

To: T10 Technical Committee
 From: Rob Elliott, HP (elliott@hp.com)
 Date: 14 January 2003
 Subject: T10/03-028r1 SPC-3 SBC-2 Block Limits VPD page

Revision History

Revision 0 (17 December 2002) first revision

Revision 1 (14 January 2003) changed to INQUIRY VPD implementation based on request from George Penokie (IBM).

Related Documents

sbc2r08 - SCSI Block Commands - 2 revision 8

spc3r10 – SCSI Primary Commands – 3 revision 10

Overview

Some block targets have maximum transfer lengths on their simple read and write commands; e.g. they might refuse a command requesting more than 16 MB by returning CHECK CONDITION/ILLEGAL REQUEST/INVALID FIELD IN CDB.

Some block targets, particularly RAID controllers, have noticeable performance degradation when transfer lengths exceed a certain threshold and/or are not multiples of a certain granularity.

A (read-only) INQUIRY VPD page to return these transfer length limitations is proposed.

Related

There is a maximum size reported for XOR write commands in the XOR Control mode page.

SSC-2 has a READ BLOCK LIMITS command for tape drives. It returns: granularity, maximum block length limit, and minimum block length limit. The opcode (05h) is marked vendor-specific for block devices.

Suggested Changes to SPC-3

8.6 Vital product data parameters

8.6.1 Vital product data parameters overview and page codes

This subclause describes the vital product data (VPD) page structure and the VPD pages (see table 265) that are applicable to all SCSI devices. These VPD pages are optionally returned by the INQUIRY command (see 7.4) and contain vendor specific product information about a target or logical unit. The vital product data may include vendor identification, product identification, unit serial numbers, device operating definitions, manufacturing data, field replaceable unit information, and other vendor specific information. This standard defines the structure of the vital product data, but not the contents.

Table 265 — Vital product data page codes

Page code	VPD page name	Reference	Support requirements
82h	ASCII	8.6.2	Optional
01h – 7Fh	ASCII	8.6.3	Optional
83h	Device i dentification	8.6.4	Mandatory
81h	Obsolete	3.3.7	
84h	Software i nterface i dentification	8.6.5	Optional
00h	Supported VPD pages	8.6.6	Mandatory
80h	Unit Serial Number	8.6.7	Optional
85h – BFh AFh	Reserved		
C0h – FFh	Vendor-specific		
B0h - BFh	See specific device type for definition		

Suggested Changes to SBC-2**5.2.xx XYZ command [each command with a TRANSFER LENGTH field]**

...

The TRANSFER LENGTH field specifies The transfer length field is constrained by the MAXIMUM TRANSFER LENGTH field in the Block Limits mode page (see 6.1.3.10).

5.2.27 VERIFY (10) command**5.2.28 VERIFY (12) command****5.2.29 VERIFY (16) command**

Change VERIFICATION LENGTH to TRANSFER LENGTH since data is transferred.

5.3.2 ERASE (10) command**5.3.3 ERASE (12) command**

Change TRANSFER LENGTH to ERASE LENGTH since no data is transferred.

6.1.3.10 XOR Control mode page

...

The MAXIMUM TRANSFER LENGTH field specifies the maximum transfer length in blocks that the target accepts for a single XDWRITE, XDWRITE EXTENDED, ~~XDWRITE~~, or XPWRITE command.

The MAXIMUM REBUILD ~~READ-TRANSFER~~ SIZE field specifies the maximum transfer length in blocks that the target shall use for commands issued as a temporary initiator (e.g., READ and XPWRITE commands) during a rebuild operation. This field does not limit the rebuild size.

6 Parameters for block devices**6.1 Parameters for direct-access block devices****6.1.n Vital product data parameters****6.1.n.1 Overview**

This subclause defines the VPD pages used with direct-access block type devices.

The VPD page codes for block devices are defined in table 354.

Table 265 — Direct-access block device VPD page codes

<u>Page code</u>	<u>VPD page name</u>	<u>Reference</u>	<u>Support requirements</u>
<u>82h</u>	<u>ASCII Implemented Operating Definition VPD page</u>	<u>SPC-3</u>	
<u>01h – 7Fh</u>	<u>ASCII Information VPD page</u>	<u>SPC-3</u>	
<u>83h</u>	<u>Device Identification VPD page</u>	<u>SPC-3</u>	
<u>81h</u>	<u>Obsolete</u>	<u>SPC-3</u>	
<u>84h</u>	<u>Software Interface Identification VPD page</u>	<u>SPC-3</u>	
<u>00h</u>	<u>Supported VPD pages VPD page</u>	<u>SPC-3</u>	
<u>80h</u>	<u>Unit Serial Number VPD page</u>	<u>SPC-3</u>	
<u>85h – AFh</u>	<u>Reserved</u>	<u>SPC-3</u>	
<u>C0h – FFh</u>	<u>Vendor-specific</u>	<u>SPC-3</u>	
<u>B0h</u>	<u>Block Limits VPD page</u>	<u>6.1.n.2</u>	<u>Optional</u>
<u>B1h – BFh</u>	<u>Reserved for this device type</u>		

[Editor's note: For opcodes, mode pages, etc. command sets have traditionally included the SPC-n pages in their lists. This means every time SPC-n gets a new feature, the command set is out of date. For VPD pages, why not just list the command-set specific pages in the command sets and let SPC-n define the rest? The resulting table would look like this:]

The VPD page codes specific to direct-access block devices are defined in table 265.

Table 265 —VPD page codes specific to direct-access block devices

<u>Page code</u>	<u>VPD page name</u>	<u>Reference</u>	<u>Support requirements</u>
<u>B0h</u>	<u>Block Limits VPD page</u>	<u>6.1.n.2</u>	<u>Optional</u>
<u>B1h – BFh</u>	<u>Reserved for this device type</u>		

6.1.n.2 Block Limits VPD page [new]

The Block Limits VPD page (see Table xx) provides the application client with the means to obtain certain operating parameters of the logical unit.

Table xx. Block Limits VPD page

	7	6	5	4	3	2	1	0
0	PERIPHERAL QUALIFIER			PERIPHERAL DEVICE TYPE				
1	PAGE CODE (B0h)							
2	Reserved							
3	PAGE LENGTH (n – 3)							
4	Reserved							
5	Reserved							
6	(MSB)	OPTIMAL TRANSFER LENGTH GRANULARITY						(LSB)
7								
8	(MSB)							
9								
10		MAXIMUM TRANSFER LENGTH						
11								(LSB)
12	(MSB)							
13								
14		OPTIMAL TRANSFER LENGTH						
15								(LSB)

The PERIPHERAL QUALIFIER field and the PERIPHERAL DEVICE TYPE field are defined in SPC-3.

The PAGE CODE field shall be set to B0h.

The PAGE LENGTH field is defined in SPC-3.

The OPTIMAL TRANSFER LENGTH GRANULARITY field specifies the optimal transfer length granularity in blocks for a single PRE-FETCH, READ, READ LONG, VERIFY, WRITE, WRITE AND VERIFY, WRITE LONG, XDREAD, XDWRITE, XDWRITEREAD, XDWRITE EXTENDED, or XPWRITE command. Transfers with transfer lengths not equal to a multiple of this value may incur significant delays in processing.

The MAXIMUM TRANSFER LENGTH field specifies the maximum transfer length in blocks that the target accepts for a single PRE-FETCH, READ, READ LONG, VERIFY, WRITE, WRITE AND VERIFY, WRITE LONG, XDREAD, XDWRITE, XDWRITEREAD, XDWRITE EXTENDED, or XPWRITE command. Requests for transfer lengths exceeding this limit result in CHECK CONDITION status with a sense key of ILLEGAL REQUEST and an additional sense code of INVALID FIELD IN CDB. A value of zero means there is no reported limit on the transfer length.

The OPTIMAL TRANSFER LENGTH field specifies the optimal transfer length in blocks for a single PRE-FETCH, READ, READ LONG, VERIFY, WRITE, WRITE AND VERIFY, WRITE LONG,

XDREAD, XDWRITE, XDWRITEREAD, XDWRITE EXTENDED, or XPWRITE command.
Transfers with transfer lengths exceeding this value may incur significant delays in processing.

6.1 Parameters for optical block devices

6.1.n Vital product data parameters

Refer to the VPD parameters for direct access block devices (see 6.1.n).

6.3 Parameters for write-once block devices

Refer to the parameters for optical memory block devices (see 6.2).