFICATION							
31								
32	SAT PRODUCT REVISION LEVEL							
35								
36	SIGNATURE							
55								
56	COMMAND CODE							
57								
59	Reserved							
60								
571	IDENTIFY DEVICE OR IDENTIFY PACKET DEVICE DATA							

The SAT VENDOR IDENTIFICATION field contains eight bytes of ASCII data identifying the vendor of the SATL. The data shall be left aligned within the field. The vendor identification string shall be one assigned by INCITS for use in the Standard INQUIRY data VENDOR IDENTIFICATION field. A list of assigned vendor identification strings is in SPC-3 and on the T10 web site (<http://www.t10.org>).

The SAT PRODUCT IDENTIFICATION field contains sixteen bytes of ASCII data as defined by the vendor of the SATL. The data shall be left-aligned within the field.

The SAT PRODUCT REVISION LEVEL field contains four bytes of ASCII data as defined by the vendor of the SATL. The data shall be left-aligned within the field.

The SIGNATURE field contains the contents of the task file registers after the last power-on reset, hardware reset, software reset, or EXECUTE DEVICE DIAGNOSTIC command. It follows the format of the initial SATA Device-to-Host Register FIS (see ATA/ATAPI-7 V3). Table 2 defines the SIGNATURE field.

**Table 2 — SIGNATURE field**

Byte\Bit	7	6	5	4	3	2	1	0
0	FIS TYPE (34h)							
1	Reserved	INTERRUPT	Reserved		PM PORT			
2	STATUS							
3	ERROR							
4	LBA LOW							
5	LBA MID							
6	LBA HIGH							
7	DEVICE							
8	LBA LOW EXP							
9	LBA MID EXP							
10	LBA HIGH EXP							
11	Reserved							
12	SECTOR COUNT							
13	SECTOR COUNT EXP							
14	Reserved							
19	Reserved							

All fields within the SIGNATURE field are defined in ATA/ATAPI-7 V1 and ATA/ATAPI-7 V3.

Table 3 lists common signature values for fields within the SIGNATURE field.

**Table 3 — Common signature values (informative)**

Field	ATA device	ATAPI device
SECTOR COUNT	01h	01h
LBA LOW	01h	01h
LBA MID/BYTE COUNT LOW	00h	14h
LBA HIGH/BYTE COUNT HIGH	00h	EBh
DEVICE	00h	00h

---

[Editor's Note 1: The SAT editor may omit the common signature values table if desired.](#)

---

The COMMAND CODE field contains the command code used to retrieve the data in the IDENTIFY DEVICE OR IDENTIFY PACKET DEVICE DATA field (e.g., ECh for IDENTIFY DEVICE (i.e., the ATA device type) or A1h for IDENTIFY PACKET DEVICE (i.e., the ATAPI device type) or 00h for other device types).

The IDENTIFY DEVICE OR IDENTIFY PACKET DEVICE DATA field contains:

- a) if the device is an ATA device, the IDENTIFY DEVICE data (see ATA/ATAPI-7 V1). If the IDENTIFY DEVICE command fails, 512 bytes each set to 00h;
- b) if the device is an ATAPI device, the IDENTIFY PACKET DEVICE data (see ATA/ATAPI-7 V1). If the IDENTIFY PACKET DEVICE command fails, 512 bytes each set to 00h; or
- c) if the device is any other device type, 512 bytes each set to 00h.

The data shall be presented with byte preservation (i.e., ATA byte n maps to SCSI byte n), as shown in table 4.

**Table 4 — IDENTIFY DEVICE OR IDENTIFY PACKET DEVICE DATA field**

Byte	Contents
0	IDENTIFY DEVICE or IDENTIFY PACKET DEVICE word 0 bits 7:0 (i.e., byte 0)
1	IDENTIFY DEVICE or IDENTIFY PACKET DEVICE word 0 bits 15:8 (i.e., byte 1)
2	IDENTIFY DEVICE or IDENTIFY PACKET DEVICE word 1 bits 7:0 (i.e., byte 2)
3	IDENTIFY DEVICE or IDENTIFY PACKET DEVICE word 1 bits 15:8 (i.e., byte 3)
...	...
510	IDENTIFY DEVICE or IDENTIFY PACKET DEVICE word 255 bits 7:0 (i.e., the SIGNATURE field)
511	IDENTIFY DEVICE or IDENTIFY PACKET DEVICE word 255 bits 15:8 (i.e., the CHECKSUM field)

NOTE 1 Although the SERIAL NUMBER field (words 10 to 19), FIRMWARE REVISION field (words 23 to 26), and MODEL NUMBER field (words 27-46) contain ASCII characters, every other byte is swapped within them (see ATA/ATAPI-7 V1). For example, the SERIAL NUMBER field is interpreted as: {word 10 bits 15:8, word 10 bits 7:0, word 11 bits 15:8, word 11 bits 7:0, ...}, which corresponds to these bytes in the IDENTIFY DEVICE DATA field: {byte 21, byte 20, byte 23, byte 22, ...}.

Since some of the fields within the IDENTIFY DEVICE and IDENTIFY PACKET DEVICE data are variable (i.e., not fixed), the IDENTIFY DEVICE or IDENTIFY PACKET DEVICE command shall be sent to retrieve updated data whenever the ATA Information VPD page is requested.