

To: T10 Technical Committee
From: Rob Elliott, HP (elliott@hp.com)
Date: 2 November 2007
Subject: 07-203r0 SBC-3 Reporting nominal form factor

Revision history

Revision 0 (2 November 2007) First revision

Related documents

sbc3r11 - SCSI Block Commands - 3 (SBC-3) revision 11
T13/e07161r2 - ATA8-ACS Reporting device nominal form factor (Wayne Bellamy, HP)
- Offshoot of e06176
- Accepted by T13 in October 2007

Overview

The major characteristics of a disk drive are:

- a) capacity (e.g., 500 GB, 750 GB) - reported via READ CAPACITY
- b) rpm (e.g., 7200 rpm, 10K rpm, 15K rpm) - reported in the Block Device Characteristics VPD page
- c) interface (e.g., SAS or SATA) - reported via ATA Information VPD page, Device Identification VPD page, and SCSI Ports VPD page
- d) form factor (e.g., 1.8", 2.5", 3.5", or 5.25") - not available

A NOMINAL FORM FACTOR field is proposed for the Block Device Characteristics VPD page, using the same encoding as the proposal recently accepted by T13 for ATA devices. This will ease SAT translations of ATA devices into SCSI block devices.

Although T10 standards are supposed to use SI units, form factor specifications generally use inches. For example, SFF has these specifications:

- a) SFF-8111 Specification for 1.8" drive form factor (60x70mm)
- b) SFF-8201 Specification for form factor of 2.5" disk drives
- c) SFF-8301 Specification for form factor of 3.5" disk drives
- d) SFF-8501 Specification for form factor of 5.25" disk drives

For reference, the equivalent units are:

- a) 1.8" = 45.72 mm
- b) 2.5" = 63.5 mm
- c) 3.5" = 88.9 mm
- d) 5.25" = 133.35 mm

This proposal uses only inches; matching the industry terminology is more important.

T13 rejected proposals to:

- a) only define coded values for precise form factors defined in specific form factor references (e.g., one code for SFF-8501, 3 codes for SFF-8301, 8 codes for SFF-8201, and 2 codes for SFF-8110). This became mired in debates over the many different heights available. Also, many devices don't comply with SFF specifications; SATA devices follow form factors defined in SATA itself.
- b) define a range for each nominal form factor (e.g., 10h-1Fh for 5.25"), with one generic code (e.g., 10h for 5.25" with no more details) and the rest reserved for specific references (e.g., 11h - 1Fh for specific SFF or SATA specification references).
- c) define separate width, length, and height dimensions. This provides too much detail and could be confusing (a 3.5" drive really has a 4" outer shell).

Although T10 could provide a more complex field definition than ATA, it is crucial that the ATA values be mappable into the SCSI values by a SATL.

Suggested changes to SBC-4

6.4 Vital product data (VPD) parameters

6.4.1 VPD parameters overview

This subclause defines the VPD pages used only with direct-access block devices. See SPC-4 for VPD pages used with all device types.

The VPD page codes specific to direct-access block devices are defined in table 129.

Table 129 — Direct-access block device VPD page codes

VPD page code	VPD page name	Reference	Support requirements
B9	Block Limits VPD page	6.4.2	Optional
B1	Block Device Characteristics VPD page	6.4.3	Optional
B2h - BFh	Reserved for this standard		

6.4.3 Block Device Characteristics VPD page

The Block Device Characteristics VPD page contains parameters indicating characteristics of the logical unit.

Table 131 defines the Block Device Characteristics VPD page.

Table 131 — Block Device Characteristics VPD page

Byte/Bit	7	6	5	4	3	2	1	0
0	PERIPHERAL QUALIFIER			PERIPHERAL DEVICE TYPE				
1	PAGE CODE (B1h)							
2	(MSB)	PAGE LENGTH (3Ch)						(LSB)
3								
4	(MSB)	MEDIUM ROTATION RATE						(LSB)
5								
6	Reserved							
7	Reserved				Reserved NOMINAL FORM FACTOR			
8								
63	Reserved							

The PERIPHERAL QUALIFIER field and the PERIPHERAL DEVICE TYPE field are defined in SPC-4.

The PAGE CODE field and the PAGE LENGTH field are defined in SPC-4 and shall be set to the values defined in table 131.

The MEDIUM ROTATION RATE field is defined in table 132.

Table 132 — MEDIUM ROTATION RATE field

Code	Description
0000h	Medium rotation rate is not reported
0001h	Non-rotating medium (e.g., solid state)
0002h - 0400h	Reserved
0401h - FFFEh	Nominal medium rotation rate in rotations per minute (i.e., rpm) (e.g., 7 200 rpm = 1C20h, 10 000 rpm = 2710h, and 15 000 rpm = 3A98h)
FFFFh	Reserved

[The NOMINAL FORM FACTOR field indicates the nominal form factor of the device containing the logical unit and is defined in table 133.](#)

Table 133 — NOMINAL FORM FACTOR field

<u>Code</u>	<u>Description</u>
0h	Nominal form factor is not reported
1h	5.25 inch
2h	3.5 inch
3h	2.5 inch
4h	1.8 inch
5h	Less than 1.8 inch
All others	Reserved